



BIDDERS MANUAL

March 16th, 2023



Canton Twp CIP - BP 02 Victory Park

Job No. 222273-300

46555 Michigan Ave, Canton, MI 48188

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Charter Township of Canton



Invitation To Bid for

Canton Twp. CIP – BP 02 Victory Park Ballfields

Contact: Michael Sheppard
Phone: 734-394-5225

Date Issued: 03/16/2023

Due Date & Time: 3:00 p.m., Thursday, April 20th

Invitation to Bid

To: Potential Bidders
Project: Canton Twp. CIP - BP 02 Victory Park Ballfields
Location: 46555 Michigan Ave, Canton, MI 48188

You are invited to submit a request for proposal for all supervision, labor, materials, tools, equipment, and general conditions required to perform the work for the Bid Package(s) described herein and in the Summary of Bid Packages. Bid Proposals will be received by Bid Package only and must include all work specified for such package. Combination bid packages are acceptable.

The deadline established for the receipt of your sealed bid is 04/20/2023 at 3:00 p.m. The bid is to be submitted to the Clerk's Office, 1150 S. Canton Center Road, Canton, Michigan 48188. Address the proposal to:

Canton - Clerk's Office
Canton Twp. CIP - BP 02 Victory Park
DUE 04/20/2023 AT 3:00 P.M.
1150 Canton Center S
Canton MI 48188

PROPOSAL INQUIRY

Any questions concerning this solicitation should be directed to Joel Trent, The Albert M. Higley Company, at 248-697-7476, or e-mail at joel.trent@amhigley.com.

BIDDING SCHEDULE

03/16/2023.....	Issue Invitation to Bid
03/27/2023..... 3:00 PM	Pre-Bid Conference - Please request an invite from Joel Trent: joel.trent@amhigley.com
03/31/2023..... 2:00 PM	Last Day for RFI's - Please direct all questions and inquiries regarding this project to Joel Trent in writing by email to joel.trent@amhigley.com
04/20/2023.....	Proposals due at 3:00 pm. HARD COPIES ONLY.



See "Submission of Offers" requirements

Project Documents can be viewed and downloaded at:

(LINK ACCESS TBD BY CANTON TWP BID PORTAL)

INSPECTION OF SITE

Bidders are directed to inspect the site and to carefully investigate all conditions involved in the execution of the Work. A pre-bid walkthrough will be held at the date and time noted below. No contractor shall attempt to access the building or contact the building owner/manager prior to this meeting. No contractor will be allowed on-site without notifying The Albert M. Higley Company. No Bidder will be allowed additional compensation for conditions to which it has failed to inform itself prior to the award of the Bid Package.

FORM OF AGREEMENT

The successful Bidder is REQUIRED to execute The Albert M. Higley Company's standard Subcontract Agreement without modification and to adhere to all the terms and conditions therein. A copy of the Subcontract is included in the bid documents.

QUALIFICATIONS OF BIDDERS

In order to *submit* a bid, subcontractors are required to follow Canton Townships requirements for submission. In order to be *awarded* a subcontract, the bidder must have completed the prequalification process and been approved as well as be approved by Canton Township. To inquire on your prequalification status, please contact our prequalification manager at subprequal@amhigley.com or the Project Manager for this project.

GENERAL REQUIREMENTS & INSTRUCTIONS

1. SUBMISSION OF OFFERS:

All offers should be submitted in a sealed envelope or package. The invitation title and opening date shall be clearly displayed on the outside of the sealed envelope or package. The delivery of responses to the Clerk's Office prior to the specified date and time is solely and strictly the responsibility of the offeror. Any submittal received in the Clerk's Office after the specified date and time will not be considered. Responses shall be submitted on the forms provided by Canton. Additional information may be attached to the submittal. Facsimile submissions are NOT acceptable. No offer may be modified after acceptance. No offer may be withdrawn after opening for a period of sixty days unless otherwise specified. Bid must include all costs. All offers must include the original and at least (1) copy.



2. EXECUTION OF OFFER:
Offer shall contain a manual signature in the space(s) provided of a representative authorized to legally bind the offeror to the provisions therein.
3. EXECUTION OF ACCEPTANCE:
Canton Township legally recognizes acceptance of formal offer when a written contract is signed by both parties. Offeror is not to assume that the Canton Board of Trustees resolution approving the bid or proposal is a binding contract.
4. OPENING & RECORDING:
Opening shall be public in the Clerk's Office immediately following the advertised deadline date and time for receipt of submittals.
5. INTEGRITY:
Canton Township does not discriminate on the basis of race, color, national origin, sex, religion, age or disability in employment or the provision of services.
6. TABULATION:
Bid results will be posted on the MITN Website at
<https://www.bidnetdirect.com/mitn/solicitations/open-bids/page1>
7. BOARD AWARDS:
As the best interest of Canton may require, Canton reserves the right to make award(s) by an individual item, group of items, all or none, or a combination thereof; on a geographical basis and/or on a countrywide basis with one or more supplier(s) or provider(s); to reject any and all offers or waive any irregularity or technicality in offers received. Offerors are cautioned to make no assumptions. Any or all awards made as a result of this invitation shall conform to applicable ordinances and policies of Canton Township. **Bid awards will be posted on the Township's website at www.canton-mi.org. Please look under meeting minutes.**
8. BRAND NAME OR EQUAL:
If items requested by this invitation have been identified in the specifications by a brand name "OR EQUAL" description, such identification is intended to be descriptive and not restrictive and is to indicate the quality and characteristics of products that will be acceptable. Offers proposing "equal" products will be considered for award if such products are clearly identified in the offer and are determined by Canton and/or AM Higley to meet fully the salient characteristic requirements listed in the specifications.
9. PRICING:
Unless otherwise specified, prices offered shall remain firm for a period of at least sixty (60) days; all pricing of goods shall include FOB and Furnish and install to Canton Township, all packing, handling, shipping charges and delivery to any point(s) within Canton to a secure area or inside delivery. This will also be coordinated with the onsite superintendent from AM Higley.
10. PAYMENT TERMS:
Canton Township will remit full payment on all undisputed invoices within thirty (30) days from receipt by the appropriate person(s) of the invoice or receipt of all products or services ordered.

Payment terms to reference AM Higley Subcontract agreement terms and conditions. Paid when paid.

11. INCURRED EXPENSE:

This invitation does not commit Canton and/or AM Higley to make an award, nor shall Canton and/or AM Higley be responsible for any cost or expense which may be incurred by any respondent in preparing and submitting a reply, or any cost or expense incurred by any respondent prior to the execution of a purchase order or contract agreement.

12. QUESTIONS/ADDENDA:

Any questions concerning the conditions or specifications shall be directed to the designated contact person. Addenda items will be posted on the township website, on the Purchasing Division page under Requests for Bids, Proposals and Qualifications. It is the bidder's responsibility to check and verify that addenda have been issued. Failure to acknowledge addenda may result in the offer not being considered.

13. CLARIFICATION/CORRECTION OF ENTRY:

Canton reserves the right to allow for the clarification of questionable entries and the correction of OBVIOUS MISTAKES.

14. INSURANCE:

The successful bidder is required to furnish evidence of the following insurance requirements in accordance with Canton's Risk Management Policy O:02. Work may not commence until the Certificates of Insurance have been received. The coverage requirements are as follows:

Workers' Compensation Insurance: The Contractor shall procure and maintain during the life of this contract, Workers' Compensation Insurance, including Employers' Liability Coverage, in accordance with all applicable statutes of the State of Michigan.

Commercial General Liability Insurance: The Contractor shall procure and maintain during the life of this contract, Commercial General Liability Insurance on an "Occurrence Basis" with limits of liability not less than \$1,000,000 per occurrence and aggregate combined single limit, Personal Injury, Bodily Injury, and Property Damage. Coverage shall include the following extensions: (A) Contractual Liability; (B) Products and Completed Operations; (C) Independent Contractors Coverage; (D) Broad Form General Liability Extensions or equivalent.

Motor Vehicle Liability: The Contractor, or its subcontractors, shall procure and maintain during the life of this contract Motor Vehicle Liability Insurance, including Michigan No-Fault Coverage, with limits of liability not less than \$1,000,000 per occurrence combined single limit, Bodily Injury, and Property Damage. Coverage shall include all owned vehicles, all non-owned vehicles, and all hired vehicles.

Additional Insured: Commercial General Liability Insurance as described above, shall include an endorsement stating that the following shall be Additional Insured: The Charter Township of Canton, all elected



and appointed officials, all employees and volunteers, all boards, commissions, and/or authorities and board members, including employees and volunteers thereof.

Cancellation Notice: The Insurance coverage described above, shall include an endorsement stating the following: "It is understood and agreed that Thirty (30) days Advance Written Notice of Cancellation, Non-Renewal, Reduction, and/or Material Change shall be sent to: Mike Sheppard, 1150 Canton Center S., Canton MI, 48188

Indemnification: To the fullest extent permitted by law, the (name of contractor) agrees to defend, pay on behalf of, indemnify, and hold harmless the Charter Township of Canton, its elected and appointed officials, employees and volunteers, and others working on behalf of the Charter Township of Canton against any and all claims, demands, suits, or loss, including all costs connected therewith, and for any damages which may be asserted, claimed, or recovered against or from the Charter Township of by reason of personal injury, including bodily injury or death and/or property damage, including loss of use thereof, which arises out of or is in any way connected or associated with this agreement.

15. PUBLIC ACT 517 OF 2012: In accordance with Public Act 517 of the Public Acts of 2012, any Iran linked business is not eligible to submit a bid on a request for proposal with a public entity in Michigan. An "Iran linked business" includes the following:

- (1) A person engaging in investment activities in the energy sector of Iran, including a person that provides oil or liquefied natural gas tanker or products used to construct or maintain pipelines used to transport oil or liquefied gas for the energy section of Iran; and
- (2) A financial institution that extends credit to another person if that person will use the credit to engage in investment activities in the energy sector of Iran.

For purposes of this prohibition, "person" includes an individual, corporation, company, limited liability company, business association, partnership, society, trust, or any other non-governmental entity, organization, or group. It also includes a governmental entity or instrumentality of a governmental entity, or any successor, subunit, parent company or subsidiary of, or company under common ownership or control with and of the foregoing.

16. RESPONSIBLE CONTRACTING: Responses to this RFP will be evaluated using the point system shown in Section 2. All Contractors and subcontractors are encouraged to provide details of all the information requested in Section 2. If bidder does not submit all of the information requested, the bidder will not be precluded from the evaluation process, but scores will reflect the lack of information provided. Final Step of determination may result in an interview process, of all or subset of responsible bidders, that will be scored independently from the above evaluation criteria. Interviews will be based on a set of predetermined questions, depending on the project scope.

SECTION # 2 – RESPONSIBLE CONTRACTING REQUESTED INFORMATION

The following describes the elements that should be included in each of the proposal sections and the weighted point system that will be used for evaluation of the proposals.

Bidders should organize Proposals into the following Sections:



- A. Price
- B. Qualifications, Experience and Accountability
- C. Workplace Safety
- D. Workforce Development
- E. Social Equity and Sustainability
- F. Work Plan

Bidders are strongly encouraged to provide details of all of the information requested below as well as all Sub-Contractors. Back-up documentation may be requested at the sole discretion of Canton Township to validate all of the responses provided herein by the proposers. False statements by proposers to any of the criteria provided herein will result in the proposal being considered non-responsive and will not be considered for award. If bidder does not submit all of the information requested, the bidder will not be precluded from the evaluation process, but scores will reflect the lack of information provided.

A. Price (35 points)

1. Submitted Proposals must break out labor costs from material and equipment costs.

B. Qualifications, Experience and Accountability (15 points)

1. Qualifications of management and supervisory personnel to be assigned by the bidder, including the qualifications of subcontractors.
2. References from individuals or entities the bidder has worked for within the last five (5) years of service including specific municipal projects, information regarding records of performance and job site cooperation.
3. Evidence of any quality assurance program used by the bidder and the results of any such program on the bidder's previous projects.
4. Assurance that all construction work for this project must proceed economically, efficiently, continuously and without interruption.
5. A list of previous projects completed within the past five (5) years of comparable size and complexity, including dates, clients, approximate dollar value, and size. Documentation from these previous projects including but not limited to all extra costs relating to the bidder's timeliness, performance, technique standards, trade standards, quality of work, extension requests, contractual fines and penalties imposed, liens filed, history of claims for extra work and any contract defaults with an explanation of the reason for the default and how the default was resolved.
6. Provide a copy of the company's most recent financial statements.

C. Workplace Safety (10 points)

1. The ratio of journeypersons to apprentices proposed to be used on the construction project job site, if apprentices are to be used on the project.
2. Documentation of an on-going Michigan OSHA approved safety training program for employees to be used on the proposed job site.
3. Evidence of the bidder's workers' compensation Experience Modification Rating (EMR). Preference will be given to contractors and subcontractors who exhibit an EMR of 1.0 or less based on a three-year average.
4. All craft labor that will be employed by the firm for the project has completed at least the OSHA 10-hour training course for safety established by the U.S. Department of Labor, Occupational Safety & Health Administration.
5. All craft labor that will be employed by the firm for the project has completed at least the OSHA 30-hour training course for safety established by the U.S. Department of Labor, Occupational Safety & Health Administration.
6. Documentation of master or journeyperson certification or status for masters and journeypersons to be used on the project, and the source of such certification or status.

D. Workforce Development (15 points)

1. Documentation as to pay rates of employees and whether the bidder provides health insurance, pension or other retirement benefits, or other benefits to its employees.
2. Documentation that the bidder participates in a Registered Apprenticeship program that is registered with the United States Department of Labor Office of Apprenticeship or by a state Apprenticeship Agency recognized by the Office of Apprenticeship.

E. Social Equity and Sustainability (10 points)

1. A statement from the bidder as to what percentage of its workforce can be drawn significantly from area residents because a goal of the Township is to utilize, in its construction activities, local residents as much as is economically feasible while retaining the high quality of construction required for its construction activities, consistent with applicable law. The township will consider in evaluation which bids best serve its interest, the extents to which responsible and qualified bidders are able to achieve this goal.



2. Assurance that the bidder is an equal opportunity employer and does not discriminate on the basis of race, sex, pregnancy, age, religion, national origin, marital status, sexual orientation, gender identity or expression, height, weight or disability.
3. Evidence of Equal Employment Opportunity Programs, such as policies or specific programs, for minorities, women, veterans, returning citizens and small businesses.
4. Evidence that the bidder is a business operated in Canton Township.
5. If applicable, state certification evidence to support if the business is owned by at least 51% by women, minorities, veterans or people with disabilities.

F. Work Plan (15 points)

1. The proposed work plan to complete the project, including such information as the schedule, staging, materials and equipment to be used, methods and techniques for completing the work that will be employed, plans to maintain operations at Township facilities or access to city infrastructure during construction if desired by the Township, or other criteria as determined by the Township in the bid documents.

Selection Process:

Final step of determination may result in an interview process, of all or subset of responsible bidders, that will be scored independently from the above evaluation criteria. This provides the opportunity to explore significant variations of the proposals received. Interviews will be based on a set of predetermined questions, depending on the project scope.

Instructions to Bidders

To: Potential Bidders
Project: Canton Twp. CIP - BP 02 Victory Park Ballfields

Please carefully review the information included in the entire set of bid documents during the preparation of your bid. All contracts will be based on the entire set of documents.

Pay attention to:

1. All bids must be on the "Form of Proposal" included in the Bidding Manual.
2. All Bids must comply with Canton Twp requirements for "Responsible Contracting Requested Information."
3. Form of Contract - AM Higley's Standard Form of Subcontract is included in the project manual for your review. No modifications to this form are permitted.
4. Insurance - AM Higley's standard requirements. A sample certificate is included for your reference.
5. Refer to the included "Schedule B's" for a description of the bid packages and detailed scopes of work.
6. Bidding multiple bid packages is acceptable, however please submit standalone pricing for each package and combination pricing as a voluntary deduct.
7. **Payment terms is paid when paid.**
8. Parking will be provided on site.
9. **The proposed schedule is based on starting September 2023 and Substantial Completion of April 15th 2024. Bidders are encouraged to make recommendation on potential concerns as it relates to the Phasing of the project and or lead times.**
10. Bid questions are to be e-mailed to Joel Trent at joel.trent@amhigley.com. Please note the due date on the Invitation to Bid.
11. There will be a pre-bid meeting held at the time and date indicated on the invitation to bid. Attendance is strongly encouraged.
12. Safety is top priority on the project and all bidders shall review and comply with Project Safety Plan.
13. The new Style Hard Hats (*meets or exceeds ANSI Z89.1 Type 1 Class E EN 12492*) are a requirement on Albert M Higley jobsite. Please review the cost associated with said hard hats and include it within your bid.
14. All bidders are subject to Canton Township's Purchasing and Procedure Finance Policy in conjunction to AM Higley prequalification requirements.

Project Narrative

To: Potential Bidders
Project: Canton Twp. CIP - BP 02 Victory Park Ballfields

PROJECT NARRATIVE

The project is an interior/exterior renovation of the existing sports bar, ballfields, and maintenance building.

Sports Bar: This includes painting/touch up of interior finishes. Re-upholster seat cushions. Removal and replacement of the existing aluminum storefront and glass. Resurfacing stainless steel panels in kitchen. Removal and rework of existing lighting controls for ballfields in electrical room.

Ballfields: This includes removal/replacement of existing ballfield light poles, lights, and lighting controls. Grinding of existing concrete in the dugouts. Renovation of the existing fencing. And repairs of the turf/grade once work has been completed.

Pavilion: Removal of exiting toilet partitions and accessories. Install of new toilet partitions, and reinstallation of toilet accessories. Remove and replace existing asphalt shingle roof.

Maintenance Building: Remove/replace existing submersible motors and pump system controller.

Canton Twp. CIP - BP 02 Victory Park Ballfields

All Bid Packages are lump sum. The scope of work is defined in the Scope of Work documents (Schedule B) and the Scope of Work Matrix.

Form of Proposal

Submitted by: _____ Date: _____
(Company Name)

Having fully read and examined the Contract Documents pertaining to the Project, including without limitation the Drawings and Specifications, Pre-bid Walkthrough, all items listed in the Summary of Work contained herein, and the following Addenda:

Add. No.: _____ Dated: _____ Add. No.: _____ Dated: _____
Add. No.: _____ Dated: _____ Add. No.: _____ Dated: _____

The undersigned Bidder proposes to furnish all engineering, supervision, labor, materials, tools, scaffold, and equipment necessary to perform all Work for the listed Bid Package(s) for the following lump sum amount:

BID PACKAGE

BID AMOUNT

BP 00	Rough Carpentry	\$ _____
BP 01	Finish Carpentry	\$ _____
BP 02	Roofing	\$ _____
BP 03	Glazing/Storefronts	\$ _____
BP 04	Tiling	\$ _____
BP 05	Interior/Exterior Painting	\$ _____
BP 06	Toilet Partitions	\$ _____

BP 07 Electrical \$ _____

BP 08 Fencing \$ _____

COMBINATION BID

Bidders have the option to submit a revised total bid for multiple bid packages. List the bid packages included in the combined bid below and the total combined bid. All bid packages included in the combined bid must be bid separately as an individual bid package.

_____ \$ _____
(List Each Bid Package Number)

PROJECT TEAM

Bidders are required to list their Project Manager and Foreman.

Project Manager: _____

Foreman: _____

ALTERNATES

The alternates below **MUST** be submitted with your base bid.

Voluntary Alternate #1

Voluntary Alternate #2

Voluntary Alternate #3

Alternates listed on Schedule B's

BREAKOUT COSTS

The costs below **MUST** be included in your base bid. These costs are for verification only.

Breakout No. 1- Labor \$ _____

Breakout No. 2- Material \$ _____

Breakout No. 3- Misc. Equipment, tools, rentals \$ _____

Breakout No. 4- Permits \$ _____



Breakout costs for Accounting / Canton Twp purposes only

Breakout No. 1- Ballfield light infrastructure	\$ _____
Breakout No. 2- Ballfield Fence and backstops	\$ _____
Breakout No. 3- Restaurant Windows Aluminum Framed	\$ _____
Breakout No. 4- Metal Panel Cold Storage Restaurant	\$ _____
Breakout No. 5- Restaurant Booths	\$ _____
Breakout No. 6- Electrical Bar Panel, Fuses, FPE	\$ _____
Breakout No. 7- Pavilion Building Shingle Roof	\$ _____
Breakout No. 8- Maint. Irrigation Pump 1 & 2	\$ _____
Breakout No. 9- Pavilion Restrooms: Men's and Women's	\$ _____
Breakout No. 10- Energy project 2 - Mechanical & lighting systems	\$ _____

LABOR RATES (include line items for overtime rates)

Please ATTACH hourly labor rates for all trades to be utilized at the Project site for straight, 1-1/2x, and 2x. **Rates will be valid for the entire duration of the project.** Include each level of the trades to be employed at the site (i.e. journeyman, foreman, etc.). These rates should be bare rates with no markup included.

REQUIRED PROPOSAL ATTACHMENTS

1. Provide any applicable unit prices not listed above as identified in the bid documents.
2. Provide hourly equipment rates to be utilized at the Project site as an attachment to your bid.
3. Any necessary assumptions and clarifications.

SAFETY

Bidder confirms that they have reviewed ALL the safety requirements contained in the bid documents and fully intends to comply with them.

TAXES

This project is a TAXABLE project; hence, all applicable taxes should be included in the above amount for work incorporated into the project.

CONTRACT

The contractor submitting a proposal on this project agrees to sign The Albert M. Higley Company Subcontract (copy is included in specifications) without any changes or modifications. The refusal to sign this contract as is, may, at the discretion of The Albert M. Higley Company, be grounds for rejecting this proposal.

SUBSTITUTIONS



Proposals shall be based upon make and type of materials and equipment set forth in the Specifications. If substitutions are made from the specifications, they will be proposed after bids have been submitted. Subject to final approval from the Architect and Owner.

COMMUNITY BENEFITS PROGRAM

The Albert M. Higley Co. fosters a culture in which all employees have the opportunity to grow and succeed, and in which our differences are celebrated. As we strive to be diverse and inclusive internally, we want to ensure this ideology is reflected by our contractors and seen in our workforce. Our mission is to create a strong, diverse pool of contractors, to ensure the benefits of a construction project spread to the whole community, and that each leave the project stronger than they started.

To facilitate community involvement during the construction process, The Albert M. Higley Co. has developed the Community Benefits Program. The Community Benefits Program will encourage firms to directly partner, subcontract with, or purchase supplies from firms to meet the project goals. All contractors are required to submit a Community Engagement Plan as part of their bid. This plan will be discussed during scope reviews and will be taken into consideration when selecting a contractor for each bid package.

COMMUNITY BENEFITS PLAN

All bidders must submit (**by \$ value**) the value of work / material supply that will be done by Certified Minority Business Enterprise entities ("MBE"), Certified Women Business Enterprise entities ("WBE"), Small Business Enterprise entities ("SBE"), and Veteran-Friendly Business Enterprise entities ("VBE"). AM Higley's posted participation goal is 15% "MBE", 5% "WBE", 5% "SBE", and 2% "VBE".

MBE Value: \$_____

WBE Value: \$_____

SBE Value: \$_____

VBE Value: \$_____

DECLARATION OF SUBCONTRACTORS/SUPPLIERS

The list of proposed vendors, subcontractors, or suppliers must accompany the bid form for all proposed to complete the package of work. Within 7 days of Notice to proceed, this list must be finalized. Any changes must be pre-approved by the Construction Manager.

Item/Subcontractor/Vendor:

1. _____

2. _____

MBE WBE SBE VBE

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------



3. _____

4. _____

5. _____

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PROPOSAL SUBMISSION

Please submit a hard copy to Mike Sheppard at Canton Township no later than the time and date indicated in the Instructions to Bidders or as modified in any addendums. Canton - Clerk's Office, Canton Township CIP – BP 02 Victory Park 04/20/2023 AT 3:00 P.M.

Address is: 1150 Canton Center S Canton MI 48188 ATTN: Mike Sheppard

BIDDER'S SIGNATURE

Company: _____

Authorized Signature: _____

Name (print): _____

Title: _____

Street Address: _____

City, State, Zip: _____

Telephone Number: _____

Email Address: _____

THE FOREGOING IS A TRUE STATEMENT OF FACTS:

I/we hereby certify under penalty of law that we are not an Iran linked business as defined in PA 517 of 2012.

Signature of Authorized Company Representative: _____

Company _____

Address: _____

Date: _____

Representative's Name _____

(Please Print)

Specific Scopes of Work

To: Potential Bidders
Project: Canton Twp. BP 02 - Victory Park Ballfields

SCOPES of WORK

Following are the specific scopes of works (Schedule B) for each bid package. All Bidders are responsible to fully understand all work within your scope of work and reference any other scopes of work which may affect your work. **Please reference the Bid Package List and Responsibility Matrix for a complete understanding of the specifications which apply to each bid package.**

BP 00	Rough Carpentry
BP 01	Finish Carpentry
BP 02	Roofing
BP 03	Glazing/Storefronts
BP 04	Tiling
BP 05	Interior/Exterior Painting
BP 06	Toilet Partitions
BP 07	Electrical
BP 08	Fencing

Canton Township CIP - BP 02 Victory Park Ballfields

		0	1	2	3	4	5	6	7	8
		Rough Carpentry	Finish Carpentry	Roofing	Glazing/Storefronts	Tiling	Interior/Exterior Painting	Toilet Partitions	Electrical	Fencing
Specification Section										
Division 01 - General Requirements										
01 20 00	Price and Payment Procedure									
01 25 00	Substitution Procedures									
01 30 00	Administrative Requirements									
01 40 00	Quality Requirements									
01 42 16	Definitions									
01 50 00	Temporary Facilities and Controls									
01 60 00	Product Requirements									
01 62 01	Request for Substitution									
01 70 00	Execution and Closeout Requirements									
01 78 00	Closeout Submittals									
Division 2- Existing Conditions										
02 41 00	Demolition	x	x	x	x	x			x	x
Division 3 - Concrete										
03 30 00	Cast-in-Place Concrete								x	x
Division 6- Wood, Plastics, and Composites										
06 10 00	Rough Carpentry (NIC in Spec Book)	x		x						
06 20 00	Finish Carpentry (NIC in Spec Book)		x							
Division 7- Thermal & Moisture Protection										
07 01 50.19	Preparation for Re-Roofing			x						
07 21 00	Thermal Insulation			x						
07 31 13	Asphalt Shingles			x						
07 92 00	Joint Sealants	x	x	x	x	x	x		x	
Division 8- Openings										
08 43 13	Aluminum-Framed Storefronts				x		x			
08 80 00	Glazing				x					
Division 9- Finishes										
09 06 01	Interior Finish Key & Schedule		x		x	x	x			
09 30 00	Tiling					x				
09 78 00	Interior Wall Paneling	x								
09 91 13	Exterior Painting						x			
09 91 23	Interior Painting						x			
Division 10- Specialties										
10 21 13.19	Plastic Toilet Compartments	x						x		
Division 26 - Electrical										
26 01 00	General Electrical Requirements								x	
26 05 00	Basic Electrical Materials and Methods								x	
26 05 43	Underground Ducts and Raceways for Electrical Systems								x	
26 05 74	Short Circuit/Protective Device Coordination/Arc Flash Study								x	
26 22 00	General Purpose Dry Type Transformers								x	
26 24 14	Main Distribution Switchboards - Circuit Breaker System								x	
26 40 00	Electrical Service System								x	
26 42 20	Distribution Panelboards - Circuit Breaker Type								x	
26 45 00	Branch Distribution and Control Equipment								x	
26 90 00	Demolition and Renovation Work								x	
26 95 00 Elec	Electrical Acceptance Tests								x	
Division 31 - Earthwork										
31 00 00	Excavation								x	x
Division 32- Exterior Improvements										
32 31 13	Chain Link Fences & Gates						x			x
32 31 23	Plastic Fences and Gates						x			x

Schedule Narrative

All bidders are required to bid the project based on the attached project schedule. This project schedule is subject to change based on input and a collaborative effort between AMHigley and the successful bidders. All costs are to be included to staff the project with manpower, tools, and equipment as necessary to meet this schedule.

Milestone Schedule:

03.16.2023 - Issue Invitation to Bid

03.27.2023 - Pre-Bid Conference Walk Thru - Time 3:00 PM

03.31.2023 - RFI's due at 2:00 PM

04.20.2023 - Proposal due at 3:00PM to Canton TWP. HARD COPY ONLY

04.24.2023 - 05.12.2023 - Post Bid Reviews

06.06.2023 - Board Meeting Recommendations Due to Canton Twp.

06.13.2023 - Board Meeting to Approve Bid Package #02 Victory Park

06.15.2023 - 09.22.2023 - Procurement, planning, and coordination

09.25.2023 - Construction Activities Begin

04.15.2024 - Substantial Completion

Electrical gear is subject to a later date install due to current lead times

THE ALBERT M. HIGLEY CO., LLC**SCHEDULE B – SCOPE OF WORK**

Scope of Work: **BP00 Rough Carpentry**
Project Name: **Canton Township CIP – BP 02 Victory
Park Ballfields**

Job No.: **222273-300**
Sub-Job No.:

It is the intention of this Subcontract to include all work necessary for a complete **BP 00 Rough Carpentry**. This includes all work not necessarily detailed on the drawings, but reasonably assumable as being part of the work of this Trade. This is not intended to exclude work not quantifiable from the design drawings and field visit. Any work that you may feel should be part of this package but cannot be quantified from the design drawings shall be first submitted as a pre-bid RFI and if an answer is not received in time, listed as an exclusion on your bid proposal. This Subcontractor is responsible for all work per the Project Specifications associated with their Scope of Work.

A. Project Specific Requirements:

1. This project consists of the renovation of the Canton Township, Victory Park Sports Center located at 46555 Michigan Ave, Canton, MI 48188.
2. Contractor parking/staging will be limited to the South side of the existing parking lot located on the Northwest side of the Victory Park Sports Center.
3. Subcontractors are to coordinate any deliveries or material drop offs with AM Higley prior to delivery. Onsite material storage will be extremely limited. Materials can be dropped off at the project site between the hours of 7am-3pm. AM Higley will assist with this coordination but will not be responsible for scheduling deliveries, assisting with unloading, or handling any materials or equipment.
4. Any work to be done on other floors, common spaces, corridors, and adjacent tenant spaces shall be completed during off hours. Coordinate with AMHigley on the removal and replacement of the ceiling tile. Should this Subcontractor damage the ceiling grid in anyway, they will be responsible for the associated costs to repair the grid.
5. Any loud or obtrusive work will need to be completed on off hours and will need to be coordinated with AMHigley's Superintendent.
6. General requirements in the project specifications noted as required by the Construction Manager shall be provided or be required by the respective prime contractor as applicable to the work.
7. This project has a no tobacco policy (including electronic smoking devices and chewing tobacco), anyone who does not comply with this policy will be subject to permanent removal from the site and possibly issued a citation by the local Police Department. There are no weapons of any kind, type or description permitted on the Project Site. Loud radios or music nor wearing of earphones or headphones are not permitted on the Project Site.
8. This project will be completed during normal business hours, except work in occupied spaces.
9. This Subcontractor will be responsible for daily clean-up of their space and debris. Should the Subcontractor fail to perform any of its clean-up obligations, the AMHigley may perform same itself, or through others, and deduct the costs incurred from the Subcontract Amount.
10. AMHigley urges this Subcontractor to read the Building Owner Documents included in the Bidders Manual. These documents carry requirements that are above and beyond what has been listed on the contract drawings and in the specification sections.

11. This Subcontractor is working in an existing operating facility and will require close communication with the Building Owner in regard to shutdowns, access, and work hours.
12. Temporary power and lighting to be provided by Electrician. Temporary water and wash tubs to be provided by Plumber. This shall include all materials, installation, maintenance, and removal.
13. Break locations to be as designated by AMHigley and the Subcontractors is not permitted to use Owner facilities (i.e. Cafeteria).
14. The normal work hours at the Project Site are Monday through Friday 7:00 am to 4:00 pm (exclusive of holidays).
15. Subcontractors shall use designated portable toilets provided at the exterior of each building at the ground level. Portable toilets will be established in the buildings on designated floors. The use of permanent toilet facilities in the buildings is not allowed.
16. Each Subcontractor is to include mockups as described in the bid documents, including expediting expenses. Mockups will be removed by the Subcontractor installing the mockup as directed by AMHigley. Mockup costs shall be listed on the schedule of values.
17. This Subcontractor shall be responsible to coordinate the installation of required devices and sleeves for this Subcontractor's work with the work of other subcontractors or trades. Unless otherwise noted in the Contract Documents, this Subcontractor shall provide all blocking required for this Subcontractor's Work to the subcontractor installing the blocking.
18. Each Subcontractor shall be responsible for all cutting and patching including fire watch, necessary for the installation of its work. The Subcontractor shall protect adjacent materials from damage, enclose space to contain debris and dust and thoroughly clean the space upon completion of work. In case sleeves or hangers are not placed in time, or are improperly placed, each Subcontractor shall be responsible for forming or drilling openings in the work where required and for any patching or corrective work necessary. Any sleeve or opening left unused by a Subcontractor requesting same shall be filled by that Subcontractor with an approved firestopping material and shall attain full fire rating of wall and/or floor construction. Sealing between the sleeve and the pipe, conduit, duct, etc. will be the responsibility of the Subcontractor who installing the pipe, conduit, duct, or other item within the sleeve.
19. This Subcontractor shall install all clips or other items of the Subcontractor's Work to components that will be fireproofed before installation of fireproofing. The Subcontractor shall pay all costs to repair fireproofing caused by the installation of clips or other items of the Subcontractor's Work after the installation of fireproofing. Patching of spray-on-fireproofing will be the responsibility of the Subcontractor causing damage to it.
20. This Subcontractor is responsible to determine the dimensions and adequacy of all housekeeping pads for all equipment furnished pursuant to this Agreement. These pads are to be placed by the Subcontractor requiring them, unless otherwise noted on the contract Documents.
21. This Subcontractor shall furnish and install all access panels required for the Subcontractor's Work for proper operation, maintenance, by the Contract Documents or applicable code, rule, or regulation. Access panels not indicated in documents but required for electrical or mechanical access shall be furnished to the Drywall Subcontractor for installation. Access doors will be furnished by the Subcontractor that installed the system requiring access for maintenance or by building code.

22. This Subcontractor shall provide all required cutting, patching, and coring required for the Subcontractor's Work, including GPR/X-ray inspections, as necessary.
23. The Mechanical Subcontractor shall prepare coordination drawings, including underground drawings, by floor and area for submission to other trades for location of their installations to avoid installation interferences.
24. This Subcontractor shall identify to AMHigley the need for CAD files if required to prepare the Subcontractor's submittal(s). AMHigley will coordinate the Subcontractor's request for CAD files to the Architect. The Subcontractor acknowledges that CAD drawings are a requirement of this Agreement, and the Subcontractor will create all necessary CAD drawings with or without CAD drawing backgrounds from the Architect. This Subcontractor shall include any cost or waiver required for release of CAD files.
25. This Subcontractors additional work shall be the cost of the work relating to a change on a time and material basis or as otherwise agreed in writing by the parties. The limitations, if any, on the subcontractor's overhead and profit shall not exceed ten percent (10%) of the actual cost of the changed Work, labor, equipment and material of a primary tier subcontractor; and/or five percent (5%) of the actual cost of changed Work, labor, equipment and material of a lower tier subcontractor.

B. Trade Specific Scope of Work:

1. All labor, material, and equipment to complete the [BP 00 Rough Carpentry Scope of Work](#).
2. Includes compliance with all current COVID guidelines, protocols, and procedures.
3. This contractor is required to use the HammerTech safety software to submit all Safety Plans, JHA's, and SDS's 15 days prior to starting work, and have each item approved prior to their start date.
4. This contractor shall be required to outfit and sustain their employees with a helmet that has an ANSI Type 2 or EN 12492 front/side/rear impact rating.
5. This contractor must have each worker either be enrolled in the MUST program or have a current (within the past year) 11 panel drug card equal to or more stringent than the substance abuse panel and thresholds listed in The Project Safety Plan.
6. Includes temporary shoring, bracing, dust protection, as required to protect the owner-occupied areas of the building from dust, debris, and unauthorized persons. Segregate all construction activity from owners in order to complete the work of this contract.
7. Includes temporary protection of adjacent surfaces while performing the work of this contract.
8. Coordination of all work with AM Higley and all other subcontractors.
9. This Contractor includes multiple mobilizations to perform the work to meet the project schedule. This includes segregating each locker room individually per the contract requirements.
10. This Contractor shall assume appropriate measures to protect existing and newly finished work while performing the work of this Contract.
11. This Subcontractor shall be responsible for any damage and subsequent repairs to any construction in place or construction that is designated as existing to remain. Any damage caused by this Contractor will be repaired or replaced at this Contractor's expense.

12. This Contractor is required to review all project documents to understand the full scope of this work. This Contractor shall visit the site and be familiar with all existing conditions for the site operations prior to starting work.
13. This Contractor will verify existing conditions and locations prior to the start of this work. Coordinate with the AMH Superintendent at least 5 days in advance, if existing conditions differ with those other than as indicated on the project documents, notify AM Higley in writing.
14. Verify with the AMH Superintendent for any materials that are required to be salvaged and turned over to the Owner. This Contractor will take care not to damage any such item. This contractor will secure all items until transferred to the owner or placed in the designated storage container.
15. This contractor will use during the entire duration a HEPA filter system adequate to eliminate free floating particulate from the atmosphere in each of the immediate work areas. This contractor will place over any return air louver, grille, or transfer duct a filter fabric adequate to prevent debris, dust, or any particulate from contaminating the building's ductwork system.
16. This Contractor shall furnish and install all interior framing, fire rated blocking/backing, and furring as required for the work of this Subcontract as well as all blocking required for work installed by others. This Contractor shall be responsible for coordinating locations, sizes, etc. for all blocking installed.
17. This Contractor shall furnish and install sealants required for the work of this Contractor. This includes fire resistive joints, acoustical sealants at drywall partition perimeters, and acoustical sealant at ceiling grid perimeters, where indicated. This Contractor shall seal the wall/ceiling construction to any sleeve penetrating the assembly. Firestopping within the sleeve will be by the Contractor who installed the sleeve. Sealing and firestopping any penetration made after the wall assembly is complete will be by others. Coordinate all work with all other trades to eliminate the need for penetrations after the wall assembly is complete.
18. This Contractor shall provide selective demolition at existing walls, ceilings, soffits, and sheathing per the construction drawings.
19. Sheathing at pavilion is to be removed, supplies, and installed by the roofers.
20. This Contractor shall furnish and install all FRP, if shown on the documents.
21. This Subcontractor shall be responsible the removal and installation of required devices, fixtures, grab bars, soap, towel and tissue dispensers and all brackets and anchorages for the toilet partitions. Coordinate with the work of other subcontractors or trades. Unless otherwise noted in the Contract Documents, this Subcontractor shall provide all blocking or backing required at each location where the blocking is needed.
22. This Contractor shall remove all toilet partitions and toilet room accessories including but not limited to grab bars, soap dispensers, toilet paper dispensers, garbage cans, and toilet partition brackets/accessories. All existing toilet room accessories are to be salvaged and reinstalled by this contractor along with any new toilet room accessories.
23. This Contractor shall coordinate and install any additional support or backing to install the new ceiling hung toilet partitions. This contractor shall coordinate any ceiling access and patch/repair of the ceiling at the new toilet partitions.

24. This Contractor shall furnish and install all cementitious backer board where needed, and finish to manufacturer's recommendations. This includes hat channel or metal stud as needed and indicated on the construction drawings.
25. This Contractor shall coordinate removal and installation of blocking and thermal insulation around the glass storefronts with the glazing contractor if required.
26. This Contractor shall remove, salvage, and reinstall all window shades above the aluminum framed storefronts. Contractor shall number window shades to ensure they go back in their original location.
27. This Contractor shall procure and install all temporary protection including along storefronts as the existing storefronts are removed. This Contractor shall remove and dispose of temporary protection once work has been completed. Glazing Contractor shall remove and reinstall temporary protection to access work at storefronts.
28. This Contractor to carry an allowance of \$5,000 for blocking at storefront replacement, if necessary. Anything unspent within said allowance is to be issued back in the form of a deduct change order.

C. Subcontract Cost Recap:

Base Bid	\$
Accepted Alternates	\$
Scope Review Adjustments	\$
Storefront Blocking ALLOWANCE	\$ 5,000
Taxes	Included
Subcontract Total	\$

This Subcontract shall include all necessary applicable taxes as required. This Subcontractor shall review and understand what materials and temporary facilities are taxable, even if the project is Tax Exempt.

D. Alternatives:

The Alternates listed herein shall be considered as options which may be selected by the Contractor. The Subcontractor is obligated to perform any or all the listed Alternates for the price(s) listed herein if the Contractor, in the Contractor's sole discretion, exercises the right to incorporate the Alternative into the Agreement. These alternates are not included in this Subcontract value.

1.

E. Unit Price Schedule:

(Unit rates to be entered below or attached to this Schedule B, for use throughout entire project duration)

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
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THE ALBERT M. HIGLEY CO., LLC**SCHEDULE B – SCOPE OF WORK**

Scope of Work: **BP01 Finish Carpentry**
Project Name: **Canton Township CIP – BP 02 Victory
Park Ballfields**

Job No.: **222273-300**
Sub-Job No.:

It is the intention of this Subcontract to include all work necessary for a complete **BP 01 Finish Carpentry**. This includes all work not necessarily detailed on the drawings, but reasonably assumable as being part of the work of this Trade. This is not intended to exclude work not quantifiable from the design drawings and field visit. Any work that you may feel should be part of this package but cannot be quantified from the design drawings shall be first submitted as a pre-bid RFI and if an answer is not received in time, listed as an exclusion on your bid proposal. This Subcontractor is responsible for all work per the Project Specifications associated with their Scope of Work.

A. Project Specific Requirements:

1. This project consists of the renovation of the Canton Township, Victory Park Sports Center located at 46555 Michigan Ave, Canton, MI 48188.
2. Contractor parking/staging will be limited to the South side of the existing parking lot located on the Northwest side of the Victory Park Sports Center.
3. Subcontractors are to coordinate any deliveries or material drop offs with AM Higley prior to delivery. Onsite material storage will be extremely limited. Materials can be dropped off at the project site between the hours of 7am-3pm. AM Higley will assist with this coordination but will not be responsible for scheduling deliveries, assisting with unloading, or handling any materials or equipment.
4. Any work to be done on other floors, common spaces, corridors, and adjacent tenant spaces shall be completed during off hours. Coordinate with AMHigley on the removal and replacement of the ceiling tile. Should this Subcontractor damage the ceiling grid in anyway, they will be responsible for the associated costs to repair the grid.
5. Any loud or obtrusive work will need to be completed on off hours and will need to be coordinated with AMHigley's Superintendent.
6. General requirements in the project specifications noted as required by the Construction Manager shall be provided or be required by the respective prime contractor as applicable to the work.
7. This project has a no tobacco policy (including electronic smoking devices and chewing tobacco), anyone who does not comply with this policy will be subject to permanent removal from the site and possibly issued a citation by the local Police Department. There are no weapons of any kind, type or description permitted on the Project Site. Loud radios or music nor wearing of earphones or headphones are not permitted on the Project Site.
8. This project will be completed during normal business hours, except work in occupied spaces.
9. This Subcontractor will be responsible for daily clean-up of their space and debris. Should the Subcontractor fail to perform any of its clean-up obligations, the AMHigley may perform same itself, or through others, and deduct the costs incurred from the Subcontract Amount.
10. AMHigley urges this Subcontractor to read the Building Owner Documents included in the Bidders Manual. These documents carry requirements that are above and beyond what has been listed on the contract drawings and in the specification sections.

11. This Subcontractor is working in an existing operating facility and will require close communication with the Building Owner in regard to shutdowns, access, and work hours.
12. Temporary power and lighting to be provided by Electrician. Temporary water and wash tubs to be provided by Plumber. This shall include all materials, installation, maintenance, and removal.
13. Break locations to be as designated by AMHigley and the Subcontractors is not permitted to use Owner facilities (i.e. Cafeteria).
14. The normal work hours at the Project Site are Monday through Friday 7:00 am to 4:00 pm (exclusive of holidays).
15. Subcontractors shall use designated portable toilets provided at the exterior of each building at the ground level. Portable toilets will be established in the buildings on designated floors. The use of permanent toilet facilities in the buildings is not allowed.
16. Each Subcontractor is to include mockups as described in the bid documents, including expediting expenses. Mockups will be removed by the Subcontractor installing the mockup as directed by AMHigley. Mockup costs shall be listed on the schedule of values.
17. This Subcontractor shall be responsible to coordinate the installation of required devices and sleeves for this Subcontractor's work with the work of other subcontractors or trades. Unless otherwise noted in the Contract Documents, this Subcontractor shall provide all blocking required for this Subcontractor's Work to the subcontractor installing the blocking.
18. Each Subcontractor shall be responsible for all cutting and patching including fire watch, necessary for the installation of its work. The Subcontractor shall protect adjacent materials from damage, enclose space to contain debris and dust and thoroughly clean the space upon completion of work. In case sleeves or hangers are not placed in time, or are improperly placed, each Subcontractor shall be responsible for forming or drilling openings in the work where required and for any patching or corrective work necessary. Any sleeve or opening left unused by a Subcontractor requesting same shall be filled by that Subcontractor with an approved firestopping material and shall attain full fire rating of wall and/or floor construction. Sealing between the sleeve and the pipe, conduit, duct, etc. will be the responsibility of the Subcontractor who installing the pipe, conduit, duct, or other item within the sleeve.
19. This Subcontractor shall install all clips or other items of the Subcontractor's Work to components that will be fireproofed before installation of fireproofing. The Subcontractor shall pay all costs to repair fireproofing caused by the installation of clips or other items of the Subcontractor's Work after the installation of fireproofing. Patching of spray-on-fireproofing will be the responsibility of the Subcontractor causing damage to it.
20. This Subcontractor is responsible to determine the dimensions and adequacy of all housekeeping pads for all equipment furnished pursuant to this Agreement. These pads are to be placed by the Subcontractor requiring them, unless otherwise noted on the contract Documents.
21. This Subcontractor shall furnish and install all access panels required for the Subcontractor's Work for proper operation, maintenance, by the Contract Documents or applicable code, rule, or regulation. Access panels not indicated in documents but required for electrical or mechanical access shall be furnished to the Drywall Subcontractor for installation. Access doors will be furnished by the Subcontractor that installed the system requiring access for maintenance or by building code.

22. This Subcontractor shall provide all required cutting, patching, and coring required for the Subcontractor's Work, including GPR/X-ray inspections, as necessary.
23. The Mechanical Subcontractor shall prepare coordination drawings, including underground drawings, by floor and area for submission to other trades for location of their installations to avoid installation interferences.
24. This Subcontractor shall identify to AMHigley the need for CAD files if required to prepare the Subcontractor's submittal(s). AMHigley will coordinate the Subcontractor's request for CAD files to the Architect. The Subcontractor acknowledges that CAD drawings are a requirement of this Agreement, and the Subcontractor will create all necessary CAD drawings with or without CAD drawing backgrounds from the Architect. This Subcontractor shall include any cost or waiver required for release of CAD files.
25. This Subcontractors additional work shall be the cost of the work relating to a change on a time and material basis or as otherwise agreed in writing by the parties. The limitations, if any, on the subcontractor's overhead and profit shall not exceed ten percent (10%) of the actual cost of the changed Work, labor, equipment and material of a primary tier subcontractor; and/or five percent (5%) of the actual cost of changed Work, labor, equipment and material of a lower tier subcontractor.

B. Trade Specific Scope of Work:

1. All labor, material, and equipment to complete the [BP 01 Finish Carpentry Scope of Work](#).
2. Includes compliance with all current COVID guidelines, protocols, and procedures.
3. This contractor is required to use the HammerTech safety software to submit all Safety Plans, JHA's, and SDS's 15 days prior to starting work, and have each item approved prior to their start date.
4. This contractor shall be required to outfit and sustain their employees with a helmet that has an ANSI Type 2 or EN 12492 front/side/rear impact rating.
5. This contractor must have each worker either be enrolled in the MUST program or have a current (within the past year) 11 panel drug card equal to or more stringent than the substance abuse panel and thresholds listed in The Project Safety Plan.
6. Includes temporary shoring, bracing, dust protection, as required to protect the owner-occupied areas of the building from dust, debris, and unauthorized persons. Segregate all construction activity from owners in order to complete the work of this contract.
7. Includes temporary protection of adjacent surfaces while performing the work of this contract.
8. Coordination of all work with AM Higley and all other subcontractors.
9. This Contractor includes multiple mobilizations to perform the work to meet the project schedule. This includes segregating each locker room individually per the contract requirements.
10. This Contractor shall assume appropriate measures to protect existing and newly finished work while performing the work of this Contract.
11. This Subcontractor shall be responsible for any damage and subsequent repairs to any construction in place or construction that is designated as existing to remain. Any damage caused by this Contractor will be repaired or replaced at this Contractor's expense.

12. This Contractor is required to review all project documents to understand the full scope of this work. This Contractor shall visit the site and be familiar with all existing conditions for the site operations prior to starting work.
13. This Contractor will verify existing conditions and locations prior to the start of this work. Coordinate with the AMH Superintendent at least 5 days in advance, if existing conditions differ with those other than as indicated on the project documents, notify AM Higley in writing.
14. Verify with the AMH Superintendent for any materials that are required to be salvaged and turned over to the Owner. This Contractor will take care not to damage any such item. This contractor will secure all items until transferred to the owner or placed in the designated storage container.
15. This Contractor shall remove and salvage all seat backs and accessories required to reinstall the existing seat backs. This Contractor shall re-upholster and reinstall all seat backs as indicated per the construction documents. Painting wood trim and benches is to be by the painters.
16. This Contractor shall coordinate the reinstallation of all seat backs with the painter and AMHigley.

C. Subcontract Cost Recap:

Base Bid	\$
Accepted Alternates	\$
Scope Review Adjustments	\$
Taxes	Included
Subcontract Total	\$

This Subcontract shall include all necessary applicable taxes as required. This Subcontractor shall review and understand what materials and temporary facilities are taxable, even if the project is Tax Exempt.

D. Alternatives:

The Alternates listed herein shall be considered as options which may be selected by the Contractor. The Subcontractor is obligated to perform any or all of the listed Alternates for the price(s) listed herein if the Contractor, in the Contractor's sole discretion, exercises the right to incorporate the Alternative into the Agreement. These alternates are not included in this Subcontract value.

1.

E. Unit Price Schedule:

(Unit rates to be entered below or attached to this Schedule B, for use throughout entire project duration)

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
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Scope of Work: **BP 02 Roofing**
Project Name: **Canton Township CIP – BP 02 Victory
Park Ballfields**

Job No.: **222273-300**
Sub-Job No.:

It is the intention of this Subcontract to include all work necessary for a complete **BP 02 Roofing**. This includes all work not necessarily detailed on the drawings, but reasonably assumable as being part of the work of this Trade. This is not intended to exclude work not quantifiable from the design drawings and field visit. Any work that you may feel should be part of this package but cannot be quantified from the design drawings shall be first submitted as a pre-bid RFI and if an answer is not received in time, listed as an exclusion on your bid proposal. This Subcontractor is responsible for all work per the Project Specifications associated with their Scope of Work.

A. Project Specific Requirements:

1. This project consists of the renovation of the Canton Township, Victory Park Sports Center located at 46555 Michigan Ave, Canton, MI 48188.
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6. General requirements in the project specifications noted as required by the Construction Manager shall be provided or be required by the respective prime contractor as applicable to the work.
7. This project has a no tobacco policy (including electronic smoking devices and chewing tobacco), anyone who does not comply with this policy will be subject to permanent removal from the site and possibly issued a citation by the local Police Department. There are no weapons of any kind, type or description permitted on the Project Site. Loud radios or music nor wearing of earphones or headphones are not permitted on the Project Site.
8. This project will be completed during normal business hours, except work in occupied spaces.
9. This Subcontractor will be responsible for daily clean-up of their space and debris. Should the Subcontractor fail to perform any of its clean-up obligations, the AMHigley may perform same itself, or through others, and deduct the costs incurred from the Subcontract Amount.
10. AMHigley urges this Subcontractor to read the Building Owner Documents included in the Bidders Manual. These documents carry requirements that are above and beyond what has been listed on the contract drawings and in the specification sections.

11. This Subcontractor is working in an existing operating facility and will require close communication with the Building Owner in regard to shutdowns, access, and work hours.
12. Temporary power and lighting to be provided by Electrician. Temporary water and wash tubs to be provided by Plumber. This shall include all materials, installation, maintenance, and removal.
13. Break locations to be as designated by AMHigley and the Subcontractors is not permitted to use Owner facilities (i.e. Cafeteria).
14. The normal work hours at the Project Site are Monday through Friday 7:00 am to 4:00 pm (exclusive of holidays).
15. Subcontractors shall use designated portable toilets provided at the exterior of each building at the ground level. Portable toilets will be established in the buildings on designated floors. The use of permanent toilet facilities in the buildings is not allowed.
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19. This Subcontractor shall install all clips or other items of the Subcontractor's Work to components that will be fireproofed before installation of fireproofing. The Subcontractor shall pay all costs to repair fireproofing caused by the installation of clips or other items of the Subcontractor's Work after the installation of fireproofing. Patching of spray-on-fireproofing will be the responsibility of the Subcontractor causing damage to it.
20. This Subcontractor is responsible to determine the dimensions and adequacy of all housekeeping pads for all equipment furnished pursuant to this Agreement. These pads are to be placed by the Subcontractor requiring them, unless otherwise noted on the contract Documents.
21. This Subcontractor shall furnish and install all access panels required for the Subcontractor's Work for proper operation, maintenance, by the Contract Documents or applicable code, rule, or regulation. Access panels not indicated in documents but required for electrical or mechanical access shall be furnished to the Drywall Subcontractor for installation. Access doors will be furnished by the Subcontractor that installed the system requiring access for maintenance or by building code.

22. This Subcontractor shall provide all required cutting, patching, and coring required for the Subcontractor's Work, including GPR/X-ray inspections, as necessary.
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B. Trade Specific Scope of Work:

1. All labor, material, and equipment to complete the [BP 02 Roofing Scope of Work](#).
2. Includes compliance with all current COVID guidelines, protocols, and procedures.
3. This contractor is required to use the HammerTech safety software to submit all Safety Plans, JHA's, and SDS's 15 days prior to starting work, and have each item approved prior to their start date.
4. This contractor shall be required to outfit and sustain their employees with a helmet that has an ANSI Type 2 or EN 12492 front/side/rear impact rating.
5. This contractor must have each worker either be enrolled in the MUST program or have a current (within the past year) 11 panel drug card equal to or more stringent than the substance abuse panel and thresholds listed in The Project Safety Plan.
6. Includes temporary shoring, bracing, dust protection, as required to protect the owner-occupied areas of the building from dust, debris, and unauthorized persons. Segregate all construction activity from owners in order to complete the work of this contract.
7. Includes temporary protection of adjacent surfaces while performing the work of this contract.
8. Coordination of all work with AM Higley and all other subcontractors.
9. This Contractor includes multiple mobilizations to perform the work to meet the project schedule. This includes segregating each locker room individually per the contract requirements.
10. This Contractor shall assume appropriate measures to protect existing and newly finished work while performing the work of this Contract.
11. This Subcontractor shall be responsible for any damage and subsequent repairs to any construction in place or construction that is designated as existing to remain. Any damage caused by this Contractor will be repaired or replaced at this Contractor's expense.

12. This Contractor is required to review all project documents to understand the full scope of this work. This Contractor shall visit the site and be familiar with all existing conditions for the site operations prior to starting work.
13. This Contractor will verify existing conditions and locations prior to the start of this work. Coordinate with the AMH Superintendent at least 5 days in advance, if existing conditions differ with those other than as indicated on the project documents, notify AM Higley in writing.
14. Verify with the AMH Superintendent for any materials that are required to be salvaged and turned over to the Owner. This Contractor will take care not to damage any such item. This contractor will secure all items until transferred to the owner or placed in the designated storage container.
15. Except where otherwise noted, wood blocking will be furnished and installed by others. This contractor includes any backing, blocking, support, etc. if not shown but required to complete the work of this contract.
16. This Contractor shall demo the existing roofing system including but not limited to shingles, flashing, counter flashing, underlayment, membrane, and accessories. This contractor is responsible for prepping and cleaning existing sheathing to accept the new roof system including the removal of nails and staples.
17. This Contractor will provide any necessary inspections of existing roofs that are affected by this work to maintain existing roof warranties, if applicable. This Contractor is responsible for removing and replacing any damaged or deteriorate sheathing as indicated per the construction drawings.
18. This Contractor will provide and install all temporary roofing and sealants as needed to ensure the building is watertight during and after construction.
19. This Contractor shall furnish and install a complete asphalt shingle roofing system as shown on the construction documents. This includes but is not limited to: all roof accessories, sheathing, roof insulation, flashings, counter-flashings, ice and water shield, metal coping, drip edge, joint sealants, plastic ridge vents, ridge protection, eve protection and sealing of all penetrations for a complete waterproof roof assembly.
20. This Contractor shall flash and seal any new or existing penetrations in the roofs to provide a complete waterproof roof assembly.
21. This Contractor shall submit a fall protection plan to be approved by AMHigley's safety team. This Contractor shall provide and install all devices, tools, and materials at the roof areas to establish fall protection, as required by the approved safety plan.
22. This Contractor shall provide a 20-year manufacturer's warranty for watertightness.

C. Subcontract Cost Recap:

Base Bid	\$
Accepted Alternates	\$
Scope Review Adjustments	\$

Taxes	Included
Subcontract Total	\$

This Subcontract shall include all necessary applicable taxes as required. This Subcontractor shall review and understand what materials and temporary facilities are taxable, even if the project is Tax Exempt.

D. Alternatives:

The Alternates listed herein shall be considered as options which may be selected by the Contractor. The Subcontractor is obligated to perform any or all of the listed Alternates for the price(s) listed herein if the Contractor, in the Contractor's sole discretion, exercises the right to incorporate the Alternative into the Agreement. These alternates are not included in this Subcontract value.

1.

E. Unit Price Schedule:

(Unit rates to be entered below or attached to this Schedule B, for use throughout entire project duration)

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
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Scope of Work: **BP 03 Glazing/Aluminum Storefront**
Project Name: **Canton Township CIP – BP 02 Victory
Park Ballfields**

Job No.: **222273-300**
Sub-Job No.:

It is the intention of this Subcontract to include all work necessary for a complete **BP 03 Glazing/Aluminum Storefront**. This includes all work not necessarily detailed on the drawings, but reasonably assumable as being part of the work of this Trade. This is not intended to exclude work not quantifiable from the design drawings and field visit. Any work that you may feel should be part of this package but cannot be quantified from the design drawings shall be first submitted as a pre-bid RFI and if an answer is not received in time, listed as an exclusion on your bid proposal. This Subcontractor is responsible for all work per the Project Specifications associated with their Scope of Work.

A. Project Specific Requirements:

1. This project consists of the renovation of the Canton Township, Victory Park Sports Center located at 46555 Michigan Ave, Canton, MI 48188.
2. Contractor parking/staging will be limited to the South side of the existing parking lot located on the Northwest side of the Victory Park Sports Center.
3. Subcontractors are to coordinate any deliveries or material drop offs with AM Higley prior to delivery. Onsite material storage will be extremely limited. Materials can be dropped off at the project site between the hours of 7am-3pm. AM Higley will assist with this coordination but will not be responsible for scheduling deliveries, assisting with unloading, or handling any materials or equipment.
4. Any work to be done on other floors, common spaces, corridors, and adjacent tenant spaces shall be completed during off hours. Coordinate with AMHigley on the removal and replacement of the ceiling tile. Should this Subcontractor damage the ceiling grid in anyway, they will be responsible for the associated costs to repair the grid.
5. Any loud or obtrusive work will need to be completed on off hours and will need to be coordinated with AMHigley's Superintendent.
6. General requirements in the project specifications noted as required by the Construction Manager shall be provided or be required by the respective prime contractor as applicable to the work.
7. This project has a no tobacco policy (including electronic smoking devices and chewing tobacco), anyone who does not comply with this policy will be subject to permanent removal from the site and possibly issued a citation by the local Police Department. There are no weapons of any kind, type or description permitted on the Project Site. Loud radios or music nor wearing of earphones or headphones are not permitted on the Project Site.
8. This project will be completed during normal business hours, except work in occupied spaces.
9. This Subcontractor will be responsible for daily clean-up of their space and debris. Should the Subcontractor fail to perform any of its clean-up obligations, the AMHigley may perform same itself, or through others, and deduct the costs incurred from the Subcontract Amount.
10. AMHigley urges this Subcontractor to read the Building Owner Documents included in the Bidders Manual. These documents carry requirements that are above and beyond what has been listed on the contract drawings and in the specification sections.

11. This Subcontractor is working in an existing operating facility and will require close communication with the Building Owner in regard to shutdowns, access, and work hours.
12. Temporary power and lighting to be provided by Electrician. Temporary water and wash tubs to be provided by Plumber. This shall include all materials, installation, maintenance, and removal.
13. Break locations to be as designated by AMHigley and the Subcontractors is not permitted to use Owner facilities (i.e. Cafeteria).
14. The normal work hours at the Project Site are Monday through Friday 7:00 am to 4:00 pm (exclusive of holidays).
15. Subcontractors shall use designated portable toilets provided at the exterior of each building at the ground level. Portable toilets will be established in the buildings on designated floors. The use of permanent toilet facilities in the buildings is not allowed.
16. Each Subcontractor is to include mockups as described in the bid documents, including expediting expenses. Mockups will be removed by the Subcontractor installing the mockup as directed by AMHigley. Mockup costs shall be listed on the schedule of values.
17. This Subcontractor shall be responsible to coordinate the installation of required devices and sleeves for this Subcontractor's work with the work of other subcontractors or trades. Unless otherwise noted in the Contract Documents, this Subcontractor shall provide all blocking required for this Subcontractor's Work to the subcontractor installing the blocking.
18. Each Subcontractor shall be responsible for all cutting and patching including fire watch, necessary for the installation of its work. The Subcontractor shall protect adjacent materials from damage, enclose space to contain debris and dust and thoroughly clean the space upon completion of work. In case sleeves or hangers are not placed in time, or are improperly placed, each Subcontractor shall be responsible for forming or drilling openings in the work where required and for any patching or corrective work necessary. Any sleeve or opening left unused by a Subcontractor requesting same shall be filled by that Subcontractor with an approved firestopping material and shall attain full fire rating of wall and/or floor construction. Sealing between the sleeve and the pipe, conduit, duct, etc. will be the responsibility of the Subcontractor who installing the pipe, conduit, duct, or other item within the sleeve.
19. This Subcontractor shall install all clips or other items of the Subcontractor's Work to components that will be fireproofed before installation of fireproofing. The Subcontractor shall pay all costs to repair fireproofing caused by the installation of clips or other items of the Subcontractor's Work after the installation of fireproofing. Patching of spray-on-fireproofing will be the responsibility of the Subcontractor causing damage to it.
20. This Subcontractor is responsible to determine the dimensions and adequacy of all housekeeping pads for all equipment furnished pursuant to this Agreement. These pads are to be placed by the Subcontractor requiring them, unless otherwise noted on the contract Documents.
21. This Subcontractor shall furnish and install all access panels required for the Subcontractor's Work for proper operation, maintenance, by the Contract Documents or applicable code, rule, or regulation. Access panels not indicated in documents but required for electrical or mechanical access shall be furnished to the Drywall Subcontractor for installation. Access doors will be furnished by the Subcontractor that installed the system requiring access for maintenance or by building code.

22. This Subcontractor shall provide all required cutting, patching, and coring required for the Subcontractor's Work, including GPR/X-ray inspections, as necessary.
23. The Mechanical Subcontractor shall prepare coordination drawings, including underground drawings, by floor and area for submission to other trades for location of their installations to avoid installation interferences.
24. This Subcontractor shall identify to AMHigley the need for CAD files if required to prepare the Subcontractor's submittal(s). AMHigley will coordinate the Subcontractor's request for CAD files to the Architect. The Subcontractor acknowledges that CAD drawings are a requirement of this Agreement, and the Subcontractor will create all necessary CAD drawings with or without CAD drawing backgrounds from the Architect. This Subcontractor shall include any cost or waiver required for release of CAD files.
25. This Subcontractors additional work shall be the cost of the work relating to a change on a time and material basis or as otherwise agreed in writing by the parties. The limitations, if any, on the subcontractor's overhead and profit shall not exceed ten percent (10%) of the actual cost of the changed Work, labor, equipment, and material of a primary tier subcontractor; and/or five percent (5%) of the actual cost of changed Work, labor, equipment and material of a lower tier subcontractor.

B. Trade Specific Scope of Work:

1. All labor, material, and equipment to complete the [BP 03 Glazing/Aluminum Storefront Scope of Work](#).
2. Includes compliance with all current COVID guidelines, protocols, and procedures.
3. This contractor is required to use the HammerTech safety software to submit all Safety Plans, JHA's, and SDS's 15 days prior to starting work, and have each item approved prior to their start date.
4. This contractor shall be required to outfit and sustain their employees with a helmet that has an ANSI Type 2 or EN 12492 front/side/rear impact rating.
5. This contractor must have each worker either be enrolled in the MUST program or have a current (within the past year) 11 panel drug card equal to or more stringent than the substance abuse panel and thresholds listed in The Project Safety Plan.
6. Includes temporary shoring, bracing, dust protection, as required to protect the owner-occupied areas of the building from dust, debris, and unauthorized persons. Segregate all construction activity from owners in order to complete the work of this contract.
7. Includes temporary protection of adjacent surfaces while performing the work of this contract.
8. Coordination of all work with AM Higley and all other subcontractors.
9. This Contractor includes multiple mobilizations to perform the work to meet the project schedule. This includes segregating each locker room individually per the contract requirements.
10. This Contractor shall assume appropriate measures to protect existing and newly finished work while performing the work of this Contract.

11. This Subcontractor shall be responsible for any damage and subsequent repairs to any construction in place or construction that is designated as existing to remain. Any damage caused by this Contractor will be repaired or replaced at this Contractor's expense.
12. This Contractor is required to review all project documents to understand the full scope of this work. This Contractor shall visit the site and be familiar with all existing conditions for the site operations prior to starting work.
13. This Contractor will verify existing conditions and locations prior to the start of this work. Coordinate with the AMH Superintendent at least 5 days in advance, if existing conditions differ with those other than as indicated on the project documents, notify AM Higley in writing.
14. Verify with the AMH Superintendent for any materials that are required to be salvaged and turned over to the Owner. This Contractor will take care not to damage any such item. This contractor will secure all items until transferred to the owner or placed in the designated storage container.
15. This Contractor shall remove all aluminum storefronts and associated materials including but not limited to: aluminum panels, aluminum framing, glazing, doors, hardware, sealants, clips, glass stops, gaskets, flashings, fasteners, etc.
16. This contractor includes any backing, blocking, support, etc. if not shown but required to complete the work of this contract. This Contractor shall assess existing blocking and coordinate with carpenters to install new if necessary.
17. This Contractor shall furnish and install all aluminum storefront framing, interior and exterior aluminum entrances, aluminum doors, glazed aluminum curtain walls, folding glass wall, aluminum windows, all decorative glazing, glazing, including all accessories required for a complete installation.
18. This Contractor shall furnish and install aluminum break metal fascia as indicated.
19. This Contractor shall furnish and install all door hardware/accessories including but not limited to: door stiles, weather stripping, thresholds, butt hinges, pull handles, exit devices, closers sill sweep strips, exit devices, and cylinders under this Contract. Keying of doors shall be coordinated with AMHigley and the owner.
20. This Contractor shall adjust hardware as necessary at the completion of the project, after balancing of the mechanical system, to ensure door and hardware functionality are operating as specified.
21. This Contractor shall furnish and install all caulking and backer rod of the glazing systems.
22. This Contractor will field measure for the work of this Contract prior to fabrication. If required due to lead times, and the project schedule AMH will provide guaranteed dimensions based on approved submittals in order to expedite fabrication. This Contractor must receive approval from the AMH Superintendent prior to releasing materials based on guaranteed dimensions.
23. This Contractor is responsible for coordinating the installation and removal of temporary protection as the existing storefront is removed, and the new storefront is installed. Temporary protection is to be provided and installed by carpenters. Carpenters will not be responsible for removal and reinstallation of temporary protection as work along the storefront is completed.
24. This contractor is to include final cleaning of all aluminum and glass surfaces included in this project.

C. Subcontract Cost Recap:

Base Bid	\$
Accepted Alternates	\$
Scope Review Adjustments	\$
Taxes	Included
Subcontract Total	\$

This Subcontract shall include all necessary applicable taxes as required. This Subcontractor shall review and understand what materials and temporary facilities are taxable, even if the project is Tax Exempt.

D. Alternatives:

The Alternates listed herein shall be considered as options which may be selected by the Contractor. The Subcontractor is obligated to perform any or all of the listed Alternates for the price(s) listed herein if the Contractor, in the Contractor's sole discretion, exercises the right to incorporate the Alternative into the Agreement. These alternates are not included in this Subcontract value.

1.

E. Unit Price Schedule:

(Unit rates to be entered below or attached to this Schedule B, for use throughout entire project duration)

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
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THE ALBERT M. HIGLEY CO., LLC**SCHEDULE B – SCOPE OF WORK**

Scope of Work: **BP 04 Tiling**
Project Name: **Canton Township CIP – BP 02 Victory
Park Ballfields**

Job No.: **222273-300**
Sub-Job No.:

It is the intention of this Subcontract to include all work necessary for a complete **BP 04 Tiling**. This includes all work not necessarily detailed on the drawings, but reasonably assumable as being part of the work of this Trade. This is not intended to exclude work not quantifiable from the design drawings and field visit. Any work that you may feel should be part of this package but cannot be quantified from the design drawings shall be first submitted as a pre-bid RFI and if an answer is not received in time, listed as an exclusion on your bid proposal. This Subcontractor is responsible for all work per the Project Specifications associated with their Scope of Work.

A. Project Specific Requirements:

1. This project consists of the renovation of the Canton Township, Victory Park Sports Center located at 46555 Michigan Ave, Canton, MI 48188.
2. Contractor parking/staging will be limited to the South side of the existing parking lot located on the Northwest side of the Victory Park Sports Center.
3. Subcontractors are to coordinate any deliveries or material drop offs with AM Higley prior to delivery. Onsite material storage will be extremely limited. Materials can be dropped off at the project site between the hours of 7am-3pm. AM Higley will assist with this coordination but will not be responsible for scheduling deliveries, assisting with unloading, or handling any materials or equipment.
4. Any work to be done on other floors, common spaces, corridors, and adjacent tenant spaces shall be completed during off hours. Coordinate with AMHigley on the removal and replacement of the ceiling tile. Should this Subcontractor damage the ceiling grid in anyway, they will be responsible for the associated costs to repair the grid.
5. Any loud or obtrusive work will need to be completed on off hours and will need to be coordinated with AMHigley's Superintendent.
6. General requirements in the project specifications noted as required by the Construction Manager shall be provided or be required by the respective prime contractor as applicable to the work.
7. This project has a no tobacco policy (including electronic smoking devices and chewing tobacco), anyone who does not comply with this policy will be subject to permanent removal from the site and possibly issued a citation by the local Police Department. There are no weapons of any kind, type or description permitted on the Project Site. Loud radios or music nor wearing of earphones or headphones are not permitted on the Project Site.
8. This project will be completed during normal business hours, except work in occupied spaces.
9. This Subcontractor will be responsible for daily clean-up of their space and debris. Should the Subcontractor fail to perform any of its clean-up obligations, the AMHigley may perform same itself, or through others, and deduct the costs incurred from the Subcontract Amount.
10. AMHigley urges this Subcontractor to read the Building Owner Documents included in the Bidders Manual. These documents carry requirements that are above and beyond what has been listed on the contract drawings and in the specification sections.

11. This Subcontractor is working in an existing operating facility and will require close communication with the Building Owner in regard to shutdowns, access, and work hours.
12. Temporary power and lighting to be provided by Electrician. Temporary water and wash tubs to be provided by Plumber. This shall include all materials, installation, maintenance, and removal.
13. Break locations to be as designated by AMHigley and the Subcontractors is not permitted to use Owner facilities (i.e. Cafeteria).
14. The normal work hours at the Project Site are Monday through Friday 7:00 am to 4:00 pm (exclusive of holidays).
15. Subcontractors shall use designated portable toilets provided at the exterior of each building at the ground level. Portable toilets will be established in the buildings on designated floors. The use of permanent toilet facilities in the buildings is not allowed.
16. Each Subcontractor is to include mockups as described in the bid documents, including expediting expenses. Mockups will be removed by the Subcontractor installing the mockup as directed by AMHigley. Mockup costs shall be listed on the schedule of values.
17. This Subcontractor shall be responsible to coordinate the installation of required devices and sleeves for this Subcontractor's work with the work of other subcontractors or trades. Unless otherwise noted in the Contract Documents, this Subcontractor shall provide all blocking required for this Subcontractor's Work to the subcontractor installing the blocking.
18. Each Subcontractor shall be responsible for all cutting and patching including fire watch, necessary for the installation of its work. The Subcontractor shall protect adjacent materials from damage, enclose space to contain debris and dust and thoroughly clean the space upon completion of work. In case sleeves or hangers are not placed in time, or are improperly placed, each Subcontractor shall be responsible for forming or drilling openings in the work where required and for any patching or corrective work necessary. Any sleeve or opening left unused by a Subcontractor requesting same shall be filled by that Subcontractor with an approved firestopping material and shall attain full fire rating of wall and/or floor construction. Sealing between the sleeve and the pipe, conduit, duct, etc. will be the responsibility of the Subcontractor who installing the pipe, conduit, duct, or other item within the sleeve.
19. This Subcontractor shall install all clips or other items of the Subcontractor's Work to components that will be fireproofed before installation of fireproofing. The Subcontractor shall pay all costs to repair fireproofing caused by the installation of clips or other items of the Subcontractor's Work after the installation of fireproofing. Patching of spray-on-fireproofing will be the responsibility of the Subcontractor causing damage to it.
20. This Subcontractor is responsible to determine the dimensions and adequacy of all housekeeping pads for all equipment furnished pursuant to this Agreement. These pads are to be placed by the Subcontractor requiring them, unless otherwise noted on the contract Documents.
21. This Subcontractor shall furnish and install all access panels required for the Subcontractor's Work for proper operation, maintenance, by the Contract Documents or applicable code, rule, or regulation. Access panels not indicated in documents but required for electrical or mechanical access shall be furnished to the Drywall Subcontractor for installation. Access doors will be furnished by the Subcontractor that installed the system requiring access for maintenance or by building code.

22. This Subcontractor shall provide all required cutting, patching, and coring required for the Subcontractor's Work, including GPR/X-ray inspections, as necessary.
23. The Mechanical Subcontractor shall prepare coordination drawings, including underground drawings, by floor and area for submission to other trades for location of their installations to avoid installation interferences.
24. This Subcontractor shall identify to AMHigley the need for CAD files if required to prepare the Subcontractor's submittal(s). AMHigley will coordinate the Subcontractor's request for CAD files to the Architect. The Subcontractor acknowledges that CAD drawings are a requirement of this Agreement, and the Subcontractor will create all necessary CAD drawings with or without CAD drawing backgrounds from the Architect. This Subcontractor shall include any cost or waiver required for release of CAD files.
25. This Subcontractors additional work shall be the cost of the work relating to a change on a time and material basis or as otherwise agreed in writing by the parties. The limitations, if any, on the subcontractor's overhead and profit shall not exceed ten percent (10%) of the actual cost of the changed Work, labor, equipment and material of a primary tier subcontractor; and/or five percent (5%) of the actual cost of changed Work, labor, equipment and material of a lower tier subcontractor.

B. Trade Specific Scope of Work:

1. All labor, material, and equipment to complete the [BP 04 Tiling Scope of Work](#).
2. Includes compliance with all current COVID guidelines, protocols, and procedures.
3. This contractor is required to use the HammerTech safety software to submit all Safety Plans, JHA's, and SDS's 15 days prior to starting work, and have each item approved prior to their start date.
4. This contractor shall be required to outfit and sustain their employees with a helmet that has an ANSI Type 2 or EN 12492 front/side/rear impact rating.
5. This contractor must have each worker either be enrolled in the MUST program or have a current (within the past year) 11 panel drug card equal to or more stringent than the substance abuse panel and thresholds listed in The Project Safety Plan.
6. Includes temporary shoring, bracing, dust protection, as required to protect the owner-occupied areas of the building from dust, debris, and unauthorized persons. Segregate all construction activity from owners in order to complete the work of this contract.
7. Includes temporary protection of adjacent surfaces while performing the work of this contract.
8. Coordination of all work with AM Higley and all other subcontractors.
9. This Contractor includes multiple mobilizations to perform the work to meet the project schedule. This includes segregating each locker room individually per the contract requirements.
10. This Contractor shall assume appropriate measures to protect existing and newly finished work while performing the work of this Contract.
11. This Subcontractor shall be responsible for any damage and subsequent repairs to any construction in place or construction that is designated as existing to remain. Any damage caused by this Contractor will be repaired or replaced at this Contractor's expense.

12. This Contractor is required to review all project documents to understand the full scope of this work. This Contractor shall visit the site and be familiar with all existing conditions for the site operations prior to starting work.
13. This Contractor will verify existing conditions and locations prior to the start of this work. Coordinate with the AMH Superintendent at least 5 days in advance, if existing conditions differ with those other than as indicated on the project documents, notify AM Higley in writing.
14. Verify with the AMH Superintendent for any materials that are required to be salvaged and turned over to the Owner. This Contractor will take care not to damage any such item. This contractor will secure all items until transferred to the owner or placed in the designated storage container.
15. This Contractor will use during the entire duration a HEPA filter system adequate to eliminate free floating particulate from the atmosphere in each of the immediate work areas. This contractor will place over any return air louver, grille, or transfer duct a filter fabric adequate to prevent debris, dust, or any particulate from contaminating the building's ductwork system.
16. This Contractor is responsible for removing existing tile base and prepping the existing area to receive new. This Contractor shall coordinate preparation of the existing wall with the carpentry contractor if required.
17. This Contractor shall furnish and install all ceramic tile as indicated per the finish schedule. This includes but is not limited to; mortar, thin-set, adhesive, grouting materials, sealers, and all other accessories and work required for a complete installation.
18. This Contractor shall furnish and install all joint sealants as required for a complete wall and floor tile installation. This includes at tile control and expansion joints, and where tile abuts to an adjacent surface requiring joint sealant.
19. This Contractor shall be responsible for performing testing of the moisture content within concrete at tile locations. All tests must be submitted to The Albert M. Higley Co. prior to installation of flooring materials.
20. This Contractor shall provide samples of grout and tile for owner's approval. New tile cannot be ordered until tile sample has been approved. This Contractor is responsible for providing lead times and time to match the existing sample once LOIs have been released.
21. This Contractor shall provide initial cleaning of tile surfaces and install temporary protection measures at tile locations after installation. The final cleaning Contractor shall remove protection.

C. Subcontract Cost Recap:

Base Bid	\$
Accepted Alternates	\$
Scope Review Adjustments	\$
Taxes	Included
Subcontract Total	\$

This Subcontract shall include all necessary applicable taxes as required. This Subcontractor shall review and understand what materials and temporary facilities are taxable, even if the project is Tax Exempt.

D. Alternatives:

The Alternates listed herein shall be considered as options which may be selected by the Contractor. The Subcontractor is obligated to perform any or all of the listed Alternates for the price(s) listed herein if the Contractor, in the Contractor's sole discretion, exercises the right to incorporate the Alternative into the Agreement. These alternates are not included in this Subcontract value.

1.

E. Unit Price Schedule:

(Unit rates to be entered below or attached to this Schedule B, for use throughout entire project duration)

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
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THE ALBERT M. HIGLEY CO., LLC**SCHEDULE B – SCOPE OF WORK**

Scope of Work: **BP 05 Interior/Exterior Painting**
Project Name: **Canton Township CIP – BP 02 Victory
Park Ballfields**

Job No.: **222273-300**
Sub-Job No.:

It is the intention of this Subcontract to include all work necessary for a complete **BP 05 Interior/Exterior Painting**. This includes all work not necessarily detailed on the drawings, but reasonably assumable as being part of the work of this Trade. This is not intended to exclude work not quantifiable from the design drawings and field visit. Any work that you may feel should be part of this package but cannot be quantified from the design drawings shall be first submitted as a pre-bid RFI and if an answer is not received in time, listed as an exclusion on your bid proposal. This Subcontractor is responsible for all work per the Project Specifications associated with their Scope of Work.

A. Project Specific Requirements:

1. This project consists of the renovation of the Canton Township, Victory Park Sports Center located at 46555 Michigan Ave, Canton, MI 48188.
2. Contractor parking/staging will be limited to the South side of the existing parking lot located on the Northwest side of the Victory Park Sports Center.
3. Subcontractors are to coordinate any deliveries or material drop offs with AM Higley prior to delivery. Onsite material storage will be extremely limited. Materials can be dropped off at the project site between the hours of 7am-3pm. AM Higley will assist with this coordination but will not be responsible for scheduling deliveries, assisting with unloading, or handling any materials or equipment.
4. Any work to be done on other floors, common spaces, corridors, and adjacent tenant spaces shall be completed during off hours. Coordinate with AMHigley on the removal and replacement of the ceiling tile. Should this Subcontractor damage the ceiling grid in anyway, they will be responsible for the associated costs to repair the grid.
5. Any loud or obtrusive work will need to be completed on off hours and will need to be coordinated with AMHigley's Superintendent.
6. General requirements in the project specifications noted as required by the Construction Manager shall be provided or be required by the respective prime contractor as applicable to the work.
7. This project has a no tobacco policy (including electronic smoking devices and chewing tobacco), anyone who does not comply with this policy will be subject to permanent removal from the site and possibly issued a citation by the local Police Department. There are no weapons of any kind, type or description permitted on the Project Site. Loud radios or music nor wearing of earphones or headphones are not permitted on the Project Site.
8. This project will be completed during normal business hours, except work in occupied spaces.
9. This Subcontractor will be responsible for daily clean-up of their space and debris. Should the Subcontractor fail to perform any of its clean-up obligations, the AMHigley may perform same itself, or through others, and deduct the costs incurred from the Subcontract Amount.
10. AMHigley urges this Subcontractor to read the Building Owner Documents included in the Bidders Manual. These documents carry requirements that are above and beyond what has been listed on the contract drawings and in the specification sections.

11. This Subcontractor is working in an existing operating facility and will require close communication with the Building Owner in regard to shutdowns, access, and work hours.
12. Temporary power and lighting to be provided by Electrician. Temporary water and wash tubs to be provided by Plumber. This shall include all materials, installation, maintenance, and removal.
13. Break locations to be as designated by AMHigley and the Subcontractors is not permitted to use Owner facilities (i.e. Cafeteria).
14. The normal work hours at the Project Site are Monday through Friday 7:00 am to 4:00 pm (exclusive of holidays).
15. Subcontractors shall use designated portable toilets provided at the exterior of each building at the ground level. Portable toilets will be established in the buildings on designated floors. The use of permanent toilet facilities in the buildings is not allowed.
16. Each Subcontractor is to include mockups as described in the bid documents, including expediting expenses. Mockups will be removed by the Subcontractor installing the mockup as directed by AMHigley. Mockup costs shall be listed on the schedule of values.
17. This Subcontractor shall be responsible to coordinate the installation of required devices and sleeves for this Subcontractor's work with the work of other subcontractors or trades. Unless otherwise noted in the Contract Documents, this Subcontractor shall provide all blocking required for this Subcontractor's Work to the subcontractor installing the blocking.
18. Each Subcontractor shall be responsible for all cutting and patching including fire watch, necessary for the installation of its work. The Subcontractor shall protect adjacent materials from damage, enclose space to contain debris and dust and thoroughly clean the space upon completion of work. In case sleeves or hangers are not placed in time, or are improperly placed, each Subcontractor shall be responsible for forming or drilling openings in the work where required and for any patching or corrective work necessary. Any sleeve or opening left unused by a Subcontractor requesting same shall be filled by that Subcontractor with an approved firestopping material and shall attain full fire rating of wall and/or floor construction. Sealing between the sleeve and the pipe, conduit, duct, etc. will be the responsibility of the Subcontractor who installing the pipe, conduit, duct, or other item within the sleeve.
19. This Subcontractor shall install all clips or other items of the Subcontractor's Work to components that will be fireproofed before installation of fireproofing. The Subcontractor shall pay all costs to repair fireproofing caused by the installation of clips or other items of the Subcontractor's Work after the installation of fireproofing. Patching of spray-on-fireproofing will be the responsibility of the Subcontractor causing damage to it.
20. This Subcontractor is responsible to determine the dimensions and adequacy of all housekeeping pads for all equipment furnished pursuant to this Agreement. These pads are to be placed by the Subcontractor requiring them, unless otherwise noted on the contract Documents.
21. This Subcontractor shall furnish and install all access panels required for the Subcontractor's Work for proper operation, maintenance, by the Contract Documents or applicable code, rule, or regulation. Access panels not indicated in documents but required for electrical or mechanical access shall be furnished to the Drywall Subcontractor for installation. Access doors will be furnished by the Subcontractor that installed the system requiring access for maintenance or by building code.

22. This Subcontractor shall provide all required cutting, patching, and coring required for the Subcontractor's Work, including GPR/X-ray inspections, as necessary.
23. The Mechanical Subcontractor shall prepare coordination drawings, including underground drawings, by floor and area for submission to other trades for location of their installations to avoid installation interferences.
24. This Subcontractor shall identify to AMHigley the need for CAD files if required to prepare the Subcontractor's submittal(s). AMHigley will coordinate the Subcontractor's request for CAD files to the Architect. The Subcontractor acknowledges that CAD drawings are a requirement of this Agreement, and the Subcontractor will create all necessary CAD drawings with or without CAD drawing backgrounds from the Architect. This Subcontractor shall include any cost or waiver required for release of CAD files.
25. This Subcontractors additional work shall be the cost of the work relating to a change on a time and material basis or as otherwise agreed in writing by the parties. The limitations, if any, on the subcontractor's overhead and profit shall not exceed ten percent (10%) of the actual cost of the changed Work, labor, equipment and material of a primary tier subcontractor; and/or five percent (5%) of the actual cost of changed Work, labor, equipment and material of a lower tier subcontractor.

B. Trade Specific Scope of Work:

1. All labor, material, and equipment to complete the [BP 05 Interior/Exterior Scope of Work](#).
2. Includes compliance with all current COVID guidelines, protocols, and procedures.
3. This contractor is required to use the HammerTech safety software to submit all Safety Plans, JHA's, and SDS's 15 days prior to starting work, and have each item approved prior to their start date.
4. This contractor shall be required to outfit and sustain their employees with a helmet that has an ANSI Type 2 or EN 12492 front/side/rear impact rating.
5. This contractor must have each worker either be enrolled in the MUST program or have a current (within the past year) 11 panel drug card equal to or more stringent than the substance abuse panel and thresholds listed in The Project Safety Plan.
6. Includes temporary shoring, bracing, dust protection, as required to protect the owner-occupied areas of the building from dust, debris, and unauthorized persons. Segregate all construction activity from owners in order to complete the work of this contract.
7. Includes temporary protection of adjacent surfaces while performing the work of this contract.
8. Coordination of all work with AM Higley and all other subcontractors.
9. This Contractor includes multiple mobilizations to perform the work to meet the project schedule. This includes segregating each locker room individually per the contract requirements.
10. This Contractor shall assume appropriate measures to protect existing and newly finished work while performing the work of this Contract.
11. This Subcontractor shall be responsible for any damage and subsequent repairs to any construction in place or construction that is designated as existing to remain. Any damage caused by this Contractor will be repaired or replaced at this Contractor's expense.

12. This Contractor is required to review all project documents to understand the full scope of this work. This Contractor shall visit the site and be familiar with all existing conditions for the site operations prior to starting work.
13. This Contractor will verify existing conditions and locations prior to the start of this work. Coordinate with the AMH Superintendent at least 5 days in advance, if existing conditions differ with those other than as indicated on the project documents, notify AM Higley in writing.
14. Verify with the AMH Superintendent for any materials that are required to be salvaged and turned over to the Owner. This Contractor will take care not to damage any such item. This contractor will secure all items until transferred to the owner or placed in the designated storage container.
15. This Contractor shall provide labor and materials to perform all exterior and exterior painting as indicated per the construction drawings and spec book.
16. This Contractor will provide all necessary patching, filler, and prep to the existing walls, ceilings, wood seats, wood trim, metal sills, and metal walls etc. as indicated per the construction drawings or spec book.
17. If visible defects exist in finishes deemed ready for prime and or paint, the Painting Subcontractor shall bring them to the attention of the AMH Superintendent at least 72 hours in advance for resolution and repairs.
18. This Contractor shall remove door and frame fire rated protective label covers after finish painting is completed.
19. This Contractor shall be required to apply the finish coat of painting as a separate mobilization per each phase of the work. The timing of this work will be as directed by AM Higley Superintendent.
20. This Contractor shall include minor spotting of drywall prior to final painting.
21. This Contractor shall caulk door frames, windows, and any other dissimilar adjacent materials to the interior drywall and or wood surfaces prior to painting or staining. Glazers are responsible for caulking around new windows and storefront system.
22. This Contractor is responsible for removing and reinstalling all light fixture and outlet covers as needed. All covers are to be reinstalled by the end of the day per AMHigley's safety requirements.

C. Subcontract Cost Recap:

Base Bid	\$
Accepted Alternates	\$
Scope Review Adjustments	\$
Taxes	Included
Subcontract Total	\$

This Subcontract shall include all necessary applicable taxes as required. This Subcontractor shall review and understand what materials and temporary facilities are taxable, even if the project is Tax Exempt.

D. Alternatives:

The Alternates listed herein shall be considered as options which may be selected by the Contractor. The Subcontractor is obligated to perform any or all of the listed Alternates for the price(s) listed herein if the Contractor, in the Contractor's sole discretion, exercises the right to incorporate the Alternative into the Agreement. These alternates are not included in this Subcontract value.

1.

E. Unit Price Schedule:

(Unit rates to be entered below or attached to this Schedule B, for use throughout entire project duration)

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
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Scope of Work: **BP 06 Toilet Partition**
Project Name: **Canton Township CIP – BP 02 Victory
Park Ballfields**

Job No.: **222273-300**
Sub-Job No.:

It is the intention of this Subcontract to include all work necessary for a complete **BP 06 Toilet Partition**. This includes all work not necessarily detailed on the drawings, but reasonably assumable as being part of the work of this Trade. This is not intended to exclude work not quantifiable from the design drawings and field visit. Any work that you may feel should be part of this package but cannot be quantified from the design drawings shall be first submitted as a pre-bid RFI and if an answer is not received in time, listed as an exclusion on your bid proposal. This Subcontractor is responsible for all work per the Project Specifications associated with their Scope of Work.

A. Project Specific Requirements:

1. This project consists of the renovation of the Canton Township, Victory Park Sports Center located at 46555 Michigan Ave, Canton, MI 48188.
2. Contractor parking/staging will be limited to the South side of the existing parking lot located on the Northwest side of the Victory Park Sports Center.
3. Subcontractors are to coordinate any deliveries or material drop offs with AM Higley prior to delivery. Onsite material storage will be extremely limited. Materials can be dropped off at the project site between the hours of 7am-3pm. AM Higley will assist with this coordination but will not be responsible for scheduling deliveries, assisting with unloading, or handling any materials or equipment.
4. Any work to be done on other floors, common spaces, corridors, and adjacent tenant spaces shall be completed during off hours. Coordinate with AMHigley on the removal and replacement of the ceiling tile. Should this Subcontractor damage the ceiling grid in anyway, they will be responsible for the associated costs to repair the grid.
5. Any loud or obtrusive work will need to be completed on off hours and will need to be coordinated with AMHigley's Superintendent.
6. General requirements in the project specifications noted as required by the Construction Manager shall be provided or be required by the respective prime contractor as applicable to the work.
7. This project has a no tobacco policy (including electronic smoking devices and chewing tobacco), anyone who does not comply with this policy will be subject to permanent removal from the site and possibly issued a citation by the local Police Department. There are no weapons of any kind, type or description permitted on the Project Site. Loud radios or music nor wearing of earphones or headphones are not permitted on the Project Site.
8. This project will be completed during normal business hours, except work in occupied spaces.
9. This Subcontractor will be responsible for daily clean-up of their space and debris. Should the Subcontractor fail to perform any of its clean-up obligations, the AMHigley may perform same itself, or through others, and deduct the costs incurred from the Subcontract Amount.
10. AMHigley urges this Subcontractor to read the Building Owner Documents included in the Bidders Manual. These documents carry requirements that are above and beyond what has been listed on the contract drawings and in the specification sections.

11. This Subcontractor is working in an existing operating facility and will require close communication with the Building Owner in regard to shutdowns, access, and work hours.
12. Temporary power and lighting to be provided by Electrician. Temporary water and wash tubs to be provided by Plumber. This shall include all materials, installation, maintenance, and removal.
13. Break locations to be as designated by AMHigley and the Subcontractors is not permitted to use Owner facilities (i.e. Cafeteria).
14. The normal work hours at the Project Site are Monday through Friday 7:00 am to 4:00 pm (exclusive of holidays).
15. Subcontractors shall use designated portable toilets provided at the exterior of each building at the ground level. Portable toilets will be established in the buildings on designated floors. The use of permanent toilet facilities in the buildings is not allowed.
16. Each Subcontractor is to include mockups as described in the bid documents, including expediting expenses. Mockups will be removed by the Subcontractor installing the mockup as directed by AMHigley. Mockup costs shall be listed on the schedule of values.
17. This Subcontractor shall be responsible to coordinate the installation of required devices and sleeves for this Subcontractor's work with the work of other subcontractors or trades. Unless otherwise noted in the Contract Documents, this Subcontractor shall provide all blocking required for this Subcontractor's Work to the subcontractor installing the blocking.
18. Each Subcontractor shall be responsible for all cutting and patching including fire watch, necessary for the installation of its work. The Subcontractor shall protect adjacent materials from damage, enclose space to contain debris and dust and thoroughly clean the space upon completion of work. In case sleeves or hangers are not placed in time, or are improperly placed, each Subcontractor shall be responsible for forming or drilling openings in the work where required and for any patching or corrective work necessary. Any sleeve or opening left unused by a Subcontractor requesting same shall be filled by that Subcontractor with an approved firestopping material and shall attain full fire rating of wall and/or floor construction. Sealing between the sleeve and the pipe, conduit, duct, etc. will be the responsibility of the Subcontractor who installing the pipe, conduit, duct, or other item within the sleeve.
19. This Subcontractor shall install all clips or other items of the Subcontractor's Work to components that will be fireproofed before installation of fireproofing. The Subcontractor shall pay all costs to repair fireproofing caused by the installation of clips or other items of the Subcontractor's Work after the installation of fireproofing. Patching of spray-on-fireproofing will be the responsibility of the Subcontractor causing damage to it.
20. This Subcontractor is responsible to determine the dimensions and adequacy of all housekeeping pads for all equipment furnished pursuant to this Agreement. These pads are to be placed by the Subcontractor requiring them, unless otherwise noted on the contract Documents.
21. This Subcontractor shall furnish and install all access panels required for the Subcontractor's Work for proper operation, maintenance, by the Contract Documents or applicable code, rule, or regulation. Access panels not indicated in documents but required for electrical or mechanical access shall be furnished to the Drywall Subcontractor for installation. Access doors will be furnished by the Subcontractor that installed the system requiring access for maintenance or by building code.

22. This Subcontractor shall provide all required cutting, patching, and coring required for the Subcontractor's Work, including GPR/X-ray inspections, as necessary.
23. The Mechanical Subcontractor shall prepare coordination drawings, including underground drawings, by floor and area for submission to other trades for location of their installations to avoid installation interferences.
24. This Subcontractor shall identify to AMHigley the need for CAD files if required to prepare the Subcontractor's submittal(s). AMHigley will coordinate the Subcontractor's request for CAD files to the Architect. The Subcontractor acknowledges that CAD drawings are a requirement of this Agreement, and the Subcontractor will create all necessary CAD drawings with or without CAD drawing backgrounds from the Architect. This Subcontractor shall include any cost or waiver required for release of CAD files.
25. This Subcontractors additional work shall be the cost of the work relating to a change on a time and material basis or as otherwise agreed in writing by the parties. The limitations, if any, on the subcontractor's overhead and profit shall not exceed ten percent (10%) of the actual cost of the changed Work, labor, equipment and material of a primary tier subcontractor; and/or five percent (5%) of the actual cost of changed Work, labor, equipment and material of a lower tier subcontractor.

B. Trade Specific Scope of Work:

1. All labor, material, and equipment to complete the [BP 06 Toilet Partition Scope of Work](#).
2. Includes compliance with all current COVID guidelines, protocols, and procedures.
3. This contractor is required to use the HammerTech safety software to submit all Safety Plans, JHA's, and SDS's 15 days prior to starting work, and have each item approved prior to their start date.
4. This contractor shall be required to outfit and sustain their employees with a helmet that has an ANSI Type 2 or EN 12492 front/side/rear impact rating.
5. This contractor must have each worker either be enrolled in the MUST program or have a current (within the past year) 11 panel drug card equal to or more stringent than the substance abuse panel and thresholds listed in The Project Safety Plan.
6. Includes temporary shoring, bracing, dust protection, as required to protect the owner-occupied areas of the building from dust, debris, and unauthorized persons. Segregate all construction activity from owners in order to complete the work of this contract.
7. Includes temporary protection of adjacent surfaces while performing the work of this contract.
8. Coordination of all work with AM Higley and all other subcontractors.
9. This Contractor includes multiple mobilizations to perform the work to meet the project schedule. This includes segregating each locker room individually per the contract requirements.
10. This Contractor shall assume appropriate measures to protect existing and newly finished work while performing the work of this Contract.
11. This Subcontractor shall be responsible for any damage and subsequent repairs to any construction in place or construction that is designated as existing to remain. Any damage caused by this Contractor will be repaired or replaced at this Contractor's expense.

12. This Contractor is required to review all project documents to understand the full scope of this work. This Contractor shall visit the site and be familiar with all existing conditions for the site operations prior to starting work.
13. This Contractor will verify existing conditions and locations prior to the start of this work. Coordinate with the AMH Superintendent at least 5 days in advance, if existing conditions differ with those other than as indicated on the project documents, notify AM Higley in writing.
14. Verify with the AMH Superintendent for any materials that are required to be salvaged and turned over to the Owner. This Contractor will take care not to damage any such item. This contractor will secure all items until transferred to the owner or placed in the designated storage container.
15. This contractor will use during the entire duration a HEPA filter system adequate to eliminate free floating particulate from the atmosphere in each of the immediate work areas. This contractor will place over any return air louver, grille, or transfer duct a filter fabric adequate to prevent debris, dust, or any particulate from contaminating the building's ductwork system.
16. This contractor shall fabricate and install new toilet partition, urinal screens, and hardware in designated areas per the drawings. The layout of the new toilet partitions is to be in compliance with ADA standards and shall be coordinated other trades as necessary as indicated per the drawings.
17. Toilet partitions shall be furnished and installed per manufacturer's standards. Blocking and backing is to be provided by others. This Contractor shall coordinate additional reinforcement such as blocking or backing with the carpentry contractor.
18. This Contractor is responsible for field measuring for all new toilet partitions and providing shop drawings with the identified measurements.
19. This Contractor shall provide all accessories and cutsheets to show how new toilet partitions will be installed and secured.

C. Subcontract Cost Recap:

Base Bid	\$
Accepted Alternates	\$
Scope Review Adjustments	\$
Taxes	Included
Subcontract Total	\$

This Subcontract shall include all necessary applicable taxes as required. This Subcontractor shall review and understand what materials and temporary facilities are taxable, even if the project is Tax Exempt.

D. Alternatives:

The Alternates listed herein shall be considered as options which may be selected by the Contractor. The Subcontractor is obligated to perform any or all of the listed Alternates for the price(s) listed herein if the Contractor, in the Contractor's sole discretion, exercises the right to incorporate the Alternative into the Agreement. These alternates are not included in this Subcontract value.

1.

- E. Unit Price Schedule:
(Unit rates to be entered below or attached to this Schedule B, for use throughout entire project duration)

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
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THE ALBERT M. HIGLEY CO., LLC**SCHEDULE B – SCOPE OF WORK**

Scope of Work: **BP 07 Electrical**
Project Name: **Canton Township CIP – BP 02 Victory
Park Ballfields**

Job No.: **222273-300**
Sub-Job No.:

It is the intention of this Subcontract to include all work necessary for a complete **BP 07 Electrical**. This includes all work not necessarily detailed on the drawings, but reasonably assumable as being part of the work of this Trade. This is not intended to exclude work not quantifiable from the design drawings and field visit. Any work that you may feel should be part of this package but cannot be quantified from the design drawings shall be first submitted as a pre-bid RFI and if an answer is not received in time, listed as an exclusion on your bid proposal. This Subcontractor is responsible for all work per the Project Specifications associated with their Scope of Work.

A. Project Specific Requirements:

1. This project consists of the renovation of the Canton Township, Victory Park Sports Center located at 46555 Michigan Ave, Canton, MI 48188.
2. Contractor parking/staging will be limited to the South side of the existing parking lot located on the Northwest side of the Victory Park Sports Center.
3. Subcontractors are to coordinate any deliveries or material drop offs with AM Higley prior to delivery. Onsite material storage will be extremely limited. Materials can be dropped off at the project site between the hours of 7am-3pm. AM Higley will assist with this coordination but will not be responsible for scheduling deliveries, assisting with unloading, or handling any materials or equipment.
4. Any work to be done on other floors, common spaces, corridors, and adjacent tenant spaces shall be completed during off hours. Coordinate with AMHigley on the removal and replacement of the ceiling tile. Should this Subcontractor damage the ceiling grid in anyway, they will be responsible for the associated costs to repair the grid.
5. Any loud or obtrusive work will need to be completed on off hours and will need to be coordinated with AMHigley's Superintendent.
6. General requirements in the project specifications noted as required by the Construction Manager shall be provided or be required by the respective prime contractor as applicable to the work.
7. This project has a no tobacco policy (including electronic smoking devices and chewing tobacco), anyone who does not comply with this policy will be subject to permanent removal from the site and possibly issued a citation by the local Police Department. There are no weapons of any kind, type or description permitted on the Project Site. Loud radios or music nor wearing of earphones or headphones are not permitted on the Project Site.
8. This project will be completed during normal business hours, except work in occupied spaces.
9. This Subcontractor will be responsible for daily clean-up of their space and debris. Should the Subcontractor fail to perform any of its clean-up obligations, the AMHigley may perform same itself, or through others, and deduct the costs incurred from the Subcontract Amount.
10. AMHigley urges this Subcontractor to read the Building Owner Documents included in the Bidders Manual. These documents carry requirements that are above and beyond what has been listed on the contract drawings and in the specification sections.

11. This Subcontractor is working in an existing operating facility and will require close communication with the Building Owner in regard to shutdowns, access, and work hours.
12. Temporary power and lighting to be provided by Electrician. Temporary water and wash tubs to be provided by Plumber. This shall include all materials, installation, maintenance, and removal.
13. Break locations to be as designated by AMHigley and the Subcontractors is not permitted to use Owner facilities (i.e. Cafeteria).
14. The normal work hours at the Project Site are Monday through Friday 7:00 am to 4:00 pm (exclusive of holidays).
15. Subcontractors shall use designated portable toilets provided at the exterior of each building at the ground level. Portable toilets will be established in the buildings on designated floors. The use of permanent toilet facilities in the buildings is not allowed.
16. Each Subcontractor is to include mockups as described in the bid documents, including expediting expenses. Mockups will be removed by the Subcontractor installing the mockup as directed by AMHigley. Mockup costs shall be listed on the schedule of values.
17. This Subcontractor shall be responsible to coordinate the installation of required devices and sleeves for this Subcontractor's work with the work of other subcontractors or trades. Unless otherwise noted in the Contract Documents, this Subcontractor shall provide all blocking required for this Subcontractor's Work to the subcontractor installing the blocking.
18. Each Subcontractor shall be responsible for all cutting and patching including fire watch, necessary for the installation of its work. The Subcontractor shall protect adjacent materials from damage, enclose space to contain debris and dust and thoroughly clean the space upon completion of work. In case sleeves or hangers are not placed in time, or are improperly placed, each Subcontractor shall be responsible for forming or drilling openings in the work where required and for any patching or corrective work necessary. Any sleeve or opening left unused by a Subcontractor requesting same shall be filled by that Subcontractor with an approved firestopping material and shall attain full fire rating of wall and/or floor construction. Sealing between the sleeve and the pipe, conduit, duct, etc. will be the responsibility of the Subcontractor who installing the pipe, conduit, duct, or other item within the sleeve.
19. This Subcontractor shall install all clips or other items of the Subcontractor's Work to components that will be fireproofed before installation of fireproofing. The Subcontractor shall pay all costs to repair fireproofing caused by the installation of clips or other items of the Subcontractor's Work after the installation of fireproofing. Patching of spray-on-fireproofing will be the responsibility of the Subcontractor causing damage to it.
20. This Subcontractor is responsible to determine the dimensions and adequacy of all housekeeping pads for all equipment furnished pursuant to this Agreement. These pads are to be placed by the Subcontractor requiring them, unless otherwise noted on the contract Documents.
21. This Subcontractor shall furnish and install all access panels required for the Subcontractor's Work for proper operation, maintenance, by the Contract Documents or applicable code, rule, or regulation. Access panels not indicated in documents but required for electrical or mechanical access shall be furnished to the Drywall Subcontractor for installation. Access doors will be furnished by the Subcontractor that installed the system requiring access for maintenance or by building code.

22. This Subcontractor shall provide all required cutting, patching, and coring required for the Subcontractor's Work, including GPR/X-ray inspections, as necessary.
23. The Mechanical Subcontractor shall prepare coordination drawings, including underground drawings, by floor and area for submission to other trades for location of their installations to avoid installation interferences.
24. This Subcontractor shall identify to AMHigley the need for CAD files if required to prepare the Subcontractor's submittal(s). AMHigley will coordinate the Subcontractor's request for CAD files to the Architect. The Subcontractor acknowledges that CAD drawings are a requirement of this Agreement, and the Subcontractor will create all necessary CAD drawings with or without CAD drawing backgrounds from the Architect. This Subcontractor shall include any cost or waiver required for release of CAD files.
25. This Subcontractors additional work shall be the cost of the work relating to a change on a time and material basis or as otherwise agreed in writing by the parties. The limitations, if any, on the subcontractor's overhead and profit shall not exceed ten percent (10%) of the actual cost of the changed Work, labor, equipment and material of a primary tier subcontractor; and/or five percent (5%) of the actual cost of changed Work, labor, equipment and material of a lower tier subcontractor.

B. Trade Specific Scope of Work:

1. All labor, material, and equipment to complete the [BP 07 Electrical Scope of Work](#).
2. Includes compliance with all current COVID guidelines, protocols, and procedures.
3. This contractor is required to use the HammerTech safety software to submit all Safety Plans, JHA's, and SDS's 15 days prior to starting work, and have each item approved prior to their start date.
4. This contractor shall be required to outfit and sustain their employees with a helmet that has an ANSI Type 2 or EN 12492 front/side/rear impact rating.
5. This contractor must have each worker either be enrolled in the MUST program or have a current (within the past year) 11 panel drug card equal to or more stringent than the substance abuse panel and thresholds listed in The Project Safety Plan.
6. Includes temporary shoring, bracing, dust protection, as required to protect the owner-occupied areas of the building from dust, debris, and unauthorized persons. Segregate all construction activity from owners in order to complete the work of this contract.
7. Includes temporary protection of adjacent surfaces while performing the work of this contract.
8. Coordination of all work with AM Higley and all other subcontractors.
9. This Contractor includes multiple mobilizations to perform the work to meet the project schedule. This includes segregating each locker room individually per the contract requirements.
10. This Contractor shall assume appropriate measures to protect existing and newly finished work while performing the work of this Contract.
11. This Subcontractor shall be responsible for any damage and subsequent repairs to any construction in place or construction that is designated as existing to remain. Any damage caused by this Contractor will be repaired or replaced at this Contractor's expense.

12. This Contractor is required to review all project documents to understand the full scope of this work. This Contractor shall visit the site and be familiar with all existing conditions for the site operations prior to starting work.
13. This Contractor will verify existing conditions and locations prior to the start of this work. Coordinate with the AMH Superintendent at least 5 days in advance, if existing conditions differ with those other than as indicated on the project documents, notify AM Higley in writing.
14. Verify with the AMH Superintendent for any materials that are required to be salvaged and turned over to the Owner. This Contractor will take care not to damage any such item. This contractor will secure all items until transferred to the owner or placed in the designated storage container.
15. This contractor will use during the entire duration a HEPA filter system adequate to eliminate free floating particulate from the atmosphere in each of the immediate work areas. This contractor will place over any return air louver, grille, or transfer duct a filter fabric adequate to prevent debris, dust, or any particulate from contaminating the building's ductwork system.
16. This Contractor shall provide all identification, cut, cap, and marking for Electrical demolition as noted on the drawings. The demolition, removal and disposal of marked Electrical after cut and cap is completed by this trade. Shut off and cap any electrical work as needed to make safe for selective demolition of walls, ceiling, etc. to occur. This Contractor shall install any temporary provisions as needed to be able to complete this work without shutting down service to occupied portions of the building. Verify if the Owner intends to salvage any fixtures and remove them and store them in a location as determined with AMH and the Owner. This Contractor will be responsible for making sure that power remains in-tact to occupied spaces while demolishing adjacent renovated spaces.
17. Should this Contractor need to remove and reinstall existing ceilings to complete electrical work that extends through finished spaces. This Contractor shall patch/repair or replace any ceiling tiles that are damaged during this process.
18. This Contractor shall notify the AMH Superintendent no less than one week in advance of any shutdown of service to the occupied portions of the building. This work will need to be coordinated with the owner at acceptable times.
19. This Contractor is responsible for providing, installing, maintaining, and removing all temporary lighting and power as directed by AMH.
20. This Contractor shall furnish and install all supports required for fixtures, cable, conduit, etc.
21. This contractor shall install all light fixtures, replacement lights fixtures, light bulbs, and lighting controls as shown per the drawings. Includes integration with existing lighting control panel associated within plant. Musco lighting and lighting controls is to be furnished by the owner.
22. This contractor shall furnish and install all new electrical equipment, disconnects, panels, ats, etc... as required per the drawings.
23. This Contractor shall furnish and install all conduit, pipe, raceways, wiring, electrical devices, panels, and accessories as required per drawings.
24. This Contractor shall install all required electrical components of door hardware furnished by others, if required. Coordinate with AMH, other contractors, and the door hardware schedule.

25. This Contractor shall provide any core drilling and any cutting and patching for penetrations as needed to complete the installation of this work.
26. This Contractor shall furnish and install all firestopping required for penetrations of fire and smoke barriers generated by the installation of conduit and/or equipment installed by the Work of this Bid Package. This Contractor is responsible for core drilling as required for this work.
27. This Contractor is responsible for sealing all penetrations which result from the installation of the work of this bid package, including all sound, fire and smoke penetrations as specified. This contractor shall seal the annular space between the pipe and the sleeve in accordance with the specifications. If this contractor penetrates any wall or floor after it is in place, this contractor shall seal between the pipe and the assembly in accordance with the specifications.
28. This Contractor shall furnish all appropriate access door and/or inspection panels for non-accessible electrical items within walls, chases, and ceilings. Location, quantity, and size of access panels/doors is the responsibility of this Contractor. Installation of access panels indicated on the plans will be installed by others. Should additional access panels be required, but are not shown, this contractor is responsible to furnish and install.
29. This Contractor shall coordinate all electrical work with low voltage contractor data locations below and above access flooring. Includes coring through access flooring as shown per the drawings.
30. This contractor includes any backing, blocking, support, etc. if not shown but required to complete the work of this contract.
31. If required. This Contractor shall coordinate all equipment terminations with the equipment supplier, including, but not limited to: Owner's equipment suppliers, Fire Protection, Plumbing, Temperature Control, HVAC, and Audio/Video.
32. This contractor includes all hardwiring and final connections of all plumbing equipment and toilet accessories as indicated per drawings.
33. This Contractor shall provide grounding to meet the requirements of the NEC.
34. This Contractor shall provide all electrical work and make all final connections and reconnections of electrical systems to equipment. This includes all necessary fittings and adapters required, even if not identified on the drawings or specifications. This Contractor shall coordinate with the other contractors for all associated required work.
35. This Contractor will participate in coordination of all above-ceiling work with other trades.
36. This Contractor shall include all costs associated with multiple partial testing and inspection of the installation as required. This applies to walls, ceilings, and ballfield lights. No claims for additional cost will be considered due to additional testing/inspections required.
37. This Contractor shall include all costs necessary to manage factory start-up of electrical distribution equipment installed under this contract. Include costs for testing and training per the specification requirements.
38. This Contractor shall include all costs associated with final cleaning the work of his bid package that is exposed in unfinished areas, such as mechanical and electrical rooms. This shall include wiping dust and dirt from all distribution equipment. This shall be performed immediately prior to Owner occupancy at the direction of the AMH Superintendent.

39. This Contractor is responsible for removal of the existing electric submersible motors and controls. This Contractor shall procure and install the new electric submersible motors and controls in the pump room as indicated per the construction drawings.
40. This Contractor shall furnish and install underground conduit as indicated per the drawings and includes digging for conduit within subgrade. Back fill and final grade of excavated material covered by this subcontractor as well as all finish grade and concrete. NOTE: All excavations that come within 36" of an underground utility, shall have hydro vacuuming potholing to exactly identify the location of the buried utility prior to proceeding with powered equipment or machinery.
41. This Contractor is responsible for cutting, capping, and the removal of all existing switch gears within Victory Park. They shall provide a backfill, finish base, concrete pad, procure, install, and reconnect all new switch gears outside of Victory Park as shown on the construction drawings.
42. This Contractor shall remove the existing step-down transformer and pad outside of Victory Park. They shall procure and install the new step-down transformer and pad as shown on the construction documents.
43. This Contractor is responsible for coordinating all work with DTE including but not limited to; locating conduit locations within new switchgear, furnish and install of conduits to and from switchgear and step down transformers, connection to existing electrical equipment, excavation, concrete ductbank, backfill, and finish grade and concrete walk.
44. SEE NOTE 03 ON DRAWING E121: This Contractor is responsible for filed investigation and circuit tracing of all existing electrical systems as required to generate a one-line diagram. Include ratings of electrical equipment (voltage, full load amps, horsepower, fuse sizes, ampacities, etc. as applicable). Indicate the following:
 - a. Utility Transformer with ratings.
 - b. Feeders to each panel board and load center in the maintenance building and in the pump enclosure.
 - c. Large loads including all pumps, controllers, and disconnecting means with ratings. Document location of the load on the one-line diagram. Provide a unique name to each load to avoid duplicates.
 - d. Indicate feeder sizes (conduit size and conductor counts and sizes with ground) and overcurrent device ratings serving each feeder.
 - e. Transformer ratings and locations serving load centers in maintenance building and in pump enclosure building.
 - f. Small 120V and 208V single phase loads fed by load centers are not required to be indicated on the one-line diagram, unless otherwise noted.
 - g. Identify the location and function of the well contractor noted in circuit 11 of load center in the maintenance building.
 - h. Identify if any loads served by panelboards are not in use or abandoned. Confirm status with owner so that breaker may be marked spare.

C. Subcontract Cost Recap:

Base Bid	\$
Accepted Alternates	\$
Scope Review Adjustments	\$
Taxes	Included

Subcontract Total	\$
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This Subcontract shall include all necessary applicable taxes as required. This Subcontractor shall review and understand what materials and temporary facilities are taxable, even if the project is Tax Exempt.

- D. Alternatives:
The Alternates listed herein shall be considered as options which may be selected by the Contractor. The Subcontractor is obligated to perform any or all of the listed Alternates for the price(s) listed herein if the Contractor, in the Contractor's sole discretion, exercises the right to incorporate the Alternative into the Agreement. These alternates are not included in this Subcontract value.

1.

- E. Unit Price Schedule:
(Unit rates to be entered below or attached to this Schedule B, for use throughout entire project duration)

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
-----------------	--------------------	-----------------	-------------------	---------------

THE ALBERT M. HIGLEY CO., LLC**SCHEDULE B – SCOPE OF WORK**

Scope of Work: **BP 08 Fencing**
Project Name: **Canton Township CIP – BP 02 Victory
Park Ballfields**

Job No.: **222273-300**
Sub-Job No.:

It is the intention of this Subcontract to include all work necessary for a complete **BP 08 Fencing**. This includes all work not necessarily detailed on the drawings, but reasonably assumable as being part of the work of this Trade. This is not intended to exclude work not quantifiable from the design drawings and field visit. Any work that you may feel should be part of this package but cannot be quantified from the design drawings shall be first submitted as a pre-bid RFI and if an answer is not received in time, listed as an exclusion on your bid proposal. This Subcontractor is responsible for all work per the Project Specifications associated with their Scope of Work.

A. Project Specific Requirements:

1. This project consists of the renovation of the Canton Township, Victory Park Sports Center located at 46555 Michigan Ave, Canton, MI 48188.
2. Contractor parking/staging will be limited to the South side of the existing parking lot located on the Northwest side of the Victory Park Sports Center.
3. Subcontractors are to coordinate any deliveries or material drop offs with AM Higley prior to delivery. Onsite material storage will be extremely limited. Materials can be dropped off at the project site between the hours of 7am-3pm. AM Higley will assist with this coordination but will not be responsible for scheduling deliveries, assisting with unloading, or handling any materials or equipment.
4. Any work to be done on other floors, common spaces, corridors, and adjacent tenant spaces shall be completed during off hours. Coordinate with AMHigley on the removal and replacement of the ceiling tile. Should this Subcontractor damage the ceiling grid in anyway, they will be responsible for the associated costs to repair the grid.
5. Any loud or obtrusive work will need to be completed on off hours and will need to be coordinated with AM Higley's Superintendent.
6. General requirements in the project specifications noted as required by the Construction Manager shall be provided or be required by the respective prime contractor as applicable to the work.
7. This project has a no tobacco policy (including electronic smoking devices and chewing tobacco), anyone who does not comply with this policy will be subject to permanent removal from the site and possibly issued a citation by the local Police Department. There are no weapons of any kind, type or description permitted on the Project Site. Loud radios or music nor wearing of earphones or headphones are not permitted on the Project Site.
8. This project will be completed during normal business hours, except work in occupied spaces.
9. This Subcontractor will be responsible for daily clean-up of their space and debris. Should the Subcontractor fail to perform any of its clean-up obligations, the AMHigley may perform same itself, or through others, and deduct the costs incurred from the Subcontract Amount.
10. AMHigley urges this Subcontractor to read the Building Owner Documents included in the Bidders Manual. These documents carry requirements that are above and beyond what has been listed on the contract drawings and in the specification sections.

11. This Subcontractor is working in an existing operating facility and will require close communication with the Building Owner in regard to shutdowns, access, and work hours.
12. Temporary power and lighting to be provided by Electrician. Temporary water and wash tubs to be provided by Plumber. This shall include all materials, installation, maintenance, and removal.
13. Break locations to be as designated by AMHigley and the Subcontractors is not permitted to use Owner facilities (i.e. Cafeteria).
14. The normal work hours at the Project Site are Monday through Friday 7:00 am to 4:00 pm (exclusive of holidays).
15. Subcontractors shall use designated portable toilets provided at the exterior of each building at the ground level. Portable toilets will be established in the buildings on designated floors. The use of permanent toilet facilities in the buildings is not allowed.
16. Each Subcontractor is to include mockups as described in the bid documents, including expediting expenses. Mockups will be removed by the Subcontractor installing the mockup as directed by AMHigley. Mockup costs shall be listed on the schedule of values.
17. This Subcontractor shall be responsible to coordinate the installation of required devices and sleeves for this Subcontractor's work with the work of other subcontractors or trades. Unless otherwise noted in the Contract Documents, this Subcontractor shall provide all blocking required for this Subcontractor's Work to the subcontractor installing the blocking.
18. Each Subcontractor shall be responsible for all cutting and patching including fire watch, necessary for the installation of its work. The Subcontractor shall protect adjacent materials from damage, enclose space to contain debris and dust and thoroughly clean the space upon completion of work. In case sleeves or hangers are not placed in time, or are improperly placed, each Subcontractor shall be responsible for forming or drilling openings in the work where required and for any patching or corrective work necessary. Any sleeve or opening left unused by a Subcontractor requesting same shall be filled by that Subcontractor with an approved firestopping material and shall attain full fire rating of wall and/or floor construction. Sealing between the sleeve and the pipe, conduit, duct, etc. will be the responsibility of the Subcontractor who installing the pipe, conduit, duct, or other item within the sleeve.
19. This Subcontractor shall install all clips or other items of the Subcontractor's Work to components that will be fireproofed before installation of fireproofing. The Subcontractor shall pay all costs to repair fireproofing caused by the installation of clips or other items of the Subcontractor's Work after the installation of fireproofing. Patching of spray-on-fireproofing will be the responsibility of the Subcontractor causing damage to it.
20. This Subcontractor is responsible to determine the dimensions and adequacy of all housekeeping pads for all equipment furnished pursuant to this Agreement. These pads are to be placed by the Subcontractor requiring them, unless otherwise noted on the contract Documents.
21. This Subcontractor shall furnish and install all access panels required for the Subcontractor's Work for proper operation, maintenance, by the Contract Documents or applicable code, rule, or regulation. Access panels not indicated in documents but required for electrical or mechanical access shall be furnished to the Drywall Subcontractor for installation. Access doors will be furnished by the Subcontractor that installed the system requiring access for maintenance or by building code.

22. This Subcontractor shall provide all required cutting, patching, and coring required for the Subcontractor's Work, including GPR/X-ray inspections, as necessary.
23. The Mechanical Subcontractor shall prepare coordination drawings, including underground drawings, by floor and area for submission to other trades for location of their installations to avoid installation interferences.
24. This Subcontractor shall identify to AMHigley the need for CAD files if required to prepare the Subcontractor's submittal(s). AMHigley will coordinate the Subcontractor's request for CAD files to the Architect. The Subcontractor acknowledges that CAD drawings are a requirement of this Agreement, and the Subcontractor will create all necessary CAD drawings with or without CAD drawing backgrounds from the Architect. This Subcontractor shall include any cost or waiver required for release of CAD files.
25. This Subcontractors additional work shall be the cost of the work relating to a change on a time and material basis or as otherwise agreed in writing by the parties. The limitations, if any, on the subcontractor's overhead and profit shall not exceed ten percent (10%) of the actual cost of the changed Work, labor, equipment and material of a primary tier subcontractor; and/or five percent (5%) of the actual cost of changed Work, labor, equipment and material of a lower tier subcontractor.

B. Trade Specific Scope of Work:

1. All labor, material, and equipment to complete the [BP 08 Fencing Scope of Work](#).
2. Includes compliance with all current COVID guidelines, protocols, and procedures.
3. This contractor is required to use the HammerTech safety software to submit all Safety Plans, JHA's, and SDS's 15 days prior to starting work, and have each item approved prior to their start date.
4. This contractor shall be required to outfit and sustain their employees with a helmet that has an ANSI Type 2 or EN 12492 front/side/rear impact rating.
5. This contractor must have each worker either be enrolled in the MUST program or have a current (within the past year) 11 panel drug card equal to or more stringent than the substance abuse panel and thresholds listed in The Project Safety Plan.
6. Includes temporary shoring, bracing, dust protection, as required to protect the owner-occupied areas of the building from dust, debris, and unauthorized persons. Segregate all construction activity from owners in order to complete the work of this contract.
7. Includes temporary protection of adjacent surfaces while performing the work of this contract.
8. Coordination of all work with AM Higley and all other subcontractors.
9. This Contractor includes multiple mobilizations to perform the work to meet the project schedule. This includes segregating each locker room individually per the contract requirements.
10. This Contractor shall assume appropriate measures to protect existing and newly finished work while performing the work of this Contract.
11. This Subcontractor shall be responsible for any damage and subsequent repairs to any construction in place or construction that is designated as existing to remain. Any damage caused by this Contractor will be repaired or replaced at this Contractor's expense.

12. This Contractor is required to review all project documents to understand the full scope of this work. This Contractor shall visit the site and be familiar with all existing conditions for the site operations prior to starting work.
13. This Contractor will verify existing conditions and locations prior to the start of this work. Coordinate with the AMH Superintendent at least 5 days in advance, if existing conditions differ with those other than as indicated on the project documents, notify AM Higley in writing.
14. Verify with the AMH Superintendent for any materials that are required to be salvaged and turned over to the Owner. This Contractor will take care not to damage any such item. This contractor will secure all items until transferred to the owner or placed in the designated storage container.
15. This Contractor shall selectively remove, salvage and repair all fencing as indicated per the drawings. Including, but not limited to all PVC type fencing, metal fencing, chain link fencing, overhang brace posts at backstop. This includes field welding any necessary areas that require repair.
16. This Contractor shall include all material and accessories necessary for repairing of existing fencing and furnish and install of new fencing as indicated per the drawings.
17. This Contractor shall furnish and install new Kingston style fence as indicated per the drawings.
18. This Contractor to include auger drilling for piers, pouring concrete foundations, and backfilling posts.
19. This Contractor is to coordinate with other trades on site, specifically in regards to the light pole replacement.
20. This Contractor shall provide a breakout cost for fencing removal and reinstall in necessary for new light pole installation around ball fields.
21. This contractor to provide protection and clean up of their own work.

C. Subcontract Cost Recap:

Base Bid	\$
Accepted Alternates	\$
Scope Review Adjustments	\$
Taxes	Included
Subcontract Total	\$

This Subcontract shall include all necessary applicable taxes as required. This Subcontractor shall review and understand what materials and temporary facilities are taxable, even if the project is Tax Exempt.

D. Alternatives:

The Alternates listed herein shall be considered as options which may be selected by the Contractor. The Subcontractor is obligated to perform any or all of the listed Alternates for the price(s) listed herein if the Contractor, in the Contractor's sole discretion, exercises the right to incorporate the Alternative into the Agreement. These alternates are not included in this Subcontract value.

1.

- E. Unit Price Schedule:
(Unit rates to be entered below or attached to this Schedule B, for use throughout entire project duration)

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
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Project Manual

Canton Township – CIP Bid Package 2

Project Name: Victory Park Ballfields

A3C Project No. 21033

Issue Date: February 23, 2023

Issued For: Bid

**Canton Township - CIP Bid Package 2
Victory Park Ballfields
A3C Project No. 21033**

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Specifications appear on Drawings

END OF SECTION

**Canton Township - CIP Bid Package 2
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SECTION 00 01 15 - LIST OF DRAWINGS

AN INDEX OF DRAWINGS APPEARS ON THE DRAWING TITLE SHEET G0.1.

END OF SECTION

**Canton Township - CIP Bid Package 2
Victory Park Ballfields
A3C Project No. 21033**

SECTION 01 10 00 - SUMMARY

PART 1 GENERAL

1.01 PROJECT

- A. Project Name: Victory Park Ballfields.
- B. Owner's Name: Canton Township.
- C. Architect's Name: A3C - Collaborative Architecture.
- D. The Project consists of the alteration of interior and exterior elements.

1.02 CONTRACT DESCRIPTION

- A. Contract Type: A single prime contract based on a Stipulated Price.

1.03 DESCRIPTION OF ALTERATIONS WORK

- A. Scope of alterations work is indicated on drawings.
- B. Electrical Power and Lighting: Alter existing system and add new construction, keeping existing in operation.
- C. Owner will remove the following items before start of work:
 - 1. Furniture.
 - 2. Furnishings.
 - 3. Loose equipment.

1.04 OWNER OCCUPANCY

- A. Owner intends to continue to occupy adjacent portions of the existing facilities during the entire construction period.
- B. Owner intends to occupy the Project upon Substantial Completion.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner occupancy and public access.

1.05 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
 - 1. Locate and conduct construction activities in ways that will limit disturbance to site.
- B. Provide access to and from site as required by law and by Owner:
 - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 - 2. Do not obstruct roadways, sidewalks, or other public ways without permit.
- C. Time Restrictions:
 - 1. Limit conduct to the hours of building occupancy unless directed otherwise by Owner.
- D. Utility Outages and Shutdown:
 - 1. Limit disruption of utility services to hours the building is unoccupied.
 - 2. Prevent accidental disruption of utility services to other facilities.

1.06 WORK SEQUENCE

- A. Coordinate construction schedule and operations with Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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Victory Park Ballfields
A3C Project No. 21033

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.02 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
 - 1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 5. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- B. A Substitution Request for specified installer constitutes a representation that the submitter:
 - 1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
 - 1. Note explicitly any non-compliant characteristics.
- D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.
- E. Limit each request to a single proposed substitution item.
 - 1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

- A. Submittal Time Restrictions:
 - 1. Instructions to Bidders specifies time restrictions and the documents required for submitting substitution requests during the bidding period.
- B. Submittal Form (before award of contract):
 - 1. Submit substitution requests by completing the form attached to this section. See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Submittal Form (after award of contract):

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1. Submit substitution requests by completing the form attached to this section. See this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- B. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
- C. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
 1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
 2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
 3. Bear the costs engendered by proposed substitution of:
 - a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.
- D. Substitutions will not be considered under one or more of the following circumstances:
 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 2. Without a separate written request.
 3. When acceptance will require revisions to Contract Documents.

3.04 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify Contractor in writing of the Owner's decision to accept or reject request.

3.05 ACCEPTANCE

- A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.06 CLOSEOUT ACTIVITIES

- A. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

3.07 ATTACHMENTS

- A. A facsimile of the Substitution Request Form (During Construction) required to be used on the Project is included after this section.

END OF SECTION

**Canton Township - CIP Bid Package 2
Victory Park Ballfields
A3C Project No. 21033**

SECTION 01 25 01 - REQUEST FOR SUBSTITUTION

PART 1 – GENERAL

1.01 CONTRACT:

- A. To: _____ Date: _____
Project / Contract: _____
Specified Item: _____
(Section) (Paragraph Description)
Proposed Substitution: _____
(Short Description) _____

PART 2 – PRODUCTS

2.01 SUBSTITUTION

- A. The undersigned proposes the above listed substitution in accordance with the provisions of Section 01 25 00.
1. The data attached includes product description, specifications, drawings, performance and test data, certifications and product guarantees for evaluation of the proposed substitution. Applicable portions of the data are clearly identified. The product description includes composition and materials, basic use, applicable properties and standards, and limitations on its use.
 2. Also, attached is a description of the changes to the Work required if the proposed substitution is accepted.
 3. Also, attached a description of the differences between the proposed substitution and the specified or drawn item; and fully describe how the acceptance of the substitution will affect the project due to dimensional differences or differences in the relationship with architectural items / assemblies or differences in the relationship with the structural, mechanical, and electrical systems.
- B. The undersigned declares that the following statements, except as may be modified on the attachments, are correct:
1. The proposed substitution does not affect dimensions on the Drawings.
 2. The proposed substitution will have no adverse effect on other work of the Contract or the Project, nor the construction schedule.
 3. The guarantee, maintenance and service provisions for the proposed substitution are the same, or better than the specified item.
- C. The undersigned further declares that the use of the proposed substitution:
1. () Will result in a credit to the Owner of \$ _____.
 2. () Will result in no change (monetarily or in time) to the Contract with the Owner.
- D. The undersigned further understands that he/she shall pay for the Architect's reviewing time and all time required should new drawings or changes to the existing contract drawings be required due to the substitution.
- E. The undersigned further understands that:
1. The Architect's Recommendation below does not modify the Contract.
 2. The Owner's Comments below do not modify the Contract.
 3. Only the completion of a properly executed Change Order shall modify the Contract.
- Specified Item: _____
(from page 1)(Section) (Paragraph Description)

PART 3 – EXECUTION

3.01 SUBMITTAL

- A. Submitted by: _____
(Signature of Officer) (Print Name and Title)

**Canton Township - CIP Bid Package 2
Victory Park Ballfields
A3C Project No. 21033**

(Firm)

(Firm Address)

(City and State)

(Telephone and Fax Numbers)

B. Manufacturer of proposed substitution materials:

(Signature of manufacturer) (Print Name and Title)

(Company)

(Company Address)

(City and State)

(Telephone and Fax Numbers)

C. Architectural Recommendation:

(☐) Accept (☐) Accept As Noted (☐) Not Accept

Firm: _____

Representative of Firm: _____

Remarks: _____

D. Owner's Comments:

Remarks: _____

E. Owner's remarks, including apparent acceptance, do not modify the Contract.

END OF FORM

**Canton Township - CIP Bid Package 2
Victory Park Ballfields
A3C Project No. 21033**

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General administrative requirements.
- B. Preconstruction meeting.
- C. Progress meetings.
- D. Construction progress schedule.
- E. Number of copies of submittals.
- F. Requests for Interpretation (RFI) procedures.
- G. Submittal procedures.

1.02 GENERAL ADMINISTRATIVE REQUIREMENTS

- A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

1.03 PROJECT COORDINATOR

- A. Project Coordinator: Construction Manager, A.M. Higley.
- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for public/private/contractor access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 10 00 - Summary.
- F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- G. Make the following types of submittals to Architect through the Project Coordinator:
 - 1. Requests for Interpretation.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Correction Punch List and Final Correction Punch List for Substantial Completion.
 - 8. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

- A. Project Coordinator will schedule a meeting after Notice of Award.
- B. Attendance Required:
 - 1. Owner.
 - 2. Contractor.
- C. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 - 5. Designation of personnel representing the parties to Contract and Architect.

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6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS

- A. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- B. Attendance Required:
 1. Contractor.
 2. Owner.
 3. Architect.
- C. Agenda:
 1. Review minutes of previous meetings.
 2. Review of work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems that impede, or will impede, planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Review of RFIs log and status of responses.
 7. Review of off-site fabrication and delivery schedules.
 8. Maintenance of progress schedule.
 9. Corrective measures to regain projected schedules.
 10. Planned progress during succeeding work period.
 11. Coordination of projected progress.
 12. Maintenance of quality and work standards.
 13. Effect of proposed changes on progress schedule and coordination.
 14. Other business relating to work.
- D. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.03 CONSTRUCTION PROGRESS SCHEDULE

- A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.
- B. Submit updated schedule with each Application for Payment.

3.04 REQUESTS FOR INTERPRETATION (RFI)

- A. Definition: A request seeking one of the following:
 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
 - b. Do not forward requests which solely require internal coordination between subcontractors.
 2. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

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- C. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
 - 1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
 - 2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
 - a. Approval of submittals (use procedures specified elsewhere in this section).
 - b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
 - 3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
 - 4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
- D. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
 - 1. Discrete and consecutive RFI number, and descriptive subject/title.
 - 2. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 - 3. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 - 4. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- E. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- F. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
 - 1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- G. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.

3.05 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.06 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

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- B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 - 1. After review, produce duplicates.
 - 2. Retained samples will not be returned to Contractor unless specifically so stated.

3.07 SUBMITTAL PROCEDURES

- A. General Requirements:
 - 1. Transmit using approved form.
 - a. Use Contractor's form, subject to prior approval by Architect.
 - 2. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
 - 3. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
 - 4. Schedule submittals to expedite the Project, and coordinate submission of related items.
 - 5. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
 - 6. Provide space for Contractor and Architect review stamps.
 - 7. When revised for resubmission, identify all changes made since previous submission.
- B. Product Data Procedures:
 - 1. Submit only information required by individual specification sections.
 - 2. Collect required information into a single submittal.
 - 3. Do not submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
 - 1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 - 2. Do not reproduce Contract Documents to create shop drawings, without a Hold Harmless Agreement from the Architect.
 - 3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
 - 1. Transmit related items together as single package.
 - 2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
- E. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- F. Submittals not requested will not be recognized or processed.

3.08 SUBMITTAL REVIEW

- A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.
- B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.
- C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

3.09 ARCHITECT'S ACTION

- A. Except for submittals for the record or for information, where action and return of submittals is required, the Architect will review each submittal, mark to indicate the action taken, and return.
 - 1. Compliance with specified characteristics is the Contractor's responsibility and not considered part of the Architect's review and indication of action taken.
- B. Action Stamp: The Architect will stamp each submittal with a uniform, action stamp. The Architect will mark the stamp appropriately to indicate the action taken, as follows:

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1. Final Unrestricted Release: Where submittals are marked "Reviewed," the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final acceptance will depend on that compliance.
2. Final-but-Restricted Release: When submittals are marked "Furnish As Corrected," the Work covered by the submittal may proceed provided it complies with both the Architect's notations or corrections on the submittal and requirements of the Contract Documents. Final acceptance will depend on that compliance.
3. Returned for Resubmittal: When submittal is marked "Revise And Re-Submit" do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the Architect's notations. Resubmit without delay. Repeat if necessary to obtain a different action mark.
 - a. Do not permit submittals marked "Rejected" or "Revise And Re-Submit" to be used at the Project Site or elsewhere where construction is in progress.

END OF SECTION

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SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittals.
- B. References and standards.
- C. Testing and inspection agencies and services.
- D. Contractor's construction-related professional design services.
- E. Control of installation.
- F. Tolerances.
- G. Defect Assessment.

1.02 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations, pertaining to, but not limited to the following:
 - 1. Temporary bracing.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Compliance with Contract Documents.
 - k. When requested by Architect, provide interpretation of results.
 - 2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
- C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
 - 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

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1.04 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.
- D. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- E. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 TESTING AND INSPECTION AGENCIES AND SERVICES

- A. Owner will employ and pay for services of an independent testing agency to perform other specified testing.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

- A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.
- B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
- C. Notify Architect seven (7) working days in advance of dates and times when mock-ups will be constructed.
- D. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
- E. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- F. Accepted mock-ups shall be a comparison standard for the remaining Work.
- G. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

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3.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

- A. See individual specification sections for testing and inspection required.
- B. Testing Agency Duties:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
 - 6. Perform additional tests and inspections required by Architect.
 - 7. Submit reports of all tests/inspections specified.
- C. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 - 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 - 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.
- F. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.05 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

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SECTION 01 42 16 - DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

- A. Other definitions are included in individual specification sections.

1.02 DEFINITIONS

- A. Furnish: To supply, deliver, unload, and inspect for damage.
- B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.
- C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.
- D. Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.
- E. Provide: To furnish and install.
- F. Supply: Same as Furnish.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Dewatering
- B. Temporary utilities.
- C. Temporary telecommunications services.
- D. Temporary sanitary facilities.
- E. Temporary Controls: Barriers, enclosures, and fencing.
- F. Security requirements.
- G. Vehicular access and parking.
- H. Waste removal facilities and services.
- I. Field offices.

1.02 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2016.

1.03 TEMPORARY UTILITIES

- A. Owner will provide the following:
 - 1. Electrical power, consisting of connection to existing facilities.
 - 2. Water supply, consisting of connection to existing facilities.
- B. Existing facilities may be used.
- C. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.04 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

1.05 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Do not use for disposal of construction waste.
- C. Maintain daily in clean and sanitary condition.
- D. At end of construction, return facilities to same or better condition as originally found.

1.06 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.07 FENCING

- A. Construction: Contractor's option.

1.08 EXTERIOR ENCLOSURES

- A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.09 INTERIOR ENCLOSURES

- A. Provide temporary dust partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
 - 1. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

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CONTROLS
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- a. Maximum flame spread rating of 75 in accordance with ASTM E84.

1.10 SECURITY

- A. Coordinate with Owner's security program.

1.11 VEHICULAR ACCESS AND PARKING

- A. Coordinate access and parking with Owner.
- B. Coordinate access and haul routes with governing authorities and Owner.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Existing parking areas may be used for construction parking.

1.12 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

1.13 FIELD OFFICES

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.

1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations.
- F. Procedures for Owner-supplied products.

1.02 REFERENCE STANDARDS

- A. Green Seal GC-03 - Anti-Corrosive Paints; Green Seal, Inc.; 1997
- B. Green Seal GS-11 - Paints; Green Seal, Inc.; 1993
- C. SCAQMD 1113 - Architectural Coatings; South Coast Air Quality Management District Rule No. 1113; 2004

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
- D. Specific Products to be Reused: The reuse of certain materials and equipment already existing on the project site is required.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. Use of products having any of the following characteristics is not permitted:
 - 1. Made outside the United States, its territories, Canada, or Mexico.
 - 2. Made using or containing CFC's or HCFC's.
 - 3. Made of wood from newly cut old growth timber.
- C. Urea-Formaldehyde Prohibition:
 - 1. Overall Project Requirement: Provide composite wood and agrifiber products having no added urea-formaldehyde resins.
- D. Adhesives and Joint Sealants:
 - 1. Definition: This provision applies to gunnable, trowelable, and liquid-applied adhesives, sealants, and sealant primers used anywhere on the interior of the building inside the weather barrier, including duct sealers.
 - 2. Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.

Architectural Applications	VOC Limit [g/L less water]	Specialty Applications	VOC Limit [g/L less water]
Indoor Carpet Adhesives	50	PVC Welding	510
Carpet Pad Adhesives	50	CPVC Welding	490
Wood Flooring Adhesives	100	ABS Welding	325
Rubber Flooring Adhesives	60	Plastic Cement Welding	250

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Subfloor Adhesives	50	Adhes. Primer for Plastic	550
Ceramic Tile Adhesives	65	Contact Adhesive	80
VCT Flooring Adhesives	50	Special Purpose Contact	250
Drywall & Panel Adhesives	50	Structural Wood Member	140
Cove Base Adhesives	50	Sheet Applied Rubber Lining Operations	850
Multipurpose Construction	70	Top & Trim Adhesive	250
Structural Glazing Adhes.	100		
Substrate Specific Applications	VOC Limit [g/L less water]	Sealants	VOC Limit [g/L less water]
Metal to Metal	30	Architectural	250
Plastic Foams	50	Nonmembrane Roof	300
Porous Material (except wood)	50	Roadway	250
Wood	30	Single-ply Membrane Roof	450
Glass Fiber (e.g.Fiberglass)	80	Other	420
		Sealant Primers	VOC Limit [g/L less water]
		Architectural Non-Porous	250
		Architectural Porous	775
		Other	750

- a. Require each installer to certify compliance and submit product data showing product content.
3. Specific Product Categories: Comply with limitations specified elsewhere.
- E. Aerosol Adhesives:
 1. Provide only products having lower volatile organic compound (VOC) content than required by Green Seal GS-36.

Aerosol Adhesives	VOC Weight [g/L minus water]
General purpose mist spray	65% VOCs by weight
General purpose web spray	55% VOCs by weight
Special purpose aerosol adhesives (all types)	70% VOCs by weight

- a. Require each installer to certify compliance and submit product data showing product content.
2. Specific Product Categories: Comply with limitations specified elsewhere.
- F. Paints and Coatings:
 1. Architectural paints, coatings and primers site-applied to interior walls and ceilings:
 - a. Provide only products not exceeding volatile organic compound (VOC) content limits as established by Green Seal GS-11.
 - 1) Flats: 50 g/L.
 - 2) Non-Flats: 150 g/L.
 2. Anti-corrosive and anti-rust paints site-applied to interior ferrous metal substrates:
 - a. Provide only products not exceeding VOC content limit of 250 g/l as established by Green Seal GC-03.

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3. Clear wood finishes, floor coatings, stains, sealers and shellacs site-applied to interior elements:
- a. Provide only products not exceeding VOC content limits as established by the South Coast Air Quality Management District Rule 1113.

Material	VOC Limit	Material	VOC Limit
Clear Wood Varnish	350	Waterproofing Sealers	250
Clear Wood Lacquer	550	Sanding Sealers	275
Floor Coatings	100	All Other Sealers	200
Clear Shellac	730	Stains	250
Pigmented Shellac	550		

4. Require each installer to certify compliance and submit product data showing product content.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 01 25 00 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

- A. Owner's Responsibilities:
1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
 2. Arrange and pay for product delivery to site.
 3. On delivery, inspect products jointly with Contractor.
 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 5. Arrange for manufacturers' warranties, inspections, and service.
- B. Contractor's Responsibilities:
1. Review Owner reviewed shop drawings, product data, and samples.
 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 3. Handle, store, install and finish products.
 4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

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3.04 STORAGE AND PROTECTION

- A. Provide protection of stored materials and products against theft, casualty, or deterioration.
- B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 74 19.
- C. Store and protect products in accordance with manufacturers' instructions.
- D. Store with seals and labels intact and legible.
- E. Arrange storage of materials and products to allow for visual inspection for the purpose of determination of quantities, amounts, and unit counts.
- F. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- G. For exterior storage of fabricated products, place on sloped supports above ground.
- H. Provide off-site storage and protection when site does not permit on-site storage or protection.
- I. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- J. Comply with manufacturer's warranty conditions, if any.
- K. Do not store products directly on the ground.
- L. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- M. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- N. Prevent contact with material that may cause corrosion, discoloration, or staining.
- O. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- P. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

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SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition.
- C. Cutting and patching.
- D. Cleaning and protection.
- E. Starting of systems and equipment.
- F. Demonstration and instruction of Owner personnel.
- G. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
 - 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Effect on work of Owner or separate Contractor.
 - f. Written permission of affected separate Contractor.
 - g. Date and time work will be executed.
- C. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.03 QUALIFICATIONS

- A. For demolition work, employ a firm specializing in the type of work required.
 - 1. Minimum of three years of documented experience.

1.04 PROJECT CONDITIONS

- A. Use of explosives is not permitted.
- B. Perform dewatering activities, as required, for the duration of the project.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
- E. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
 - 1. Indoors: Limit conduct of especially noisy interior work to the hours of 6 pm to 7 am.
- F. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- G. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- H. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

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1.05 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and clean-up of work of separate sections.
- F. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements and Section 01 25 00 - Substitution Procedures.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

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- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.04 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
 - 1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
 - 2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
 - 2. Remove items indicated on drawings.
 - 3. Relocate items indicated on drawings.
 - 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 - 5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- E. Services (Including but not limited to Electrical): Remove, relocate, and extend existing systems to accommodate new construction.
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 - 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 - 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. Provide temporary connections as required to maintain existing systems in service.
 - 4. Verify that abandoned services serve only abandoned facilities.
 - 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- F. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
- G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

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1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
- H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- I. Refinish existing surfaces as indicated:
 1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- J. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- K. Do not begin new construction in alterations areas before demolition is complete.

3.05 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
 1. Complete the work.
 2. Fit products together to integrate with other work.
 3. Provide openings for penetration of mechanical, electrical, and other services.
 4. Match work that has been cut to adjacent work.
 5. Repair areas adjacent to cuts to required condition.
 6. Repair new work damaged by subsequent work.
 7. Remove samples of installed work for testing when requested.
 8. Remove and replace defective and non-complying work.
- D. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
- E. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- F. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- G. Cutting Concrete Floors: Before core drilling, saw-cutting, or breaking up concrete floors, test for the presence of electrical conduits. Use an impulse induction type scanner, similar to Hilti Ferrosan, capable of detecting both metallic conduits and copper wires in PVC conduits. Tracers that scan for energized cables or that scan for injected high frequency signals are not acceptable. Immediately restore, at no cost to the Owner, conduits damaged during cutting operations. Comply with the following notification requirements:
 1. Notify the Project Coordinator prior to conducting each test.
 2. Notify the Project Coordinator not less than 72 hours in advance of each core drilling operation. Project Coordinator will arrange notification of building occupants of potential for power outage.
- H. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- I. Restore work with new products in accordance with requirements of Contract Documents.
- J. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- K. Patching:
 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 2. Match color, texture, and appearance.

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- 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.
- L. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- M. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.
- N. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.06 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- C. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.
- G. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- H. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and owner seven days prior to start-up of each item.
- C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- D. Verify that wiring and support components for equipment are complete and tested.
- E. Execute start-up under supervision of applicable Contractor personnel in accordance with manufacturers' instructions.
- F. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.09 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

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- C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.10 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.11 FINAL CLEANING

- A. Execute final cleaning after Substantial Completion but before making final application for payment.
- B. Use cleaning materials that are nonhazardous.
- C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.12 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Architect and Owner.
- B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
- D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
- E. Owner will occupy all of the building as specified in Section 01 10 00.
- F. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
- G. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- H. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
- I. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION

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SECTION 01 78 00 - CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project record documents.
- B. Operation and maintenance data.
- C. Warranties and bonds.

1.02 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
 - 1. Final Application for Payment will not be processed until such documents are submitted and reviewed by the Owner and Architect.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 - 2. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Addenda.
 - 3. Change Orders and other modifications to the Contract.
 - 4. Reviewed shop drawings, product data, and samples.
 - 5. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish first floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

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- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 - 1. Product data, with catalog number, size, composition, and color and texture designations.
 - 2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Additional information as specified in individual product specification sections.
- D. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Include color coded wiring diagrams as installed.
- E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- G. Include manufacturer's printed operation and maintenance instructions.
- H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- I. Provide control diagrams by controls manufacturer as installed.
- J. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 3 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- C. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- D. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

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- E. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- F. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- H. Arrangement of Contents: Organize each volume in parts as follows:
 - 1. Project Directory.
 - 2. Table of Contents, of all volumes, and of this volume.
 - 3. Operation and Maintenance Data: Arranged by system, then by product category.
 - a. Product data, shop drawings, and other submittals.
 - b. Operation and maintenance data.
 - c. Photocopies of warranties and bonds.

3.06 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.

END OF SECTION

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SECTION 02 41 00 - DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Selective demolition of built site elements.
- B. Selective demolition of building elements for alteration purposes.

1.02 DEFINITIONS

- A. Demolition: Dismantle, raze, destroy or wreck any building or structure or any part thereof.
- B. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.
- C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.
- D. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.
- E. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Site Plan: Indicate:
 - 1. Areas for temporary construction and field offices.
- C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.04 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of five years of documented experience.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 DEMOLITION

- A. Remove portions of existing buildings including the following:
 - 1. Bench and booth upholstery.
 - 2. Exterior window frames and glazing.
 - 3. Toilet partitions (Pavilion).
 - 4. Roof shingles and underlayment (Pavilion).
- B. Remove portions of site elements including the following:
 - 1. Exterior ballfield light poles.
 - 2. Exterior ballfield light fixtures.
 - 3. Ballfield chain link fencing and supports.
- C. Remove other items indicated, for salvage, relocation, and recycling.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 3. Provide, erect, and maintain temporary barriers and security devices.
 - 4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.

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5. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
6. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Do not begin removal until built elements to be salvaged or relocated have been removed.
 1. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. Protect existing structures and other elements to remain in place and not removed.
 1. Provide bracing and shoring.
 2. Prevent movement or settlement of adjacent structures.
 3. Stop work immediately if adjacent structures appear to be in danger.
- E. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- F. Hazardous Materials:
 1. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.

3.03 EXISTING UTILITIES

- A. Protect existing utilities to remain from damage.
- B. Do not disrupt public utilities without permit from authority having jurisdiction.
- C. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- D. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
 1. Verify construction and utility arrangements are as indicated.
 2. Report discrepancies to Architect before disturbing existing installation.
 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Separate areas in which demolition is being conducted from areas that remain occupied.
 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.
- D. Remove existing work as indicated and required to accomplish new work.
 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction indicated.
 2. Remove items indicated on drawings.
- E. Services including, but not limited to, Electrical: Remove existing systems and equipment as indicated.
 1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 3. Verify that abandoned services serve only abandoned facilities before removal.
 4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.

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- 5. Ancillary Materials: Where electrical devices are indicated to be demolished, legally dispose of ancillary materials.
- F. Protect existing work to remain.
 - 1. Prevent movement of structure. Provide shoring and bracing as required.
 - 2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch to match new work.

3.05 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

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SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete formwork.
- B. Joint devices associated with concrete work.
- C. Miscellaneous concrete elements, including equipment pads, light pole bases, and fence posts.

1.02 SUPPLEMENTAL SPECIFICATIONS

- A. Refer to supplemental specifications contained in the drawings and reference installation instructions.

1.03 REFERENCE STANDARDS

- A. ACI 117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
- B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).
- C. ACI 301 - Specifications for Concrete Construction; 2020.
- D. ACI 302.1R - Guide to Concrete Floor and Slab Construction; 2015.
- E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
- F. ACI 305R - Guide to Hot Weather Concreting; 2020.
- G. ACI 306R - Guide to Cold Weather Concreting; 2016.
- H. ACI 308R - Guide to External Curing of Concrete; 2016.
- I. ACI 318 - Building Code Requirements for Structural Concrete; 2019, with Errata (2021).
- J. ACI 347R - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- K. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2016.
- L. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2021.
- M. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2022a.
- N. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2015a.
- O. ASTM C150/C150M - Standard Specification for Portland Cement; 2016.
- P. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.
- Q. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2016.
- R. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).
- S. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).
- T. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2022.
- U. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2017.
- V. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2015.
- W. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2018.
- X. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting; 2015.
- Y. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

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- C. Mix Design: Submit proposed concrete mix design.
- D. Mix Design: Submit for approval prior to pour.
- E. Test Reports: Submit report for each test or series of tests specified.
- F. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- G. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.
- H. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

2.02 CONCRETE MATERIALS

- A. Cement: ASTM C 150, Type I - Normal Portland type.
 - 1. Acquire cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
 - 1. Acquire aggregates for entire project from same source.
- C. Fly Ash: ASTM C618, Class C or F.
- D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.03 ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C260/C260M.
- C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
- D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
- E. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
- F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- G. Accelerating Admixture: ASTM C494/C494M Type C.
- H. Retarding Admixture: ASTM C494/C494M Type B.
- I. Water Reducing Admixture: ASTM C494/C494M Type A.

2.04 BONDING AND JOINTING PRODUCTS

- A. Epoxy Bonding System:
 - 1. Complying with ASTM C881/C881M and of Type required for specific application.

2.05 CURING MATERIALS

- A. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
 - 1. Application: Use where finish is scheduled as Concrete Sealer.
 - 2. Vehicle: Solvent-based.

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3. Solids by Mass: 25 percent, minimum.
4. VOC Content: OTC compliant.
5. Manufacturers:
 - a. BASF Construction Chemicals-Building Systems; Product Kure-N-Seal 25 ES: www.buildingsystems.basf.com.
 - b. Dayton Superior Corporation; Product Cure & Seal 1315 EF: www.daytonsuperior.com.
 - c. Euclid Chemical; Product Everclear VOX: www.euclidchemical.com.
 - d. L&M Construction Chemicals, Inc.; Product Dress & Seal WB: www.lmcc.com.
- B. Moisture-Retaining Sheet: ASTM C171.
 1. White-burlap-polyethylene sheet, weighing not less than 3.8 ounces per square yard.
- C. Polyethylene Film: ASTM D2103, 4 mil, 0.004 inch thick, clear.
- D. Water: Potable, not detrimental to concrete.

2.06 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
 1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.
- B. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
- C. Normal Weight Concrete:
 1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch, unless noted otherwise on drawings.
 2. Water-Cement Ratio: Maximum 40 percent by weight.
 3. Total Air Content: interior 4 percent; Exterior 6 percent, determined in accordance with ASTM C173/C173M.
 4. Maximum Aggregate Size: 3/4 inch.

2.07 MIXING

- A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
- B. Transit Mixers: Comply with ASTM C94/C94M.
- C. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- C. Prepare existing concrete surfaces to be repaired according to ICRI 310.2R.
- D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in accordance to bonding agent manufacturer's instructions.
 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.

3.03 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

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- C. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
- D. Finish floors and equipment pads level and flat, unless otherwise indicated, within the tolerances specified below.

3.04 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. Maximum Variation of Surface Flatness:
 - 1. Exposed Concrete Floors: 1/4 inch in 10 feet.
- B. Correct the slab surface if tolerances are less than specified.
- C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.05 CONCRETE FINISHING

- A. Concrete Slabs and Equipment Pads: Finish to requirements of ACI 302.1R, and as follows:
 - 1. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

3.06 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.07 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
- D. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.
- E. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- F. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.08 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.09 PROTECTION

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

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SECTION 07 01 50.19 - PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Removal of existing roofing system in preparation for entire new roofing system.
- B. Removal of existing flashing and counterflashings.
- C. Temporary roofing protection.

1.02 QUALITY ASSURANCE

- A. Materials Removal Company Qualifications: Company specializing in performing work of type specified with at least three years of documented experience.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

1.04 FIELD CONDITIONS

- A. Existing Roofing System: Asphalt shingle roofing.
- B. Do not remove existing roofing when weather conditions threaten the integrity of building contents or intended continued occupancy.
- C. Maintain continuous temporary protection prior to and during installation of new roofing system.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Temporary Roofing Protection Materials:
 - 1. Contractor's responsibility to select appropriate materials for temporary protection of roofing areas as determined necessary for this work.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing roof surface has been cleared of materials being removed from existing roofing system and ready for next phase of work as required.

3.02 PREPARATION

- A. Sweep roof surface clean of loose matter.
- B. Remove loose refuse and dispose of properly off-site.

3.03 MATERIAL REMOVAL

- A. Remove only existing roofing materials that can be replaced with new materials the same day.
- B. Remove metal counter flashings.
- C. Repair existing wood deck surface to provide smooth working surface for new roof system.
 - 1. Submit Proposal for this scope of work to Owner for review and approval before proceeding.

3.04 INSTALLATION

3.05 PROTECTION

- A. Provide temporary protective sheeting over uncovered deck surfaces.

END OF SECTION

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SECTION 07 21 00 - THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Batt insulation for filling perimeter window and door shim spaces.

1.02 REFERENCE STANDARDS

- A. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2016.
- C. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2016.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

1.04 FIELD CONDITIONS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 MINERAL FIBER BLANKET INSULATION MATERIALS

- A. Flexible Glass Fiber Blanket Thermal Insulation: Preformed insulation, complying with ASTM C665; friction fit.
 - 1. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 - 2. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
 - 3. Facing: Unfaced.
- B. Mineral Wool Blanket Thermal Insulation: Flexible preformed insulation, complying with ASTM C665.
 - 1. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

3.02 BATT INSTALLATION

- A. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- B. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.03 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

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SECTION 07 31 13 - ASPHALT SHINGLES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Asphalt shingle roofing.
- B. Flexible sheet membranes for eave protection, underlayment, and ridge protection.
- C. Metal flashing.
- D. Plastic ridge vents.

1.02 REFERENCE STANDARDS

- A. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017.
- B. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2015a.
- C. ASTM D3462/D3462M - Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules; 2019.
- D. ASTM D4869/D4869M - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing; 2016a (Reapproved 2021).
- E. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2020a.
- F. ASTM F1667/F1667M - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples; 2021a.
- G. NRCA (RM) - The NRCA Roofing Manual; 2017.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data indicating material characteristics, performance criteria, and limitations.
- C. Shop Drawings: For metal flashings, indicate specially configured metal flashings, jointing methods and locations, fastening methods and locations, and installation details.
- D. Samples: Submit two samples of each shingle color indicating color range and finish texture/pattern; for color selection.
- E. Manufacturer's Installation Instructions: Indicate installation criteria and procedures.
- F. Installer's qualification statement.
- G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in installing asphalt shingles, with at least 5 years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store materials with labels intact in manufacturer's unopened packaging until ready for installation.
- B. Store materials under dry and waterproof cover, well ventilated, and elevated above grade on a flat surface.
- C. Protect materials from harmful environmental elements, construction dust, direct sunlight, and other potentially detrimental conditions.
- D. When storing roofing materials on roofing system ensure that no damage occurs to supporting members and other materials.

1.06 FIELD CONDITIONS

- A. Do not install shingles, eave protection membrane or underlayment when surface, ambient air, or wind chill temperatures are below 45 degrees F.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

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- B. Provide 20-year manufacturer's warranty for watertightness.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Asphalt Shingles: Intent is to approximate existing shingle color.
1. CertainTeed Roofing: www.certainteed.com/#sle.
 2. GAF: www.gaf.com/#sle.
 3. Owens Corning Corp: www.owenscorning.com/#sle.
 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Algae Resistant Asphalt Shingles:

2.02 ASPHALT SHINGLES

- A. Asphalt Shingles: Asphalt-coated glass felt, mineral granule surfaced, complying with ASTM D3462/D3462M.
1. Fire Resistance: Class A, complying with ASTM E108.
 2. Warranted Wind Speed: Not greater than 130 mph.
 3. Algae resistant.
 4. Provide matching ridge and hip cap shingles.

2.03 SHEET MATERIALS

- A. Eave Protection Membrane:
1. Eave Protection Membrane: Self-adhering polymer-modified asphalt sheet complying with ASTM D1970/D1970M; 40 mil total thickness; with strippable treated release paper and polyethylene sheet top surface.
 2. Products:
 - a. CertainTeed Corporation, WinterGuard Waterproofing Underlayment
 - b. GAF Corporation, Weather Watch Waterproofing Underlayment
 - c. Owens Corning Corporation, Weather Lock Waterproofing Underlayment
 - d. W.R.Grace – Ice and Water Shield
- B. Underlayment: Synthetic non-asphaltic sheet, intended by manufacturer for compliance with ASTM D226 and ASTM D4869.
1. Liquid Water Transmission: Passes ASTM D4869/D4869M.
 2. Fasteners: As recommended by manufacturer or building code qualification report or approval.
 3. Products:
 - a. CertainTeed Corporation, Diamond Deck High Performance Synthetic Roofing Underlayment.
 - b. GAF Corporation, Deck Armor Synthetic Roof Underlayment
 - c. Owens Corning Corporation, Deck Defense High Performance Synthetic Roof Underlayment.

2.04 METAL FLASHING

- A. Metal Flashings: Provide sheet metal eave edge and other flashing as indicated.
1. Form flashings to protect roofing materials from physical damage and shed water.
 2. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
 3. Hem exposed edges of flashings minimum 1/4 inch on underside.
- B. Steel Flashing: Prefinished and galvanized steel sheet, 26 gauge, 0.0179 inch minimum thickness, G90/Z275 hot-dip galvanized; PVC coated, color as selected.

2.05 ACCESSORIES

- A. Roofing Nails: Standard round wire shingle type, galvanized steel or stainless steel, minimum 3/8-inch head diameter, 12-gauge, 0.109-inch nail shank diameter, 1-1/4 inches long and complying with ASTM F1667/F1667M.
- B. Plastic Hip and Ridge Vents: Extruded plastic with vent openings that do not permit direct water or weather entry; flanged to receive shingles; Hip Ridge Vent by Air Vent, Inc. or approved equal.

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- C. Plumbing Vent Flashing: Prefinished aluminum flange with an elastomeric (EPDM) collar; sized to fit the existing pipe diameters.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions prior to starting this work.
- B. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.
- C. Verify deck surfaces are dry, free of ridges, warps, or voids.

3.02 PREPARATION

- A. At areas where eave protection membrane is to be adhered to substrate, fill knot holes and surface cracks with latex filler.
- B. Broom clean deck surfaces before installing underlayment or eave protection.
- C. Protect surrounding areas and adjacent surfaces from damage during execution of this work.
- D. Install eave drip flashings tight with fascia boards, weather lap joints 2 inches and seal with roof cement. 1- inch. and seal with roof cement.
- E. Install eave drip edge flashings tight with fascia boards, weather lap joints 1- inch.

3.03 INSTALLATION

- A. Eave Protection Membrane:
 - 1. Install eave protection membrane from eave edge to minimum 36 inches up-slope.
 - 2. Install eave protection membrane in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- B. Underlayment:
 - 1. Roof Slopes Up to 4:12: Install a layer of underlayment over area not protected by eave protection, with ends and edges weather lapped minimum 4 inches; stagger end laps of each consecutive layer and nail in place.
 - 2. Weather lap and seal watertight with plastic cement any items projecting through or mounted on roof.
- C. Metal Flashing:
 - 1. Weather lap joints minimum 1 inches.
 - 2. Items Projecting Through or Mounted on Roofing: Flash and seal weather tight with plastic cement.
- D. Shingles:
 - 1. Install shingles in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
 - a. Fasten individual shingles using two nails per shingle, or as required by manufacturer and local building code, whichever is greater.
 - b. Fasten strip shingles using four nails per strip, or as required by manufacturer and local building code, whichever is greater.
 - 2. Place shingles in straight coursing pattern with 5-1/2-inch weather exposure to produce double thickness over full roof area, and provide double course of shingles at eaves.
 - 3. Project first course of shingles 1/2 inch beyond drip edge.
 - 4. Extend shingles 1/2 inch beyond face of gable edge fascia boards.
 - 5. Place new hip/ridge vents over locations of existing ridge vents. Cover with shingles per manufacturers instructions.
 - 6. Cap hips and ridges with individual shingles, maintaining 5-inch weather exposure, and place to avoid exposed nails.
 - 7. Coordinate installation of roof mounted components or work projecting through roof with weathertight placement of apron, step and backer flashings. Install a surface -mounted counterflashing over the new flashing at the goose-neck ventilator.

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8. Install the specified prefabricated pipe flashings over the plumbing vent pipe(s). Set the flange in a bead of sealant and secure with roofing nails. Cover the upper portions of the flange with eaves flashing. Trim the shingles to closely fit around the vent flashing. Seal any exposed nails with sealant.
9. Prime and paint the goose neck vent stack to closely match the shingle color.
10. Complete installation to provide weathertight service.

3.04 CLEANING

- A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- B. Clean exposed work upon completion of installation; remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to finish.

3.05 PROTECTION

- A. Do not permit traffic over finished roof surface; protect roofing until completion of project.
- B. Touch-up, repair, or replace damaged asphalt shingles or accessories before Date of Substantial Completion.

END OF SECTION

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SECTION 07 92 00 - JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Joint backings and accessories.

1.02 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015.
- B. ASTM C834 - Standard Specification for Latex Sealants; 2014.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014a.
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
- E. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2002 (Reapproved 2013).

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 4. Substrates the product should not be used on.
 - 5. Substrates for which use of primer is required.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Samples for Selection: Where sealant color is not specified, submit two samples of actual beads, buttons, or ribbons illustrating sealant colors for selection.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years experience and approved by manufacturer.
- C. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

- A. Scope:
 - 1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to:
 - a. Joints between door, window, and other frames and adjacent construction.
 - 1) Do not seal weep holes in or below frames.
 - 2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
 - a. Joints between door, window, and other frames and adjacent construction.
 - b. Other joints indicated below.

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2.02 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide interior products with levels of volatile organic compound (VOC) content as indicated in Section 01 60 00.

2.03 NONSAG JOINT SEALANTS

- A. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, neutral curing, mildew and fungus resistant, non-staining, non-bleeding; not expected to withstand continuous water immersion or traffic.
1. Color: White.
 2. Service Temperature Range: Minus 65 to 180 degrees F.
 3. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
 4. Applications: Use for:
 - a. Quarry tile base replacements.
 5. Manufacturers:
 - a. Bostik Inc; Chem-Calk 1200: www.bostik-us.com.
 - b. Dow Corning Corporation; 786 Mildew Resistant: www.dowcorning.com.
 - c. Pecora Corporation; Pecora 898 NST (Non-Staining Technology): www.pecora.com/#sle.
 - d. Sherwin-Williams Company; Silicone Rubber All Purpose Sealant: www.sherwin-williams.com.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.
- B. General Purpose Exterior Sealant: Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
1. Color: To be selected by Architect from manufacturer's standard range.
 2. Applications: Use for:
 - a. Joints between metal frames and other materials.
 - b. Other exterior joints for which no other sealant is indicated.
 3. Manufacturers:
 - a. BASF Construction Chemicals-Building Systems; NP-1: www.buildingsystems.basf.com.
 - b. Bostik Inc.; Chem-Calk 900: www.bostik-us.com.
 - c. Pecora Corporation; DynaTrol II: www.pecora.com/#sle.
 - d. Tremco Global Sealants; Vulchem 116: www.tremcosealants.com.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.
- C. General Purpose Interior Sealant: Acrylic Emulsion Latex: Water-based; ASTM C834, Type OP, single component, non-staining, non-bleeding, non-sagging, paintable; not intended for exterior use.
1. Color: To be selected by Architect from manufacturer's standard range.
 2. Grade: ASTM C834; Grade - NF.
 3. Applications: Use for:
 - a. Joints between door frames and wall surfaces.
 - b. Other interior joints for which no other type of sealant is indicated.
 4. Products:
 - a. BASF Construction Chemicals-Building Systems; Sonolac: www.buildingsystems.basf.com.
 - b. Bostik Inc; Chem-Calk 600: www.bostik-us.com.
 - c. Pecora Corporation; AC-20 +Silicone: www.pecora.com/#sle.
 - d. Sherwin-Williams Company; White Lightning 3006 Siliconized Acrylic Latex Caulk: www.sherwin-williams.com/#sle.
 - e. Sherwin-Williams Company; 950A Siliconized Acrylic Latex Caulk: www.sherwin-williams.com/#sle.
 - f. Tremco Global Sealants; Tremflex 834: www.tremcosealants.com.
 - g. Substitutions: See Section 01 60 00 - Product Requirements.

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2.04 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
 - 1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
 - 2. Open Cell: 40 to 50 percent larger in diameter than joint width.
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- E. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.03 INSTALLATION

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- D. Install bond breaker backing tape where backer rod cannot be used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 CLEANING

- A. Clean adjacent surfaces soiled by sealant installation.

3.05 PROTECTION

- A. Protect sealants until cured.

END OF SECTION

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SECTION 08 43 13 - ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors and frames.
- C. Weatherstripping.
- D. Door hardware.
- E. Refer to notes on Drawings for additional requirements.

1.02 REFERENCE STANDARDS

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.
- B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2015.
- C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014 (2015 Errata).
- D. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- E. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- F. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- H. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.
- I. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
- J. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- K. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2016).

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass, door hardware, and internal drainage details.
- C. Shop Drawings: Indicate field verified conditions, system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
- D. Samples: Submit two samples [1 x 6] inches in size illustrating finished aluminum surface.
- E. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- F. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

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1.06 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

- A. Front-Set Style, Thermally-Broken:
 - 1. Basis of Design: Kawneer, TriFab 451T.
 - 2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
- B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
 - 1. EFCO, a Pella Company: www.efcocorp.com/#sle.
 - 2. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com/#sle.
 - 3. YKK AP America Inc: www.ykkap.com/#sle.
- C. Substitutions: Not permitted.
 - 1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.02 BASIS OF DESIGN -- SWINGING DOORS

- A. Medium Stile, Insulating Glazing, Thermally-Broken:
 - 1. Basis of Design: Kawneer.
 - 2. Thickness: 1-3/4 inches.
- B. Other Manufacturers: Must be same manufacturer as Storefront.
- C. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
 - 1. EFCO, a Pella Company: www.efcocorp.com/#sle.
 - 2. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com/#sle.
 - 3. YKK AP America Inc: www.ykkap.com/#sle.
- D. Substitutions: Not permitted.
 - 1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.03 STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Glazing Rabbet: For 1 inch insulating glazing.
 - 2. Finish: Class II color anodized.
 - a. Factory finish all surfaces that will be exposed in completed assemblies.
 - 3. Finish Color: Dark bronze.
 - 4. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 - 5. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.

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6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 7. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 8. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
 9. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
 10. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing, and heel bead of glazing compound.
- B. Performance Requirements
1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - a. Design Wind Loads: Comply with requirements of ASCE 7.
 - b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
 2. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf.
 3. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 6.27 psf pressure difference.
 4. Condensation Resistance Factor of Framing: 60, minimum, measured in accordance with AAMA 1503.
 5. Overall U-value Including Glazing: 0.47 Btu/(hr sq ft deg F), maximum.

2.04 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
1. Glazing Stops: Flush.
 2. Cross-Section: 2 x 4 1/2 inch nominal dimension.
- B. Glazing: As specified in Section 08 80 00.
- C. Swing Doors: Glazed aluminum; medium stile.
1. Thickness: 1-3/4 inches.
 2. Top Rail: 3 1/2 inches wide.
 3. Vertical Stiles: 3 1/2 inches wide.
 4. Bottom Rail: 10 inches wide.
 5. Glazing Stops: Square.
 6. Finish: Same as storefront.

2.05 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Sheet Aluminum: ASTM B209/B209M.
- C. Fasteners: Stainless steel.
- D. Concealed Flashings: Sheet aluminum, 26 gauge, 0.017 inch minimum thickness.
- E. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.
- F. Sealant for Setting Thresholds: Non-curing butyl type.
- G. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

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2.06 FINISHES

- A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick.
- B. Color: Dark bronze.

2.07 HARDWARE

- A. For each door, include weatherstripping, sill sweep strip, and threshold.
- B. Other Door Hardware: Storefront manufacturer's standard type to suit application.
 - 1. Finish on Hand-Contacted Items: Polished chrome or stainless steel interior (except closer); match medium bronze on closer and exterior.
 - 2. For each door, include butt hinges, pull handle, exit device, and closer.
- C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- D. Sill Sweep Strips: Resilient seal type, of neoprene; provide on all doors.
- E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; ADA compliant bevels; provide on all doors.
- F. Exit Devices: Panic type, "dogable", keyed cylinder outside.
- G. Door Closers: Exposed overhead.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

- A. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- B. Provide alignment attachments and shims to permanently fasten system to building structure.
- C. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- D. Provide thermal isolation where components penetrate or disrupt building insulation.
- E. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- F. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- H. Set thresholds in bed of sealant and secure.
- I. Install hardware using templates provided; ADA compliant.
- J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL

- A. Water-Spray Test: Provide water spray quality test of installed storefront components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
 - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
 - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

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- B. Repair or replace storefront components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

- A. Adjust operating hardware for smooth operation.

3.06 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.

3.07 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

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SECTION 08 80 00 - GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Insulating glass units.
- B. Glazing compounds and accessories.

1.02 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- C. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.
- F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
- G. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.
- H. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.
- I. GANA (GM) - GANA Glazing Manual; 2008.
- J. GANA (SM) - GANA Sealant Manual; 2008.
- K. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2016).
- L. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2020.
- M. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2020.
- N. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2020.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data on Insulating Glass Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- D. Samples: Submit two samples 12 by 12 inch in size of glass units.
- E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM), GANA (SM), and IGMA TM-3000 for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.05 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

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1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Float Glass Manufacturers:
 - 1. Guardian Glass, LLC: www.guardianglass.com/#sle.
 - 2. Pilkington North America Inc: www.pilkington.com/na/#sle.
 - 3. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
 - 1. Design Pressure: Calculated in accordance with ASCE 7.
 - 2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
 - 3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
 - 4. Glass thicknesses listed are minimum.
- B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
 - 1. In conjunction with weather barrier related materials described in other sections, as follows:
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
 - 1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 - 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 - 3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless noted otherwise.
 - 1. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and FT.
 - 2. Fully Tempered Safety Glass: Complies with ANSI Z97.1 and 16 CFR 1201 criteria.
 - 3. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

2.04 INSULATING GLASS UNITS

- A. Manufacturers:
 - 1. Guardian Glass, LLC: www.guardianglass.com.
 - 2. Oldcastle: www.obe.com.
 - 3. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
 - 4. Viracon, Apogee Enterprises, Inc: www.viracon.com.
 - 5. Substitutions: Not permitted.
- B. Insulating Glass Units: Types as indicated.
 - 1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
 - 2. Warm-Edge Spacers: Polypropylene and stainless steel.
 - a. Spacer Width: As required for specified insulating glass unit.

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3. Spacer Color: Black.
4. Purge interpane space with dry air, hermetically sealed.
- C. Insulating Glass Units: Vision glass, double glazed.
 1. Applications: Exterior glazing unless otherwise indicated.
 2. Space between lites filled with air.
 3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Low-E (passive type), on #2 surface.
 4. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 5. Total Thickness: 1 inch.
 6. Glazing Method: Dry glazing method, gasket glazing.
- D. Insulating Glass Units: Safety glazing.
 1. Applications:
 - a. Glazed lites in exterior doors.
 - b. Glazed sidelights and panels next to doors.
 - c. Other locations required by applicable federal, state, and local codes and regulations.
 2. Space between lites filled with air.
 3. Glass Type: Same as other vision glazing except use fully tempered float glass for both outboard and inboard lites.
 4. Total Thickness: 1 inch.
 5. Warm-edge spacer.
 6. Glazing Method: Dry glazing method, gasket glazing.

2.05 ACCESSORIES

- A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Continuous x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
- C. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.

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- D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 CLEANING

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove non-permanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.06 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

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SECTION 09 06 01 - INTERIOR FINISH KEY AND SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Products.
- B. Product options.

PART 2 PRODUCTS

2.01 MANUFACTURERS/PRODUCTS

- A. Scheduled on the drawings.

2.02 PRODUCTS

- A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.
- B. Refer to individual Sections for additional manufacturers, products and requirements.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: products of one of manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit request for substitution for any manufacturer not named in accordance with the following article.
- D. Substitutions may be considered when a product becomes unavailable through no fault of Contractor. Failure of the Contractor to consider delivery lead time schedules when ordering products shall not be acceptable grounds for considering substitutions.
- E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals, without separate written request, or when acceptance will require revision to Contract Documents.

PART 3 EXECUTION - NOT USED

END OF SECTION

**Canton Township - CIP Bid Package 2
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SECTION 09 30 00 - TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tile base for wall applications.

1.02 REFERENCE STANDARDS

- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2019.
- B. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2013.1.
- C. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2016.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Samples: Provide two samples of tile for verification of color match.
- D. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
- B. Installer Qualifications:
 - 1. Company specializing in performing tile installation, with minimum of five years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.06 FIELD CONDITIONS

- A. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

- A. Match size, thickness, color, texture, edge condition and pattern of adjacent existing tile.
 - 1. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Quarry Tile: ANSI A137.1, standard grade.
 - 1. Trim Units: Matching cove base shapes in size to match adjacent existing tile.

2.02 TRIM AND ACCESSORIES

2.03 SETTING MATERIALS

- A. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.
 - 1. Products:
 - a. Custom Building Products; EBM-Lite Epoxy Bonding Mortar: www.custombuildingproducts.com/#sle.
 - b. LATICRETE International, Inc; LATICRETE LATAPOXY 300 Adhesive: www.laticrete.com/#sle.
 - c. Merkrete, by Parex USA, Inc; Merkrete Pro Epoxy: www.merkrete.com/#sle.
 - d. Sika Corp; SikaTile 350 Flex Set: www.sika.com/#sle.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.

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2.04 GROUTS

- A. Provide setting and grout materials from same manufacturer.
- B. Match size and color of adjacent existing tile installation.
- C. Manufacturers:
 - 1. ARDEX Engineered Cements: www.ardexamericas.com.
 - 2. Bostik Inc: www.bostik-us.com/#sle.
 - 3. H.B. Fuller Construction Products, Inc: www.tecspecialty.com/#sle.
 - 4. Custom Building Products: www.custombuildingproducts.com.
 - 5. LATICRETE International, Inc: www.laticrete.com/#sle.
 - 6. Mapei: www.mapei.us.
 - 7. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout; NSF registered
 - 1. Applications: Commercial kitchens.
 - 2. Color(s): To match adjacent existing installations.
- E. Tile Sealant: Refer to Section 07 90 05.

2.05 MAINTENANCE MATERIALS

- A. Grout Release: Temporary, water-soluble pre-grout coating.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
 - 1. Test as Follows:
 - a. Alkalinity (pH): ASTM F710.
 - 2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.

3.03 INSTALLATION - GENERAL

- A. Install tile base and grout in accordance with applicable requirements of ANSI A108.1 through ANSI A108.13, manufacturer's instructions, and TCA Handbook recommendations.
- B. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- C. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- D. Sound tile after setting. Replace hollow sounding units.
- E. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- F. Grout tile joints unless otherwise indicated.
- G. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

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3.04 INSTALLATION - WALL BASE TILE

- A. On non-porous wall panels install with epoxy adhesive in accordance with TCNA (HB) and adhesive manufacturer's written instructions. Install with NSF registered epoxy grout in kitchen environments.

3.05 CLEANING

- A. Clean tile and grout surfaces.

3.06 PROTECTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

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SECTION 09 78 00 - INTERIOR WALL PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Plastic wall paneling.
- B. Accessories.

1.02 REFERENCE STANDARDS

- A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010.
- B. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).
- C. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.
- D. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2017.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2016.
- F. ISO 846 - Plastics - Evaluation of the Action of Microorganisms; 2019.
- G. ISO 2812-1 - Paints and Varnishes -- Determination of Resistance to Liquids -- Part 1: Immersion in Liquids Other than Water; 2017.
- H. NSF 35 - High Pressure Decorative Laminates for Surfacing Food Service Equipment; 2020.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's descriptive literature for each specified product. Include anchorage devices specific to project substrate types.
- C. Samples: Submit two samples 6 by 6 inches in size, indicating finish, color, and texture for each type of panels.
- D. Maintenance Data: Include recommended instructions, methods, and materials for cleaning FRP panels.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least five years of documented experience.
- B. Installer Qualifications: Company specializing in installing work of the type specified in this section, and with at least three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to project site in manufacturer's original packaging, marked with manufacturer's product identification.
- B. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Plastic Wall Paneling:
 - 1. Crane Composites, Inc: www.cranecomposites.com/#sle.
 - 2. Marlite, Inc: www.marlite.com/#sle.
 - 3. Nudo Products, Inc: www.nudo.com/#sle.
 - 4. Panolam Surface Systems: www.panolam.com/#sle.
 - 5. MDC Interior Solutions: www.mdcwall.com/#sle.
 - 6. Substitutions: See Section 01 60 00 - Product Requirements.

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2.02 REGULATORY REQUIREMENTS

- A. Surface Burning Classification: Provide wall paneling assemblies meeting Class A when tested in accordance with ASTM E84.
- B. Food Grade: NSF registered.

2.03 PLASTIC WALL PANELING

- A. Plastic Wall Paneling: With manufacturer's standard scratch-resistant, UV-resistant protective coating.
 - 1. Panel Thickness: 0.075 inch.
 - 2. Material: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
 - a. Impact Strength: Greater than 6 ft lbf/in, when tested in accordance with ASTM D256.
 - b. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - c. Chemical Cleanability: Excellent chemical resistance to common cleaners and detergents when tested in accordance with ISO 2812-1.
 - d. Biological Resistance: Rating of 0, when tested in accordance with ISO 846.
 - e. Water Absorption: 0.2 percent, maximum, when tested in accordance with ASTM D570.
 - 3. Edges: Square.
- B. Accessories:
 - 1. Adhesive: Type recommended by panel manufacturer.
 - 2. Sealant, Edges and Joints: Type recommended by paneling manufacturer; clear.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions and substrate flatness before starting work.
- B. Verify that substrate surfaces for adhered items are clean and smooth.
 - 1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer.
 - 2. Comply with adhesive manufacturer's recommendations for remedial measures at locations and application conditions where adhesion test results are unsatisfactory.
- C. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION

- A. Install panels in accordance with manufacturer's instructions.
- B. Apply adhesive to back side of panel using trowel recommended by adhesive manufacturer.
- C. Apply panels to wall with vertical joints plumb and horizontal joints level and pattern aligned with adjoining panels.
- D. Using a roller, apply pressure to panel face to ensure proper adhesion between surfaces.
- E. Install panels with manufacturer's recommended gaps for panel field and corner joints.
- F. Seal joints at wall base and top and between panels with approved sealant to prevent moisture intrusion.
- G. Remove excess sealant after paneling is installed and prior to curing.

3.03 CLEANING

- A. Remove nonpermanent labels immediately after glazing installation is complete.
- B. Clean panel faces using cleaning agents and methods recommended by manufacturer to remove soiling.

3.04 PROTECTION

- A. Protect installed interior wall paneling from subsequent construction operations.

END OF SECTION

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SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
 - 1. Exposed surfaces of steel lintels and ledge angles.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco.
 - 6. Glass.

1.02 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section.

1.03 REFERENCE STANDARDS

- A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.
- B. SSPC-SP 1 - Solvent Cleaning; 2015.
- C. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Systems Schedule: Provide systems schedule based on specified Paint Systems, listing products to be provided for each coat of each system. Coordinate with product data submittal.
 - 1. If systems other than those of the specified Base Manufacturer are proposed, submit a schedule that lists the Acceptable Manufacturer's systems in identical format to the Paint Systems scheduled herein.
- C. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
- D. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.
- F. Maintenance Data: Submit data including care and cleaning instructions, touch-up procedures, and repair of painted and finished surfaces.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

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- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Minimum Application Temperatures for Latex Paints: 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Provide paints and finishes from the same manufacturer to the greatest extent possible.
- C. Paints:
 - 1. Base Manufacturer: Benjamin Moore & Co.: www.benjaminmoore.com.
 - 2. AkzoNobel; Devoe and Dulux products: www.akzonobel.com.
 - 3. O'Leary Paint: www.olearypaint.com.
 - 4. PPG Paints: www.ppgpaints.com/#sle.
 - 5. Pratt & Lambert Paints: www.prattandlambert.com/#sle.
 - 6. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
- D. Primer Sealers: Same manufacturer as top coats.

2.02 PAINTS AND FINISHES - GENERAL

- A. Match product, color, and sheen indicated by reference to manufacturer's standard designations for these characteristics in Section 09 06 01 - Interior Finish Key and Schedule, unless indicated otherwise.
- B. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.
- C. Primers: As required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Specific products listed below are generally Benjamin Moore unless noted otherwise. Refer also to acceptable manufacturers listed above.
- B. Ferrous Metals, Unprimed, Latex, 3 Coat:
 - 1. One coat of latex primer; Primer #P04.
 - 2. Semi-gloss: Two coats of latex enamel; Super Spec HP #P29.

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- C. Ferrous Metals, Primed, Latex, 2 Coat:
 - 1. Touch-up with rust-inhibitive primer #P04.
 - 2. Semi-gloss: Two coats of latex enamel; Super Spec HP #P29.
- D. Galvanized Metals, Latex, 3 Coat:
 - 1. One coat galvanize primer #P04.
 - 2. Semi-gloss: Two coats of latex enamel; Super Spec #P29.

2.04 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or repair existing paints or finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- E. Galvanized Surfaces:
 - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
 - 2. Prepare surface according to SSPC-SP 2.
- F. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.
 - 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
 - 3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 Commercial Blast Cleaning. Protect from corrosion until coated.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions.
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance.
- D. Sand metal surfaces lightly between coats to achieve required finish.

3.04 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

- A. Protect finishes until completion of project.

END OF SECTION

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SECTION 09 91 23 - INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
 - 1. Wood benches and booths, wood beadboard and trim, wood window stools.
 - 2. Dropped ceilings and soffits, where indicated.
- D. Do Not Paint or Finish the Following Items:
 - 1. Wood table tops, wood countertops.
 - 2. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 3. Items indicated to receive other finishes.
 - 4. Items indicated to remain unfinished.
 - 5. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.

1.02 DEFINITIONS

- A. Comply with ASTM D16 for interpretation of terms used in this section.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.
- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2015.
- D. SSPC-SP 1 - Solvent Cleaning; 2015.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Systems Schedule: Provide systems schedule based on specified Paint Systems, listing products to be provided for each coat of each system. Coordinate with product data submittal.
 - 1. If systems other than those of the specified Base Manufacturer are proposed, submit a schedule that lists the Acceptable Manufacturer's systems in identical format to the Paint Systems scheduled herein.
- C. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
 - 2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
- D. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
- E. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- F. Manufacturer's Instructions: Indicate special surface preparation procedures.
- G. Maintenance Data: Submit data including material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, and repair of painted and finished surfaces.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

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- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Provide paints and finishes from the same manufacturer to the greatest extent possible.
- C. Paints:
 - 1. Base Manufacturer: Benjamin Moore & Co: www.benjaminmoore.com.
 - 2. AkzoNobel; Devoe and Dulux products: www.akzonobel.com.
 - 3. Behr Process Corporation: www.behr.com/#sle.
 - 4. O'Leary Paint: www.olearypaint.com.
 - 5. PPG Paints: www.ppgpaints.com/#sle.
 - 6. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
- D. Primer Sealers: Same manufacturer as top coats.

2.02 PAINTS AND FINISHES - GENERAL

- A. Match product, color, and sheen indicated by reference to manufacturer's standard designations for these characteristics in Section 09 06 01 - Interior Finish Key and Schedule.
- B. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 3. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- C. Primers: As required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- D. Volatile Organic Compound (VOC) Content:
 - 1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
 - a. Paints and Coatings:
 - 1) Architectural paints, coatings and primers site-applied to interior walls and ceilings:

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- (a) Provide only products not exceeding volatile organic compound (VOC) content limits as established by Green Seal GS-11.
 - (1) Flats: 50 g/L.
 - (2) Non-Flats: 150 g/L.
- 2) Anti-corrosive and anti-rust paints site-applied to interior ferrous metal substrates:
 - (a) Provide only products not exceeding VOC content limit of 250 g/l as established by Green Seal GC-03.
- 3) Clear wood finishes, floor coatings, stains, sealers and shellacs site-applied to interior elements:
 - (a) Provide only products not exceeding VOC content limits as established by the South Coast Air Quality Management District Rule 1113.

Material	VOC Limit	Material	VOC Limit
Clear Wood Varnish	350	Waterproofing Sealers	250
Clear Wood Lacquer	550	Sanding Sealers	275
Floor Coatings	100	All Other Sealers	200
Clear Shellac	730	Stains	250
Pigmented Shellac	550		

- 4) Require each installer to certify compliance and submit product data showing product content.
- b. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
- 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- E. Chemical Content: The following compounds are prohibited:
 - 1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
 - 2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.
- F. Flammability: Comply with applicable code for surface burning characteristics.
- G. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

2.03 PAINT SYSTEMS - INTERIOR

- A. Specific products listed below are generally Benjamin Moore unless noted otherwise. Refer also to acceptable manufacturers listed above.
- B. Wood, Opaque, Latex, 3 Coat:
 - 1. One coat of latex primer sealer.
 - 2. Semi-gloss: Two coats of latex enamel; Super Spec HP #P29.
- C. Ferrous Metals, Unprimed, Latex, 3 Coat:
 - 1. One coat of latex primer; #P04.
 - 2. Semi-gloss: Two coats of latex enamel; Super Spec HP #29.
- D. Ferrous Metals, Primed, Latex, 2 Coat:
 - 1. Touch-up with latex primer; #P04.
 - 2. Semi-gloss: Two coats of latex enamel; Super Spec HP #29.
- E. Gypsum Board/Plaster, Latex, 3 Coat:

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1. One coat of latex primer sealer; Ultra Spec N534.
2. Semi-gloss: Two coats of latex enamel; Ultra Spec N539.
3. Eggshell: Two coats of latex enamel; Ultra Spec N538.
4. Flat: Two coats of latex enamel; Ultra Spec N537.

2.04 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been adequately prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
 1. Gypsum Wallboard: 12 percent.
 2. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or repair existing paints or finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- G. Ferrous Metal:
 1. Solvent clean according to SSPC-SP 1.
 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
- H. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions.
- B. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- F. Sand wood and metal surfaces lightly between coats to achieve required finish.
- G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- H. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

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3.04 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

- A. Protect finishes until completion of project.

END OF SECTION

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SECTION 10 21 13.19 - PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Solid plastic toilet compartments.
- B. Urinal screens.

1.02 REFERENCE STANDARDS

- A. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.

1.03 ADMINISTRATIVE REQUIREMENTS

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on panel construction, hardware, and accessories.
- C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- D. Samples: Submit two samples of partition panels, 4 by 4 inch in size illustrating panel finish, color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Solid Plastic Toilet Compartments:
 - 1. Basis of Design: ASI Global Partitions: www.globalpartitions.com.
 - 2. Other acceptable manufacturers, as compliant with all specified criteria:
 - 3. All American Metal Corp - AAMCO: www.allamericanmetal.com/#sle.
 - 4. Hadrian: www.hadrian-inc.com/#sle.
 - 5. Metpar Corp: www.metpar.com/#sle.
 - 6. Substitutions: Section 01 60 00 - Product Requirements.

2.02 PLASTIC TOILET COMPARTMENTS

- A. Solid Plastic Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), tested in accordance with NFPA 286; ceiling-hung.
 - 1. Color: As scheduled.
 - 2. Doors:
 - a. Thickness: 1 inch.
 - b. Width: 24 inch.
 - c. Width for Handicapped Use: 36 inch, out-swinging.
 - d. Height: 55 inch.
 - 3. Panels:
 - a. Thickness: 1 inch.
 - b. Height: 55 inch.
 - 4. Pilasters:
 - a. Thickness: 1 inch.
 - b. Width: As required to fit space; minimum 3 inch.
 - 5. Urinal Screens: To match compartments; mounted to wall with continuous panel brackets; size as indicated on drawings.

2.03 ACCESSORIES

- A. Pilaster Shoes: Stainless steel, satin finish, 3 inches high; concealing ceiling fastenings.

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- B. Wall and Pilaster Brackets: Stainless steel; manufacturer's standard type for conditions indicated on drawings.
- C. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
 - 1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.
- D. Hinges: Stainless steel, manufacturer's standard finish.
 - 1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
- E. Door Hardware: Stainless steel, manufacturer's standard finish.
 - 1. Door Latch: Slide type with exterior emergency access feature.
 - 2. Door Strike and Keeper with Rubber Bumper: Mount on pilaster in alignment with door latch.
 - 3. Provide door pull for outswinging doors.
- F. Coat Hook: Two per compartment (one at ADA height), mounted on door.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 260100 - GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

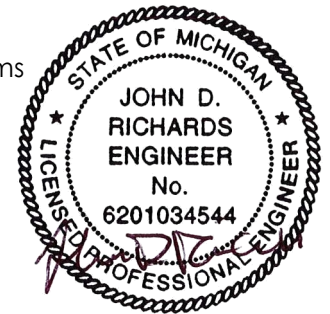
1.01 RELATED DOCUMENTS:

- A. Attention is directed to General Conditions, Supplementary Conditions and General Requirements which are hereby made a part of this Section.

1.02 INTENT:

- A. The Electrical Specifications are, for convenience, divided into the following Sections which contain the requirements applicable to the systems named:

260100 - General Electrical Requirements
260500 - Basic Electrical Materials and Methods
260543 - Underground Ducts and Raceways for Electrical Systems
260574 - Short-Circuit/Protective Device Coordination Study
262200 - General Purpose Dry Type Transformers
262414 - Main Distribution Switchboards (Circuit Breaker System)
264000 - Electrical Service System
264220 - Distribution Panelboards - (Circuit Breaker Type)
264500 - Branch Distribution and Control Equipment
269000 - Demolition and Renovation Work
269500 - Electrical Acceptance Tests



- B. The "General Electrical Requirements" contained herein are hereby made a part of all the above named Sections of the Specifications, Division 26, 27 & 28.

1.03 SEPARATE AND ALTERNATE PRICES:

- A. As Required by Construction Manager.

1.04 DEFINITIONS:

- A. "Provide" shall mean "furnish and install" or "furnish labor and material required for installation of".

1.05 SITE EXAMINATION:

- A. Examination of the site is mandatory. Contractor is hereby held to have examined the site and have satisfied himself as to the conditions under which the work will be performed and have included in his Bid price all costs related thereto.

1.06 QUALITY ASSURANCE:

- A. References to standards, codes, Specifications, recommendations etc., shall mean the latest edition of such publications adopted and published at date of invitation to submit Bid Proposals.
- B. In addition to requirements shown or specified, comply with the applicable standards, specifications and codes listed below. Where requirements of the

Contract Documents are in excess of these requirements, the Contract Documents shall govern.

- C. The following associations, codes, standards and abbreviations are included herein by reference currently adopted versions:

ANSI	American National Standards Institute
BFS	State of Michigan Department of Labor and Economic Growth, Bureau of Fire Services
DEQ	Department of Environmental Quality
MBC	Michigan Building Code
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA 72	National Fire Alarm Code
NFPA 101	Life Safety Code
UFAS	Uniform Federal Accessibility Standards
UL	Underwriters' Laboratories, Inc.

- D. Approved manufacturers shall be considered for material in accordance with the requirements of Division 26, 27 & 28, subject to the approval of the Architect/Engineer. Such approval applies to the manufacturer only and does not in any way act to permit any deviation from strict compliance with the requirements of these Specifications.
- E. All electrical equipment and materials used in the work shall be listed and labeled by a recognized testing laboratory – i.e. UL, ETL, or CSA. The label shall be for the assembled device as delivered by the manufacturer. Assembled with UL rated devices, labeled sub-assemblies, or equivalent are not acceptable alternates.
- F. Licensed Journeyman or registered Apprentice Electricians shall perform electrical work. The number of Apprentices on a project shall not exceed the number of Journeymen. Electricians shall carry a copy of their license or registration while working on site.

1.07 COORDINATION DRAWINGS:

- A. Prior to performing any work, Contractor is to produce detailed coordination drawings with other trades indicating routing and installation details for electrical systems which are coordinated with other trades and with existing conditions. Coordinate with Construction Coordinator/Construction Manager to organize coordination meetings with all trades as required and to implement development of coordination drawings. Remove finished lay-in ceilings and any other obstructions and survey to determine existing conditions, systems and structural elements and potential interferences above and below finished coolings. Coordinate with existing to-remain elements and with new work drawings. Proposed solutions to any conflicts found on coordination drawings.
- B. In addition to lighting fixture installation and other electrical and raceway work, closely coordinate installation of new cable tray and relocation/raising of existing-to-remain cable tray.

- C. Note the installation of steel for patient lifts and service booms. Coordinate with Architectural plans for locations.

1.08 SUBMITTALS:

- A. Submit Shop Drawings for all major components or systems of the project, and where specified.
- B. Refer to General Conditions and Division 1, General Requirements, for Shop Drawings to be submitted in transparency form, procedure and other pertinent data. For brochures and other non-reproducible forms of Shop Drawings, submit to the Architect for review, the required number of copies of Shop Drawings, of each piece of equipment and/or apparatus to be used, together with such descriptions and/or explanatory notes as may be required to give a clear idea of its arrangement and construction.
- C. Prior to issuing any submittals, provide a complete schedule to the Electrical Engineer through the Architect showing all submittals that will be issued for the project. For each product/shop drawing being submitted, indicate the following information in the schedule:
 - 1. System/Subject and material (product data and/or shop drawings).
 - 2. Relevant specification number.
 - 3. Expected quantity of pages/sheets in the submittal (provide approximate count to gauge review time, e.g. 100 pages versus 10 pages).
 - 4. Expected date submittal will be issued.
 - 5. Requested return date of submittal.
 - 6. If any submittals overlap in review time, numerically prioritize the requested submittal review/return by the A/E or adjust requested review duration/return date so there is not overlap.
- D. Where items are referred to by symbolic designation on the drawings and specifications, all submittals shall bear the same designation (light fixtures). Refer to other sections of the electrical specifications for additional requirements. Submit the following in addition to any other specified systems/equipment.
 - 1. Short Circuit Evaluation – Note requirement to submit proof of adequate ratings prior to distribution equipment submittals.
 - 2. Power Distribution Equipment
 - 3. Identification
- E. Where new work ties into existing systems, include the detailed location and tie-in requirements in the submittal. Include any accessories necessary for tie-in.
- F. No apparatus or equipment shall be shipped from stock or fabricated until Shop Drawings for same have been stamped "Reviewed" or "Reviewed as Noted". If "Reviewed as Noted" status is applied all review comments must be incorporated for equipment to be ordered/fabricated and for work to proceed.
- G. Submit system components, product data and shop drawings complete for each system under one submittal. Do not break out equipment for one system between multiple submittals.

- H. If different systems are included in one submittal, clearly separate information with tabs or binding and provide different sub-numbering of systems.
- I. All Shop Drawings must be clearly marked to show equipment submitted and any deviations from specifications shall be noted in writing. Deviations not specifically noted in writing will be the Contractors responsibility to replace if installed. Do not include only model numbers to indicate submitted equipment. Model numbers/ordering numbers will not be reviewed. Edited product data will be reviewed. Strike out any information on product data that is not project specific, and edit relevant information to show actual equipment submitted. Electrical Contractor must review, sign and approve all shop drawings prior to submittal.
- J. Identify submitted equipment with nomenclature indicated on the Contract Documents.
- K. Provide project specific submittals from contractor to reviewer rather than supplier/manufacturer to reviewer. Do not include any claim of work or product "by others" if the work is the contractor's responsibility. Contractor's signature on submittal indicates that contractor finds submitted equipment and systems to meet contract document requirements.
- L. Uniquely and consecutively number each page in submittal.
- M. Shop Drawings that are incomplete, unsigned and not plainly marked will not be reviewed.
- N. Coordinate submittal schedule and construction schedule with CM/GC. Provide complete, accurate submittals to avoid re-submittals. Time required for any re-submittals is to be planned into project schedule by the Contractor. The A/E will not be responsible for construction delays due to re-submittals and will not be required to accelerate re-submittal review times. Pricing changes will not be approved due to re-submittals. Include in bid all costs required to allow for re-submittals.

1.09 CONTRACT DRAWINGS:

- A. Contract Drawings for electrical work are diagrammatic, intended to convey the scope of the work and indicate general arrangement of systems and approximate locations of equipment and outlets. Do not scale Drawings for measurements.
- B. Consult Architectural, Structural and Mechanical Contract Drawings and Specifications to become familiar with all conditions affecting the work, coordinate interconnecting work and other Trades affected, and verify all spaces in which the work will be installed.
- C. Where job conditions require reasonable changes in indicated locations and arrangements, make changes without extra cost to the Owner.
- D. The Contract Documents (Drawings and Specifications) are to be cooperative, and whatever is called for by either shall be binding as if called for by both.

- E. Various items of apparatus and equipment will be furnished and set under other Contracts.
- F. Remove and reinstall ceilings, including outside the renovation areas, as required to perform work. Reinstall ceilings to pre-construction condition or better, subject to review and approval of the Architect.

1.10 WORK INVOLVING OTHER TRADES:

- A. Certain items of equipment or materials specified in the Electrical Division may have to be installed by other Trades such as Mechanical Trades or Architectural Trades due to code requirements or union jurisdictional requirements. Where this occurs, Electrical Trades shall include the full cost for completing the work installed by others.
- B. Include allowance in bid for variations in electrical services (branch circuits/feeders) to mechanical equipment specified. Equipment specified and designed into Contract Documents may vary due to manufacturer differences and equipment selections and substitutions. Allow for revisions to services with no extra charge prior to installation. Coordinate with approved mechanical submittals to verify equipment characteristics prior to beginning electrical installation.

1.11 RECORD DRAWINGS:

- A. After completion of the work, provide a complete set of "Record" Drawings to Owner and the Engineer. Contractor shall obtain from Engineer at cost (\$10.00 per drawing) the project electronic files on which Contractor shall record all as-built data. Submit updated electronic Auto Cad files along with a set of marked up drawings with as-built changes for final approval.
- B. In addition to hard copy, submit on compact disks electronic versions of as built panel schedules. Submit to A/E and to Owner's Building Engineer in Microsoft excel format. Match format of schedule used for construction documents. Template file is available to Contractor from Engineer upon request.

1.12 CODES, PERMITS, INSPECTIONS AND FEES:

- A. All work shall be in accordance with National Electrical Code, latest edition and all local, state and national bodies having jurisdiction thereof.
- B. Contractor shall be licensed in the municipality in which the work is located.
- C. Contractor shall take out all permits required and arrange for all necessary inspections, licenses and approvals as required by local and state laws and shall pay all fees and expenses in connection therewith and shall include same in Base Bid prices. Prepare any detailed drawings or diagrams which may be required by the governing authorities. Where the drawings and/or specifications indicate materials or construction in excess of code requirements, the drawings and/or specifications shall govern.
- D. Upon completion of the work, furnish to the Engineer all certificates of inspection and/or approvals which are customary for the classes of work involved.

1.13 COORDINATION AND COOPERATION:

- A. Electrical Contractor shall coordinate his work with that of the Construction Manager/General Contractor as applicable and other Subcontractors for the Project.
- B. Contractor shall coordinate with designated Representative the placing of panels, flush devices or other equipment installed in masonry walls or partitions. All such flush installations shall be coordinated with masonry coursing as applicable.
- C. Chases and recesses are provided by the architectural trades, but the contractor shall be responsible for their accurate location and size.

1.14 SCHEDULING OF WORK:

- A. Work may be scheduled in phases and/or may be performed on a fast-track schedule. Prior to bid submission, coordinate with GC/CM and with Owner to determine project schedule. Include in bid all costs to achieve completion of work within project schedule.

1.15 USE OF EQUIPMENT:

- A. The use of any equipment, or any part thereof, for any purpose including testing even with the Owner's consent, shall not be construed to be an acceptance of the work on the part of the Owner, nor shall it be construed to obligate him in any way to accept improper work or defective materials.
- B. Do not use Owner's lamps for temporary lighting except as allowed and directed by the Owner. Equip lighting fixtures with new lamps when the project is turned over to the Owner.

1.16 PROPOSED SUBSTITUTIONS AND CONTRACTOR'S RESPONSIBILITY:

- A. Manufacturers other than those listed in Divisions 26, 27 and 28 may be submitted for consideration in accordance with "Substitutions" of the General Conditions and Division 1, General Requirements of these Specifications.
- B. Any substitutions contemplated shall be subject to the final approval of the Architect/Engineer at their sole and absolute discretion prior to bid award. After bid award all products submitted shall comply with Contract Documents.
- C. Substitute equipment and material submittals shall be complete and clear and shall include all data required to establish equal quality, to specified and indicated products.
- D. Substitutions will be considered only once and if found lacking in detail or required supportive data, or if they are not found to be equal by the A/E review, they will be rejected outright, and such rejection shall be final. Substitutions and changes to products will not be considered after the product has been approved or approved as noted with comments in a submittal.

- E. "Approved Equal" equipment, material or systems are intended to provide the same quality, aesthetics and performance and function as those named and are not considered as substitutes for the purpose of this article. The Architect/Engineer will review products submitted as equal and will allow or disallow their use in the project. If submitted products are not determined to be equal by the Architect/Engineer for any reason, provide the specified/listed product at no change in project cost. The Contractor's bid is to include all costs to comply with specified/indicated work. Changes in costs will not be approved for equal products. Refer to Section 265000 for additional requirements specific to Lighting Systems.
- F. Submit product data and written description of how proposed substitution varies from specified product. Any characteristics not specifically submitted in writing as a deviation from the Contract Documents will be assumed to conform to the intent of the specified product.
- G. Submit project cost increases or deductions that result from the acceptance of each substitution. Additional cost to the project will not be approved unless specifically included with the substitution.

1.17 OPERATION AND MAINTENANCE MANUALS:

- A. Upon completion of the work and fourteen (14) days before final inspection, the Contractor is to compile and deliver to the Architect, three (3) sets of Manuals of material and equipment used in the building. This shall include, but shall not be limited to, transformers, switchboards, panels, etc.
- B. In each set of manuals, the following information shall be included for each item of material, equipment and hardware installed:
 - 1. Name and address of manufacturer and/or fabricator.
 - 2. Trade names, catalog number, serial number, contract number of other accurate provision for ordering replacement and spare parts.
 - 3. Certified Drawings, where applicable, showing the amount of parts and general dimensions.
 - 4. Operating and maintenance instructions and/or manuals.
 - 5. Routine maintenance procedures.
 - 6. Trouble-shooting procedures.
 - 7. Shop drawings and product data.

1.18 TEMPORARY LIGHT AND POWER:

- A. Consult Supplementary General Conditions, for requirements pertaining to this work and comply.
- B. Provide complete systems of adequate capacity and design, and in accordance with Federal, State and Local Codes. Provide lighting (normal and emergency/egress) which matches the pre-construction levels. Coordinate with Architect to maintain proper egress and exit lighting during all phases of work.

1.19 CONSTRUCTION POWER:

- A. Existing facilities may be used upon permission from Owner.

- B. Contractor to provide for all trades.

1.20 TRAINING:

- A. Provide training to Owners personnel as specified in individual specification sections.
- B. Hours of training in each section are the actual time spent training Owners personnel. Travel and preparation time are not included in this time.
- C.

1.21 WARRANTY:

- A. Unless a longer period is specified in individual specification sections, provide a minimum of a one year warranty on all electrical work beginning the date of final acceptance of the project by the Owner. A manufacturer's warranty on equipment shall be extended a minimum of one year from final project acceptance. Manufacturer's warranties which are longer than a one year term shall remain in effect for their entire length.

PART 3 - EXECUTION

3.01 ACCESSIBILITY:

- A. Install all electrical work with working clearances and dedicated electrical space as applicable per National Electrical Code requirements. Relocate any existing equipment and building system interferences in locations where adequate working clearances and electrical space are not present. Field verify that proper working clearances will be achieved for the actual equipment to be installed and notify the Architect/Engineer of any non-compliant conditions found prior to the installation of any electrical work including but not limited to raceways, supports and equipment. Note that installed equipment dimensions and locations and field conditions may vary from the basis of design. No extra costs will be approved for rework of installed non-Code-compliant work.
- B. Provide minimum 18" x 18" hinged access doors (panels) for all junction, outlet and pull boxes and for all equipment requiring inspection, maintenance, service, replacement and access which is located behind walls or above permanent non-lay-in ceilings and canopies. Provide larger hinged access doors if required to adequately access equipment. Coordinate door size with approved submittals and manufacturer's recommended installation and maintenance instructions. Coordinate location with Architect prior to installation. Paint to match architectural finish at installed surface. Access doors are not indicated on plan drawings.
- D. As a minimum, route conduits, as high as possible in ceiling spaces, cable tray, and other materials high enough above the accessible ceiling tiles to allow easy removal of the tiles, or above access hatches ease of maintenance and inspection.

- E. Layout devices in ceilings so there are enough 'free' (removable) tiles to allow maintenance of above ceiling equipment, pulling new cables in tray, and making minor additions of new conduits and the like (during renovations).
- F. Coordinate work with other trades prior to installation to maximize accessibility.

3.02 INSERTS, SLEEVES AND PENETRATIONS:

- A. Provide and install all necessary inserts, conduit sleeves, hanger bolts, etc., to hang equipment and to run conduit through walls, floor slabs or footings.
- B. Holes through walls, ceilings or floor slabs shall be sealed completely in an approved manner to form a fire barrier.
- C. All electrical lines to roof mounted equipment shall be installed within equipment curbs.
- D. For penetrations through fire-rated assemblies, provide UL listed system for the penetration, equal to or greater than the rating of the rated assembly. Refer to Architectural documents for fire rated assembly types and locations.
- E. In addition to manufactured systems indicated (such as fire-rated poke-throughs), fire stop components shall consist of packer-style red pillows and moldable fire-stop compound. Packets shall be used where multiple cables pass through a fire-rated wall, ceiling or floor, such as data and phone cable trays. Fire-stop compound shall be used where individual cables in conduit penetrate fire-rated wall, ceiling or floors.
- F. Fire stopping shall be performed by a Contractor who is certified in its installation. Fire stopping Contractor is a sub-contractor to the Electrical Contractor.
- G. Provide sleeves for all conduits penetrating floors and concrete/masonry walls.

3.03 PROTECTION AND HANDLING:

- A. All electrical systems or divisions thereof shall be duly cared for and properly protected until all systems have been completely tested, inspected and finally accepted by Owner.
- B. After delivery, before and after installation, protect equipment and material against theft, injury or damage from all causes.
- C. Protect equipment outlets, conduit openings and electrical raceways with temporary plugs or caps.
- D. Receive, properly house, hoist, handle and deliver to the proper location, equipment and material required for this Division of the work.
- E. Deliver materials to the job site in original containers and packages, bearing the manufacturer's labels indicating name, type and brand.

3.04 PAINTING, CLEANING AND TOUCH-UP:

- A. Any required painting of electrical equipment in existing areas will be done by Architectural Trades. Whenever painting is required by this Trade for certain portions of the work, it will be specifically specified hereinafter.
- B. All factory finished equipment shall be thoroughly cleaned at the completion of the work. Any equipment showing mars or rust spots shall be refinished and restored to original factory finish.

3.05 ELECTRICAL REQUIREMENTS FOR MECHANICAL WORK:

- A. Furnish and install disconnects for mechanical and building equipment requiring the same unless otherwise specified herein or noted.

3.07 BUILDING EQUIPMENT AND MECHANICAL EQUIPMENT:

- A. Provide and install all electrical work required to put in operation building and mechanical equipment requiring electrical service.
- B. Connections to new equipment shall be done in accordance with manufacturer's Shop Drawings and installation instructions. Requirements generally vary from one manufacturer to another and Contractor is bound to comply and provide all work as required although certain discrepancies regarding requirements may exist.
- C. Provide power wiring, protection and disconnect devices to all mechanical equipment and make final connections, including testing and motors for proper rotation. Exhaust fans are generally provided with integral disconnects by Mechanical Trades.
- D. Packaged equipment is provided as a unit by manufacturer including all control and power wiring at a main junction box. Install disconnect switch, power wiring and make final connections.
- E. Prior to installation of electrical work, perform the following coordination:
 - 1. Coordinate lug sizes on approved equipment shop drawings with conductor size indicated feeding the equipment. Conductors may be upsized for voltage drop. Include cost in bids to provide reducing adaptors at equipment terminations to reduce conductor size to fit lug size for each piece of equipment. Refer to 600V Wire Terminations and Connections for reducing adapter requirements.
 - 2. Coordinate equipment lug listing for compatibility with conductor type to be installed (copper or aluminum where permitted).
 - 3. Coordinate equipment lug listing for compatibility with reducing adaptors to be installed (copper or aluminum).

3.08 IDENTIFICATION:

- A. Identify all electrical system components. Identification shall be subject to final approval by Architect/Engineer.
- B. Identification shall be all inclusive and shall include switchboards and switchboard individual devices, distribution panels and individual devices, power

panels and individual devices, transformers, lighting and receptacle panels, time switches, relays, contactors, push-button stations, pull and junction boxes, toggle switches used for motor disconnects, disconnects and safety switches, motor starters, variable frequency drives, transformers, meters, control panels, NEMA enclosures housing electrical system components, etc. Include equipment name from the contract documents, voltage, rating, power source room number of power source as applicable, eg "RP-A", 208Y/120V, fed from MSWBD in Room 1H23" or "T-1, 480-208Y/120V, 30 KVA, fed from LP-A in Room B23, serves RP-1". Submit list of nameplates for Owner review.

- C. All lighting and receptacle panels shall be provided with a typewritten directory on inside of panel given complete and accurate description of all circuits and devices and/or equipment connected to each circuit. Description shall include number of outlets, load and a readily identifiable location statement. Submit as-built electronic schedules as specified in Record Drawings, this Section.
- D. Nameplates shall be white plastic laminate with 1/4" black engraved letters. Nameplates shall be fastened to equipment with stainless steel machine screws. Magic markers and Dymo labels are strictly prohibited.
- E. Identify wiring device coverplates with lettered tape identifying panelboard and branch circuit number serving device, e.g. "A-15". Provide identification for all switches, dimmers receptacles in all applications. Provide 1/4" machine-written black lettering on clear plastic adhesive tape. Locate on bottom front of coverplate, centered below wiring device(s). For weatherproof coverplates, locate circuit identification on the inside of the flip up coverplate lid. Submit sample of labeled tape with wiring device/coverplate submittal. Sample may be adhered to paperwork in submittal, rather than to a coverplate.

3.09 TESTS AND CERTIFICATION:

- A. Test all circuits as soon as conductors are installed. If circuits are not properly controlled and insulated, make all necessary repairs.
- B. Perform any additional tests specified hereinafter and any other tests deemed necessary by Architect/Engineer for systems supplied or installed.
- C. Provide testing work as specified in Section 269500, "Electrical Acceptance Test".

3.10 EQUIPMENT CONNECTIONS:

- A. Connection to equipment, fixtures, etc., shall be made in accordance with the Shop Drawings and rough-in measurements provided by the manufacturer of the particular equipment furnished.

3.11 BASIC SUPPORTING PROCEDURES:

- A. Unless otherwise shown, all overhead mechanical and electrical items supported from the building structural steel system shall be supported from structural beams or purlins or truss and open web steel joist panel points (or within 6" thereof). Panel points being the point of intersection of web members (rods, angles, etc.) with top or bottom chords (horizontal members).

- B. Item distribution shall be such that multiple loads are not concentrated on single hanging points.
- C. Provide U-channel supports and miscellaneous steel and hardware as required to support electrical work in dry interior applications. Provide hot-dipped galvanized finish for all components and hardware.
- D. Attachment devices shall be a type resulting in the load being centered on the center of the members.
- E. Rigidly support all electrical equipment.
- F. Provide fiberglass u-channel support for exterior locations, damp and wet locations, and where specified or indicated to support equipment, raceways and wiring devices. Provide stainless steel or fiberglass fittings and hardware suitable for fiberglass u-channel system. Manufacturers: Aickinstrut, Champion Fiberglass, or approved equal.
- G. Coordinate support system components, hardware and fastening method as required for each load supported per manufacturer's recommendation.
- H. Support electrical items independently of the supports provided by other trades and independently from existing electrical system supports. Do not support electrical items from conduits/raceways.
- I. Provide concrete pad for freestanding electrical equipment. Pads may not be specifically indicated. Size pad to extend 4" around footprint of equipment. Coordinate size with manufacturer's dimensions based approved equipment submittals, unless a larger pad is indicated.

3.12 MOUNTING HEIGHTS:

- A. Height above finished floor for all control and wiring devices shall be in accordance with the Americans with Disabilities Act (ADA). Switches shall not be more than 48" above finish floor (AFF). General purpose receptacles shall not be less than 12" AFF and no more than 48" AFF.
- B. General purpose convenience receptacles shall be mounted at 16" AFF to the bottom of outlet box. Telephone outlets shall be installed at the same height as receptacles except for wall mounted instruments, outlets shall be installed at 48" AFF.
- C. Light control switches, dimmers, manual starters and similar devices shall be generally mounted at 48" AFF.
- D. Consult Drawings for special mounting heights, base mounted devices, horizontally mounted receptacles and other special mounting requirements.
- E. Receptacles in Toilet Rooms, Janitor Closets and Mechanical Rooms shall be installed at 48" AFF. Receptacles and switches at counters shall be installed at 6" above counter measured to the center of the box. Height of special devices shall be as indicated on the Drawings or as directed.

- F. Mounting heights indicated on the Drawings shall take precedence over the requirements stated herein.
- G. Whenever the mounting heights of any device is in question, consult the Architect for direction prior to installation of raceway and outlet box.

3.13 RESPONSIBILITY FOR VOLTAGE VERIFICATION:

- A. Contractor shall be responsible for verification of correct voltages for all mechanical and building equipment. In case of discrepancy, notify Engineer immediately and prior to Shop Drawing submittals. Failure to comply with this requirement holds Contractor fully responsible for any subsequent equipment revisions and work.

3.14 RESPONSIBILITY FOR SUBSTITUTIONS:

- A. In the event that substitute equipment, material or whole systems are approved for use on the project, the Trade Contractor using the substitute material, equipment or systems shall pay all subsequent additional costs; that may be incurred for proper implementation, function and use of such equipment; In addition, the Trade Contractor shall pay for all time expended by the Architect and/or Engineer relative to the substitution.

END OF SECTION 260100

SECTION 260500 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to General Conditions, Supplementary Conditions and General Requirements which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. General: Provide basic materials and methods for electrical work and install in accordance with the Contract Documents.
- B. Major items of work and equipment included under this Section of the Specifications are conduit, wiring, devices, boxes, cover plates, hangers, supports, wireways and general materials for Electrical work.
- C. References to other Sections of the Specifications: All Sections of this Division.

1.03 MATERIAL AND EQUIPMENT STANDARDS:

- A. All material and equipment shall be of new stock and of the grade herein specified.
- B. All material and equipment used on this project shall have Underwriters' Label for intended use.

PART 2 - PRODUCTS

2.01 CONDUIT SYSTEMS:

- A. Refer to Section 260543 for Underground Ducts and Raceways for Electrical Systems.
- B. Conduit systems shall consist of an electrically continuous raceway system, suitable for the installation of electrical wiring, and may be made up of rigid conduit, "thin wall" electric metallic tubing, or non-metallic conduit as specified herein.
- C. All metallic conduits shall be hot dip galvanized. Non-metallic conduits shall be heavy wall PVC, Schedule 40 unless Schedule 80 is indicated. Non-metallic conduit may be installed below (not in) slabs on grade only and may not serve patient care areas. Stub UPS, ells and risers are to be galvanized rigid steel. Minimum conduit size shall be 1/2" diameter.
- D. Heavy wall galvanized rigid steel conduit (RSC) shall be used for all hazardous locations, for conduits larger than 4" in diameter, for all locations where exposed to weather, for aboveground service risers, for general slab burial up to 1" in diameter, for underground/below slab applications where circuits serve patient care areas and where indicated.

- E. Thin wall conduit (EMT) may be used, concealed or exposed within building proper and for feeders 4" and less in diameter. EMT conduit may not be buried in or under concrete slabs or exposed to weather.
- F. Non-metallic conduit shall be used for underground exterior applications as indicated on the Drawings unless otherwise specified. PVC installed under slab shall be kept at least 6" below slab. When PVC conduit is used, all stub-ups, ells, extensions above floor and aboveground risers, shall be heavy wall rigid steel. PVC ells may be used only with 4" service conduits and larger terminating in switchboards or primary service equipment located on ground level or outside of building. PVC may not be used for circuits serving patient care areas.
- G. PVC conduit except as prohibited by code and up to 1" diameter, may be buried in floor slab provided it is installed in a secure manner and well protected from damage that may be caused during slab construction and concrete pouring operations. In addition, all the requirements of previous paragraph are observed.
- H. Fittings for EMT conduit shall be either compression type or double set screw type. Rigid conduit fittings shall be threaded. PVC fittings shall be glue-on type and shall be same manufacturer as the conduit. Termination of PVC conduit into device boxes or equipment enclosures without proper fitting is prohibited.
- I. Flexible conduit shall be galvanized single strip steel equal to Greenfield or Flexsteel with single screw type box fittings equal to Appleton #7482V. Coordinate model number of fitting with conduit size.
- J. In damp locations, flexible conduit shall be liquid tight, neoprene jacketed, grounded type equal to "Sealtite" Type #UA with Appleton Type "ST" fittings or equal.
- K. Manufacturers: General Electric, Youngstown, Allied Tube, Anaconda, Carlon, Triangle or approved equal.

2.02 BOXES AND OUTLETS:

- A. Provide outlet boxes for all work. Boxes shall be stamped galvanized steel or cast metal. Non-metallic boxes are prohibited. Outlet boxes exposed to weather shall be cast metal with gasketed covers.
- B. Where two or more wiring devices, dimmers, and/or voice/data outlets are indicated adjacent to each other, they shall be installed in ganged outlet boxes and provided with suitable gang barriers. All boxes in finished areas shall be flush mounted. Boxes shall be suitable to receive the devices specified. Coordinate device locations between lighting and power plans and gang as applicable. Provide boxes for ganged dimmers sized per manufacture's recommendation and suitable for installation of dimmers with no side fin heat-sinks removed.
- C. Lighting fixture outlet boxes shall consist of a pressed steel 4" octagonal outlet box not less than 1-1/2" deep, equipped with ears for cover screws and suitable cover.

- D. Outlet boxes for concealed work for wall switches, receptacles and other wiring devices shall consist of pressed steel outlet box not less 2-1/8" deep and equipped with plaster ring suitable to accommodate the device(s) specified or indicated.
- E. Non-metallic outlet boxes shall be used where non-metallic sheathed cables type NM, NMC are used.
- F. Outlet boxes in dry locations of brick, tile, block or stone shall be square to facilitate cutting and providing a neatly finished job. Match specified dimensions above.
- G. Outlet boxes installed outdoors, in wet locations and where "WP" or weatherproof is indicated shall be cast. Refer to Wiring Devices, this Section for additional requirements.
- H. For telecommunications (Voice/Data Outlet Boxes), refer to Section 270528, Voice/Data Communications Systems.
- I. Wall switch outlets when installed near doors shall be installed on the lock side of the door.
- J. Receptacle outlets in general areas shall be installed with units mounted vertically, grounding pole down. When horizontal mounting is required, horizontally mounted outlets will be indicated on Drawings.
- K. Whenever a location or height of an outlet is in question it shall be coordinated in the field to suit job conditions or as directed by Architect/Engineer. Refer to "Mounting Heights", Section 260100 for additional requirements.

2.03 JUNCTION AND PULL BOXES:

- A. Wherever required to facilitate the pulling of wire, pull boxes shall be installed.
- B. All pull boxes shall be fabricated from No. 12 or heavier gauge galvanized steel of not less than the minimum size required by the National Electrical Code and shall be equipped with screwed covers.
- C. All junction boxes must have covers and be accessible after completion of the building. Where several feeders pass through a common pull box or junction box, the feeders shall be tagged to indicate clearly their electrical characteristics, circuit number and panel designation. Paint same information on the cover of the box.

2.04 600V. WIRE AND CABLE:

- A. All conductors shall be AWG, soft drawn copper of sizes specified and/or indicated. All conductors shall be insulated for 600 Volts and with 75 degrees C. code grade insulation.
- B. All conductors #8 and larger, in dry locations, shall be made up of stranded single conductor cable and shall be THHN insulation. Underground and damp location wiring shall be THWN or XHHW insulation. Whenever stranded conductors are used

for conductors larger than #10, pressure type crimp-on terminals shall also be used.

- C. Conductors #10 and smaller shall be solid, code grade insulation type THHN/THWN.
- D. Typical branch circuits are 2 #12 and 1# 12G fed from a 20A, 1-pole circuit breaker to wiring devices within 100 feet. Typical branch circuits sizes are not indicated; circuit numbers only are indicated for typical circuits. Contractor may combine circuits in raceways provided the Contractor sizes and derates circuit conductors per NEC requirements as applicable.
- E. Branch circuit conductors shall not be less than #12 AWG on 20 ampere lighting and receptacle circuits. Control wiring for push buttons, relays, thermostats, etc., may be #14 AWG.
- F. All wires and cables shall be installed in conduit without use of any oil or grease lubricant. Conductors terminating in outlets shall be extended no less than 8" beyond outlet.
- G. MC type cable may be used by the Contractor, allowed by the local inspector, and NEC.

2.05 WIRING DEVICES:

- A. Color of all wiring devices shall be "white" unless otherwise specified.
- B. Local wall switches shall be 20 ampere, 120/277V specification grade, toggle type, quiet operation and shall be single pole, double or 3-way as indicated. Switches shall be Hubbell #HBL1221/22/23 or approved equal. Key operated switches shall be Hubbell #HBL1209.
- C. Provide low voltage switches as required for the application. Coordinate switch type with control equipment for compatibility. Submit proof of compatibility between switches and equipment.
- D. Duplex receptacles shall be heavy duty specification grade duplex, 2 pole, 3 wire, grounding type, 20 ampere, 125V, Hubbell #HBL5362 or approved equal. Isolated ground receptacles shall be "orange" color Hubbell #IG-5362.
- E. Ground fault circuit interrupter receptacles shall be weather resistant and tamper resistant, Hubbell #GFR5362TR or approved equal. Receptacles designated as "WP" or weatherproof shall be ground fault circuit interrupter type with cast box and weathertight gasketed cover plate, Hubbell #GFR5362TR with WPFS26 cover plate or approved equal.
- F. USB Charging Receptacle: Combination duplex receptacle/USB Charger, tamper resistant, 20A, 125 VAC, 2-Pole, 3-Wire grounding, duplex with 5 VDC 2-Port USB Charging and LED Charging Indicator Light, Ivory with Stainless Steel coverplate.
Cooper/Arrow-Hart TR7746 Series or approved equal.

- G. Receptacles designated as "TR" or tamper resistant shall be Hubbell #HBL8300SG series or approved equal.
- H. Weatherproof While-In-Use covers shall be thermoplastic with semi transparent cover, Hubbell RW57500 Series or approved equal. Coordinate cover for compatibility with applicable wiring device.
- I. Cover plates shall be provided for all wiring devices and outlet boxes installed. Plates shall be of gangs, type and configuration required for the wiring devices installed, or blank if no device is installed. Cover plates shall be smooth edge non-magnetic 302/304 grade brush finish stainless steel. Lutron Satin Nickel Metal plates may be used for Lutron dimmers as an equivalent to brushed stainless steel. Refer to additional coverplate requirements for dimmers as specified in this Section. Submit coverplate product data. Provide and submit identification on coverplates as specified in Section 260100, "Identification". Hubbell Smooth #SS Series.

2.06 GROUND PLATE (GROUND BUS)

- A. A 1/4-inch thick by 2-inches wide by twelve inches long soft copper bar with drilled holes for bolted connections of ground conductors. Provide seven drilled holes for 1/4-inch grounding screws/bolts, and seven drilled holes for 3/8-inch grounding screws/bolts. Symmetrically space drill holes.
- B. Provide stand offs with insulators and miscellaneous hardware to wall mount ground plate.
- C. Provide #6 AWH green insulated copper equipment ground conductor in 3/4" conduit from ground bus to electrical service equipment's equipment ground bus.
- D. Ground plate and ground bus may be used interchangeably.

2.07 GROUNDING AND BOUNDING

- A. Provide systems grounding as required by NEC article 250.
- B. Provide bonding for all conductive non-current carrying part of services, enclosures, Raceways, etc.
- C. Provide a green ground conductor in every conduit properly sized to correspond to the feeder or circuit rating.

PART 3 - EXECUTION

3.01 CONDUIT INSTALLATION:

- A. Conduit runs as indicated on the Drawings are diagrammatic. Exact routing of conduit shall suit job conditions.
- B. All conduits shall be run concealed in building construction except in unfinished areas, it may be exposed. Exposed conduit shall be run parallel to building lines. Exposed conduit subject to mechanical damage shall be heavy wall rigid.

Conduit may not be run on building exterior walls between block and brick, or anywhere on exterior walls which would interfere with insulation and vapor barrier.

- C. Conduit may not be run in concrete floor slabs unless specifically indicated as such to serve flush poured floor mounted service fittings and installation is approved by Structural Engineer prior to installation.
- D. All conduits shall be securely fastened in place, carefully reamed before installation and provided with suitable protection of wire against edge of conduit equal to Thomas & Betts "Insuline" bushings and connectors.
- E. Where MC or AC cable is approved for use in the project, provide UL-Listed anti-short bushings between the armor and cable at each location where armor is terminated. Provide connectors and clamps per NEC suitable for visible inspection of bushings.
- F. Groups of conduits shall be supported on trapeze type hangers; Unistrut, Kindorf or equal. Individual conduits not supported on pipe straps shall be provided with clevis type hangers; Thomas & Betts or equal. Hanger supports shall be rod or pipe with threaded connections. For exterior and wet locations, and for installation on first floor open spaces for parking, support conduit and electrical equipment with fiberglass U-channel as specified in "Basic Supporting Procedures", Section 260100.
- G. No conduit shall be supported from ductwork or other pipes.
- H. Conduit, cable tray and surface raceways running through expansion joints of building shall be provided with expansion fittings as required. Provide bonding of all expansion joints and fittings. Coordinate with architectural documents for location of expansion joints.
- I. All conduits installed and capped for future use shall be identified with metal tags indicating purpose and provided with pull rope and insulating bushings at both ends. Typical for fire alarm, telecommunications, audio-visual, special systems and "spare" conduits.
- J. Conduit shall be kept at least 3" clear from all hot water lines, steam lines, flues, etc., and shall be run so that it will not interfere with proper installation of other work.
- K. Conduit, other electrical raceways or electrical boxes shall not be in any way attached to, fastened, suspended or supported from roof deck or ceiling suspension system. Conduit shall be supported from building structural system. See 260100 - "Basic Supporting Procedures".
- L. Flexible metal conduit shall be used for final short connections to motors, transformers, vibrating equipment, and from lighting outlet box to hung and flush lighting fixtures. Flexible conduit shall not be used as the sole grounding mean of a circuit or system, a green equipment grounding conductor shall be provided.

- M. For conduit and raceway installed in existing finished spaces, the intent is to run conduit concealed. Cut and patch walls and floors to conceal conduit unless otherwise indicated. Existing block and concrete walls also require flush installation unless surface mounting is allowed by Architect. Base bid is to include flush mounting. If Architect allows surface mounting; coordinate raceway type, routing and finish with Architect if not otherwise specified or indicated.
- N. Cable tray, conduit, surface raceway fittings and bends shall have bend radii greater than the minimum bend radii of the cables enclosed. Unless otherwise noted use a radius 10 times diameter of largest cable installed, or 12 times the diameter of the conduit.
- O. All major pull, and junction boxes, in service areas, tunnels, above accessible ceilings and in accessible chases are to have 1/2" black lettering on the box, identifying the feeder or system.
- P. Systems with conductors exceeding 240 volts to ground are to have voltage identification stenciled with 1" high black letters on all panels, safety switches, pull boxes, junction boxes. For cables above 1000 volts, label conduit every 30 feet along exposed conduits. Flush panels in finished areas are to be lettered inside the door. Example: 480 volts.
- Q. Conduits entering junction boxes, enclosures, etc., shall be marked showing panel name and circuit number.
- R. Route conduit in mechanical and electrical spaces as high as possible. In existing spaces (renovation work), maintain all existing clear heights, i.e. do not install overhead raceways lower than existing conditions.

3.02 WIRING DEVICE INSTALLATION:

- A. Install outlet boxes flush, unless otherwise specified. Cut and patch walls and floors as required to achieve flush installation, including existing block and concrete walls. Coordinate outlet box installation to match conduit installation as specified in this Section.
- B. Gang outlet boxes for multiple wiring devices as specified in Boxes and Outlets, this Section.
- C. Install wiring devices vertically, unless otherwise indicated.
- D. Install receptacles with grounding pole oriented to match any existing-to-remain devices in the same area, or grounding pole up or to the right if there are no existing devices.
- E. Provide ground fault circuit interrupter receptacles (GFR) where required by NEC and where devices are indicated with "GFR", "GFI" or "GFCI" (these designations are used interchangeably). Wire GFR type receptacles for self protection and not for downstream protection of other wiring devices.
- F. All receptacles installed outdoors, at rooftop equipment, in wet locations, or designated as "WP" or weatherproof shall be weatherproof type.

- G. For exterior, wet and damp locations where wiring devices outlets are exposed (for example: roof or grade mounted devices or devices at HVAC equipment), support with fiberglass U channel as specified in Section 16010.
- H. Provide dedicated neutral conductors for each feeder and each branch circuit.
- I. Allow for relocation of any outlet as directed by Architect/Engineer/Owner up to 10 feet in any direction from plan location before rough-in at no extra cost.
- J. Ground wiring devices via a 'pigtail' to the outlet box ground screw allowing the future replacement of the device without affecting the grounding of other devices on the same circuit.

3.03 WIRING METHODS:

- A. All wiring shall be installed in an approved electrical raceway system as specified and indicated. Cables of any kind are not permitted.
- B. All conduits shall be provided with a separate insulated equipment grounding conductor within conduit.
- C. Wiring shall be color coded as follows:
 - 1. 480/277V. System: Phase A-brown, B-orange, C-yellow, Neutral-gray.
 - 2. 120/208V. and 120/240V. Systems: Phase A-black, B-red, C-blue, N-white.
 - 3. Equipment ground conductor for all systems shall be insulated, green.
 - 4. Provide identification of ungrounded conductors as specified in Section 264500, Branch Distribution and Control Equipment.
- D. Provide dedicated neutral conductors for each dimming branch circuit.
- E. Unless otherwise indicated, provide continuous feeders with no splices.

3.04 WIRE LABELING

- A. Power Wiring
 - 1. All branch circuit wiring in panel, shall be labeled as to circuit number.
 - 2. At each junction/pull box, note source panel and branch circuit numbers for wiring passing through or to, the box. Label outside cover of box in areas where box is not normally visible, such as above finished ceilings. Label inside cover if box is visible. Permanent marker is acceptable for box cover labeling. Label wires in outlet box as to circuit number. Refer to "Identification", Section 260100, for additional coverplate labeling.
- B. Non-Power Systems Wiring
 - 1. All control, signal, fire alarm, security and other like special systems cables shall be labeled in all junction boxes, device locations, and enclosures.
 - 2. All junction boxes shall be labeled as to function. Use permanent markers, and write functions in a visible location inside the boxes, and on the outside covers where box is in a concealed area.

3.05 600V. WIRE TERMINATIONS AND CONNECTIONS:

- A. All wiring systems for 600V. or less and including low voltage systems shall be properly installed and terminated as specified herein.
- B. Connection of conductors to terminal posts or other conductors shall assure a good connection without damaging the conductors and shall be made by means of solderless compression type terminals or lugs.
- C. All joints in outlet or junction boxes shall be taped in such manner and thickness that the insulation value of the joint or splice will be at least equal to the insulation value of the conductor to which it is applied.
- D. Tape shall be as required by the application. In damp location, varnish cambric tape shall be applied first then covered with all-weather tape. In dry locations all-weather tape shall be used.
- E. Cast splice kits similar to Scotch Cast by 3M shall be used for all splices in underground circuits.
- F. Terminals and lugs for copper cable shall be copper.
- G. Clean conductor surfaces before installing lugs and connectors.
- H. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- I. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 14, 12 and 10 AWG.
- J. Connectors for #6 AWG and larger wires shall be made only with heavy duty compression type double indent solderless connectors.
- K. All conductors larger than 10 AWG shall run continuous from point to point. Conductor splices are NOT ACCEPTABLE.
- L. Lugs, terminals and connectors for all wires shall be solderless compression type similar to T&B "Sta-Kon", Burndy "Hydent" or Penn Union.
- M. Connectors for #6 AWG and larger wires shall be made only with heavy duty compression type double indent solderless connectors.
- N. Wing nut wire connectors by Ideal, Buchanan or 3M shall be used for termination of lighting and power branch circuit wiring connections only.
- O. Provide conductor size-reducing adaptors where required to make final connection to equipment lugs. Adaptors are to be crimp-type anti-oxidant-filled conductor connection, UL Listed for both aluminum and copper 90 degree C conductors, and rated for full ampacity of incoming conductor. Coordinate with equipment lugs for compatibility at time of equipment submittals and prior to installation as specified in "Building Equipment and Mechanical Equipment," under General Electrical Requirements. Allow cost in bid for reducing adaptors on any equipment connection. Adaptors are not shown on drawings.

1. Manufacturer: IlSCO, or approved equal. IlSCO models are listed below are copper material for CPM series and aluminum material for ACM material:

- a. CPM-4/0 (#4/0 to #2/0)
- b. CPM-250 (250 kcmil to #3/0)
- c. CPM-300 (300 kcmil to #4/0)
- d. CPM-350 (350 kcmil to #4/0)
- e. CPM-400 (400 kcmil to 250 kcmil)
- f. CPM-500 (500 kcmil to 350 kcmil)
- g. CPM-600 (600 kcmil to 350 kcmil)
- h. ACM-600 (600 kcmil to 400 kcmil)
- i. ACM-750 (750 kcmil through 700 kcmil to 500 kcmil)

3.09 GROUND PLATE (GROUND BUS) INSTALLATION:

- A. Provide a wall mounted ground plate at each telephone/telecommunications backboard. Ground plates may not be indicated on drawings.
- B. Provide additional ground plates where indicated.
- C. Connect each ground bus to electrical service equipment ground with insulated copper ground wire in metallic conduit. Unless larger size is indicated, size ground wire to match grounding electrode conductor size. Bond metal raceway per NEC Article 250.

END OF SECTION 260500

SECTION 260543 - UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Conduit, ducts, and duct accessories for direct-buried duct banks.
 - 2. Handholes and boxes.

1.03 DEFINITION

- A. RNC: Rigid nonmetallic conduit.

1.04 SUBMITTALS

- A. Product Data: For the following:
 - 1. Duct-bank materials, including separators and miscellaneous components.
 - 2. Ducts and conduits and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
 - 3. Accessories for handholes and boxes.
 - 4. Warning tape.
- B. Shop Drawings for Precast or Factory-Fabricated Underground Utility Structures: Include plans, elevations, sections, details, attachments to other work, and accessories, including the following:
 - 1. Duct entry provisions, including locations and duct sizes.
 - 2. Reinforcement details.
 - 3. Ladder details.
 - 4. Grounding details.
- C. Shop Drawings for Factory-Fabricated Handholes and Boxes Other Than Precast Concrete: Include dimensioned plans, sections, and elevations, and fabrication and installation details, including the following:
 - 1. Duct entry provisions, including locations and duct sizes.
 - 2. Cover design.
 - 3. Grounding details.
 - 4. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.
- D. Duct-Bank Coordination Drawings: Show duct profiles and coordination with other utilities and underground structures.
 - 1. Include plans and sections, drawn to scale, and show bends and locations of expansion fittings.
 - 2. Drawings shall be signed and sealed by a qualified professional engineer.

- E. Product Certificates: For concrete and steel used in precast concrete handholes, as required by ASTM C 858.
- F. Qualification Data: For professional engineer and testing agency.
- G. Source quality-control test reports.
- H. Field quality-control test reports.

1.05 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Comply with ANSI C2.
- C. Comply with NFPA 70.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver ducts to Project site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.
- B. Store precast concrete and other factory-fabricated underground utility structures at Project site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.
- C. Lift and support precast concrete units only at designated lifting or supporting points.

1.07 PROJECT CONDITIONS

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:
 - 1. Notify Construction Manager no fewer than ten days in advance of proposed interruption of electrical service.
 - 2. Do not proceed with interruption of electrical service without Construction Manager's written permission.

1.08 COORDINATION

- A. Coordinate layout and installation of ducts, manholes, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field.
- B. Coordinate elevations of ducts and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of ducts and duct banks as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations from those indicated as

required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Architect.

PART 2 - PRODUCTS

2.01 CONDUIT

- A. Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1.
- B. RNC: NEMA TC 2, Type EPC-40-PVC and Type EPC-80-PVC, UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B.

2.02 DUCT ACCESSORIES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:
 - 1. ARNCO Corp.
 - 2. Beck Manufacturing.
 - 3. Cantex, Inc.
 - 4. CertainTeed Corp.; Pipe & Plastics Group.
 - 5. Condux International, Inc.
 - 6. ElecSys, Inc.
 - 7. Electri-Flex Company.
 - 8. IPEX Inc.
 - 9. Lamson & Sessions; Carlon Electrical Products.
 - 10. Manhattan/CDT; a division of Cable Design Technologies.
 - 11. Spiraduct/AFC Cable Systems, Inc.
- B. Duct Accessories:
 - 1. Duct Separators: Factory-fabricated rigid PVC interlocking spacers, sized for type and sizes of ducts with which used, and selected to provide minimum duct spacings indicated while supporting ducts during concreting or backfilling.
 - 2. Warning Tape: Underground-line warning tape specified in Division 26 Section "Identification for Electrical Systems."

2.03 PRECAST CONCRETE MANHOLES, HANDHOLES AND BOXES

- 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:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Carder Concrete Products.
 - 2. Christy Concrete Products.
 - 3. Elmhurst-Chicago Stone Co.
 - 4. Oldcastle Precast Group.
 - 5. Riverton Concrete Products; a division of Cretex Companies, Inc.
 - 6. Utility Concrete Products, LLC.
 - 7. Utility Vault Co.

8. Wausau Tile, Inc.
- C. Comply with ASTM C 858 for design and manufacturing processes.
- D. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of manhole, handhole or box.
 1. Frame and Cover: Weatherproof cast-iron frame, with cast-iron cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.
 2. Frame and Cover: Weatherproof steel frame, with steel cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.
 3. Frame and Cover: Weatherproof steel frame, with hinged steel access door assembly with tamper-resistant, captive, cover-securing bolts.
 - a. Cover Hinges: Concealed, with hold-open ratchet assembly.
 - b. Cover Handle: Recessed.
 4. Frame and Cover: Weatherproof aluminum frame with hinged aluminum access door assembly with tamper-resistant, captive, cover-securing bolts.
 - a. Cover Hinges: Concealed, with hold-open ratchet assembly.
 - b. Cover Handle: Recessed.
 5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 6. Cover Legend: Molded lettering, "ELECTRIC," or as appropriate for system served.
 7. Configuration: Units shall be designed for flush burial and have closed bottom, unless otherwise indicated.
 8. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.
 - a. Extension shall provide increased depth of 12 inches (300 mm).
 - b. Slab: Same dimensions as bottom of enclosure, and arranged to provide closure.
 9. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks plus an additional 12 inches (300 mm) vertically and horizontally to accommodate alignment variations.
 - a. Windows shall be located no less than 6 inches (150 mm) from interior surfaces of walls, floors, or frames and covers of handholes, but close enough to corners to facilitate racking of cables on walls.
 - b. Window opening shall have cast-in-place, welded wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
 - c. Window openings shall be framed with at least two additional No. 4 steel reinforcing bars in concrete around each opening.
 10. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
 - a. Type and size shall match fittings to duct or conduit to be terminated.

- b. Fittings shall align with elevations of approaching ducts and be located near interior corners of handholes to facilitate racking of cable.
- 11. Handholes 12 inches wide by 24 inches long (300 mm wide by 600 mm long) and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.04 UTILITY STRUCTURE ACCESSORIES

- A. Pulling Eyes in Concrete Walls: Eyebolt with reinforcing-bar fastening insert, 2-inch- (50-mm-) diameter eye, and 1-by-4-inch (25-by-100-mm) bolt.
 - 1. Working Load Embedded in 6-Inch (150-mm), 4000-psi (27.6-MPa) Concrete: 13,000-lbf (58-kN) minimum tension.
- B. Bolting Inserts for Concrete Utility Structure Cable Racks and Other Attachments: Flared, threaded inserts of noncorrosive, chemical-resistant, nonconductive thermoplastic material; 1/2-inch (13-mm) ID by 2-3/4 inches (69 mm) deep, flared to 1-1/4 inches (32 mm) minimum at base.
 - 1. Tested Ultimate Pullout Strength: 12,000 lbf (53 kN) minimum.
- C. Expansion Anchors for Installation after Concrete Is Cast: Zinc-plated, carbon-steel-wedge type with stainless-steel expander clip with 1/2-inch (13-mm) bolt, 5300-lbf (24-kN) rated pullout strength, and minimum 6800-lbf (30-kN) rated shear strength.
- D. Cable Rack Assembly: Steel, [hot-rolled] [hot-dip] galvanized, except insulators.
 - 1. Stanchions: T-section or channel; 2-1/4-inch (57-mm) nominal size; punched with 14 holes on 1-1/2-inch (38-mm) centers for cable-arm attachment.
 - 2. Arms: 1-1/2 inches (38 mm) wide, lengths ranging from 3 inches (75 mm) with 450-lb (204-kg) minimum capacity to 18 inches (460 mm) with 250-lb (114-kg) minimum capacity. Arms shall have slots along full length for cable ties and be arranged for secure mounting in horizontal position at any vertical location on stanchions.
 - 3. Insulators: High-glaze, wet-process porcelain arranged for mounting on cable arms.
- E. Duct-Sealing Compound: Nonhardening, safe for contact with human skin, not deleterious to cable insulation, and workable at temperatures as low as 35 deg F (2 deg C). Capable of withstanding temperature of 300 deg F (150 deg C) without slump and adhering to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.
- F. Ladder: Provide rigidly supported permanent steel ladder for manholes.

2.05 SOURCE QUALITY CONTROL

- A. Test and inspect precast concrete utility structures according to ASTM C 1037.

PART 3 - EXECUTION

3.01 ACCESSIBILITY

- A. Coordinate work with Architectural, Civil, Structural and Mechanical documents and schedules for construction.
- B. Coordinate with existing and new utilities on site.
- C. Coordinate with DTE and AHJ for any approved installation prior to determining work.

3.02 UNDERGROUND DUCT APPLICATION

- A. Ducts for Electrical Cables Over 600 V: RNC, NEMA Type EPC-80-PVC, in direct-buried duct bank, unless otherwise indicated.
- B. Ducts for Electrical Feeders 600 V and Less: RNC, NEMA Type EPC-80-PVC, in direct-buried duct bank, unless otherwise indicated.
- C. Ducts for Electrical Branch Circuits: RNC, NEMA Type EPC-80-PVC, in direct-buried duct bank, unless otherwise indicated.
- D. Underground Ducts for Telephone, Communications, or Data Utility Service Cables: RNC, NEMA Type EPC-40-PVC, in direct buried duct bank, unless otherwise indicated.
- E. Underground Ducts Crossing Paved Paths, Walks, Driveways and Roadways: galvanized rigid steel conduit.
- F. Concrete-encase the duct bank (in lieu of direct burial) where indicated.

3.03 UNDERGROUND ENCLOSURE APPLICATION

- A. Handholes and Boxes for 600 V and Less, Including Power Telephone, Communications, and Data Wiring:
 - 1. Units in Roadways and Other Deliberate Traffic Paths: Precast concrete, AASHTO HB 17, H-20 structural load rating.
 - 2. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Precast concrete, AASHTO HB 17, H-20 structural load rating.
 - 3. Units in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Precast concrete, AASHTO HB 17, H-10 structural load rating.

3.04 EARTHWORK

- A. Excavation and Backfill: Comply with Division 31 Section "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.

- B. Restore surface features at areas disturbed by excavation and reestablish original grades, unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
- C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Division 32 Sections "Turf and Grasses" and "Plants."
- D. Cut and patch existing pavement in the path of underground ducts and utility structures according to Division 01 Section "Cutting and Patching."

3.05 DUCT INSTALLATION

- A. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes to drain in both directions.
- B. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 12.5 feet (4 m) both horizontally and vertically, at other locations, unless otherwise indicated.
- C. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.
- D. Duct Entrances to Concrete Handholes: Use end bells, spaced approximately 10 inches (250 mm) o.c. for 5-inch (125-mm) ducts, and vary proportionately for other duct sizes.
 - 1. Begin change from regular spacing to end-bell spacing 10 feet (3 m) from the end bell without reducing duct line slope and without forming a trap in the line.
 - 2. Direct-Buried Duct Banks: Install an expansion and deflection fitting in each conduit in the area of disturbed earth adjacent to manhole or handhole.
 - 3. Grout end bells into structure walls from both sides to provide watertight entrances.
- E. Building Wall Penetrations: Make a transition from underground duct to rigid steel conduit at least 10 feet (3 m) outside the building wall without reducing duct line slope away from the building, and without forming a trap in the line. Use fittings manufactured for duct-to-conduit transition. Install conduit penetrations of building walls as specified in Division 26 Section "Common Work Results for Electrical."
- F. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig (1.03-MPa) hydrostatic pressure.
- G. Pulling Cord: Install 100-lbf- (445-N-) test nylon cord in ducts, including spares.
- H. Direct-Buried Duct Banks:

1. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
2. Space separators close enough to prevent sagging and deforming of ducts, with not less than 5 spacers per 20 feet (6 m) of duct. Secure separators to earth and to ducts to prevent displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger spacers approximately 6 inches (150 mm) between tiers.
3. Excavate trench bottom to provide firm and uniform support for duct bank. Prepare trench bottoms as specified in Division 31 Section "Earth Moving" for pipes less than 6 inches (150 mm) in nominal diameter.
4. Install backfill as specified in Division 31 Section "Earth Moving."
5. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand-place backfill to 4 inches (100 mm) over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction as specified in Division 31 Section "Earth Moving."
6. Install ducts with a minimum of 4 inches between ducts for like services and 6 inches (150 mm) between power and signal ducts.
7. Depth: Install top of duct bank at least 36 inches (900 mm) below finished grade, unless otherwise indicated.
8. Set elevation of bottom of duct bank below the frost line.
9. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of the elbow.
10. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.
 - b. For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.
11. Warning Tape: Bury continuous warning tape approximately 18 inches above direct-buried ducts and duct banks.

3.06 INSTALLATION OF CONCRETE MANHOLES, HANDHOLES AND BOXES

- A. Precast Concrete Handhole Installation:
 1. Comply with ASTM C 891, unless otherwise indicated.
 2. Install units level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances.
 3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch (25-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.

B.Elevations:

1. Manhole Roof: Install with rooftop at least 15 inches (380 mm) below finished grade.
2. Manhole Frame: In paved areas and trafficways, set frames flush with finished grade. Set other manhole frames 1 inch (25 mm) above finished grade.
3. Install handholes with bottom below the frost line.
4. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch (25 mm) above finished grade.
5. Where indicated, cast handhole cover frame integrally with handhole structure.

C. Drainage: Install drains in bottom of manholes where indicated. Coordinate with drainage provisions indicated.

D. Manhole Access: Circular opening in manhole roof; sized to match cover size.

1. Manholes with Fixed Ladders: Offset access opening from manhole centerlines to align with ladder.
2. Install chimney, constructed of precast concrete collars and rings to support frame and cover and to connect cover with manhole roof opening. Provide moisture-tight masonry joints and waterproof grouting for cast-iron frame to chimney.

E. Waterproofing: After ducts have been connected and grouted, and before backfilling, waterproof joints and connections and touch up abrasions and scars.

F. Field-Installed Bolting Anchors in Manholes and Concrete Handholes: Do not drill deeper than 3-7/8 inches (98 mm) for manholes and 2 inches (50 mm) for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

G. Warning Sign: Install "Confined Space Hazard" warning sign on the inside surface of each manhole cover.

3.07 GROUNDING

A. Ground underground ducts and utility structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

3.08 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
2. Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
3. Test handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Division 26 Section "Grounding and Bonding for Electrical Systems."

B. Correct deficiencies and retest as specified above to demonstrate compliance.

3.09 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

B. Clean internal surfaces of manholes, including sump. Remove foreign material.

END OF SECTION 260543

SECTION 260574 - SHORT-CIRCUIT/ PROTECTIVE DEVICE COORDINATION/ARC FLASH STUDY

1.01 SCOPE:

- A. The contractor shall furnish short-circuit; protective device coordination and arc flash studies and labeling.
- B. All equipment included in all portions of the study and in the field labeling shall be identified using the nomenclature indicated in the Contract Documents, for example use RP-1A and not a generic term such as BUS 12.
- C. All portions of the study are to include new and existing-to-remain distribution equipment from service transfer to panelboards. Relocated and/or re-fed equipment is included in existing-to-remain equipment.
- D. Include in bid all costs to provide final approved study including multiple iterations or "runs" of the study as required if first pass study finds that equipment is not compliant, and/or if submittals are not approved. Do not assume that the study will result in acceptable or "passing" equipment ratings and settings on the first run. The study is to provide direction and recommendations as required to achieve an acceptable electrical system including possible revisions to specified equipment in the modeling. Additional cost for multiple iterations, "runs," and submittals will not be approved.

1.02 REFERENCES:

- A. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
 - 1. IEEE 141 – Recommended Practice for Electric Power Distribution and Coordination of Industrial and Commercial Power Systems.
 - 2. IEEE 242 – Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.
 - 3. IEEE 399 – Recommended Practice for Industrial and Commercial Power System Analysis.
 - 4. IEEE 241 – Recommended Practice for Electric Power Systems in Commercial Buildings.
 - 5. IEEE 1015 – Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems.
- B. American National Standards Institute (ANSI):
 - 1. ANSI C57.12.00 – Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.
 - 2. ANSI C37.13 – Standard Low Voltage AC Power Circuit Breakers Used in Enclosures.
 - 3. ANSI C37.010 – Standard Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
 - 4. ANSI C37.41 – Standard Design Tests for High Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches and Accessories.
 - 5. ANSI Z535.4 – Product Safety Signs and Labels.

- C. The National Fire Protection Association 70, National Electrical Code, latest edition.
 - 1. NFPA 70, National Electrical Code (current version adopted by Authority Having Jurisdiction, unless a more recent version is specified).
 - 2. NFPA 70E – 2004 – Standard for Electrical Safety in the Workplace 2004 Edition.

1.03 SUBMITTALS FOR REVIEW/APPROVAL:

- A. The short-circuit and protective device coordination studies shall be submitted to the design engineer prior to submittal of any distribution equipment shop drawings and prior to release of equipment for manufacturing.
- B. If formal completion of the studies may cause delay in equipment manufacturing, approval from the engineer may be obtained for preliminary submittal of sufficient study data to indicate that the submitted distribution equipment will be adequately rated for short-circuit. The preliminary submittal must also confirm that selective coordination specified in this section will be achieved with the equipment included in power distribution submittals. Evaluate prior to power distribution submittals. Indicate that the submittal is preliminary (if applicable) and indicate which information is not included in the submittal. Submit complete study as a second submittal when complete, prior to project completion and prior to applying protective device settings and arc flash labeling.
- C. Submit studies to the local authority as required for permitting and/or plan review. Comply with any additional local authority requirements.

1.04 SUBMITTALS FOR CONSTRUCTION:

- A. The results of the short-circuit and coordination studies shall be summarized in a final report. No more than five (5) bound copies of the complete final report shall be submitted. For large system studies, submittals requiring more than five (5) copies of the report will be provided without the section containing the computer printout of the short-circuit input and output data.
- B. The report shall include the following sections:
 - 1. Utility available fault current and relevant data at point of connection.
 - 2. One-line diagram.
 - 3. Descriptions, purpose, basis and scope of the study.
 - 4. Tabulations of circuit breaker, fuse and other protective device ratings versus calculated short circuit duties.
 - 5. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip unit settings, fuse selection.
 - 6. Documentation to demonstrate that selective coordination is achieved for all emergency systems, legally required standby systems and optional standby systems.

7. Fault current calculations including a definition of terms and guide for interpretation of the computer printout.
8. Arc fault calculation results.
9. Samples of arc fault labeling to be applied.
10. Recommendations for system improvements, where needed.
11. Executive Summary.

1.05 QUALIFICATIONS:

- A. The short-circuit and coordination studies shall be conducted under the supervision and approval of a Registered Professional Electrical Engineer skilled in performing and interpreting the power system studies. The Registered Professional Electrical Engineer shall be a full-time employee of the Engineering Services Organization.

1.06 RECOMMENDED SUPPLIERS:

- A. The following are acceptable sources with Power Systems Engineers capable of performing studies:
 1. Power Factor Engineering
 2. Utilities Instrumentation Services
 3. Bussman
 4. Eaton
 5. Siemens
 6. Or Approved Equal

PART 2 - PRODUCTS

2.01 STUDIES:

- A. Contractor to furnish short-circuit and protective device coordination and arc fault studies as specified.

2.02 DATA COLLECTION:

- A. Contractor shall furnish all data as required by the power system studies. The Engineer performing the short-circuit and coordination studies shall furnish the Contractor with a listing of required data immediately after award of the contract. The Contractor shall expedite collection of the data to assure completion of the studies as required for final approval of the distribution equipment shop drawings and/or prior to the release of the equipment for manufacturing.
- B. Source combination may include present and future motors and generators.
- C. Load data utilized may include existing and proposed loads obtained from Contract Documents provided by Owner, or Contractor.

- D. Include fault contribution of existing motors in the study, with motors < 100 hp grouped together. The Contractor shall obtain required existing equipment data, if necessary, to satisfy the study requirements.
- E. Obtain from the Utility the available fault current, X/R ratio and any relevant data needed at point of connection to utility power system.

2.03 SHORT-CIRCUIT AND PROTECTIVE DEVICE EVALUATION STUDY:

- A. Use typical conductor impedances based on IEEE Standards 141-1993.
- B. Transformer design impedances shall be used when test impedances are not available.
- C. Provide the following:
 - 1. Calculation methods and assumptions.
 - 2. Selected base per unit quantities.
 - 3. One-line diagram of the system being evaluated.
 - 4. Source impedance data, including electric utility system and motor fault contribution characteristics.
 - 5. Typical calculations.
 - 6. Tabulations of calculated quantities.
 - 7. Results, conclusions, and recommendations.
- D. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault at each:
 - 1. Electric utility's supply termination point.
 - 2. Incoming switchgear.
 - 3. Unit substation primary and secondary terminals.
 - 4. Low voltage switchgear.
 - 5. Motor control centers.
 - 6. Standby generators and automatic transfer switches.
 - 7. Branch circuit panelboards.
 - 8. Other significant locations throughout the system.
- E. For grounded systems, provide a bolted line-to-ground fault current study for areas as defined for the three-phase bolted fault short-circuit study.
- F. The distribution system is intended to be a fully-rated system. If the Contractor/Power Systems Engineer selects any series-rated equipment, include documentation of series rating in the study and in the distribution equipment submittal, including proof from the manufacturer that the selected components are listed as series-rated. Provide marking per NEC Articles 110.22 & 240.86 on all series-rated distribution equipment.
- G. Achieve selective coordination for Emergency Systems, Legally Required Standby Systems and Optional Standby Systems. Provide coordination through adjustable settings on overcurrent devices and recommend hardware revisions where required to achieve coordination.

H. Protective Device Evaluation:

1. Evaluate equipment and protective devices and compare to short circuit ratings.
2. Adequacy of switchgear, motor control centers, and panelboard bus bars to withstand short-circuit stresses.
3. Adequacy of transformer windings to withstand short-circuit stresses.
4. Cable and busway sizes for ability to withstand short-circuit heating.
5. Notify Owner in writing, of existing, circuit protective devices improperly rated for the calculated available fault current.

2.04 PROTECTIVE DEVICE COORDINATION STUDY:

- A. Proposed protective device coordination time-current curves shall be graphically displayed on log-log scale paper.
- B. Include on each curve sheet a complete title and one-line diagram with legend identifying the specific portion of the system covered.
- C. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which device is exposed.
- D. Identify device associated with each curve by manufacturer type, function, and, in applicable, tap, time delay, and instantaneous settings recommended.
- E. Plot the following characteristics on the time-current curve sheets, where applicable:
 1. Electric utility's protective device.
 2. Medium voltage equipment relays.
 3. Medium and low voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.
 4. Low voltage equipment circuit breaker trip devices, including manufacturer's tolerance bands.
 5. Transformer full-load current, magnetizing inrush current, and ANSI transformer withstand parameters.
 6. Conductor damage curves.
 7. Ground fault protective devices, as applicable.
 8. Pertinent motor starting characteristics and motor damage points.
 9. Pertinent generator short-circuit decrement curve and generator damage point.
 10. Other system load protective devices for the largest branch circuit and the largest feeder circuit breaker in each motor control center.
- F. Select protective devices with adequate time margins between device characteristics such that selective operation is provided, while providing proper protection. Selected devices may vary from equipment shown on Contract Documents. Contractor to include allowance in bid as required to accommodate modifications to equipment based on recommendations made in study.

2.05 ARC FAULT CALCULATIONS:

- A. Perform calculations as required to apply field markings as specified in Part 3. Field Markings, this Section.

2.06 REPORT SECTIONS:

A. Input Data:

- 1. Short-circuit reactance of rotating machines.
- 2. Cable and conduit materials.
- 3. Bus ducts.
- 4. Transformers.
- 5. Reactors.
- 6. Aerial lines.
- 7. Circuit resistance and reactive values.

B. Short-Circuit Data:

- 1. Source fault impedance and generator contributions.
- 2. X to R ratios.
- 3. Asymmetry factors.
- 4. Motor contributions.
- 5. Short circuit kVA.
- 6. Symmetrical and asymmetrical fault currents.

C. Recommended Protective Device Settings:

1. Phase and Ground Relays:

- a. Current transformer ratio.
- b. Current setting.
- c. Time setting.
- d. Instantaneous setting.
- e. Specialty non-overcurrent device settings.
- f. Recommendations on improved relaying systems, if applicable.

2. Circuit Breakers:

- a. Adjustable pickups and time delays (long time, short time, ground).
- b. Adjustable time-current characteristic.
- c. Adjustable instantaneous pickup.
- d. Recommendations on improved trip systems, is applicable.

D. Arc Fault Calculations:

- 1. Calculation results for all required equipment including recommended marking requirements boundaries and descriptions.

2. Submit sample of Field markings to be applied (printed samples are acceptable in lieu of final adhesive/nameplate material).

PART 3 - EXECUTION

3.01 FIELD ADJUSTMENT:

- A. Adjust relay and protective device settings according to the recommended settings table provided by the coordination study. Field adjustments to be completed by the engineering service division of the equipment manufacturer under the Startup and Acceptance Testing contract portion.
- B. Make minor modifications to equipment as required to accomplish conformance with short circuit and protective device coordination studies.
- C. Notify Owner in writing of any required major equipment modifications.
- D. Following completion of all studies, acceptance testing and startup by the field engineering service division of the equipment manufacturer, a 2-year warranty shall be provided on all components manufactured by the engineering service parent manufacturing company.

3.02 FIELD MARKINGS:

- A. Field mark distribution equipment (switchboards, panelboards, control panels, and motor control centers) with flash protection information per National Electrical Code Article 110.16 Flash Protection. Include calculated energy ratings on markings (note that short circuit value alone is not acceptable).
- B. Provide any additional markings on equipment as required by Authority Having Jurisdiction.
- C. Field mark flash protection boundaries resulting from calculations per NFPA 70E.

END OF SECTION 260574

SECTION 262200 - GENERAL PURPOSE DRY TYPE TRANSFORMERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to General Conditions, Supplementary Conditions and General Requirements which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. General: Provide basic materials and methods for electrical work and install in accordance with the Contract Documents.
- B. Major items of work and equipment included under this Section of the Specifications are step down dry type transformers.
- C. Reference to other Sections of the Specifications: Basic Electrical Materials and Methods - Section 260500.

1.03 SUBMITTALS:

- A. Submit transformer product data including but not limited to transformer temperature class, impedance, efficiency, regulation, core losses, heat dissipation at no load and full load, and full load amperes, and sound level data.
- B. Submit vibration pad product data.

PART 2 - PRODUCTS

2.01 SCOPE:

- A. Transformers shall be dry type, ventilated, self-cooled, completely enclosed except for ventilation openings and complete with all mounting hardware and accessories as specified and with provisions for conduit connection and grounding.
- B. Provide transformers with weather shields and enclosure suitable for outdoor applications where indicated outdoors.

2.02 CONSTRUCTION:

- A. Transformer insulation rating shall meet the following temperature class:

Ambient Level	40 degrees C.
Winding Temperature Rise	115 degrees C.
Hot Spot Temperature Rise	30 degrees C.
Temperature Class	220 degrees C.
K-Rating	K-1 unless otherwise specified or indicated.
- B. Transformer shall be UL listed under the requirements of standards 506 and 1561. In addition, transformers shall be CSA certified.

- C. Sound levels in decibels shall not exceed the rating listed herein as measured per ANSI C89.2-1986.

0 - 9	40 dB
10 - 50	45 dB
51 - 150	50 dB
151 - 300	55 dB

- D. Transformers shall be capable of operating continuously at 100% of nameplate rating while in ambient temperature not exceeding 40 degrees C.
- E. Transformers shall have permissible once daily overloads of 123% NPR for 2 hours while maintaining normal life expectancy.
- F. Transformers shall be of KVA, primary and secondary voltage rating as indicated on Drawings, 60 HZ, and with six full capacity taps on the primary side, two (2) above and four (4) below nominal voltage.

2.03 MANUFACTURERS:

- A. Transformers shall be manufactured by GE, Cutler Hammer, Heavy Duty, Square D.

PART 3 - EXECUTION

3.01 TRANSFORMER INSTALLATION:

- A. Transformers up to 15 KVA may be wall mounted. Transformers larger than 15 KVA shall be floor mounted unless otherwise indicated.
- B. Final connections to transformers shall be made with flexible metallic conduit.
- C. All transformers shall be grounded as a separately derived source as required by the National Electrical Code.

3.03 IDENTIFICATION:

- A. Provide plastic laminate nameplate on transformer enclosure indicating the following:
1. Transformer name from construction documents.
 2. Primary and secondary voltages.
 3. Primary power source, e.g., "Fed from MDP-1".
 4. Source served, e.g., "Feeds LP-A".

END OF SECTION 262200

SECTION 262414 - MAIN DISTRIBUTION SWITCHBOARDS - CIRCUIT BREAKER SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to General Conditions, Supplementary Conditions and General Requirements which are hereby made a part of this Section.
- B. All work performed under this Section of the work is subject to all requirements contained under Section 260100 - "Basic Electrical Requirements".

1.02 DESCRIPTION OF WORK:

- A. General: Provide basic materials and methods for electrical work and install in accordance with the Contract Documents.
- B. Major items of work and equipment included under this Section of the Specifications are main distribution switchboards.
- C. References to other Sections of the Specifications: Basic Electrical Materials and Methods - Section 260500, Short-Circuit/Coordination Study – Section 260574 and Grounding - Section 264000.
- D. Contractor/manufacturer may re-arrange circuit order in switchboards, however circuit numbers from contract documents must be indicated on any submitted switchboard elevations, drawings, tables and schedules.
- E. Submit distribution equipment after coordinating all ratings with approved Short Circuit/Protective Device analysis as specified in Section 260574.

1.03 STANDARDS:

- A. The switchboards shall be designed, built and tested in accordance with NEMA PB-2 and Underwriters Laboratories No. UL 891 and the latest requirements of the National Electrical Code. All sections and devices shall be UL listed and labeled.
- B. Provide U.L. service entrance label.
- C. Integrated short circuit rating shall be a minimum of 65,000 amperes RMS symmetrical amperes at 480 volts A.C.

1.04 SPECIAL WARRANTY:

- A. Where component manufacturers differ, provide equipment which maintains switchboard manufacturer's original warranty and listing.
- B. Provide a complete parts and labor warranty for twenty-four months from the date of acceptance of switchgear by Owner.

C. Special Warranty:

1. SPD (Surge Protective Device) System: A written warranty, executed by manufacturer, agreeing to repair or replace components of surge protective system components including surge suppressors that fail in materials or workmanship within 10 years from date of project acceptance by Owner.

PART 2 - PRODUCTS

2.01 CONFIGURATION:

A. The switchboard shall be:

- ☒ NEMA 3R Outdoor Construction
- ☒ 480/277 volts, 3-phase, 4-wire plus ground.

- B. Switchboards shall consist of the required number of vertical sections bolted together to form one rigid freestanding assembly incorporating the type of protective devices shown on the Drawings, including all the necessary interconnections, instrumentation and control wiring.
- C. Switchboard shall be completely front accessible and must be capable of being installed against a wall without access to sides or rear.
- D. Switchboard depth shall not exceed 30" unless specifically approved by Engineer.

2.02 CONSTRUCTION:

- A. Switchboards shall be universal frame type using die formed, welded and bolted members. The sides, top and rear shall be covered with removable screw-on plates. Front plates shall be sectionalized and removable. All plates shall be fabricated from code gauge steel. Ventilation openings shall be provided where required. Provide 3" high channel under switchboard for rolling or skidding and provide adequate means for lifting.
- B. The switchboard bussing shall be copper or tin plated aluminum and of sufficient cross-sectional area to continuously conduct rated full load current with a maximum average temperature rise of 65 degrees C. above an ambient temperature of 25 degrees C. Overall operating temperature rating shall be 90 degrees C. Bus current density shall not exceed 750 amperes per square inch. Unless otherwise indicated, provide vertical bussing in each section with ampacity rating matching the main horizontal bussing.
- C. A-B-C type bus arrangement (left to right, top to bottom, front to rear) shall be used throughout to assure convenient and safe testing and maintenance. Where special circuitry precludes this arrangement, bus bars shall be labeled. The through bus on the end section shall be extended and pre-drilled to allow the addition of future sections with standard splice plates.
- D. Provide 100% rated neutral bus.

- E. Provide copper ground bus with lugs, firmly secured to metal frame structure and extending the entire width of switchboard.
- F. Small wiring, necessary fuse blocks and terminal blocks within the switchboard shall be furnished. All groups of control wires leaving the switchboard shall be provided with terminal blocks with suitable numbering strips. All hardware used on conductors shall have high tensile strength and anti-corrosive plating.
- G. All steel surfaces of the switchboard shall be properly cleaned and finished with gray, ANSI 61 or 49 paint over corrosion resistant coating. The finish paint shall be of a type to which field applied paint will adhere.
- H. The internal components and protective devices shall be removable from the front and shall be group mounted with necessary current, line and load connections, front accessible.
- I. Vertical sections shall be completely factory assembled, wired, and tested before delivery. Individual vertical sections shall be designed for bolting together at the installation site with the only electrical connection being the main cross buss. Splice plates shall not be required.
- J. All lugs shall be solderless type, designed for copper or aluminum conductors, based on 90 degree C. conductor temperature rating. All bolted connection points shall be silver or tin plated.
- K. Provide heaters for anti-consideration in exterior applications.
- L. Provide padlockable doors on all sections.

2.03 INCOMING SERVICE SECTION:

- A. Incoming section shall be built as indicated on design drawings.
- B. Lugs shall be provided, top or bottom, for incoming service wiring as indicated. When bus duct is used for incoming service, suitable provisions shall be made by manufacturer to mate with bus duct indicated or specified.

2.04 PROTECTIVE DEVICES:

- A. Provide main protective devices consisting of molded case circuit breaker with frame and trip ratings as indicated.
- B. Provide feeder protective devices consisting of molded case circuit breakers with the frame and trip rating as indicated.
- C. Provide positions indicated as "spare" with devices with the ratings as indicated.
- D. Provide positions indicated as "space" with bus connections, compartment accessories, compartment door and other equipment ready for the insertion of devices with ratings as indicated.

- E. Provide any additional vertical positions that result from manufacturers layout of devices fully bussed as "space" and indicate on submittals.
- F. Provide energy reduction system (energy-reducing maintenance switching with local status indicator) on main breaker and on all feeder breakers rated 1200A or larger.

2.05 MAIN BREAKER:

- A. Manually operated, 480 volt, 3-pole with solid state, continuously adjustable, interchangeable overcurrent tripping device, 3-phase, current sensors and the following adjustment ranges:
 - Long time trip.
 - Long time trip delay.
 - Short time trip.
 - Short time trip delay.
 - Ground fault trip.
 - Ground fault delay.
 - Target or status lights to indicate trip mode.
 - 65,000 symmetrical amperes interrupting rating and 30 cycle withstand rating at 480 volts.

2.06 FEEDER BREAKERS:

- A. 400A and above: Manually operated, 480 volts, 3-pole with solid state, continuously adjustable, interchangeable overcurrent tripping device, 3-phase, current sensors and the following adjustments and ranges:
 - Long time trip.
 - Long time trip delay.
 - Short time trip.
 - Short time trip delay.
 - Instantaneous trip.
 - Ground fault trip.
 - Ground fault delay.
 - Target or status lights to indicate trip mode.
 - 65,000 symmetrical amperes interrupting and 30 cycle withstand rating at 480 volts.
- B. Less than 400A: Provide molded case thermal magnetic "quick-make, quick-break" operating mechanism. Breakers shall be rated at 65,000 symmetrical amperes minimum at 480 volts, bolted design, single, double or three pole as indicated

2.07 SURGE PROTECTIVE DEVICES (SPD):

- A. Manufacturers:
 - 1. Current Technology – TG 200 Series
 - 2. Cutler Hammer – Tycor
 - 3. L.E.A. International
 - 4. Liebert

5. Or approved equal which meets performance requirements.
- B. Provide SPD equipment directly connected to phase bus and ground bus. Do not mount SPD external to switchboard.
- C. Coordinate manufacturers of switchboard and SPD equipment to meet specified requirements. Do not submit non-compatible equipment or components which do not meet specification requirements.
- D. Solid-state, metal oxide varistor suppression modules with no series-connected suppression components. Install fuses in each current carrying conductor to ensure that faults are isolated to the failure.
- E. Provide the following ratings and performance according to NEMA LS 1:
1. System Exposure IEEE C62-41 High – Service Entrance
 2. Disconnect: Include U.L. 248-1 200KAIC fusing and integral disconnect.
 3. Monitoring: LED phase indicators, dual form "C" dry contacts, display event counter, battery powered audible alarm. Status indication of elements including MOV's, capacitors, and fusing in each phase showing touchpad % Protection available, Neutral-to-Ground Fault Indication, Neutral-to-Ground Current and Voltage Sensing (Wye systems), True RMS Voltage Sag Detection, Voltage Swell Detection, Power Dropout Detection, Power Outage Detection.
 4. Minimum surge current capacities and protection modes:

Line-Neutral	200,000 amps
Line-Ground	200,000 amps
Line-Line	200,000 amps
Neutral-Ground	200,000 amps
 5. 6,500 Impulses: Repetitive surge current capacities per mode utilizing 1.2 x 50 micro-second 20 KV open circuit voltage, 8 x 20 micro-second 10 KA short circuit current Category C3 bi-wave at one minute intervals without suffering performance degradation or more than 10% deviation of clamping voltage at the rated surge current capacity.
 6. Maximum Clamping Voltage Date ANSI/IEEE C62.41 (Taken at 90° phase angle, by mode, positive polarity only) for 480/277V system:

Mode	A3 Ringwave	B3 Ringwave	B3/C1 Comb. Wave	C3 Comb. Wave
a. L-N	600V	700V	850V	1150V
b. L-G	875V	725V	850V	1175V
c. N-G	675V	650V	825V	1050V
d. L-L	750V	1375V	1675V	2100V
 7. Maximum Continuous Operation Voltage: Greater than 115% of nominal voltage, in compliance with test and evaluation procedures outlined in NEMA LS 1-1992, paragraphs 2.2.6 and 3.6.
 8. Connection Means: Permanent, parallel connections direct bus.
 9. Minimum EMI-RFI Noise Rejection over the rated frequency range:

a.	41 dB	100KHz
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- | | | |
|----|-------|---------|
| b. | 31 dB | 1 MHz |
| c. | 35 dB | 10 MHz |
| d. | 53 dB | 100 MHz |

2.08 MONITOR PANEL:

- A. Main switchboard shall be complete with three phase digital AC monitor panel. Panel shall be capable of measuring true RMS current and voltage being monitored, as well as, providing displays of volts and amperes for each phase, KW, KVA, KVAR, power factor, total energy in kilo-watt hour, demand values for KW and ampere, and peak and average values.
- B. Monitor panel shall consist of display module mounted to switchboard front and control module mounted inside switchboard and interconnected via factory supplied interface cable.
- C. Include all current and potential transformers required for metering.
- D. Submit monitor product data with switchboard submittal.
- E. Monitor panel shall be as manufactured by Siemens #9200 "Power Meter" with Option #2 Measurements (9200 DG "C-Version") or approved equal.

2.09 NAME PLATES:

- A. Provide nameplate entire switchboard and for each protective device. Submit nameplate schedule with Shop Drawings. Include circuit numbers and load names from Contract Documents.
- B. Nameplates shall be 1" H x 3" W, engraved laminated plastic with 1/4" black letters on white background.

2.10 WATT-HOUR DEMAND METER:

- A. Provide watt-hour meter per ANSI C12.1, semi-flush, 3-phase, induction type, 5-amperes, 120 volts, 60 hertz with integral demand register.

2.11 UTILITY METERING COMPARTMENT:

- A. When utility metering is provided as part of the switchboard, compartment shall be built as specified herein and in accordance with the standards of the utility providing the service.
- B. The current transformer compartment shall be located in the service entrance of the switchboard and connected for cold or hot sequence metering as required by utility. The compartment shall be provided with cover plate having sealing provisions.
- C. This compartment shall be coordinated with system Monitor Panel specified hereinafter.

2.12 MANUFACTURERS:

- A. Switchboard shall be as manufactured by Square D, G.E., Siemens, Cutler Hammer or Park Metal.

PART 3 - EXECUTION:

- A. Train Owner in operation of Monitor Panel functions.

END OF SECTION 262414

SECTION 264000 - ELECTRICAL SERVICE SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to General Conditions, Supplementary Conditions and General Requirements which are hereby made part of this Section.

1.02 DESCRIPTION OF WORK:

- A. General: Provide basic materials and methods for electrical work and install in accordance with the Contract Documents.
- B. Reference to other Sections of the Specifications: Basic Electrical Materials and Methods - Section 260500.

1.03 SERVICE CHARACTERISTICS:

- A. Electric service to the site is existing to remain to utility transformer only. Rework service as indicated. Coordinate all work with utility.

PART 3 - EXECUTION

3.01 DEMOLITION

- A. Prior to beginning demolition and new work, the Electrical Contractor is to confirm existing phase rotation, phase and voltages of power distribution systems, and wiring color coding of existing distribution systems. Notify A/E of any conditions which vary from that specified for new work.

3.02 GROUNDING:

- A. Maintain ground continuity.
- B. Continuous conduit may not be used as equipment ground. Install equipment ground conductor sized per NEC with every circuit.
- C. Ground all enclosures, neutrals, panels, conduit systems, motor frames, etc., as required. Install separate ground wires in all plastic conduits. Metal conduits provided with ground wires within conduit shall be provided with grounding bushings.
- D. All equipment ground connections shall be bolted.
- E. Minimum size of equipment ground wire shall be in accordance with NEC, latest edition, but not smaller than #12.

END OF SECTION 264000

SECTION 264220 - DISTRIBUTION PANELBOARDS – CIRCUIT BREAKER TYPE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to General Conditions, Supplementary Conditions and General Requirements which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. General: Provide basic materials and methods for electrical work and install in accordance with the Contract Documents.
- B. Major items of work and equipment included under this Section of the Specifications are Distribution Panels (DP's) and Power Panels (PP's).
- C. References to other Sections of the Specifications: Basic Electrical Materials and Methods - Section 260500 and Fuses - Section 262813.
- D. Contractor/manufacturer may re-arrange circuit order in panelboards, however circuit numbers from contract documents must be indicated on any submitted panel elevations, drawings, tables and schedules.
- E. Submit distribution equipment after Short Circuit Study per Section 260574.

PART 2 - PRODUCTS:

2.01 SCOPE:

- A. Panelboards shall be circuit breaker type, fully rated, surface or recessed, as indicated. Layout of panelboards, voltage and ampere rating, number of protective devices, spare or space positions as indicated or scheduled.

2.02 CONSTRUCTION:

- A. Cabinets shall be dead front construction, finished in manufacturer's standard gray color, conforming to NEC requirements and bearing UL label. Bussing shall be copper or aluminum, braced for 65,000 amperes minimum short circuit current at rated voltage.
- B. Overall operating temperature rating shall be 75 degrees C.
- C. Circuit breaker units shall be molded case, Thermal Magnetic "quick-make", "quick-break" operating mechanism. Breakers shall be rated at 65,000 A.I.C. minimum at rated voltage, bolted design, single, double or triple pole as indicated. Spare positions shall be complete with devices indicated. Space positions shall be completely bussed for future addition of devices indicated.
- D. Mount main device when present separate from and not in branch device positions.

- E. All interiors shall be completely assembled with protective devices, wire connectors, and ground bus or lugs as indicated. All wire connectors except for screw terminals, shall be of the anti-turn solderless type and shall be suitable for copper or aluminum wire.
- F. Interiors shall be so designed such that the protective devices can be replaced without disturbing adjacent units and without removing the main bus connectors. Circuits shall be interchangeable without machining, drilling or tapping.
- G. Provide twin-mounted branch devices wherever possible. Manufacturer's layout is to include additional spaces as required to achieve pairs of twin units in addition to the branch devices, spares and spaces indicated. Indicate and number any additional manufacturer supplied spaces in submittal.
- H. Doors shall be provided in all trims and shall be hinged. Doors shall have a semi-flush cylinder key lock and catch except doors over 48" in height, which shall be provided with vault type handle and three-point catch, complete with lock. Door hinges shall be concealed, and all doors shall be keyed alike. Opening of doors shall not expose any live parts.
- I. Whenever panelboards are used as Service Entrance Equipment they shall be so labeled.

2.04 IDENTIFICATION:

- A. Label Distribution Panel with plastic laminate nameplate indicating panel name from Contract Documents, ampacity voltage, phases/wires, and power service (e.g. DP-1, 480/277V, 3-phase, 4 wire, 800A, fed from substation A breaker A5).
- B. Label each feeder device, spare and space with plastic laminate nameplate according to name of load fed per Contract Documents.

2.05 MANUFACTURERS:

- A. Panelboards shall be Cutler Hammer Pow-R-Line 4b Series or equal by General Electric, Park Metal, Electrical Power Products, Square D or Siemens.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Do not floor mount distribution panels. Wall mount only.
- B. Do not cut panel bottom to floor mount. Wall mount at specified height.

END OF SECTION 264220

SECTION 264500 - BRANCH DISTRIBUTION AND CONTROL EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to General Conditions, Supplementary Conditions and General Requirements which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. General: Provide basic materials and methods for electrical work and install in accordance with the Contract Documents.
- B. Major items of work and equipment included under this Section of the Specifications are panels, safety switches, motor control and lighting controls.
- C. References to other Sections of the Specifications: Basic Electrical Materials and Methods - Section 260500, Short Circuit/Protective Device Coordination Study - Section 260574, Grounding - Section 264000, and Fuses - Section 262813.
- D. Contractor/manufacture may re-arrange circuit order in panels; however, circuit numbers from panelboard schedules in contract documents must be indicated on any submitted panelboard information. Submit panelboards in elevation format, one page per panelboard. Include circuit numbers, dimensions and all information specific to each individual panelboard on one page. Edited product data may be submitted in multiple pages as necessary. Invoices and bills of material will not be reviewed. Submit distribution equipment after Short Circuit Analysis per Section 260574.

PART 2 - PRODUCTS

2.01 GENERAL:

- A. Coordinate ratings of Branch Distribution and Control Equipment with approved submittals for the systems they serve. Modify ratings as required and submit data for equipment only after coordination is complete as specified in Section 260500, Electrical Requirements for Mechanical Work, and Buildings and HVAC Mechanical Equipment.
- B. Modify equipment ratings as required by Short Circuit/Protective Device Coordination Study, Section 260574. Submit distribution equipment after study as specified in Section 260574.

2.04 SAFETY SWITCHES, FUSES AND HEATERS:

- A. Safety and disconnect switches shall be 600V or 250V, as applicable, heavy duty, 3 pole as required, "quick-make", "quick-break" switch mechanism and cover interlock.
- B. Switches shall be fused or unfused as indicated on the Drawing and they shall be same manufacturer as motor starters.
- C. Manual motor starters shall be toggle switch type, lockable off, with ambient compensated thermal overload element and pilot light. Starters shall be flush in all finished areas and shall have stainless steel cover plates. Where loads do not require overloads or where they have integral overloads, provide manual motor switches to match above except without overloads. Coordinate each application.
- D. Provide all necessary fuses and replace all those blown during construction. All fuse sizes shall be in accordance with NEC and as specified in Section 16460.
- E. Heaters shall be thermal alloy, melting type and shall be used for all motors. Check all thermal overload elements supplied with motor starters against motor nameplate data. If said overloads are not of proper size and capacity, replace with the proper size and capacity, replace with the proper size overloads.
- F. A complete set of suitable and intact fuses shall be installed in all fuse holders.
- G. For any safety switch serving as a motor disconnecting means between a Variable Frequency Drive (VFD) and the motor itself, provide an auxiliary set of 15A single pole contacts in the safety switch with voltage to match switch. Contacts are to be used for drive shut down. Coordinate selection of normally open or normally closed contacts with VFD installation instructions prior to ordering. Auxiliary contacts are not specifically shown on plans.
- H. Coordinate and modify ratings of switches, fuses and heaters serving mechanical equipment with mechanical submittals per Section 260500.

2.05 ENCLOSED CIRCUIT BREAKERS:

- A. Provide circuit breaker suitable for the voltage, phase and service to which it is connected. Provide a thermal magnetic, toggle type, molded case circuit breaker with "quick-make", "quick-break" operating mechanism. Unless higher ratings are indicated in drawings, breakers shall be rated 22,000 A.I.C. minimum at 240 V.A.C. and 35,000 A.I.C. at 480 V.A.C. with single, double or triple pole breakers as indicated. Single pole circuit breakers, rated 20 amperes or less shall be "SWD" marked in compliance with NEC (Article 240-83(d)).
- B. Enclosure shall be dead front construction, constructed of code gauge galvanized steel. Coordinate enclosure size to accommodate all wiring and accessories. Unless otherwise indicated, provide NEMA 1 enclosures for indoor dry applications. Provide NEMA 3R enclosures for outdoor, wet and damp locations.

- C. Cabinet fronts shall be painted to indicate electrical system branch as specified in Identification, Section 26 05 00. Tops of enclosures shall be 6'-0" above finish floor.
- D. Where indicated, provide shunt trip circuit breakers for remotely operation (tripping) of circuit breakers indicated. Provide breakers suitable for 120V AC control compatible with momentary operation pushbutton device. Shunt trip device shall reset when circuit breaker is manually reset to "on".
- E. Include enclosure dimensions (height, width and depth) in submittal.
- F. All devices installed in finished areas shall be flush mounted. Enclosures may be surface mounted in unfinished areas and in mechanical/electrical rooms.
- G. Provide plastic laminate nameplate as specified.
- H. Manufacturers:
 - 1. Siemens
 - 2. Square D
 - 3. Eaton
 - 4. G.E.

2.06 MOTOR CONTROLLERS (INDIVIDUAL):

- A. Three phase motor starters shall be magnetic, with three thermal overload elements, pilot light and control device (i.e., H.O.A. switch and reset push button). Starters shall have integral control transformer, 120V maximum for control power, and one set of auxiliary contacts, one NO and one NC, in addition to those used for controls. Contacts shall be rated 10 amperes minimum at 120 volts inductive load. Provide indicating lights on enclosure cover for "run" (green) and "stop" (red). Provide 480 volt, 3-phase combination motor starters as indicated on plans, or sized as follows if not indicated:
 - 1. Motors up to and including 10 HP: Size 1
 - 2. Motors above 10 HP, up to and including 25 HP: Size 2
 - 3. Motors above 25 HP, up to and including 50 HP: Size 3
 - 4. Motors above 50 HP, up to and including 100 HP: Size 4
 - 5. Motors above 100 HP, up to and including 200 HP: Size 5
 - 6. Provide variable frequency drives in lieu of starters where specified or indicated.
- B. Combination starters shall consist of a fused disconnect switch as previously specified and a 3 phase magnetic motor starter in one enclosure. Provide NEMA 1 enclosure for indoor dry locations and NEMA 3R enclosure for outdoor, damp and or wet locations.
- C. Manual motor starters shall be toggle switch type, with ambient compensated thermal overload element and red "run" pilot light and padlock provisions. Starters shall be flush in all finished areas and shall have stainless steel cover plates.
- D. Starters shall be Square D, Siemens, Allen Bradley or Cutler Hammer.

PART 3 - EXECUTION

3.01 STANDARD REQUIREMENTS FOR MOTORS AND MOTOR CONTROLS:

- A. In general, all motors will be furnished and installed in place by Mechanical Trades. The Electrical Trades Contractor shall receive, install and connect 3 phase magnetic starters when furnished by Mechanical Trades. In addition, Electrical Trades shall furnish and install combination starters where required and make final connections.
- B. Furnish and install fused disconnecting means at each motor. Provide NEMA 3R rating if located outside or if exposed to moisture.
- C. Furnish and install remote control devices where shown or indicated.
- D. Furnish and install disconnecting means at each motor as shown or indicated.
- E. In general, motors larger than 3/4 HP shall operate on a 480V, 3 phase power system. Motors 3/4 HP and smaller shall operate on 120V, single phase power system. Actual motor voltages are indicated on Drawings – (See Mechanical Schedules).
- F. For all motors, 1/8 HP through 3/4 HP inclusive, furnish and install manual motor starters as specified. For all motors provide a local disconnecting means required by code. These requirements may not be indicated on Design Drawings.
- G. All equipment and devices shall be suitable for use at locations noted and shall be U.L. listed.
- H. Where exposed to weather and/or wet locations manual motor starters and motor disconnecting means shall be NEMA 3R rated.
- I. Install variable frequency drives furnished by Mechanical Trades.
- J. For safety switches with VFD auxiliary shutdown contacts, provide 2#14 AWG in 3/4" conduit between motor disconnect and VFD and wire to signal drive shutdown when the disconnect is opened and motor is shut down. Conduit and wiring is not specifically shown on plans.

3.02 GROUNDING AND BONDING

- A. Bond panelboards in healthcare facilities serving the patient vicinity with #10AWG continuous copper conductor per NEC Article 517. Include bonding at existing and new panelboards. Bonding is not specifically shown on drawings.

END OF SECTION 264500

SECTION 269000 - DEMOLITION AND RENOVATION WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to General Conditions, Supplementary Conditions and General Requirements which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. General: Provide basic materials and methods for electrical demolition and renovation work and complete in accordance with the Contract Documents.
- B. Major items of work and equipment included under this Section of the Specifications are removal and/or replacement of existing electrical equipment and material as specified, indicated maintenance of existing services to remain as applicable, existing to remain conditions, and miscellaneous relocations.
- C. Where existing slabs/floors are to be cut or demolished the contractor shall inspect scan, test, and perform all required investigations to identify the presence of telecommunication raceways, electrical feeders, branch circuits and or services which are to be maintained in and below the slab whether noted on the drawings or not, and take all steps necessary to protect and maintain those services.
- D. References to other Section of the Specifications: 260100 – General Electrical Requirements, Basic Electrical Materials and Methods - Section 260500.

1.03 INTENT:

- A. Demolition and renovation work shall be carried on in a workmanlike manner with minimum disturbance to the existing structure and its occupants.
- B. All surfaces damaged by this contractor in the course of performing his work shall be restored to satisfactory condition, as directed by the architect and all costs of repairs shall be paid for by the contractor. Similarly all equipment, systems, building and site components damaged shall be repaired to pre-work condition.
- C. It is the intent of these Documents to render a complete and functioning installation in accordance with design intent. All work required to accomplish the above shall be included and performed and shall be considered as basic to the Contract work.
- D. Disconnect, remove, relocate, rewire or dispose of, any equipment interfering with new construction or effected by renovation work.

1.04 FIELD CONDITIONS:

- A. In instances where actual field conditions dictate methods or materials other than those indicated on the Drawings, Contractor shall consult Architect for direction and shall be governed accordingly in carrying out the work. All work necessitated

by field conditions shall be considered as incidental to the proper performance of the Contract work.

- B. Where panelboards and other electrical equipment are installed in existing spaces, survey proposed location prior to installation. Verify that no interferences exist which would infringe on electrical equipment working clearances and panelboard dedicated electrical space as required by the National Electrical Code. Notify the Architect/Engineer of any conflicts prior to installation of equipment and related raceways.

PART 3 - EXECUTION

3.01 EXISTING EQUIPMENT AND SERVICES:

- A. All services indicated to remain shall be maintained in safe and satisfactory operation at all times.
- B. All removed equipment shall remain the property of the Owner and shall be disposed of as directed, either to storage or "off" the site.
- C. Relocated equipment shall be inspected, repaired when required, and thoroughly cleaned prior to installation.
- D. Where services or circuits are disconnected or discontinued, it is mandatory that any existing unused wiring be removed to the source unless specifically accepted on the Drawings. It is the intent of this article to permanently disconnect all unused circuits at the main source whenever possible. No energized circuit shall be taped and abandoned in outlet boxes unless so specified on Drawings for reuse in new work.
- E. In kitchens, bathrooms and where required by code, replace any existing to remain duplex receptacles with GFR (Ground Fault Circuit Interrupter) type. These receptacles may not be indicated on plans.
- F. Where penetrations are left in rated walls, floors and ceilings, seal the penetration to achieve a listed fire/smoke rating which matches the rating of the existing penetrated surface. Coordinate with Architect for ratings of existing surfaces.

3.02 BRANCH CIRCUITS AND PANELBOARDS:

- A. Any existing panel schedules shown are not intended to imply actual installed conditions. Existing schedules are issued for reference only. Information indicated is taken from Owner's existing circuit directories and design drawings, which may not reflect existing conditions. Contractor is to field verify all existing conditions by circuit tracing panel feeder and all branch circuits. Contractor is required to indicate actual conditions on as-built documentation including loads of existing to remain circuits.
- B. Work involving existing branch circuit panelboards, shall be such that when all work is completed, existing panels are provided with new, updated and accurately typed directories. Circuit trace existing to remain circuits as required to update directories. Submit as-built directories as specified in "Record Drawings," Section 260100.

- C. All vacant circuits shall be marked spare. When new breakers are required, they shall be installed in existing spaces and shall match those that are existing, including manufacturer, breaker type and interrupting rating. If multiple interrupting ratings exist in the panel, match highest existing rating.
- D. Where circuits are removed from existing relay panels contactors and control devices due to demolition, remove existing control equipment such as relays and contactors if they are unused at the completion of new work. Maintain control equipment if any circuits are existing to remain. Where all circuits and control equipment are removed from the existing relay panels, or panelboards, remove the entire enclosure itself and patch the surface where the panel was removed.
- E. Fill void left by flush mounted panels or fill anchoring holes left by surface mounted panels. Coordinate with Architect for all fill and finish. Include in bid costs to remove all affected panels.

3.03 WIRING METHODS:

- A. Contractor may utilize existing conduits and outlet boxes provided they are in acceptable condition to Authority Having Jurisdiction.
- B. Re-support existing reused conduit and boxes if required. If contractor chooses not to reuse existing raceways, include in bid work for providing new raceways.
- C. Provide new raceway where specified and indicated and where existing raceways are not in satisfactory condition to Authority Having Jurisdiction.
- D. Provide pricing to re-support existing to remain conduit and boxes above finished ceilings in renovation area if required. Provide separate add alternate as line item price in bid for work, and perform work only if directed by Owner/GC/CM.

3.04 EXPOSED WORK:

- A. It is the intent of the overall design to conceal all work except in unfinished areas. Contractor shall utilize wall and ceiling spaces to conceal all work.
- B. Only in cases where it is impossible to conceal the work, short exposed metal surface raceways (not conduit) may be used subject to approval of Architect. Paint to match wall.

3.05 EQUIPMENT REMOVAL AND WORK ABANDONED IN PLACE:

- A. Where electrical outlets and data outlets, switches and other wiring devices are removed and not reused, remove the device, wiring, box and raceway as noted below and patch surface to match existing.
 - 1. Power: Back to panel, or first junction box where circuit continues on to other, existing, active loads.
 - 2. Telecommunications/data: IT Contractor to disconnect at source in communication room and at outlet. Electrical Contractor to carefully remove cable.
 - 3. Concealed conduit in walls: Abandon in place. Install blank stainless steel cover plates at removed outlet, cut off conduit above ceiling or where

otherwise accessible, and plug or cap end. If conduit in wall is flex, it shall be removed.

4. Accessible conduit above ceilings and in exposed installations: Remove conduit and plug openings in panels and boxes left from removed conduit.
 5. Fire stop all holes in floors and in fire walls.
- B. Wiring shall be disconnected, removed to the source and properly disposed of. There shall be no exception to this rule. Do not abandon unused wiring in raceways.
- C. Unless otherwise noted conduits and other parts of electrical systems that become exposed as part of the renovation work shall be removed if unused or relocated if in service to a point where the exposed portion is totally concealed.

3.06 SURFACE REPAIR:

- A. Repair finished surfaces around removed electrical equipment to match final finished condition. Coordinate with Architect for finish requirements.

3.07 SERVICE SHUTDOWN AND POWER OUTAGE:

- A. No service shutdown will be allowed during regular business hours. Service shutdown and power outages will be allowed during non-business hours provided that they are scheduled with Owner or his Representative prior to any work on existing services is done. Schedule shall be in writing and shall show a detailed description of the proposed work and the duration of outage. Coordinate shutdowns with other building Owners for any buildings/properties served by the same utility source. Verify with utility if any other customers are served by the same source prior to shutdown.
- B. Contractor shall have sufficient number of workers on the job to accomplish the work during the allotted time as per agreed upon schedule.
- C. All outage work and service modification shall be included in Base Bid and subject to the conditions in the Contract Documents.

END OF SECTION 269000

SECTION 269500 - ELECTRICAL ACCEPTANCE TESTS

PART 1 - GENERAL

1.01 GENERAL:

- A. This guideline defines the standard tests that all electrical systems and equipment must pass prior to final acceptance by the Owner. These tests are in addition to acceptance tests specified by equipment manufacturers or defined in the other Design Guidelines sections. Obtain permission through the Design Manager before specifying tests less than or in excess of these tests.

1.02 RELATED SECTIONS:

- A. Design Guidelines Technical Sections: All
- B. U-M Master Specifications: All

1.03 REFERENCES:

- A. NETA "Acceptance Testing Specifications"
- B. NFPA 70, "National Electrical Code"
- C. NFPA 72, "National Fire Alarm Code"

1.04 SCOPE OF WORK:

- A. Acceptance tests shall be performed and documented by an independent testing agency. The Electrical Contractor shall assist in the testing as specified in this section.
- B. Approved Independent Testing Agencies for Electrical Power Systems, Lighting and Lighting Controls:
 - 1. Bisbee Infrared Services (Penny Wilson, Phone: 517-787-4620)
 - 2. Northern Electrical Testing (Lyle Detterman, Phone: 248-689-8980)
 - 3. Utilities Instrumentation Services (David Wheeler, Phone: 734-482-1450)
- C. The Contractor shall provide all test equipment, materials and labor necessary to perform the tests, and coordinate with the other trades for necessary services, such as scaffolding and the uncoupling of motors.
- D. Tests shall be performed in accordance with applicable codes, standards, and equipment manufacturers' instructions.
- E. Tests shall consist of visual inspections, manual operations, and electrical testing under all normal and expected abnormal operating conditions.
- F. The Owner shall be notified at least 3 working days in advance of all tests.

- G. Tests shall be witnessed by the Owner unless such witnessing is waived in writing.
- H. The Owner shall be provided with a written test report, signed and dated, for all tests. Indicate specified report data and overall pass/fail status as applicable.

1.05 TESTING CRITERIA:

- A. Acceptance tests shall be performed in accordance with applicable codes, standards and manufacturers' instructions.

- B. Insulation Resistance Test (Megger Test)

1. Perform test with a voltage source capable of providing a constant direct voltage for the time intervals as specified below. Do not use hand cranked voltage sources for direct voltages greater than 2500 volts.
2. The magnitude of applied direct voltage depends upon the voltage system to which the equipment is connected, as follows:

System Voltage	Test Voltage
120 - 300	500
301 - 600	1000
601 - 15000	2500
15001 and above	5000

3. Hold 2500-volt and 5000-volt tests for a minimum of five minutes or until three equal consecutive readings one minute apart are obtained. Take and record readings every 30 seconds during the first two minutes and every minute thereafter.
4. Hold 1000-volt and 500-volt insulation resistance tests for a minimum of one minute or until the reading reaches a constant value for 15 seconds unless specified otherwise.
5. Apply tests from phase to ground with the other phases grounded. Test each phase in a similar manner.
6. Check phase matching and phase identification immediately prior to energizing equipment.

- C. High Potential Tests

1. Give cables and bus over 600 volts a high potential dc test after splices, stress cones and/or potheads are completed.
2. Test new cables before cables are connected to terminals.
3. Provide test voltage at a DC voltage equal to 80 percent of the factory DC test voltage. Document both voltages in submittal.
4. Apply the dc test potential in at least eight equal increments until maximum test voltage is reached. Do not allow an initial application of voltage greater than the rated voltage of the cable.
5. Record dc leakage current at each step after a constant stabilization time consistent with system charging current delay.
6. Provide a graphic plot of leakage current versus applied potential at each increment.

7. After reaching test voltage, maintain the potential for ten minutes. Record readings of leakage current at 30 seconds, one minute and at one minute intervals thereafter.
 8. Provide a graphic plot of leakage current versus applied potential at each increment.
 9. Reduce the conductor test potential to zero at the completion of each conductor test and apply grounds for a minimum of thirty minutes.
 10. Do not subject switches, surge protective devices, or other equipment connected to a cable being tested to a test voltage in excess of their test rating. In case of conflict, coordinate with the equipment manufacturer to lower the test voltage or to disconnect the equipment. Document voltage used or equipment disconnected in Submittal.
 11. Test each conductor with other conductors grounded and shields grounded.
 12. Do not perform more than one high potential test on any item without Owner's authorization.
- D. Continuity checks shall be performed with a low voltage DC meter, light or bell.
- E. The resistance to ground shall be measured using either the three point method or the fall-of potential method.
- F. Test instruments shall be calibrated to national standards to insure accuracy of tests.
- G. These calibration reports shall be made available to the Owner when requested.
- H. Depending upon frequency of use, the instruments shall be calibrated at least every 12-months.
- 1.06 VISUAL INSPECTIONS:
- A. Prior to manual operation and electrical testing, verify the following:
1. The equipment complies with the contract documents and the shop drawing submittals.
 2. The equipment is completely and properly installed according to the contract documents and the manufacturer's instructions.
 3. Adequate working space exists around the equipment to fully open doors and access panels, and to access all components that require maintenance.
 4. The equipment is free from damage and defects.
 5. Shipping blocks and restraints have been removed.
 6. The equipment has been aligned.
 7. The equipment has been lubricated.
 8. The ventilation louvers are open and unobstructed.
 9. Electrical connections have been tightened.
 10. Voltages, phases, and rotation have been identified.
 11. Terminations have been identified.
 12. Equipment labels have been installed.
 13. The equipment has been calibrated.

14. The equipment is ready to be electrically tested.

1.07 MANUAL OPERATIONS:

- A. Prior to electrical testing, verify the following:
 1. Mechanical components operate smoothly and freely.
 2. Mechanical stops, limit switches, etc., are properly adjusted.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.02 DUCT BANKS:

- A. A stiff bristled brush shall be pulled through each duct to clean out dirt and debris.
- B. A solid mandrel rated for the inside diameter of the ducts and at least 5 inches long shall be pulled through each duct to verify the absence of kinks, flat spots, and other obstructions.

3.04 CONTROL CABLES:

- A. A continuity check shall be performed on control and instrumentation wiring.

3.05 TRANSFORMERS, REACTORS, SWITCHBOARDS, PANELBOARDS, AND MOTOR CONTROL EQUIPMENT:

- A. A continuity check and a 1,000 volt DC megger test shall be performed on 1 and 3 phase distribution and isolation transformers, and on line reactors.
- B. A 1,000 volt DC megger test shall be performed on buses, motor starters, circuit breakers, and disconnect switches. This test may be combined with the power cable megger test by testing the devices and terminated cables together.
- C. A continuity check shall be performed on motor control circuits and control panel internal wiring.
- D. An operational test shall be performed on the motor controls.
- E. Motor heater sizes shall be checked for proper size.

3.06 MOTORS:

- A. A 1,000 volt megger test shall be performed on 460 volt, 3 phase motors. A 500 volt megger test shall be performed on 200 volt, 1 and 3 phase motors and on 120 volt, 1 phase motors.
- B. Motors shall be "bumped" to verify proper direction of rotation.

- C. Motors shall be run to verify proper ampere draw and the absence of vibration or overheating.
- D. The Electrical Contractor shall assist the Temperature Control Contractor and the Mechanical Contractor and insure proper operation of safeties, interlocks and motor controls.

3.07 GROUNDING:

- A. The resistance to ground of each ground rod in a ground mat shall be measured before connection to the other ground rods. The resistance shall not exceed 10 ohms. If the reading exceeds 10 ohms, add one extension and drive it another 10 feet. Further testing of that rod is not needed.
- B. The resistance to ground of the total ground system shall be measured with all connections completed. The resistance shall not exceed 2 ohms for switching stations, or utility (DTE) feed point services; or exceed 5 ohms for building service substations.
- C. Ground rods for manholes and light poles need not be tested.
- D. A continuity check shall be performed from equipment ground bus bars and ground lugs to the ground system.

END OF SECTION 269500

**Canton Township - CIP Bid Package 2
Victory Park Ballfields
A3C Project No. 21033**

SECTION 32 31 13 - CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Posts, rails, and frames.
- B. Wire fabric.
- C. Accessories.

1.02 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- B. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric; 2011a (Reapproved 2017).
- C. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2014a (Reapproved 2019).
- D. CLFMI CLF-SFR0111 - Security Fencing Recommendations; 2014.
- E. FS RR-F-191/1D - Fencing, Wire and Post Metal (Chain-Link Fence Fabric); 1990.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.
- C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.
- D. Samples: Submit two samples of fence fabric, 12 inch by 12 inch in size illustrating construction and finish.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Fence Installer: Company with demonstrated successful experience installing similar projects and products, with not less than five years of documented experience.

PART 2 PRODUCTS

2.01 COMPONENTS

- A. Line posts, corner and terminal posts, and horizontal and brace rails: Diameter to match adjacent similar installations.
- B. Fabric: Intent is to match pattern, size and gauge of adjacent similar installations; especially where patched into existing installations. 2 inch diamond mesh interwoven wire, 6 gauge, 0.1920 inch thick, top selvage knuckle end closed, bottom selvage twisted tight.
- C. Tension Wire: 6 gauge, 0.1920 inch thick steel, single strand.
- D. Tie Wire: Aluminum alloy steel wire.

2.02 MATERIALS

- A. Posts, Rails, and Frames:
 - 1. Line Posts: Type I round in accordance with FS RR-F-191/1D.
 - 2. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round in accordance with FS RR-F-191/1D.
- B. Wire Fabric:
 - 1. ASTM A392 zinc coated steel chain link fabric.

2.03 ACCESSORIES

- A. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.
- B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; galvanized steel.

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2.04 FINISHES

- A. Components: Galvanized in accordance with ASTM A123/A123M, at 1.7 ounces per square foot.
- B. Accessories: Same finish as framing.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Verify that areas are clear of obstructions or debris.

3.02 INSTALLATION

- A. Install framework, fabric, accessories in accordance with ASTM F567.
- B. Intent is to duplicate structure and appearance of adjacent existing installations.
- C. Place fabric on playing field side of posts and rails.
- D. Set all posts plumb, in concrete footings with top of footing 2 inches above finish grade. Slope top of concrete for water runoff.
- E. Post Footing Depth Below Finish Grade: ASTM F567; minimum 4'-0".

3.03 CLEANING

- A. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.
- B. Clean fence with mild household detergent and clean water rinse well.
- C. Touch up scratched surfaces using materials recommended by manufacturer.

END OF SECTION

**Canton Township - CIP Bid Package 2
Victory Park Ballfields
A3C Project No. 21033**

SECTION 32 31 23 - PLASTIC FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Posts, rails, and frames.
- B. Plastic pickets.
- C. Concrete.
- D. Manual gates with related hardware.

1.02 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2019.
- C. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2022a.
- D. ASTM D1784 - Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds; 2020.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on fence panels, posts, accessories, fittings and hardware.
- C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components.
- D. Samples: Submit two samples of pickets, 6 inches by 6 inches in size indicating construction and colored finish.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer: Company with demonstrated successful experience installing similar projects and products, with not less than five years of documented experience.

1.05 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for plastic fence components. Complete forms in Owner's name and register with manufacturer.
- C. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Plastic Fences and Gates:
 - 1. Basis of Design: Rafab Incorporated (734.789.8590); Kingston PVC Privacy Fence; with Windsor top; Almond color.
 - 2. Other acceptable manufacturers include:
 - a. CertainTeed Corporation: www.certainteed.com/fence/#sle.
 - b. Husker Vinyl Inc: www.huskervinyl.com/#sle.
 - c. PlyGem: www.plygem.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PLASTIC FENCES AND GATES

- A. PVC Posts, Rails, and Pickets: High-impact, UV-resistant, rigid polyvinyl chloride, complying with ASTM D1784, Class 14344B.

Canton Township - CIP Bid Package 2
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1. Fence Style: Full privacy.
 - a. Fence Height: 6 feet.
 - b. Color: As indicated.
 - c. Finish: Smooth.
 2. Line and Corner Posts: 5 by 5 inches, minimum; 0.135-inch wall thickness, 3/8-inch corner radius.
 3. Rails: 1-1/2 by 5-1/2 inches, minimum; 0.090-inch wall thickness, 5/16-inch corner radius.
 4. Top Accent Rails: 2 by 3-1/2 inches, minimum; 0.120-inch, 13/16-inch corner radius.
 5. Pickets: 5/8 by 11-3/8 inches, minimum, tongue and groove; 0.050-inch wall thickness, 1/16-inch corner radius.
 - a. Picket Spacing: Full privacy.
 6. Gate Posts: 2-1/2 by 4 inches, minimum; 0.120-inch wall thickness, 3/16-inch corner radius.
 7. Gate Hardware: 120-degree hinges, two for gates up to 60 inches high, three for taller gates.
 - a. Hinges: Size and material to suit gate dimensions; non lift-off type, self closing, glass-filled nylon with adjuster plate; black finish.
 - b. Latch: Manufacturer's standard self latching, glass-filled nylon and stainless steel composition single or dual access gravity latch; black finish.
 8. Post Caps: Match cross section of post; 0.095-inch wall thickness, flat configuration.
 9. Stiffener Channels: ASTM A36/A36M, galvanized steel with predrilled holes for drainage; sized to fit within PVC rails.
- B. Concrete:
1. Ready-mixed, complying with ASTM C94/C94M; normal portland cement; 2,500 psi strength at 28 days, 3-inch slump; 3/4 inch nominal size aggregate.
- C. Fasteners: Manufacturer's standard stainless steel fasteners.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Verify that areas are clear of obstructions or debris and underground utilities.

3.02 INSTALLATION

- A. Install framework, pickets, fence panels, accessories in accordance with manufacturer's instructions.
- B. Set intermediate and terminal posts plumb, in concrete footings with top of footing 2 inches above finish grade. Slope top of concrete for water runoff.
- C. Line Post Footing Depth Below Finish Grade: 42 inches.
- D. Corner and Terminal Post Footing Depth Below Finish Grade: 42 inches.

3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Position: 1 inch.

3.04 CLEANING

- A. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.
- B. Clean fence with mild household detergent and clean water; rinse well.

END OF SECTION

Installation Specification: Sports Lighting

Canton Township Victory Park Baseball Canton, Michigan

Customer Responsibilities:

1. Complete access to the site for construction utilizing standard 2-wheel drive rubber tire equipment.
2. Locate existing underground utilities not covered by your local utilities. (i.e., water lines, electrical lines, irrigation systems, and sprinkler heads). Contractor will not be responsible for repairs to unmarked utilities.
3. Locate and mark field reference points per supplied layout. (i.e., home plate, center of FB field)
4. Pay for extra costs associated with foundation excavation in non-standard soils (rock, caliche, high water table, collapsing holes, etc.) or soils not defined in geo-technical report. Standard soils are defined as soils that can be excavated using standard earth auguring equipment.
5. Pay any power company fees and requirements.
6. Pay all permitting fees and obtain the required electrical permitting.
7. Provide area on site for disposal of spoils from foundation excavation.
8. Provide area on site for dumpsters.
9. Provide sealed Electrical Plans. (If required)

Sports Lighting Manufacturers Responsibilities:

1. Provide required foundations, poles, electrical enclosures, luminaires, wire harnesses, and control cabinets.
2. Provide layout of pole locations and aiming diagram.
3. Provide stamped foundation designs based on soil parameters as outlined in the geotechnical report, or, soils that meet or exceed those of a Class 5 material as defined by 2018 IBC Table 1806.2.

Contractor Responsibilities

General:

1. Obtain any required permitting.
2. Contact your local utility for locating underground public utilities and then confirm they have been clearly marked.
3. Contact the facility owner/manager to confirm the existing private underground utilities and irrigation systems have been located and are clearly marked to avoid damage from construction equipment. Notify owner and repair damage to marked utilities. Notify owner regarding damage which occurred to unmarked utilities.
4. Provide labor, equipment, and materials to off load equipment at jobsite per scheduled delivery.
5. Provide storage containers for material, (including electrical components enclosures), as needed.
6. Provide necessary waste disposal and daily cleanup.
7. Provide adequate security to protect delivered products from theft, vandalism, or damage during the installation.
8. Keep all heavy equipment off playing fields when possible. Repair damage to grounds which exceeds that which would be expected. Indentations caused by heavy equipment traveling over dry ground would be an example of expected damage. Ruts and sod damage caused by equipment traveling over wet grounds would be an example of damage requiring repair.
9. Provide startup and aiming as required to provide complete and operating sports lighting system.
10. Installation to commence upon delivery and proceed without interruption until complete. Notify owner immediately of any breaks in schedule or delays.



Installation Specification: Sports Lighting

Demolition: All poles designated at Class 3, Class 4, and (2) Class 2 leaning poles

1. Disassemble and leave at owner designated location on-site the existing lighting poles, fixtures, and electrical enclosures. This will include the recycling of lamps, aluminum reflectors, ballast, and steel, as necessary.
2. Demolish existing foundations to 2 ft (0.6 m) below grade.
3. Leave existing power feed in place for connection to new pole locations.

Foundations, Poles, and Luminaires: New Poles replacing all poles designated as Class 3, Class 4, and (2) Class 2 leaning poles.

1. Mark and confirm pole locations per the aiming diagram provided. If there are any issues, notify the owner.
2. Provide labor, materials, and equipment to install (33) LSS foundations as specified on Layout and per the stamped foundation drawings, if applicable.
3. Remove spoils to owner designated location at jobsite.
4. Provide labor, materials, and equipment to assemble luminaires, electrical component enclosures, poles, and pole harnesses.
5. Provide labor, equipment, and materials to erect (33) dressed LSS Poles and aim utilizing the pole alignment beam.

Mounting Sports Lighting Equipment to Existing Poles: Designated Class 1 and Class 2 poles

1. Provide labor, materials, and equipment to assemble and install equipment on existing poles and terminate grounding and power feed. Power feed may need to be reworked to adapt to the new equipment.
2. Ensure grounding components meet minimum standards required by NEC and NFPA780.
3. For concrete poles provide new lightning down conductor(aluminum) and $\frac{5}{8}$ in copper ground rod. For poles 75 ft (22 m) or less use 1/0 AWG, poles over 75 ft (22 m) use 4/0 AWG conductor. Bond internal pole ground to new down conductor.
4. For steel poles provide new ground rod and pole bonding conductor per NFPA Annex A.1.6.
5. Down conductor shall be converter to copper wire for any underground runs and bonded to ground rod(s).
6. Ensure all components are bonded to both equipment and lightning grounds. No upward sweeps allowed for lightning down conductor or bonding jumper(s).
7. Test ground resistance with 3-point megger and confirm 25 ohms or less for each pole. Install additional ground rods or create grounding grid until resistance of 25 ohms or less is achieved.

Control System:

1. Provide labor, equipment, and materials to install (7) control and monitoring cabinets and terminate all necessary wiring.
2. Provide a dedicated 120 V 20 A controls circuit or a step-down transformer for 120 V control circuit if not available.

Project Contact:

Jefferson T. Barber

Musco Sports Lighting

Michigan Field Sales

616-510-7146

jefferson.barber@musco.com

fax 800-374-6402





Control System Summary

Project Specific Notes:

Project Information

Project #: 203640
Project Name: Canton Township Victory Park Baseball
Date: 07/12/22
Project Engineer: Brendon Guler
Sales Representative: Jefferson Barber
Control System Type: Control-Link™ Control and Monitoring System
Communication Type: PowerLine-ST
Scan: 203640A
Document ID: 203640P1V1-0712074248
Distribution Panel Location or ID: Canton Township Baseball
Total # of Distribution Panel Locations for Project: 1
Design Voltage/Hertz/Phase: 480/60/3
Control Voltage: 120

Equipment Listing

DESCRIPTION	APPROXIMATE SIZE	
1.Control and Monitoring Cabinet	24 X 72	
2.Control and Monitoring Cabinet	24 X 48	
	QTY	SIZE (AMPS)
Total Contactors	12	60 AMP
Total Off/On/Auto Switches:	12	

Materials Checklist

Contractor/Customer Supplied:

- ☐ A dedicated control circuit must be supplied per distribution panel location
 - If the control voltage is NOT available, a control transformer is required
- ☐ Electrical distribution panel to provide overcurrent protection for circuits
 - HID rated or D-curve circuit breaker sized per full load amps on Circuit Summary by Zone Chart
- ☐ Wiring
 - See chart on page 2 for wiring requirements
 - Equipment grounding conductor and splices must be insulated (per circuit)
 - Lightning ground protection (per pole), if not Musco supplied
- ☐ Electrical conduit wireway system
 - Entrance hubs rated NEMA 4, must be die-cast zinc, PVC, or copper-free die-cast aluminum
- ☐ Mounting hardware for cabinets
- ☐ Breaker lock-on device to prevent unauthorized power interruption to control power and powerline connection (if present)
- ☐ Anti-corrosion compound to apply to ends of wire, if necessary

Call Control-Link Central™ operations center at 877/347-3319 to schedule activation of the control system upon completion of the installation.

Note: Activation may take up to 1 1/2 hours.

IMPORTANT NOTES

1. Please confirm that the design voltage listed above is accurate for this facility. Design voltage/phase is defined as the voltage/phase being connected and utilized at each lighting pole's electrical components enclosure disconnect. Inaccurate design voltage/phase can result in additional costs and delays. Contact your Musco sales representative to confirm this item.
2. In a 3 phase design, all 3 phases are to be run to each pole. When a 3 phase design is used Musco's single phase luminaires come pre-wired to utilize all 3 phases across the entire facility.
3. One contactor is required for each pole. When a pole has multiple circuits, one contactor is required for each circuit. All contactors are 100% rated for the published continuous load. All contactors are 3 pole.
4. If the lighting system will be fed from more than one distribution location, additional equipment may be required. Contact your Musco sales representative.
5. A single control circuit must be supplied per control system.
6. Size overcurrent devices using the full load amps column of the Circuit Summary By Zone chart- Minimum power factor is 0.9.

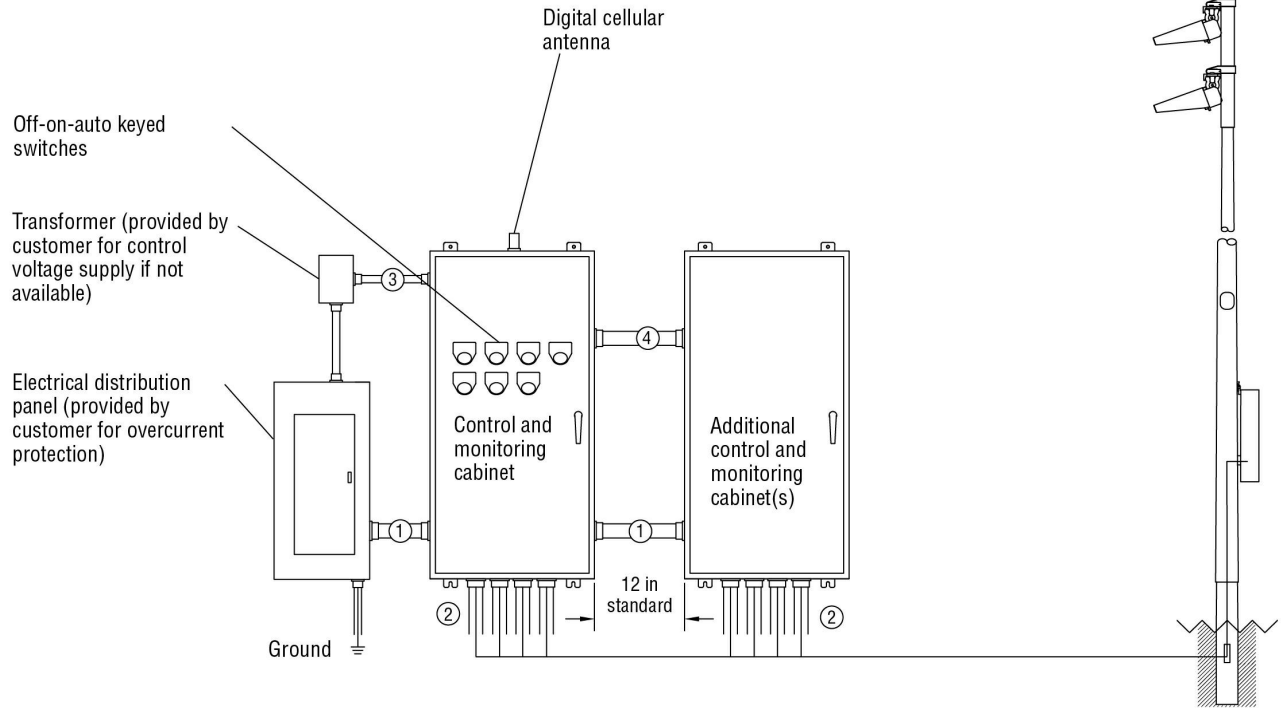
NOTE: Refer to Installation Instructions for more details on equipment information and the installation requirements.



Control System Summary

Canton Township Victory Park Baseball / 203640 - 203640A
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Control•Link® Control and Monitoring System



Conduit ID	Description	# of Wires	Wire (AWG)	Conduit (in)	Max. Wire Length (ft)	MUSCO Supplied	Notes
1	Line power to contactors, and equipment grounding conductor	*A	*B	*C	N/A	No	A-E
2	Load power to lighting circuits, and equipment grounding conductor	*A	*B	*C	N/A	No	A-E
3	Control power (dedicated, 20A)	3	12	*C	N/A	No	C,E
4	Control harnesses	*F	12	2	*F	Yes	C,E,F

* Notes:

- A. See voltage and phasing per the notes on cover page.
- B. Calculate per load and voltage drop.
- C. All conduit diameters should be per code unless otherwise specified to allow for connector size.
- D. Equipment grounding conductor and any splices must be insulated.
- E. Refer to control and monitoring system installation instructions for more details on equipment information and the installation requirements.
- F. Harness is provided in 8-ft length.

R60-101-00_B

IMPORTANT: Control wires (3,4) must be in separate conduit from line and load power wires (1, 2).



Control System Summary

Canton Township Victory Park Baseball / 203640 - 203640A
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SWITCHING SCHEDULE

Field/Zone Description	Zones
Field 1	1
Field 2	2
Field 3	3
Field 4	4
Field 5	5
Field 6	6
Field 7	7
Field 8	8
Field 9	9
Field 10	10
Field 11	11
Field 12	12

CONTROL POWER CONSUMPTION	
120V Single Phase	
VA loading of Musco Supplied Equipment	INRUSH: 2940.0 SEALED: 312.0

CIRCUIT SUMMARY BY ZONE

POLE	CIRCUIT DESCRIPTION	# OF FIXTURES	# OF DRIVERS	*FULL LOAD AMPS	CONTACTOR SIZE (AMPS)	CONTACTOR ID	ZONE
A18,A4,B17,B3 C1,C2	Field 1	28	2	38.9	60	C1	1
A10,A4,B3,B9 C5,C6,C7,C8	Field 2	32	2	38.0	60	C2	2
A10,A14,B13,B9 C11,C12	Field 3	28	26	39.0	60	C3	3
A14,A18,B13,B17 C15,C16	Field 4	28	26	39.0	60	C4	4
A20,A34,B19,B33 C15,C16	Field 5	28	28	42.3	60	C5	5
A20,A24,B19,B23 C21,C22	Field 6	28	28	43.0	60	C6	6
A24,A30,B23,B29 C25,C26,C27,C28	Field 7	32	32	40.4	60	C7	7
A30,A34,B29,B33 C31,C32	Field 8	28	28	39.7	60	C8	8
A38,A52,B37,B51 C35,C36	Field 9	28	26	40.3	60	C9	9
A38,A44,B37,B43 C39,C40,C41,C42	Field 10	31	31	39.8	60	C10	10
A44,A48,B43,B47 C45,C46	Field 11	28	28	39.7	60	C11	11
A48,A52,B47,B51 C49,C50	Field 12	28	28	40.4	60	C12	12

*Full Load Amps based on amps per driver.



Control System Summary

Canton Township Victory Park Baseball / 203640 - 203640A
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PANEL SUMMARY						
CABINET #	CONTROL MODULE LOCATION	CONTACTOR ID	CIRCUIT DESCRIPTION	FULL LOAD AMPS	DISTRIBUTION PANEL ID (BY OTHERS)	CIRCUIT BREAKER POSITION (BY OTHERS)
1	1	C1	Pole A18,A4,B17,B3,C1,C2	38.90		
1	1	C2	Pole A10,A4,B3,B9,C5,C6,C7,C8	37.97		
1	1	C3	Pole A10,A14,B13,B9,C11,C12	38.96		
1	1	C4	Pole A14,A18,B13,B17,C15,C16	39.01		
1	1	C5	Pole A20,A34,B19,B33,C15,C16	42.31		
1	1	C6	Pole A20,A24,B19,B23,C21,C22	43.04		
1	1	C7	Pole A24,A30,B23,B29,C25,C26,...	40.39		
2	2	C8	Pole A30,A34,B29,B33,C31,C32	39.66		
2	2	C9	Pole A38,A52,B37,B51,C35,C36	40.27		
2	2	C10	Pole A38,A44,B37,B43,C39,C40,...	39.78		
2	2	C11	Pole A44,A48,B43,B47,C45,C46	39.69		
2	2	C12	Pole A48,A52,B47,B51,C49,C50	40.39		

ZONE SCHEDULE				
ZONE	SELECTOR SWITCH	ZONE DESCRIPTION	CIRCUIT DESCRIPTION	
			POLE ID	CONTACTOR ID
Zone 1	1	Field 1	A18	C1
			A4	C1
			B17	C1
			B3	C1
			C1	C1
			C2	C1
Zone 2	2	Field 2	A10	C2
			A4	C2
			B3	C2
			B9	C2
			C5	C2
			C6	C2
			C7	C2
Zone 3	3	Field 3	C8	C2
			A10	C3
			A14	C3
			B13	C3
			B9	C3
			C11	C3
			C12	C3
Zone 4	4	Field 4	A14	C4
			A18	C4
			B13	C4
			B17	C4
			C15	C4
			C16	C4
Zone 5	5	Field 5	A20	C5
			A34	C5
			B19	C5

CONTINUED ON NEXT PAGE



Control System Summary

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ZONE SCHEDULE				
ZONE	SELECTOR SWITCH	ZONE DESCRIPTION	CIRCUIT DESCRIPTION	
			POLE ID	CONTACTOR ID
Zone 5	5	Field 5	B33	C5
			C15	C5
			C16	C5
Zone 6	6	Field 6	A20	C6
			A24	C6
			B19	C6
			B23	C6
			C21	C6
			C22	C6
Zone 7	7	Field 7	A24	C7
			A30	C7
			B23	C7
			B29	C7
			C25	C7
			C26	C7
			C27	C7
Zone 8	1	Field 8	C28	C7
			A30	C8
			A34	C8
			B29	C8
			B33	C8
			C31	C8
Zone 9	2	Field 9	C32	C8
			A38	C9
			A52	C9
			B37	C9
			B51	C9
			C35	C9
Zone 10	3	Field 10	C36	C9
			A38	C10
			A44	C10
			B37	C10
			B43	C10
			C39	C10
			C40	C10
Zone 11	4	Field 11	C41	C10
			C42	C10
			A44	C11
			A48	C11
			B43	C11
			B47	C11
Zone 12	5	Field 12	C45	C11
			C46	C11
			A48	C12
			A52	C12
			B47	C12
			B51	C12
			C49	C12

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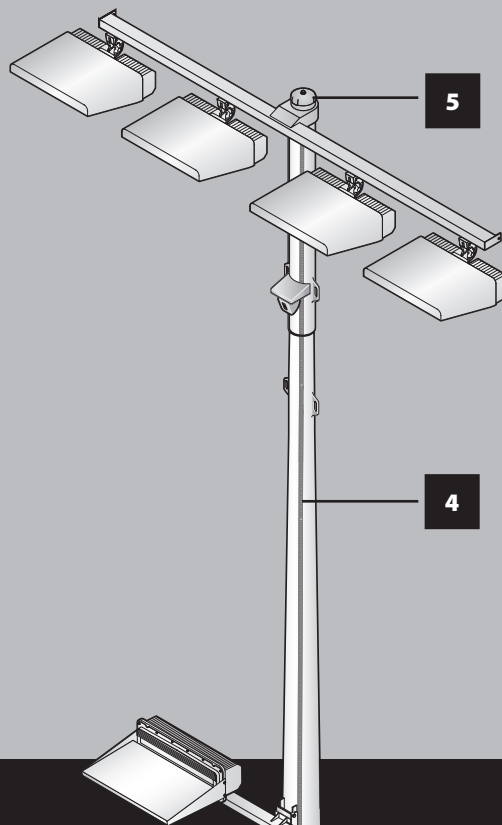


Control System Summary

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ZONE SCHEDULE				
ZONE	SELECTOR SWITCH	ZONE DESCRIPTION	CIRCUIT DESCRIPTION	
			POLE ID	CONTACTOR ID
Zone 12	5	Field 12	C50	C12

Diode Light Source—LED



Installation Instructions: **Light-Structure System™**

**Fast, trouble-free installation with
5 Easy Pieces™ approach to system design**

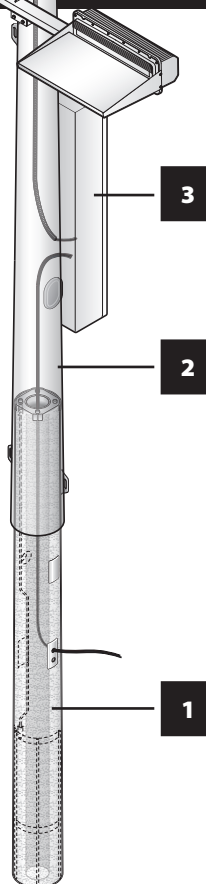
5 Poletop Luminaire Assembly

4 Wire Harness

3 Electrical Components Enclosure

2 Galvanized Steel Pole

1 Precast Concrete Base



MUSCO
Lighting
We Make It Happen.®

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Before You Begin

Safety Information

Electrical Safety Guidelines

Use extreme caution near overhead power lines or underground utilities. Observe all safety precautions for high-voltage equipment. Only qualified personnel may perform wiring. Follow all applicable building and electrical codes.

General Safety Guidelines

Follow proper safety procedures during installation. Installers must wear the appropriate personal protective equipment including:

- Hard hat
- Steel-toed shoes
- Leather work gloves
- Eye protection

Locate all underground utilities prior to digging.

All tools and equipment supplied by Musco are designed for specific use as described in these instructions. Do not use them in any other manner. Do not alter structural members in any way, such as bend, weld, or drill, without prior authorization from Musco.

Luminaires generate up to 2.6 mA per driver on the equipment grounding conductor and are designed to meet leakage current requirements per IEC 61347-1.






The luminaires should be positioned so that prolonged staring into the luminaire at a distance closer than 12–37 m (40–121 ft) is not expected, per IEC/TR 62778. See table.

Luminaire	Distance
TLC-LED-400	24 m (79 ft)
TLC-LED-550	24 m (79 ft)
TLC-BT-575	20 m (65 ft)
TLC-LED-600	24 m (79 ft)
TLC-LED-900	24 m (79 ft)
TLC-LED-900NB	no minimum
TLC-LED-1150	12 m (40 ft)
TLC-LED-1200	37 m (121 ft)
TLC-LED-1400NB	37 m (121 ft)
TLC-LED-1500	37 m (121 ft)

About These Instructions

These instructions give basic assembly procedures for the Light-Structure system. They are not a comprehensive guide to all possible situations. Direct any questions to your local Musco representative.

Throughout this manual note these important symbols:

- | | | | |
|--|---|---|---|
|  | The safety alert symbol alerts you of situations that require care and caution to avoid serious personal injury. |  | The go-to arrow indicates a branch in a procedure for special situations. In the case of optional equipment, the instructions may be in another document. |
|  | The stop and check symbol signals you to stop and verify conditions before proceeding. |  | The tip symbol points out advice that makes installation easier. |
|  | The contact Musco symbol appears in special situations where you may need to contact Musco for further information. |  | The recycle symbol identifies recyclable materials. |

Before You Begin

Standard Tools/Supplies Checklist

Refer to supplemental instructions provided for additional tools required.

Contractor/installer supplied tools	Function	Page
Hammer, pry-bar, banding cutters	Unloading equipment	7
Water pump	Removing water from base holes (as needed)	9
Two 1½ ton chain-type come-alongs	Jacking pole sections together	11, 29
Large Phillips-head screwdriver	Tightening captive screws to seal enclosure to pole hub	17
Standard screwdriver	Tightening distribution lugs, 45 A disconnect switch	30, 31
Torque wrench with ¾, 7/16 and ½ in sockets	Tightening luminaire retaining cable and spreader bar hardware	15, 24
Electrical fish tape, electrician's tape	Feeding wire harness through pole	21
Spray paint, chalk, or flags	Marking points to sight in aiming	25
Chalk or pencil	Making alignment marks	29
10 ft (3 m) stepladder or small line truck	Connecting supply wires to electrical enclosure	30, 31
Musco supplied tools	Function	Page
Wooden base wedges	Setting base	9
Level with shim for base taper	Plumbing base	9
Steel bar	Setting base, seating pole on base	9, 29
1½ in socket, extension, breaker bar, and 1½ in wrench	Tightening structural fasteners	14
⅝ in hex key	Attaching handhole covers on base and steel pole	8, 21, 30
¾ in wrench	Tightening poletop set screw, pole cap fastener, enclosure hanger bolt, and spreader bar hardware	12, 15, 17
Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)	Lubricating pole slip-fit connections	11, 25
Wooden shipping blocks	Elevating pole sections off ground during assembly	11
¾ in ratcheting combination wrench	Tightening captive bolts to secure luminaire assembly	24
Pole rotator kit	Guiding pole onto base, pole alignment	25, 27, 28
Steel chain	Setting pole on base	29
5 mm hex key	Landing primary feed wires on 125 A disconnect switch	31
¾ in hex key	Attaching grounding conductors inside electrical enclosure	30, 31
¾ in hex key	Attaching grounding conductors inside pole at handhole	31
Machinery needed	Function	Page
Crane or forklift with nylon strapping and 8 ft (2.5 m) sling (sized to weight of base)	Unloading materials, setting bases	7, 9
Auger	Boring holes for bases	8
Load-rated crane, nylon slings, and shackles	Setting poles	26

Documents You Need

- ☐ Musco Foundation And Pole Assembly drawings
- ☐ Field Aiming Diagram
- ☐ Alternate foundation design (when present)
- ☐ Control System Summary



If you do not have all of these documents, contact your local Musco representative.

Before You Begin

Electrical System Requirements

While the majority of the Light-Structure System™ can be assembled by non-professionals, a qualified electrician must handle the electrical supply installation and hook-up in accordance with national, state, and local codes. Your electrician should review this information before installation begins.

The electrician is generally required to provide these items:

- Service entrance
- Main power disconnect and distribution panel(s)
- Supply wiring and insulated equipment grounding conductors

Ensure supply wiring is rated for 90°C. Review the label inside the electrical components enclosure door and *Control System Summary* for voltage and phase requirements.

Always dispose of electronic waste in accordance with all applicable laws and regulations.

Other features that may affect the wiring supply requirements for this project include:

- Lighting contactor cabinets — refer to installation instructions provided with control equipment and the *Musco Control System Summary*.
- Control-Link® system — refer to installation instructions provided with control equipment and the *Musco Control System Summary*.
- Auxiliary bracket option — customer supplies all wiring for auxiliary components.

Volunteer Installation

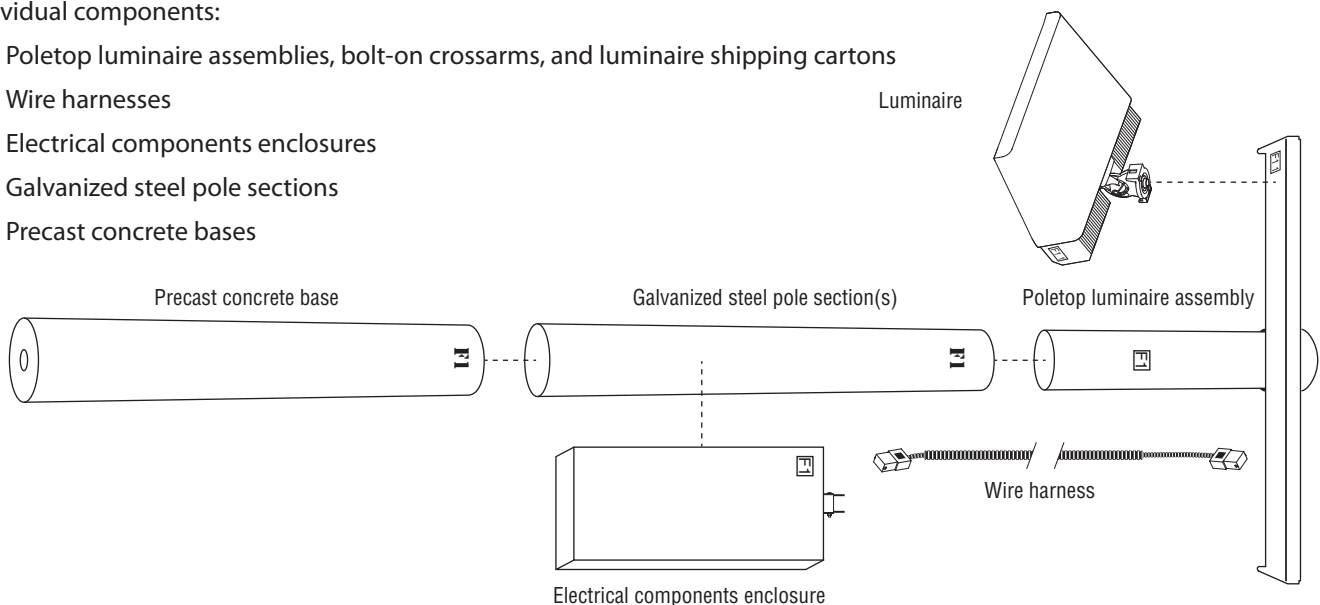
Have a qualified electrician review and complete the following:

- Create electrical system design — prior to installation.
- Provide and install trenching, supply wiring, and conduit.
- Complete all steps from *Connecting to Supply Wiring* section.
- Test complete lighting system.

Components Matching and Labeling

Pole locations are identified by a pole ID (A1, A2, B1, B2, etc.) on the *Field Aiming Diagram*. These IDs are also marked on the individual components:

- Poletop luminaire assemblies, bolt-on crossarms, and luminaire shipping cartons
- Wire harnesses
- Electrical components enclosures
- Galvanized steel pole sections
- Precast concrete bases



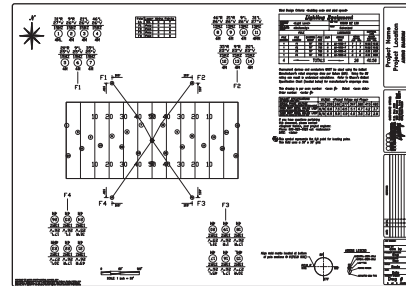
Before You Begin

Documents We Provide

Field Aiming Diagram

The *Field Aiming Diagram* is your map for locating all poles on your project. It gives this information:

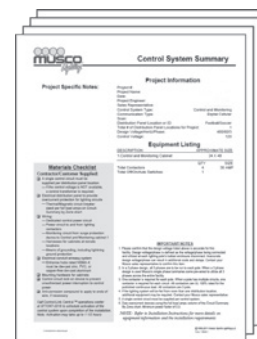
- Pole IDs, locations, and heights
- Luminaire IDs
- Field origin for coordinate measuring
- Common aiming point for all poles, or individual aiming points for each pole
- Full load current for each luminaire



Control System Summary

Projects with a control system include a *Control System Summary*. It gives this information:

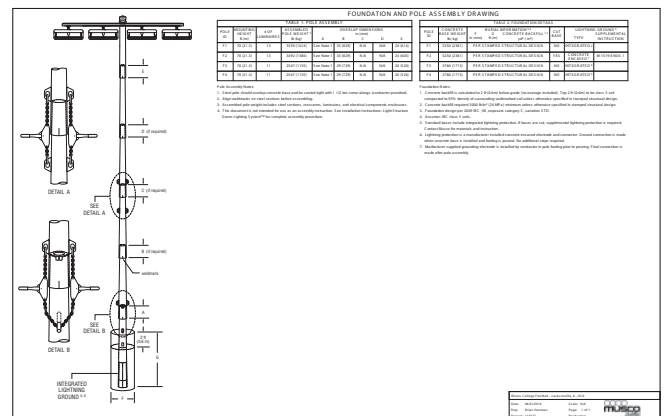
- Control system diagram and details
- Contactors and cabinets
- Lighting circuits
- Voltage, phase, and frequency information
- Full load current for each circuit



Musco Foundation and Pole Assembly Drawing

This drawing provides information related to the installation of the foundation and the galvanized steel pole.

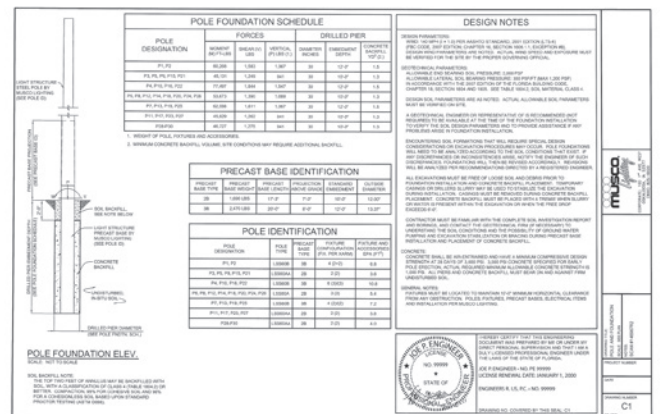
- Pole weight
- Precast concrete base weight
- Hole depth and diameter
- Concrete backfill quantities
- Pole section minimum overlaps



Note: Foundation details are omitted on projects with alternate foundation designs.

Alternate Foundation Design

Some poles on a project may require an alternate foundation design. This stamped drawing provides construction details of the alternative design. This document supersedes all other foundation information.



Before You Begin

Unloading Instructions

A typical shipment includes precast concrete bases, galvanized steel poles, electrical components enclosures, wire harnesses, and poletop luminaire assemblies with luminaires.



For ease of installation, set all matched components by the proper pole location as noted on the *Field Aiming Diagram*.

Tools/Materials Needed

- ☐ Crane with nylon web sling or forklift (load rated)
- ☐ Hammer
- ☐ Pry bar
- ☐ Banding cutters



Warning

Crushing hazard. Product is heavy and may roll.

Do not cut shipping bands or remove blocking from concrete bases or poles until they are supported by unloading equipment.

Use proper pick-up procedures conforming with local regulations when lifting concrete bases and poles. Balance point may not be at midpoint of base or pole.

- Check bill of lading to verify you have all materials.
- Inspect all materials for shipping damage.
- Store electrical components enclosures and luminaires in a dry location or cover with tarp until ready to install.



Painted poles require special handling, see *Instructions: Painted Pole Special Requirements*.



If additional information is needed, contact your local Musco representative.



Save wooden shipping blocks to use during pole assembly.



Please recycle.
Luminaires, wire harnesses, and other components are shipped in recyclable cardboard packaging.



Precast Concrete Base

Overview

The precast concrete base is set directly into the ground, backfilled with concrete, and allowed to cure for 12 to 24 hours. The base is designed for easy slip-fit connection to the galvanized steel pole. The remaining components — steel pole, poletop luminaire assembly, electrical components enclosure, and wire harness — are assembled as a unit and set onto the base. The base includes an integrated lightning ground system.

Tools/Materials Needed

Musco Supplied

- ☐ Field Aiming Diagram
- ☐ Musco Foundation and Pole Assembly Drawing or alternate foundation design
- ☐ Steel bar
- ☐ Wooden base wedges
- ☐ Level with shim for tapered base
- ☐ $\frac{5}{32}$ in hex key

Contractor Supplied

- ☐ Crane or forklift with nylon strapping and 8 ft (2.5 m) sling sized to weight of base
- ☐ Conduit for underground wiring
- ☐ Concrete backfill
- ☐ Water pump (as needed)

Installation Procedure



Verify pole ID on concrete base matches pole location on *Field Aiming Diagram*.



For options on poor soil conditions, alternative installation methods, or if there are any issues with pole locations given, contact your local Musco representative. Your project engineer's name appears on *Field Aiming Diagram*.

Note: Use only project-specific foundation designs as detailed on Musco Foundation and Pole Assembly Drawing or alternate foundation design plan.

1

Mark pole locations per *Field Aiming Diagram*.

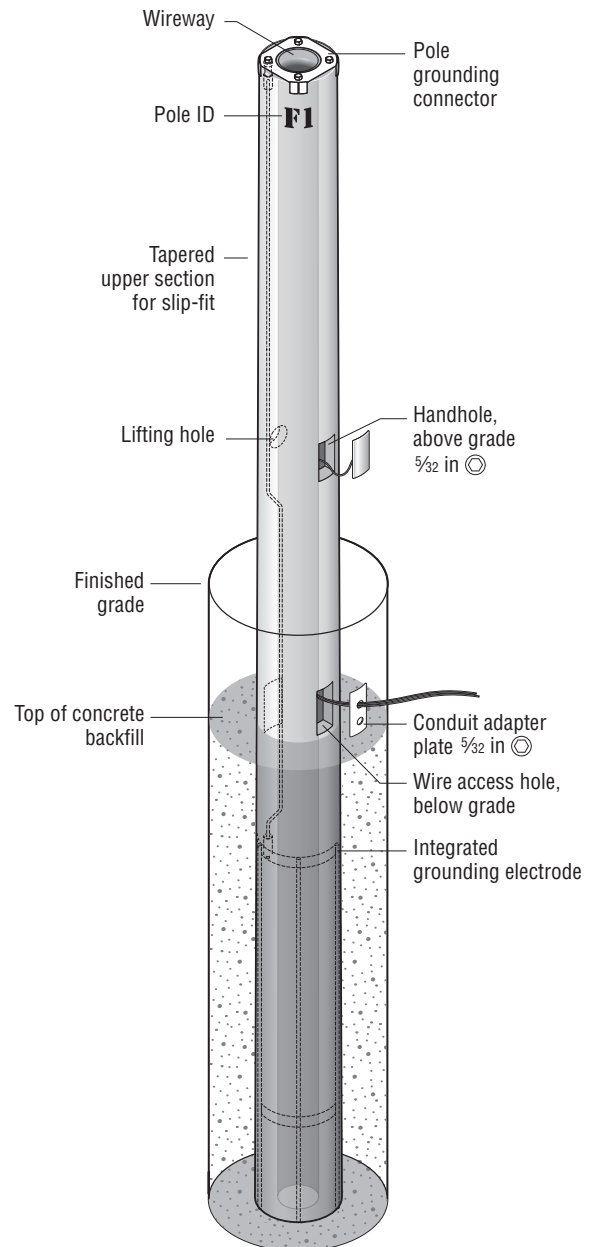
2

Excavate holes to size and depth given on Musco *Foundation and Pole Assembly Drawing* or alternate foundation design.



Warning
Fall hazard

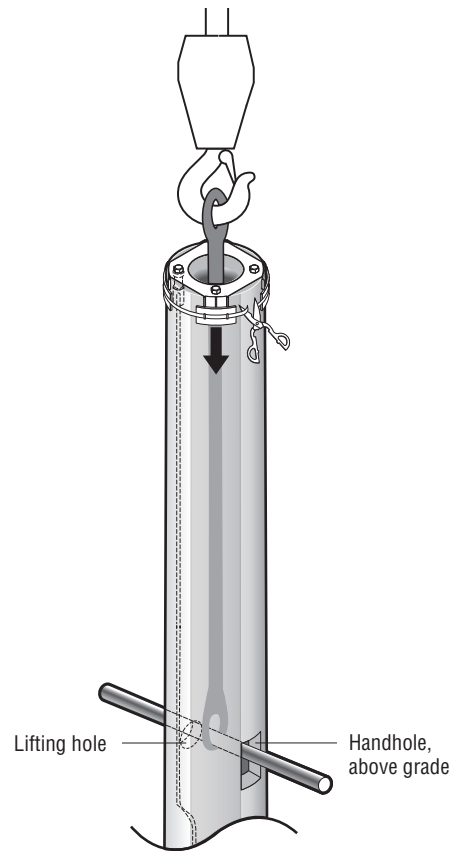
Cover holes or install fencing for fall safety.



Precast Concrete Base

3

Sling and lower base into hole. Orient wire access hole to accommodate incoming supply wiring. Snip banding and remove tab protectors.



4

Plumb base and wedge into position. Use supplied level with shim on upper end against base. Shim accommodates taper of base. Top of base is beveled. Keep level at least 6 in (150 mm) from top when plumbing.

5

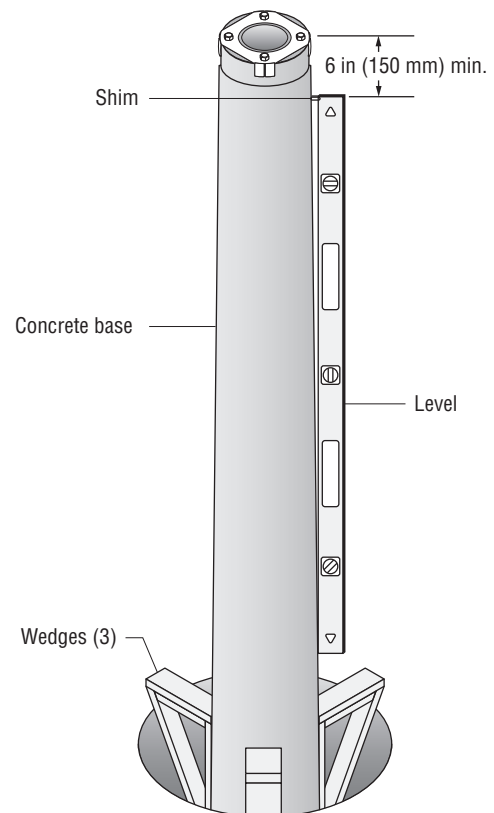
Remove any water from hole to avoid weakening foundation. Water in hole during concrete pour can also cause hollow center of base to fill with concrete.



If backfilling to finished grade with concrete instead of compacted fill, be sure to maintain wire access.

6

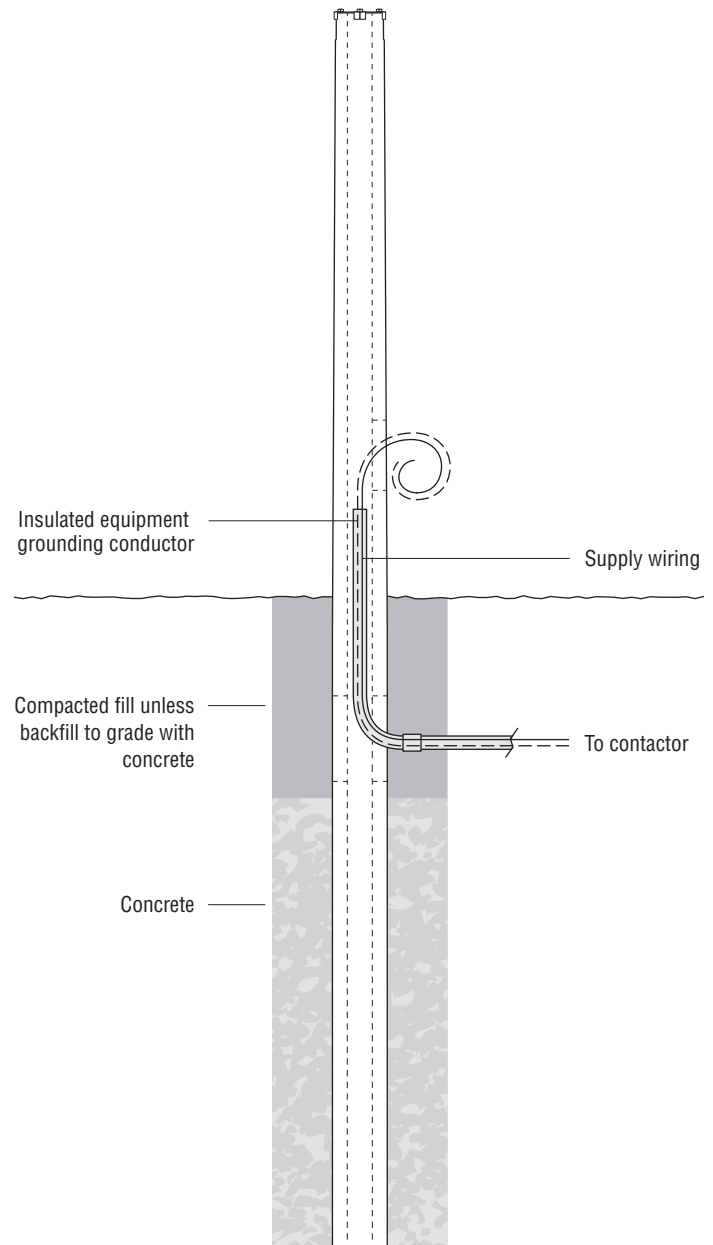
Backfill with concrete per *Musco Foundation and Pole Assembly Drawing* or alternate foundation design.



Precast Concrete Base

7 Have your electrician install all underground conduit and wiring, including insulated equipment grounding conductor. Route wires up through base to handhole. Conduit adapter plates with knockouts are provided. You may also install wiring after standing pole.

8 Backfill with compacted soil to finished grade unless alternate foundation design requires concrete to finished grade.



Galvanized Steel Pole and Poletop Luminaire Assembly

Overview

The galvanized steel pole and poletop luminaire assembly are designed to slip-fit together. Jacking ears on each pole section provide attachment points to pull pole sections together. The *Musco Foundation and Pole Assembly Drawing* gives minimum overlap specifications for each pole section.

Tools/Materials Needed

Musco Supplied

- ☐ Wooden shipping blocks
- ☐ Musco Foundation and Pole Assembly Drawing
- ☐ $\frac{5}{16}$ in wrench
- ☐ Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)

Contractor Supplied

- ☐ Two 1½ ton chain come-alongs

Assembly Procedure



Verify pole ID on each steel pole section matches pole location on *Field Aiming Diagram*. Pole ID is stenciled on inside bottom end and outside top end of each section.

1

Lay out all pole sections and poletop luminaire assembly in sequence. Ensure all weldmarks face same direction. Weldmarks represent field side of pole.



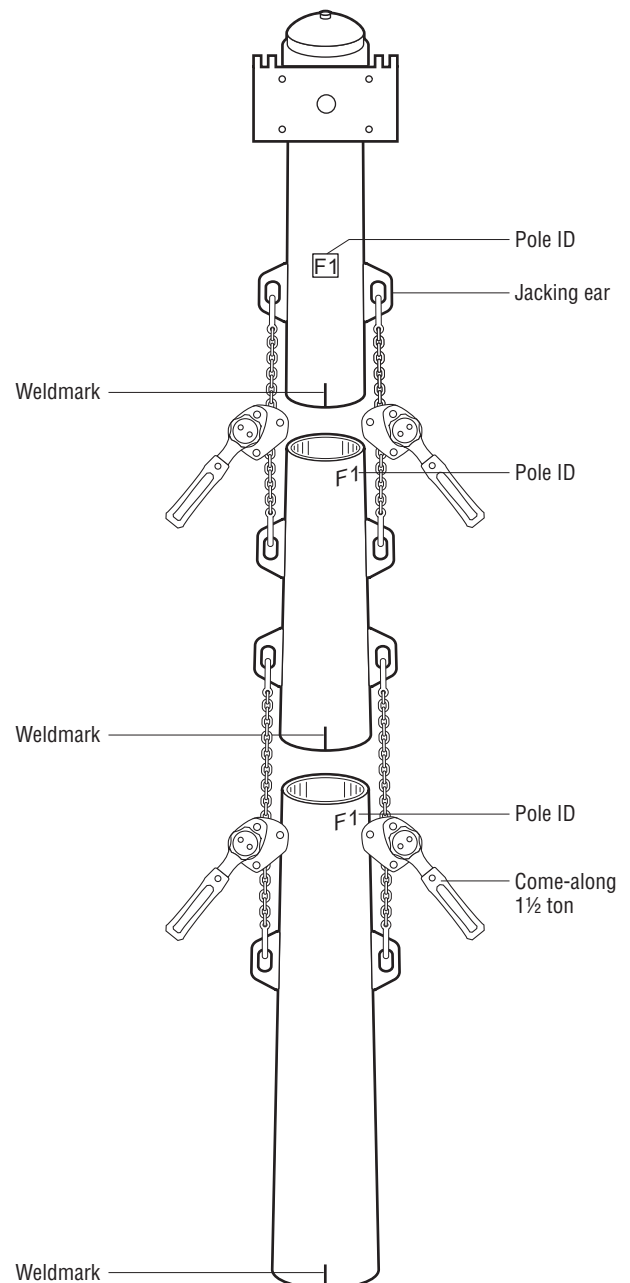
Use shipping blocks as necessary to support pole sections during assembly.

2

Lubricate top of each steel pole section with supplied dishwashing liquid.

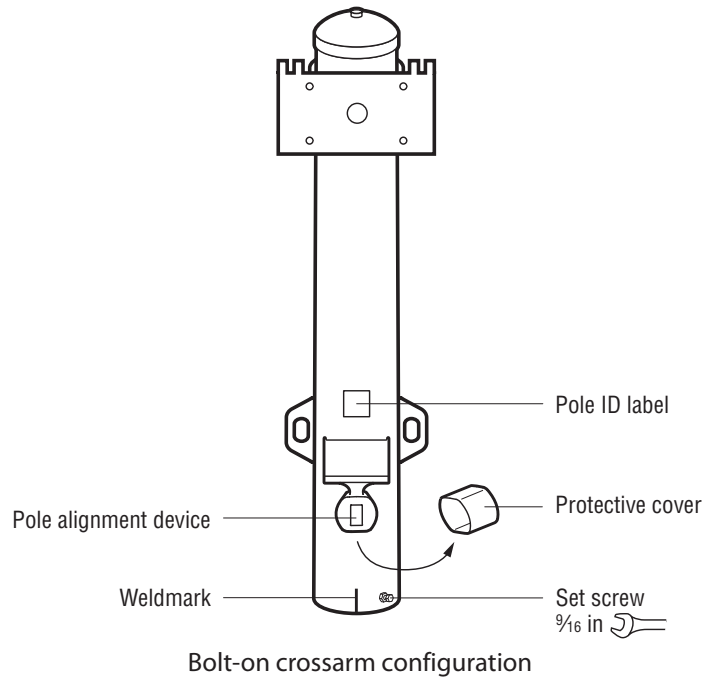
3


Align jacking ears. Using two 1½ ton come-alongs, pull sections together evenly until tight. Ensure minimum overlap per *Musco Foundation and Pole Assembly Drawing*. Repeat for all sections.



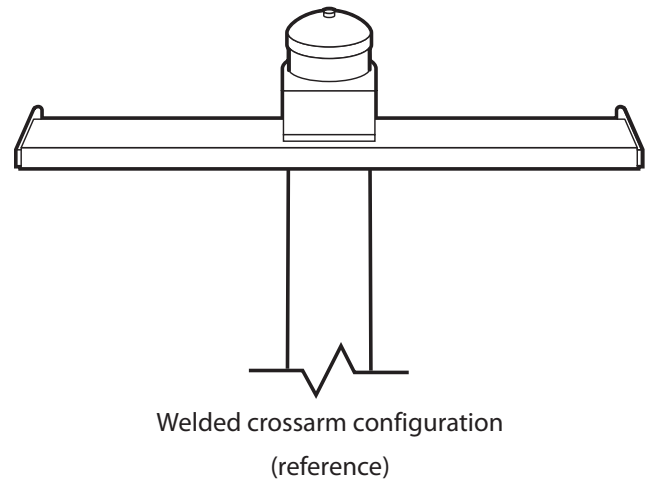
Galvanized Steel Pole and Poletop Luminaire Assembly

- 4** Tighten set screw using $\frac{9}{16}$ in wrench.
- 5** Remove protective cover from pole alignment device.



 If pole has welded crossarms, skip *Bolt-on Crossarms* section. Proceed to *Electrical Components Enclosure* section.

 See *Installation Instructions: Platform, Climbing Steps, and Safety Cable*, if your project includes these items.



Bolt-on Crossarms

Overview

Due to shipping restrictions, it is sometimes necessary to ship crossarms separate from the poletop section. For these situations, the crossarms are designed to easily attach to the poletop.

Tools/Materials Needed

Musco Supplied:

- ☐ ¾ in drive 1½ in socket
- ☐ ¾ in drive breaker bar
- ☐ ¾ in drive 4 in extension
- ☐ 1½ in wrench
- ☐ Spreader bars
- ☐ ⅜ in fasteners (for spreader bars)
- ☐ ⅝ in structural fasteners
- ☐ ⅞ in wrench

Contractor Supplied:

- ☐ Torque wrench with ⅞ in and ⅝ in socket

Assembly Procedure



Verify pole ID on crossarm matches ID of pole.

Note: Each crossarm is factory assembled for a specific position on poletop section to ensure correct aiming. Top side of crossarm is labeled with crossarm's position number. Example: Position 1 is installed on first position from top of poletop section.

1

Position crossarm near poletop, and feed crossarm wire harness through hole in center of poletop plate.

Route wire harness for crossarms 1–3 to top of pole.

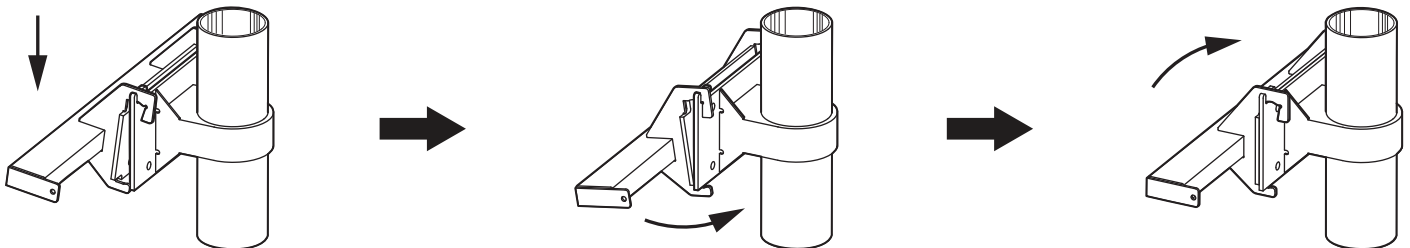
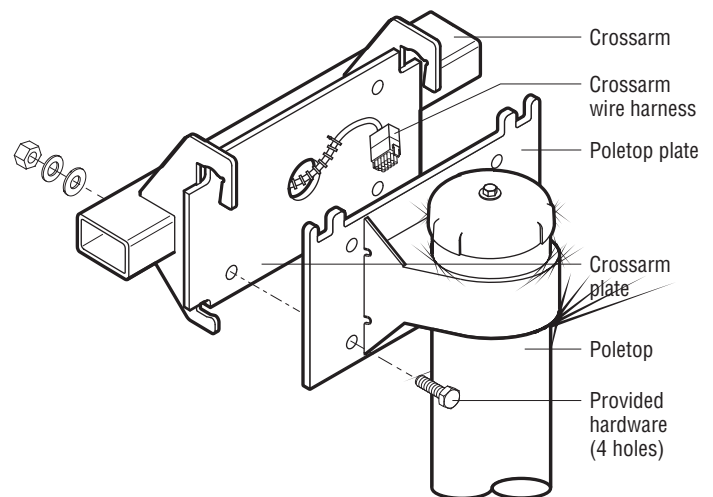
Route wire harness for crossarms 4–7 to handhole below crossarm position 5.

2

Position crossarm as shown below.



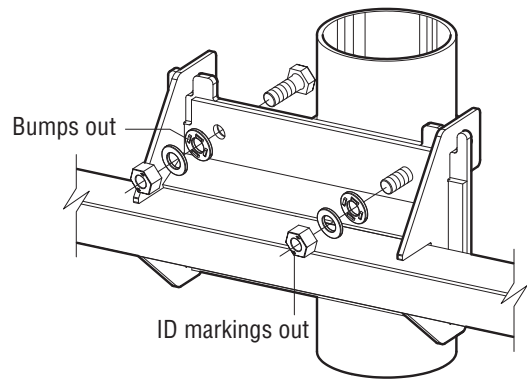
Ensure crossarm wire harness is not pinched between mating plates.



Bolt-on Crossarms

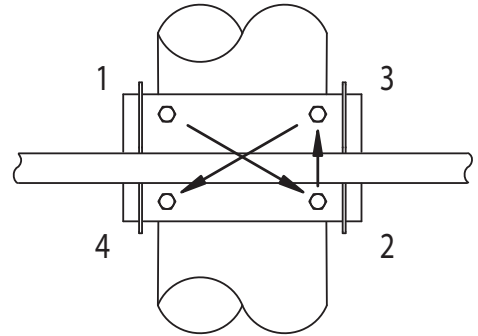
3

Install bolts through plates with threads away from pole. Place direct tension indicating (DTI) washer next, with flat surface (orange material) against plate, and bumps facing out toward nut. Place flat washer next, followed by nut. Small ID markings on nut must face out to allow proper identification of nut.



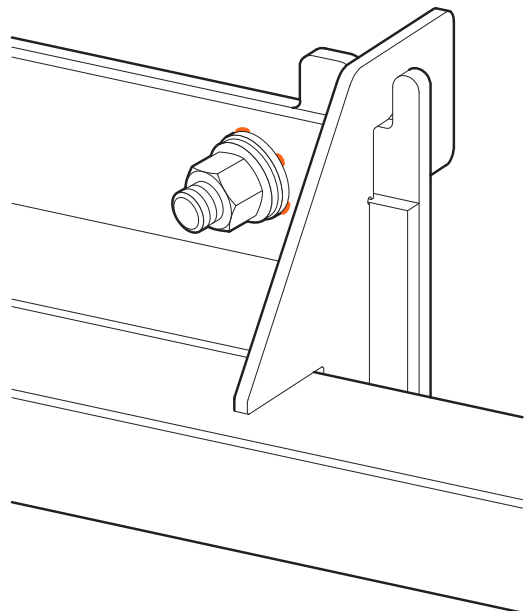
4

Snug all nuts. Using supplied 1 $\frac{1}{16}$ in wrench, tighten each nut until plates are in firm contact. Follow tightening sequence shown.



5

Using supplied breaker bar, 1 $\frac{1}{16}$ in socket, extension, and wrench, tighten each nut until orange extrusion appears from at least three bumps.



Bolt-on Crossarms

6

Repeat steps 1–5 for remaining crossarms.



Do not reuse structural fasteners. Discard if removed or loosened after tightening.



Refer to the *Musco Aiming Diagram* to determine if a pole requires spreader bars. If so, spreader bars are bundled together and marked with the pole ID. Additionally, the pole crossarms are stenciled indicating which tabs to use. Crossarms are joined in groups of two or three with the greatest grouping on top; do not form other groupings.

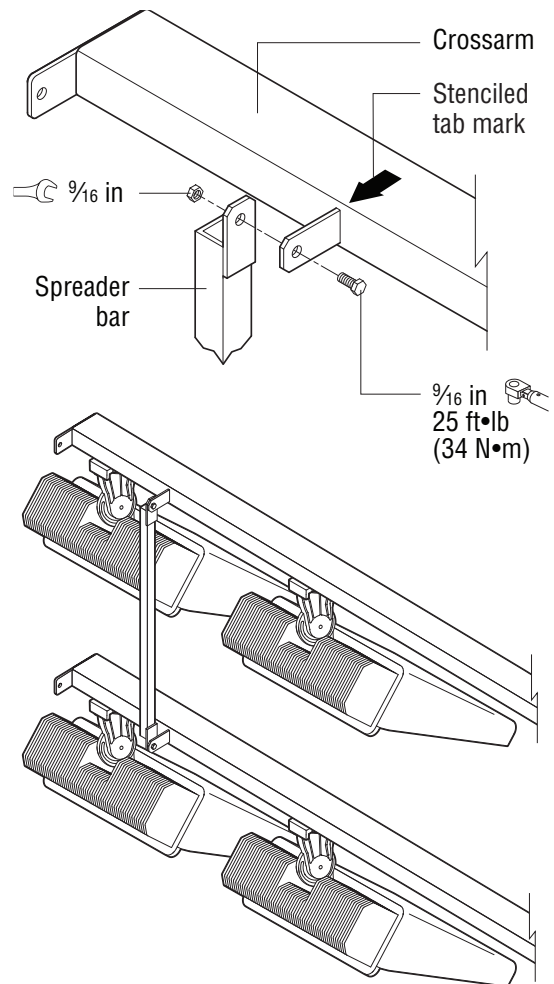
7

Install spreader bars with $\frac{3}{8}$ in fasteners at the locations marked on each crossarm. Torque to 25 ft•lb (34 N•m).

Spreader bars may come in two sizes, 30½ in (775 mm) and 60 in (1524 mm). Always install longer bars to upper three crossarms.



See *Installation Instructions: Platform, Climbing Steps, and Safety Cable*, if your project includes these items.



Electrical Components Enclosure

Overview

The electrical components enclosure is factory-wired and tested. Built-in hardware allows for easy attachment to the galvanized steel pole. Quick-connect plug-ins ensure trouble-free connection to the poletop luminaire assembly via the wire harness.

Tools/Materials Needed

Musco Supplied

❑ 9/16 in wrench

❑ 3/16 in hex key

Contractor Supplied

❑ Phillips-head screwdriver

❑ Standard screwdriver

Assembly Procedure



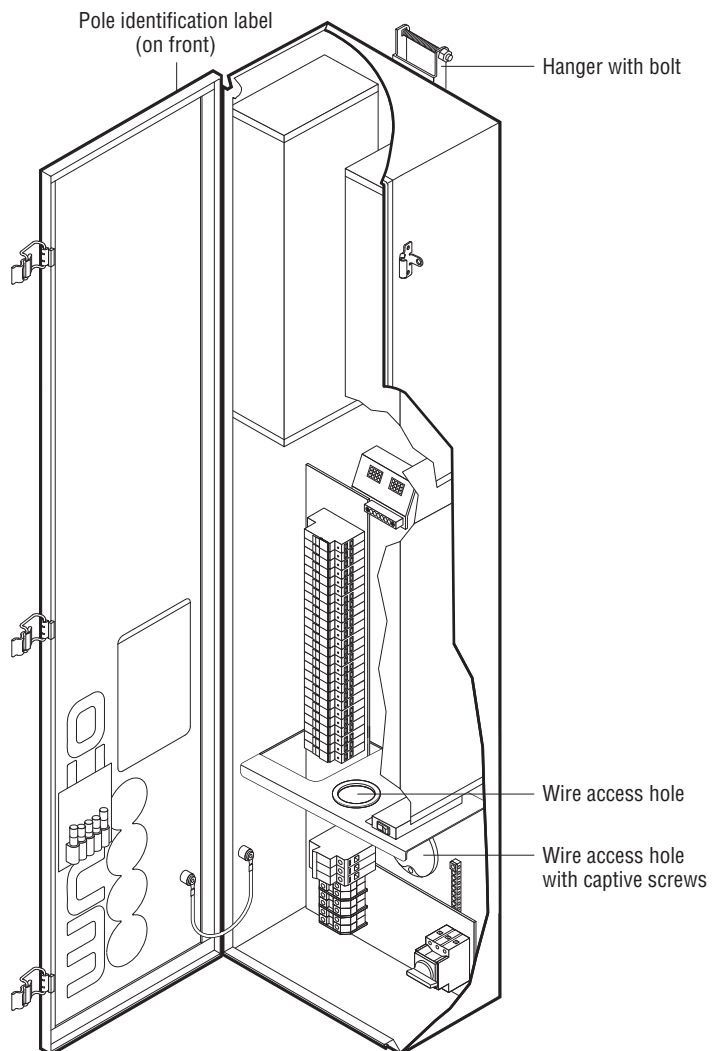
Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.



Caution

Electrical components enclosures are heavy.

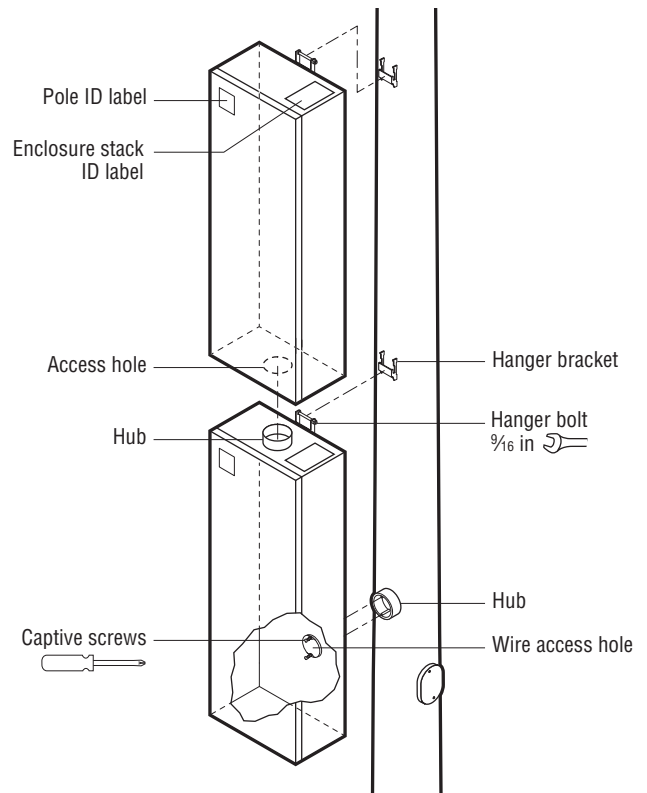
Electrical components enclosure may weigh up to 65 lb (30 kg). Lift carefully with two people to avoid injury.



Electrical Components Enclosure

1 Mount bottom enclosure on pole. Align wire access hole with hub. Tighten captive screws using Phillips-head screwdriver. Tighten hanger bolt with $\frac{1}{16}$ in wrench.

2 Mount middle and/or top enclosures. Align access hole with hub and slide box onto hanger bracket. Tighten hanger bolt with $\frac{1}{16}$ in wrench.



Only qualified personnel may perform wiring. Route wires as shown, but leave the final connections for your electrician. See section *Connecting to Supply Wiring*.

3 Route driver harnesses from top and middle enclosures to bottom enclosure and plug into connector mounted in bracket.

4 Route equipment grounding conductor and enclosure harnesses from top and middle enclosures to bottom enclosure.

5 Repeat steps 1 – 4 for each stack.



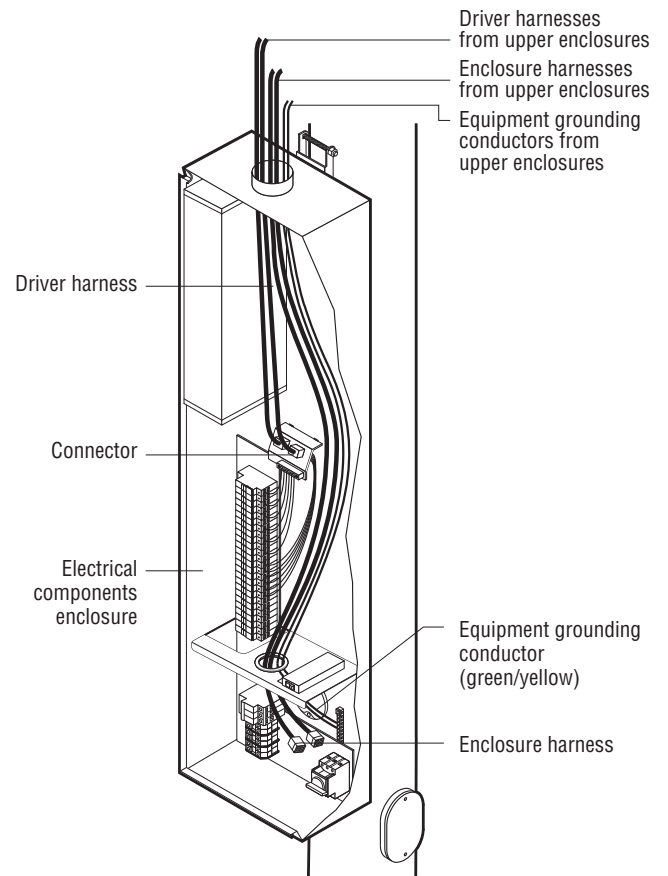
Warning

Pole rotation may be required to assemble all components onto the pole. Do not stand under pole when lifting. Steady pole with two people holding crossarms. Allow for pole to safely rotate around when it is high enough for crossarms and electrical components enclosures to clear the ground.



Caution - Equipment Damage

Properly support pole to ensure components do not get damaged. Do not attach components to pole without the pole being properly supported.

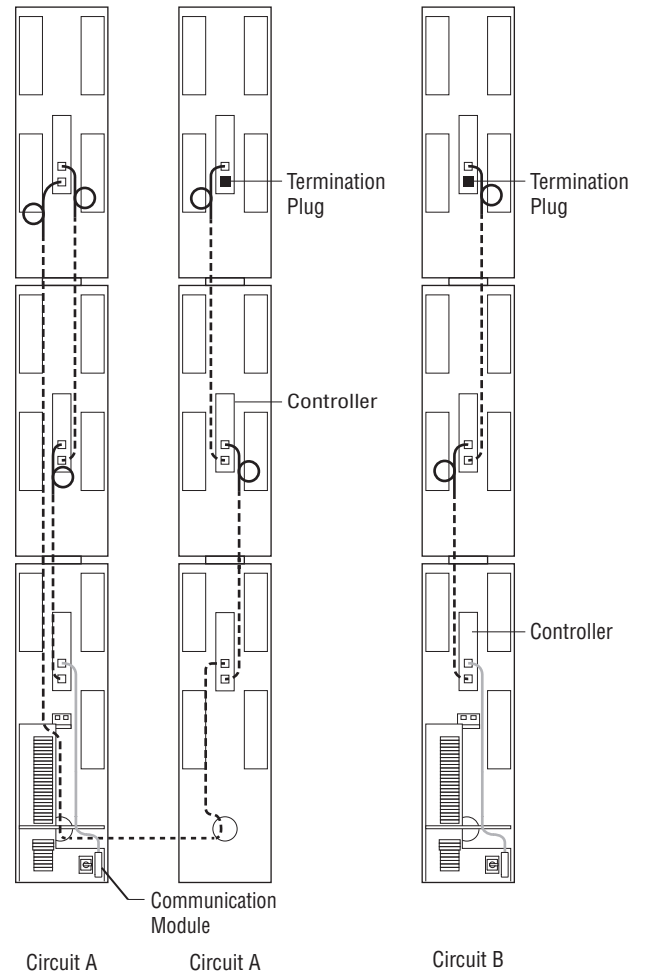


Electrical Components Enclosure

Note: Skip Step 6–7 if controller not present.

6

Pull communication cables down from top and middle boxes and plug into controller in enclosure below as shown.

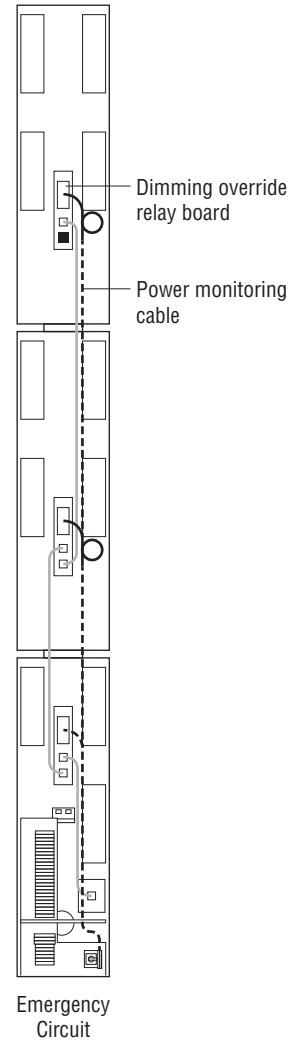


Electrical Components Enclosure

Note: Skip step 7 if emergency egress lighting dimming override relay board is not present.

7

Pull power monitoring cable from dimming override relay board in top and middle enclosures down to bottom enclosure and land black wire on terminal block M1 and blue/white wire on terminal block M2.



Electrical Components Enclosure

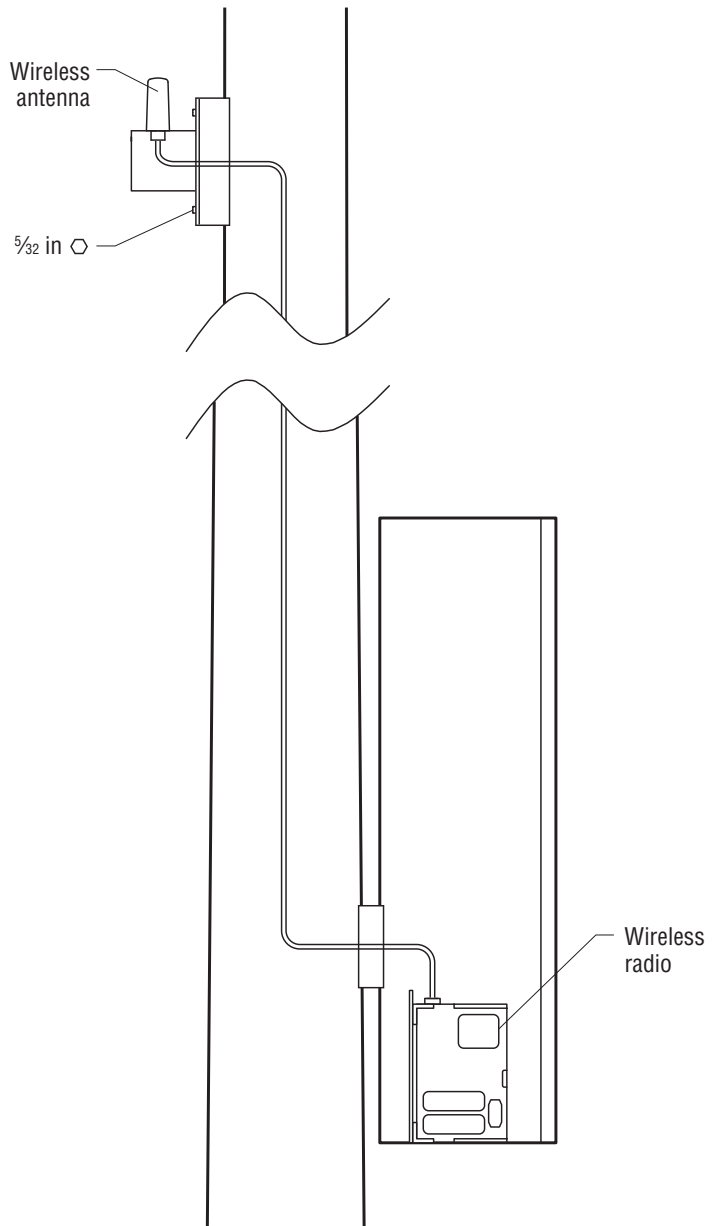
Note: Skip Steps 8 and 9 if wireless antenna not present.

8

Using a $\frac{5}{32}$ in hex wrench mount the wireless antenna on the handhole provided. Route the coaxial cable down the pole into bottom electrical components enclosure.

9

Install the coaxial cable on the wireless radio located in the electrical components enclosure.



Wire Harness

Overview

The factory-built wire harness connects the electrical components enclosure to the poletop luminaire assembly.

Tools/Materials Needed

Musco Supplied

❑ 5/32 in hex key

❑ 5/16 in wrench

Contractor Supplied

❑ Fish tape

❑ Electrician's tape

Assembly Procedure



Verify pole ID on wire harness matches pole location on *Field Aiming Diagram*.

1

Remove handhole covers using 5/32 in hex key. Remove polecap using 5/16 in wrench.

2

Fish all pole wire harnesses between poletop and appropriate electrical components enclosure(s). Use lower handhole to access enclosure hubs. Ensure protective sleeve extends through access hub and tuck harnesses behind subpanel.

3

Attach support grips at poletop and midpole (if present).

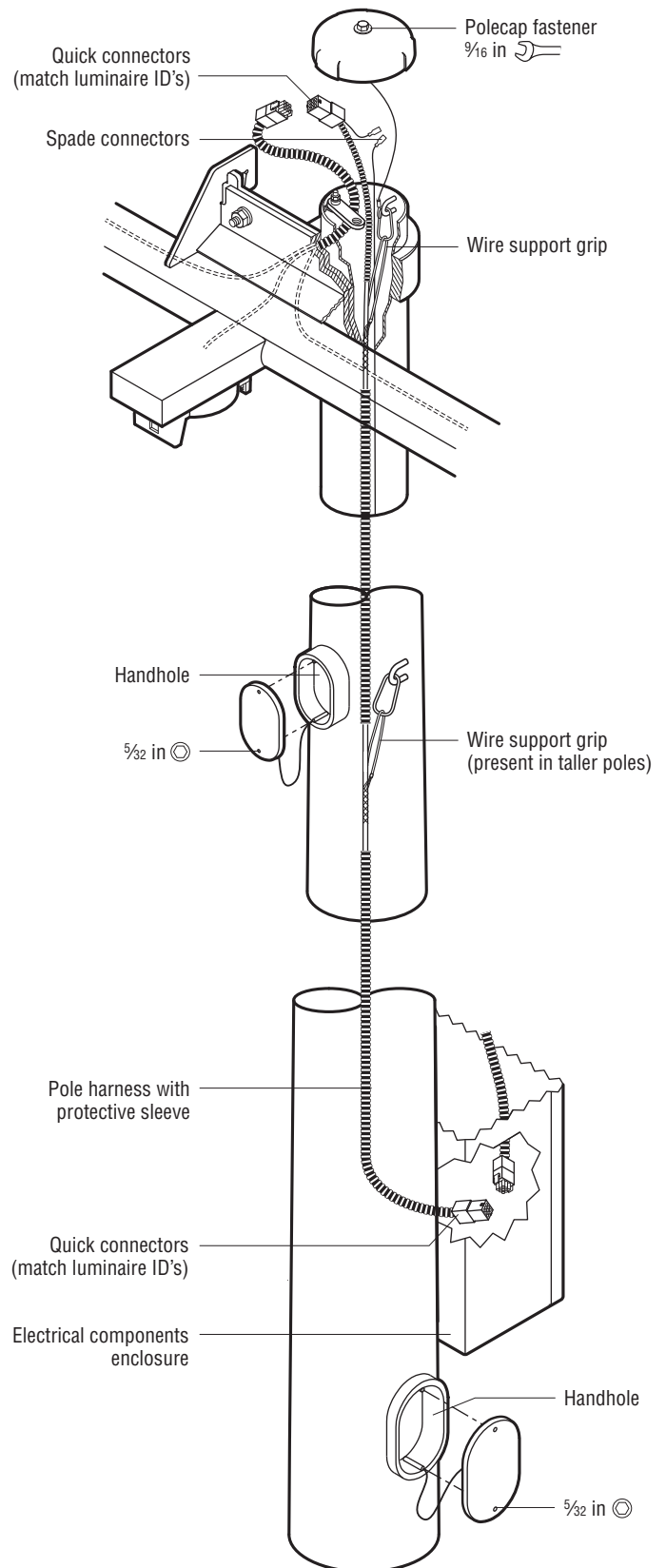
4

Mate quick-connectors at poletop and inside electrical components enclosure(s). Match driver/luminaire IDs.

Note: Each bolt-on crossarm has at least one separate harness. There is one additional spade connector for pole alignment beam.

5

Replace handhole covers and polecap.



Luminaire Attachment

Overview

Luminaires are factory built and shipped in individual cartons. They are aimed in the factory and ready for installation. Do not disassemble knuckle.

Tools/Materials Needed

Musco Supplied

- ☐ 7/16 in ratcheting combination wrench

Note: Leave luminaires in box until ready to assemble. Keep protective cover on luminaire until ready to set pole. Do not leave luminaires unassembled from crossarm in wet conditions.

Contractor Supplied:

- ☐ Torque wrench with 7/16 in socket

Assembly Procedure



Verify pole ID on luminaire cartons matches pole and location on *Field Aiming Diagram*.

1

Remove and discard orange protective caps from luminaire knuckle and mounting plate that cover electrical connections. Do not remove orange tag around captive bolts.

Note: The luminaire style may vary from what is shown.



Warning

Pole rotation may be required to assemble all components onto the pole. Do not stand under pole when lifting. Steady pole with two people holding crossarms. Allow for pole to safely rotate around when it is high enough for crossarms and electrical components enclosures to clear the ground.

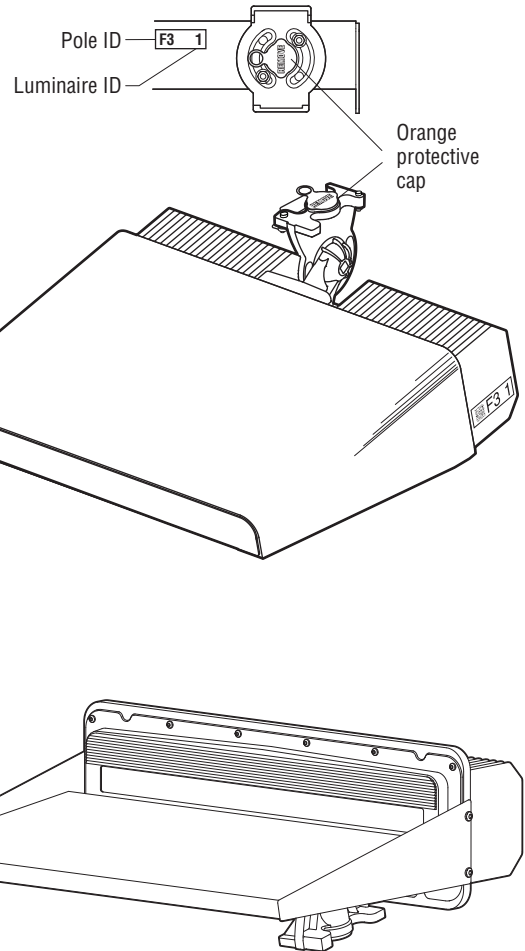


Caution - Equipment Damage

Properly support pole to ensure components do not get damaged. Do not attach components to pole without the pole being properly supported.



Some luminaires may attach to auxiliary brackets, refer to *Installation Instructions: Auxiliary Bracket*.



Luminaire Attachment

- 2** Match luminaire ID to crossarm and install luminaire onto mounting plate. Insert back of knuckle into mounting plate and pivot into position.

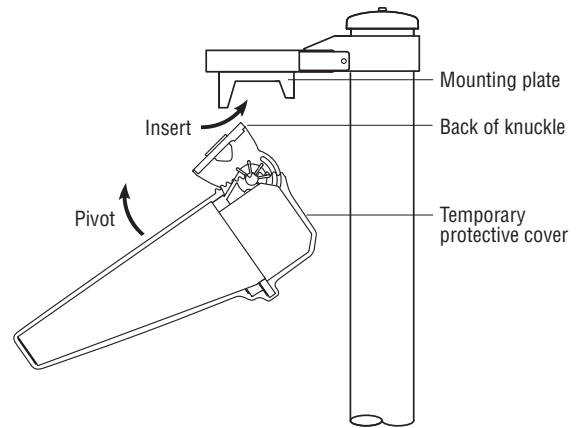
Note: The luminaire style may vary from what is shown.

Luminaire	Weight
TLC-LED-400	40 lb (18 kg)
TLC-LED-550	25 lb (11 kg)
TLC-BT-575	34 lb (15 kg)
TLC-LED-600	40 lb (18 kg)
TLC-LED-900	40 lb (18 kg)
TLC-LED-900NB	114 lb (52 kg)
TLC-LED-1150	80 lb (36 kg)
TLC-LED-1200	45 lb (20 kg)
TLC-LED-1400NB	106 lb (48 kg)
TLC-LED-1500	67 lb (30 kg)
TLC-RGB-U	20 lb (9 kg)
TLC-RGBW	40 lb (18 kg)

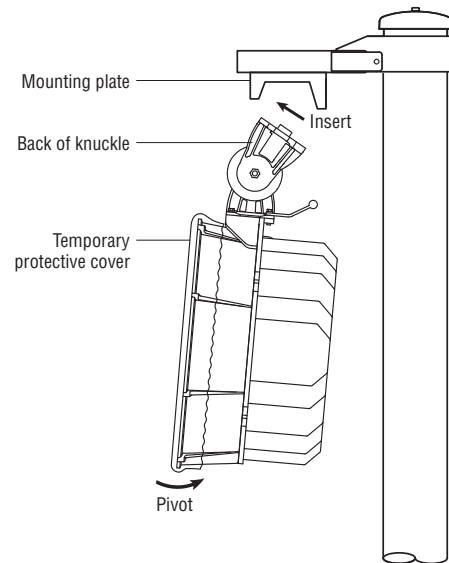


Caution

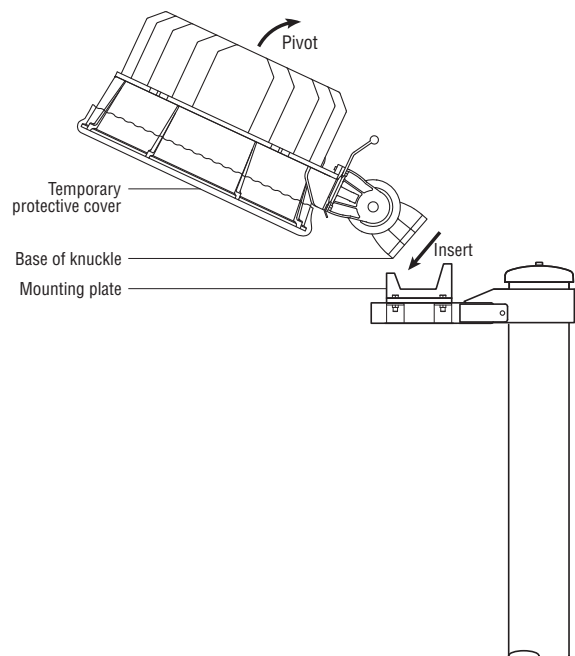
Luminaire may be heavy. Lift carefully with two people to avoid injury.



Or



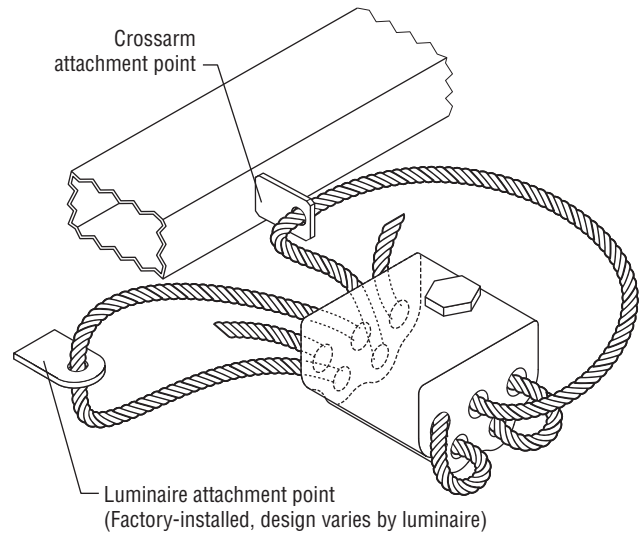
Or



Luminaire Attachment

3 Attach luminaire retaining cable (if present). Route luminaire cable through crossarm anchor point, through luminaire block, and back through the block under the set screw. Luminaire attachment point will vary per luminaire design.

4 Using $\frac{7}{16}$ in socket and torque wrench, tighten cable set screw to 60 in•lb (6.8 N•m)



5 Tighten captive mounting bolts. Orange tag will break loose before all bolts are fully tight - continue tightening. Torque must not exceed 20 ft•lb (27 N•m). To avoid overtightening, use provided $\frac{7}{16}$ in combination wrench.



Warning

Luminaire may fall if bolts are not tight.

Do not remove tag before tightening bolts.



See *Installation Instructions: Climbing Steps and Safety Cable*, if your pole includes these items.



Warning

Pole rotation may be required to assemble all components onto the pole. Do not stand under pole when lifting. Steady pole with two people holding crossarms. Allow for pole to safely rotate around when it is high enough for crossarms and electrical components enclosures to clear the ground.

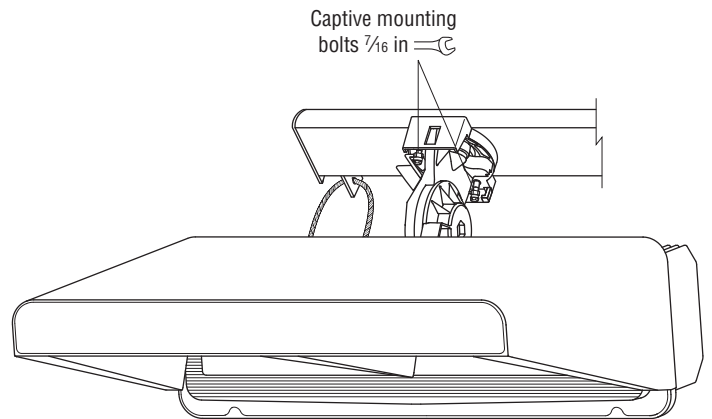


Caution - Equipment Damage

Properly support pole to ensure components do not get damaged. Do not attach components to pole without the pole being properly supported.



If pole has auxiliary equipment, refer to *Installation Instructions: Auxiliary Bracket*.



Note: Attaching auxiliary brackets before setting pole may interfere with slings. Attaching auxiliary brackets after pole is set may be preferable depending on height of auxiliary bracket.

Pole Setting and Alignment

Overview

All luminaires are factory aimed to their exact position on the field. To ensure the proper pole orientation, a simple-to-use pole alignment beam completes the precision field aiming. The pole alignment beam is attached in the factory to each pole.

Tools/Materials Needed

Musco Supplied

- ☐ *Field Aiming Diagram*
- ☐ Steel chain
- ☐ Steel bar
- ☐ Pole rotator kit
- ☐ Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)
- ☐ Level

Contractor Supplied

- ☐ Chalk or pencil
- ☐ Load-rated shackles as required
- ☐ Load-rated nylon slings as required
- ☐ Spray paint, chalk, or flags (to mark aiming points on field)
- ☐ Two 1½ ton chain come-alongs

Installation Procedure



Verify pole ID matches precast concrete base and pole location on *Field Aiming Diagram*.

1

Mark aiming point(s) on field using *Field Aiming Diagram*. Poles may have individual aiming points or may all be aimed to a common point.

2

Lubricate concrete base with provided dishwashing liquid.

3

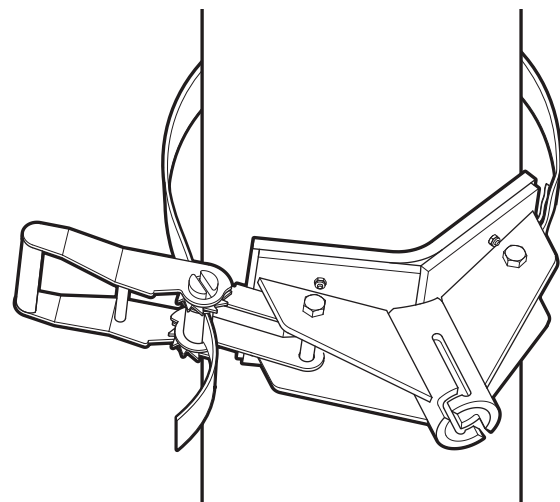
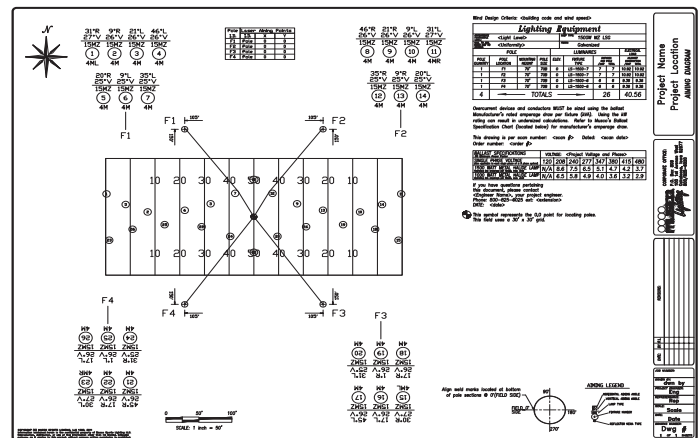
Attach pole rotator clamp approximately 12 in (300 mm) above bottom of pole. Wrap strap around pole and cinch tightly.



Caution

Risk of injury or property damage.

Rotator bar can swing with force as pole is lifted. Do not install until you are ready to lower pole onto base (step 8).



Pole Setting and Alignment

4 Remove temporary protective cover from luminaires (if present). Do not use knife.

5 Turn on alignment beam and check. Device has toggle switch inside electrical components enclosure. For poles with platforms, alignment beam device has a rotary switch located on the back of the alignment device.



Warning **Laser radiation hazard**

Pole alignment beam is safe for viewing at a distance of three feet (one meter) or more. Do not look into beam from closer than three feet (one meter). Do not use binoculars, camera, or telescope to view beam from any distance. Locator beam is a class 2M laser device. Wavelength: 635-660 nm, laser power for classification: <1 mW continuous, divergence: <1.5 mrad x 1 rad. Using alignment beam in a manner other than as described here may result in hazardous exposure. Do not modify, dismantle, or attempt to repair.



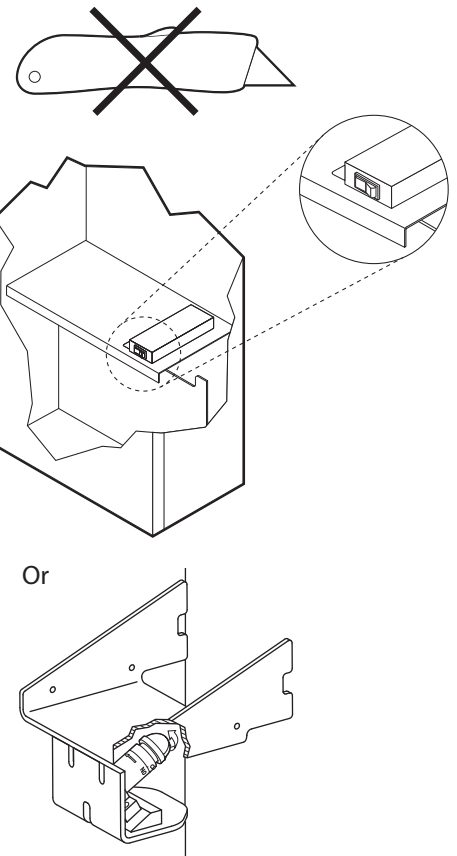
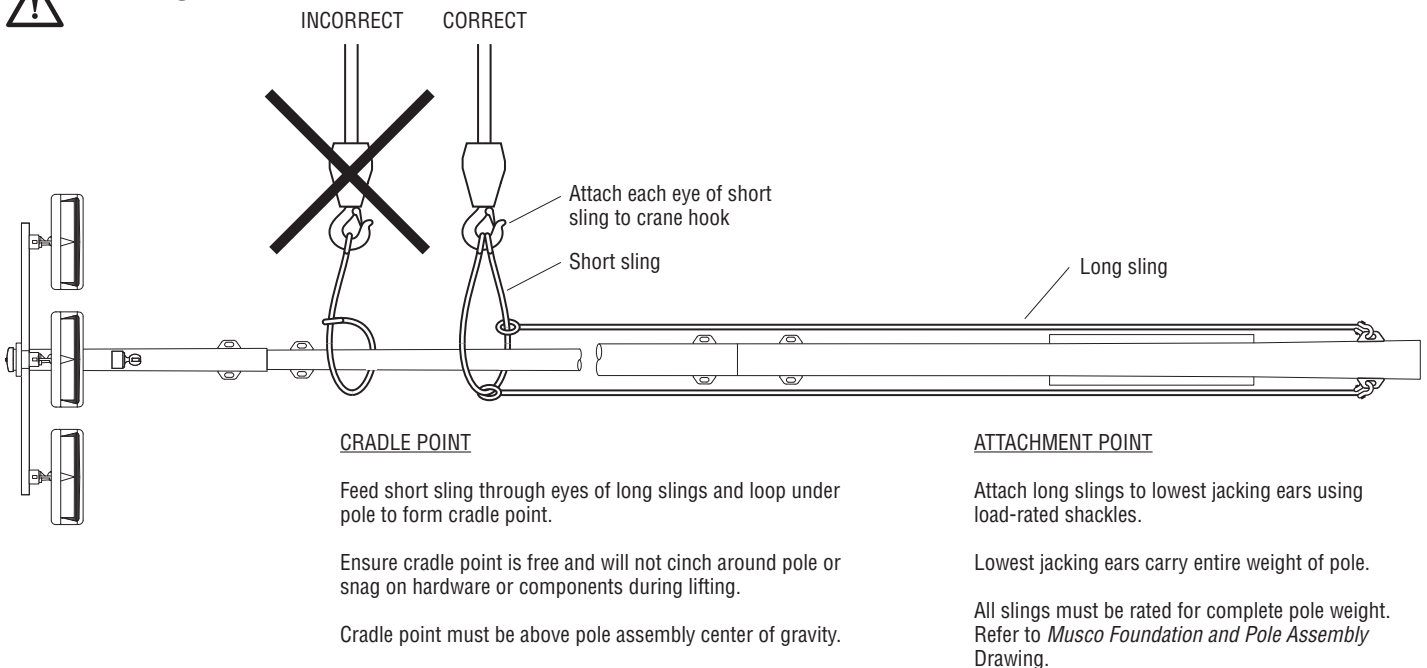
Warning **Improper rigging can cause pole sections to separate and fall.**

Follow these instructions carefully. Do not choke pole or lift from crossarms.

6 Sling pole using this recommended method (see illustration). You must lift pole from lowest section. Friction between assembled sections will not hold pole together when lifting. To keep pole upright when lifting, ensure cradle point is above pole center of gravity. Ensure cradle point is free and will not cinch around pole or snag on hardware or components during lifting.



Warning



Pole Setting and Alignment



Warning **Crushing hazard**

Pole can rotate with force, causing injury.

Do not stand under pole when lifting. Steady pole with two people holding crossarms. Allow pole to safely rotate around when it is high enough for crossarms and electrical components enclosures to clear the ground.

7

Lift pole. Use care to avoid dragging bottom of pole. Keep crane head below crossarms.



Watch for these signs to ensure you are lifting pole properly:

- Short sling slides freely up the pole and long slings tighten.
- Top of pole rises first.
- Short sling does not choke or snag on pole. Lowest jacking ears carry entire weight of pole.

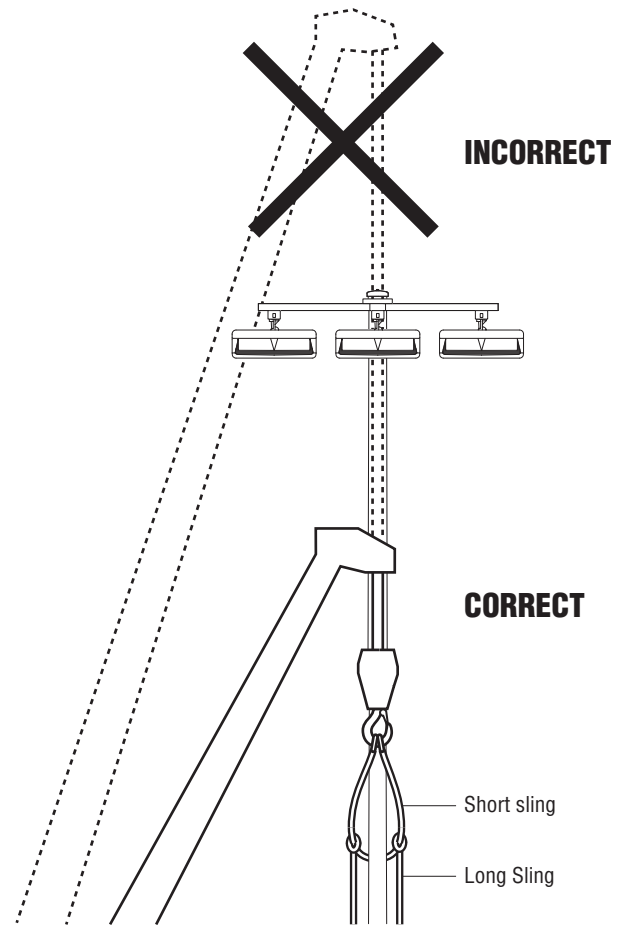
8

When pole is suspended, insert rotator bar to clamp and turn to lock in place. Guide pole into position over base using rotator bar and lower onto base. Do not allow pole to seat on base until it is properly aimed (step 9). Pole should rotate with reasonable force applied to bar, but not freely.



Warning **Pinching hazard**

Keep hands clear when setting pole on concrete base.



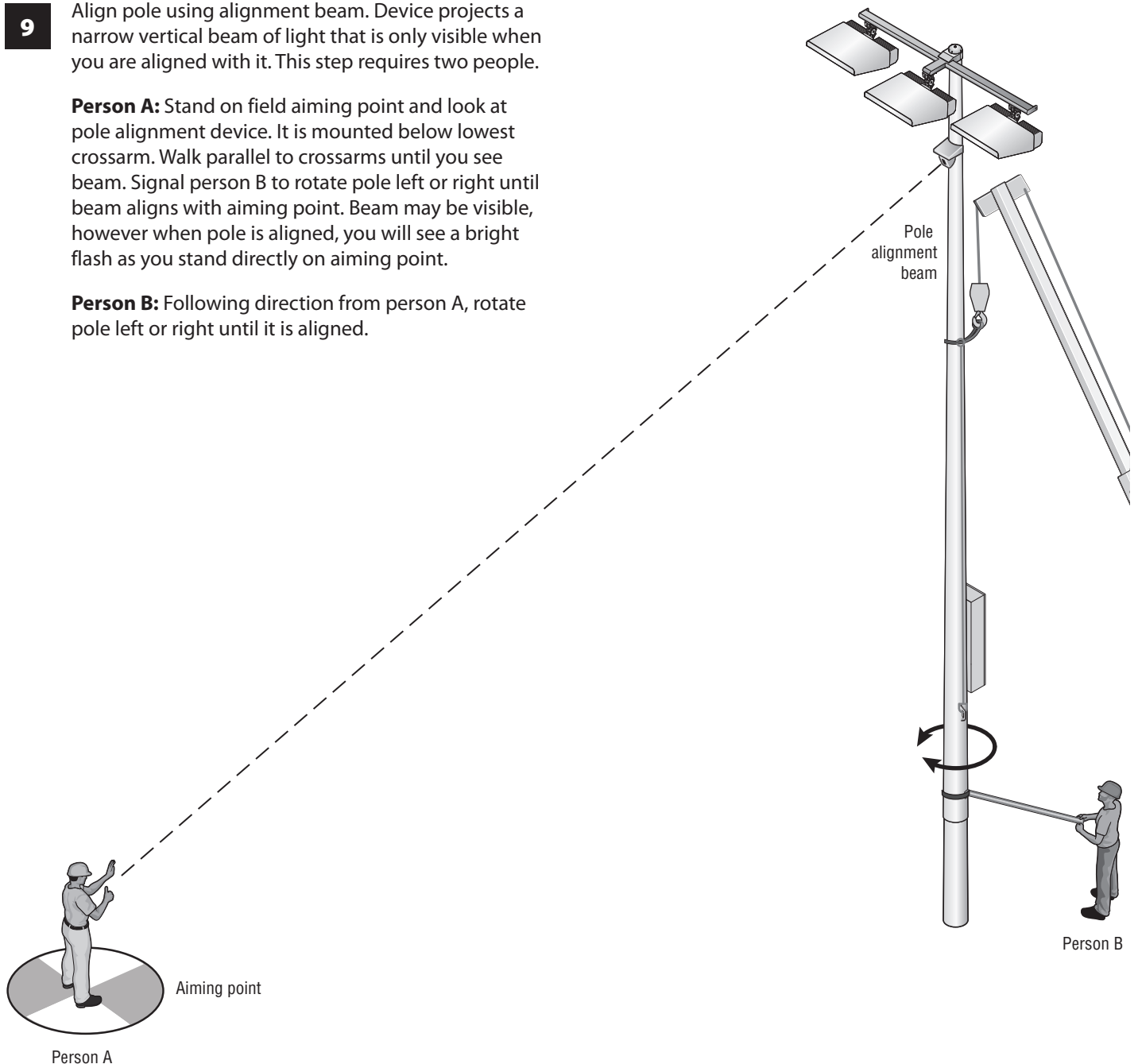
Pole Setting and Alignment

9

Align pole using alignment beam. Device projects a narrow vertical beam of light that is only visible when you are aligned with it. This step requires two people.

Person A: Stand on field aiming point and look at pole alignment device. It is mounted below lowest crossarm. Walk parallel to crossarms until you see beam. Signal person B to rotate pole left or right until beam aligns with aiming point. Beam may be visible, however when pole is aligned, you will see a bright flash as you stand directly on aiming point.

Person B: Following direction from person A, rotate pole left or right until it is aligned.



Warning **Laser radiation hazard**


Pole alignment beam is safe for viewing at a distance of three feet (one meter) or more. Do not look into beam from closer than three feet (one meter). Do not use binoculars, camera, or telescope to view beam from any distance. Locator beam is a class 2M laser device. Wavelength: 635-660 nm, laser power for classification: <1 mW continuous, divergence: <1.5 mrad x 1 rad. Using alignment beam in a manner other than as described here may result in hazardous exposure. Do not modify, dismantle, or attempt to repair.


Pole Setting and Alignment

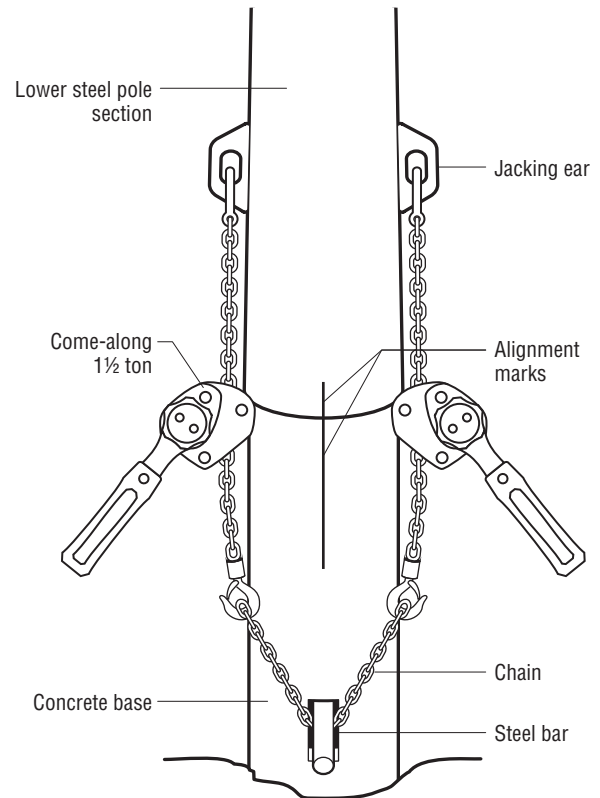
10 Once pole is aligned, use level to draw a thin vertical alignment mark on pole and concrete base. Use mark to verify alignment is maintained while lowering pole (step 11) and jacking onto base (step 12).

11 Lower pole into position. Hold pole rotator bar to maintain alignment until pole seats on base. Remove rotator bar and clamp.

12 Insert provided steel bar through base. Wrap provided chain around base below steel bar. Attach two 1½ ton come-alongs to jacking ears. To avoid twisting, attach come-alongs to provided chain directly below jacking ears. If ears align parallel with steel bar, do not use chain. Pull pole down onto base, keeping marks aligned. Ensure minimum overlap per Musco *Foundation and Pole Assembly Drawing*.

 If pole seats out of alignment, contact Musco to request separating tools. See *Installation Instructions: Separating Steel Pole from Concrete Base*.

 If pole has climbing steps and safety cable, see *Installation Instructions: Climbing Steps and Safety Cable* for cable tensioning instructions.



Connecting to Supply Wiring

Overview

The final step of installation is connecting the supply wiring at the subpanel. Terminals for phase wires and neutral (if used), disconnect switch with lockout, and equipment ground bar are provided on the subpanel in the electrical components enclosure. If there are multiple circuits on the pole, a disconnect is provided for each circuit. This may be on a separate subpanel in another enclosure. The lighting system uses an integrated lightning ground embedded in the precast concrete base. Depending on foundation design and/or soil conditions, a supplemental grounding electrode may be required.

Tools/Materials Needed


Musco Supplied

- ☐ $\frac{3}{16}$ in hex key (ground bar)
- ☐ $\frac{5}{16}$ in hex key (bonding terminal inside handhole)
- ☐ $\frac{5}{32}$ in hex key (handhole covers)
- ☐ 5 mm hex key (125 A disconnect terminals)
- ☐ Equipment bonding jumper

Contractor Supplied

- ☐ Underground wiring and conduit
- ☐ Main power disconnect and distribution panel(s)
- ☐ Standard screwdriver
- ☐ 10 ft (3 m) stepladder or small line truck

Installation Procedure

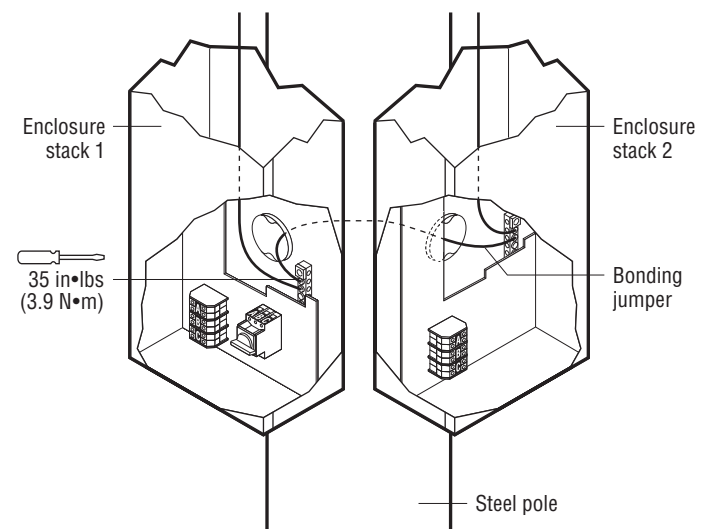
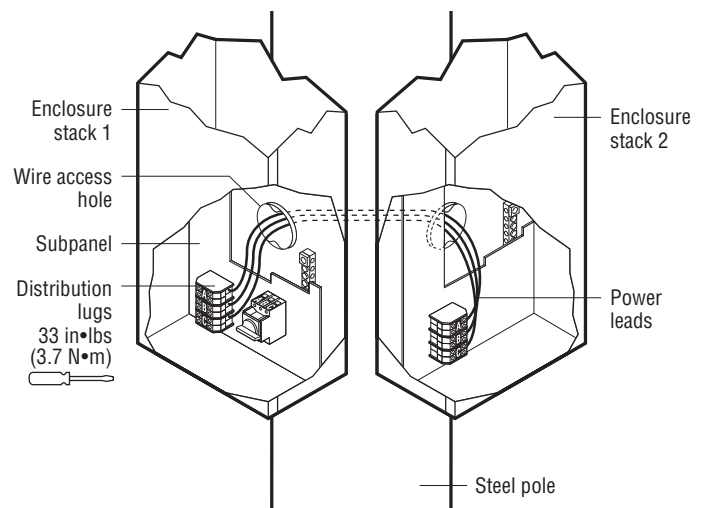
 Musco *Control System Summary* or *Field Aiming Diagram* provides electrical loading information needed to size wire and switchgear.

Musco provides instructions for installing Control-Link™ control system or lighting contactor cabinet when these items are part of your project.



- 1** If pole has multiple stacks on the same electrical circuit then route lower loads from second stack to distribution lugs on main subpanel.

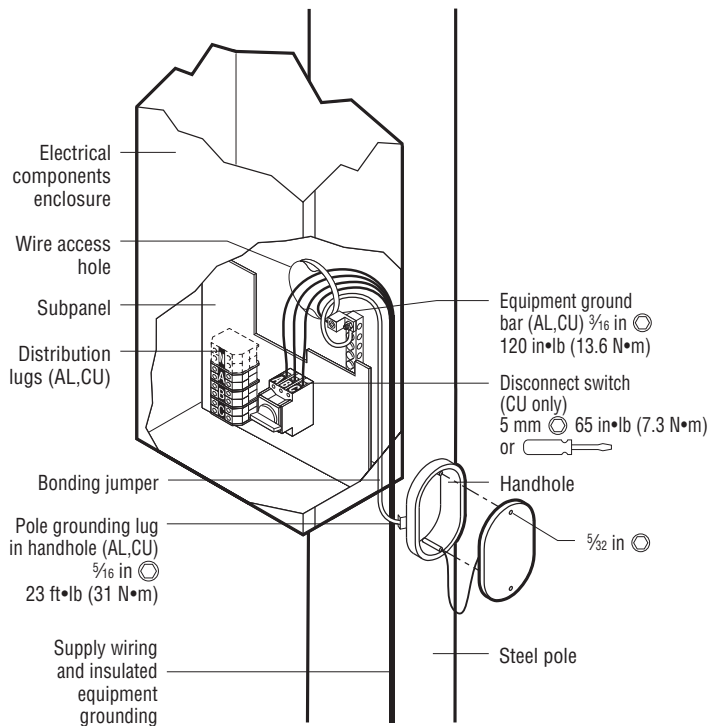
Route all power leads for lighting equipment to appropriate subpanel locations.

- 2** Connect equipment grounding conductors (green/yellow) from each upper enclosure to equipment ground bar in bottom enclosure. If pole has multiple stacks, connect bonding jumper from stack one.



Connecting to Supply Wiring

- 3** Remove handhole cover using $\frac{5}{32}$ in hex key. Rout supply wiring through access hub into electrical components enclosure.
- 4** Connect insulated equipment grounding conductor (supply) to ground bar. Tighten lug using $\frac{3}{16}$ in hex key.
-  Disconnect is rated for copper wire only. Contact Musco for adaptor or use UL Listed adaptor for aluminum supply wire.
- 5** Connect phase wires (supply) to disconnect switch. Tighten lugs using standard screwdriver (45 A disconnect) or 5 mm hex key (125 A disconnect). Connect neutral wire (if used) to distribution lug. Tighten lug using standard screwdriver.
- 6** Route provided equipment bonding jumper (green/yellow) through access hub to pole grounding lug inside handhole. Tighten lug using $\frac{5}{16}$ in hex key.
- 7** Ensure all handhole covers are installed and electrical components enclosure is closed and latched.
-  If your project includes a supplemental grounding electrode kit, follow instructions in kit for installing electrode.



Warning **Risk of electric shock.**

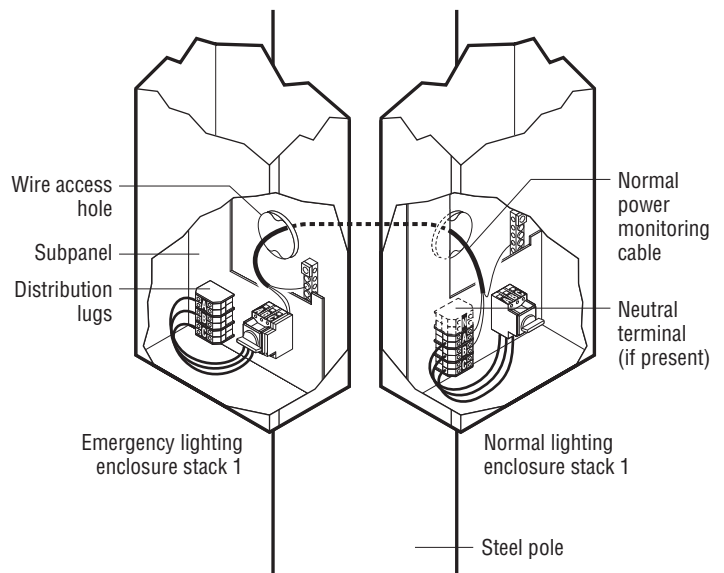
Terminate equipment grounding conductor at equipment ground bar in electrical components enclosure.

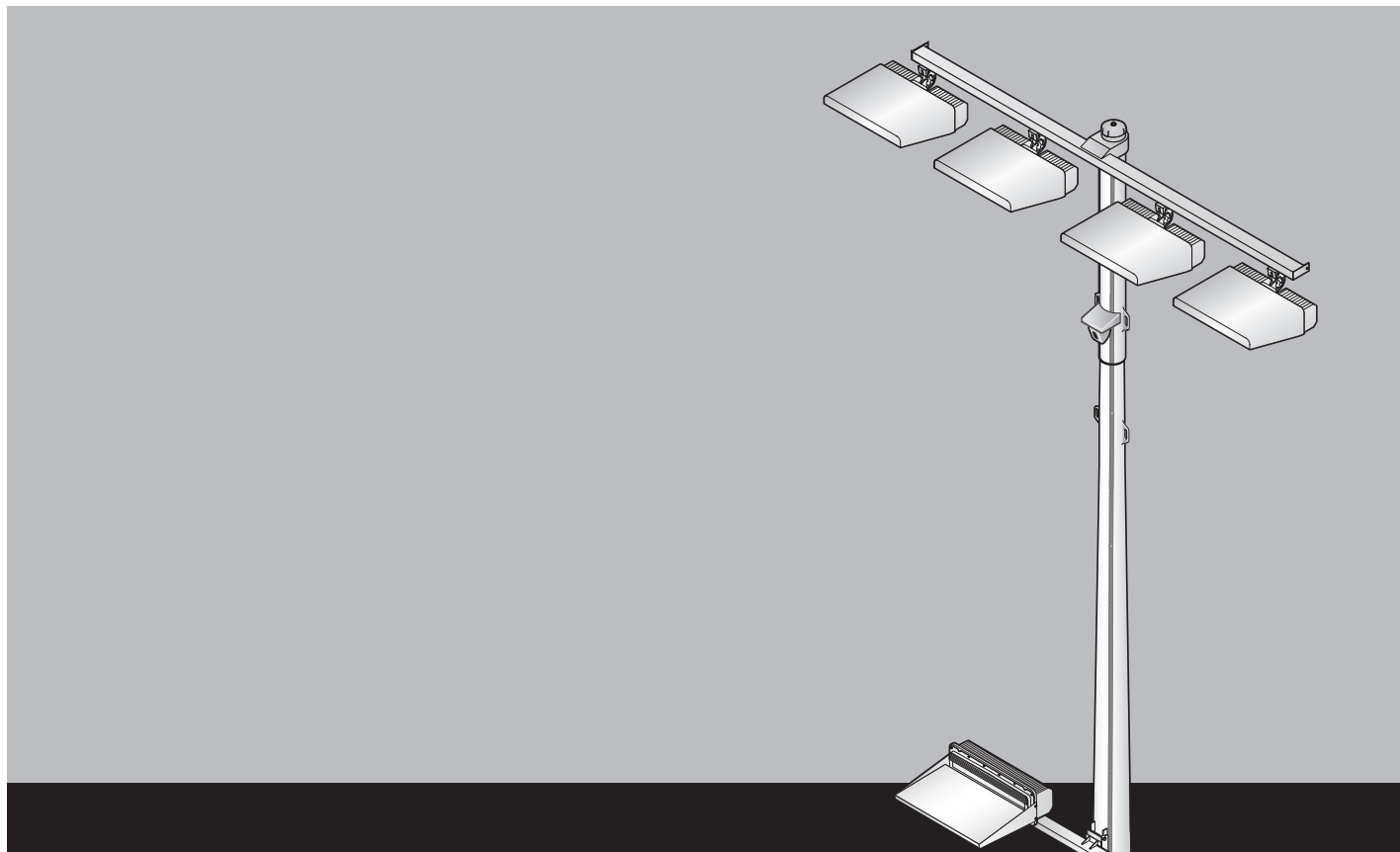
Warning **Lightning hazard.**

For poles located near metal fences, metal bleachers, or other metal structures, bond structures to pole ground to maintain equal electrical potential.

Note: Skip step 8 if no emergency egress lighting is present.

- 8** Route cable for normal power to adjacent enclosure stack. Connect black wire and blue/white wire to any two active terminals A, B, C, or neutral, if present, and green wire to ground bar.

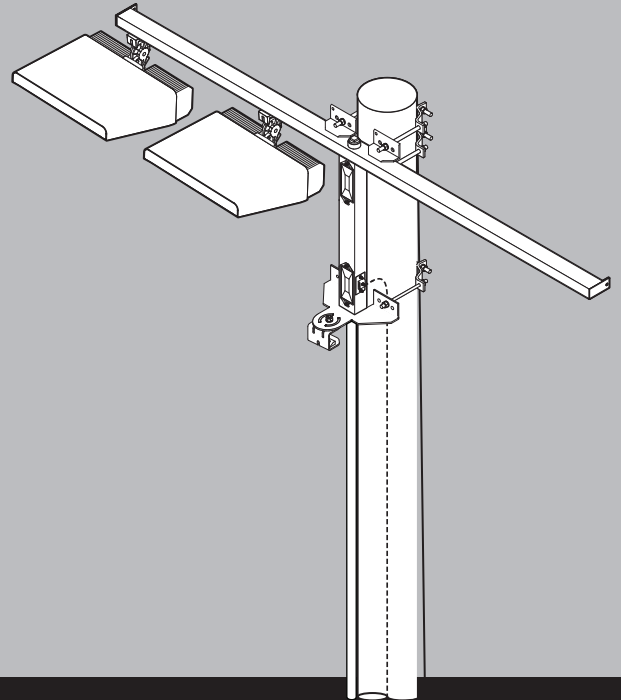




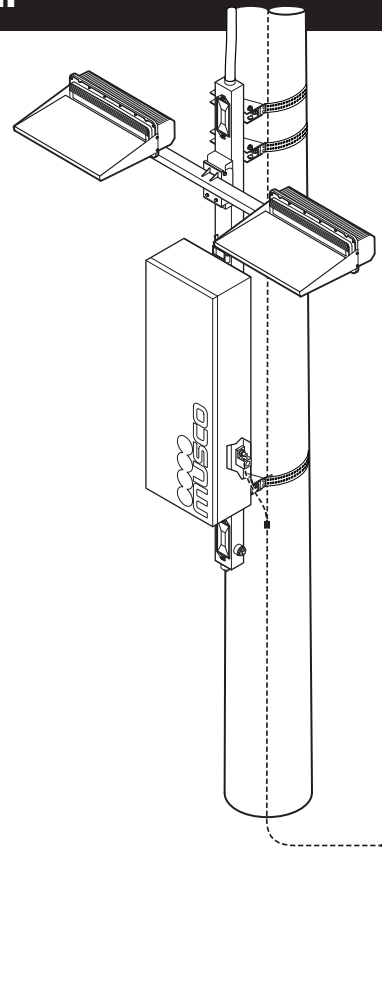
Musco Light-Structure System™ product referenced or shown may be protected by one or more of the following patents. United States Patent(s): D593883, D794244, D841854, D841855, D841856, D872350, D872351, D872927, D872928, D872929, D873462, D874050, D880035, D882141, D882850, D882860, D892375, D892376, 8163993, 8300219, 8742254, 8789967, 9435517, 9781780, 9951929, 10267491, 10330284, 10344948, 10549384. Benelux: 87546-01, 87547-01, 87548-01, 87990-01, 87991-01, 87992-01, 87994-01, 87995-01. 88535-01, 88536-01. Canada Patent(s): 2912148. China Patent for Invention 中国发明专利: ZL201280036994.1, ZL201380077801.1, ZL201610187066.5. China Patents for Design 中国外观设计专利: ZL201830262493.5, ZL201830262495.4, ZL201830262588.7, ZL201930116087.2. European Patent(s): 2715222, 2999920. Germany Patents: 402018100450-0001, 402018100451-0001, 402018100452-0001, 402019100343, 402019100344, 402019100345, 402019100346, 402019100347, 402019100348. Mexico Patent(s): 346527. Republic of Korea Patent(s): 10-1577571, 10-1661263, 10-1881998, 30-1014229, 30-1014230, 30-1014231, 30-1037776, 30-1037783-0001-0004, 30-1037788-0001-0004, 30-1037795, 30-1037796-0001 - 0004, 30-1037802-0001 - 0004. Russia Patent: 2616559. United Kingdom Patent(s): 6032011, 6032022, 6032023, 6056943, 6056944, 6056945, 6056946, 6056947, 6056948. U.S. and foreign patents pending. [Pat_057R]



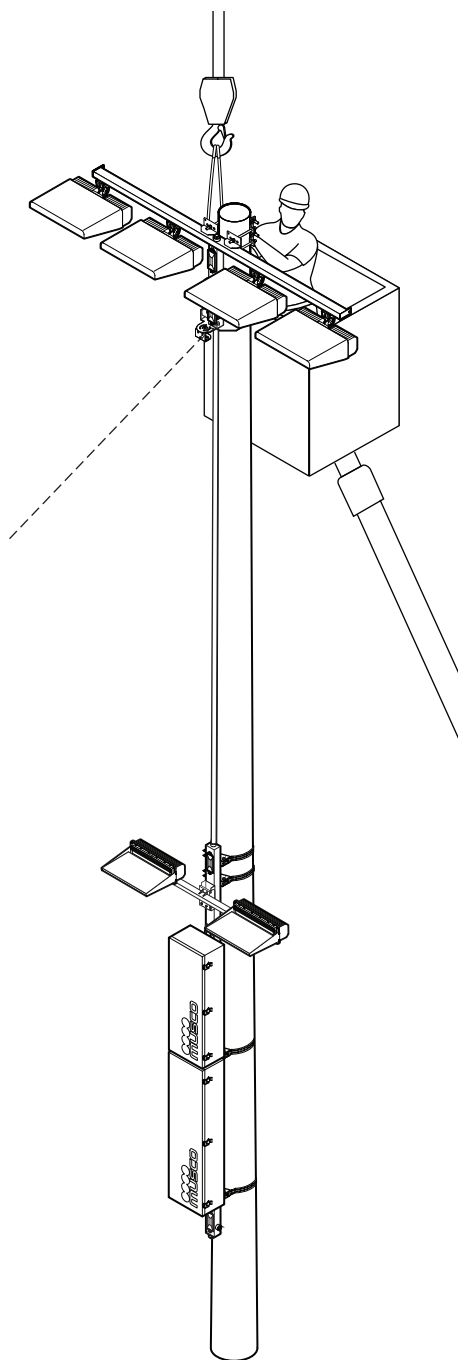
www.musco.com



Installation Instructions: **SportsCluster®** Lighting System



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Supplemental Instructions for Optional Features or Special Situations

Provided with your project as needed

Auxiliary Bracket	D
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Installation Instructions: **SportsCluster®** Lighting System

Before You Begin

Safety Information

Electrical Safety Guidelines

Use extreme caution near overhead power lines or underground utilities. Observe all safety precautions for high-voltage equipment. Only qualified personnel may perform wiring. Follow all applicable building and electrical codes.

General Safety Guidelines

Follow proper safety procedures during installation. Installers must wear the appropriate personal protective equipment including:

- Hard hat
- Steel-toed shoes
- Fall protection
- Leather work gloves
- Eye protection

Locate all underground utilities prior to digging.

All tools and equipment supplied by Musco are designed for specific use as described in these instructions. Do not use them in any other manner. Do not alter structural members in any way, such as bend, weld, or drill, without prior authorization from Musco.

Luminaires generate up to 2.6 mA per driver on the equipment grounding conductor and are designed to meet leakage current requirements per IEC 61347-1.

The luminaires should be positioned so that prolonged staring into the luminaire at a distance closer than 12–37 m (40–121 ft) is not expected, per IEC/TR 62778. See table.

Luminaire	Distance
TLC-LED-400	24 m (79 ft)
TLC-LED-550	24 m (79 ft)
TLC-BT-575	20 m (65 ft)
TLC-LED-600	24 m (79 ft)
TLC-LED-900	24 m (79 ft)
TLC-LED-900NB	no minimum

Luminaire	Distance
TLC-LED-1200	37 m (121 ft)
TLC-LED-1400NB	37 m (121 ft)
TLC-LED-1500	37 m (121 ft)
TLC-RGBW	15 m (49 ft)
TLC-RGBU	12 m (40 ft)

About These Instructions

These instructions outline basic assembly procedures for the SportsCluster® lighting system. They are not a comprehensive guide to all possible situations. Direct any questions to your local Musco representative or call +1-800-825-6020 or +1-641-676-2309.

Throughout this manual note these important symbols:



The safety alert symbol alerts you of situations that require care and caution to avoid serious personal injury.



The stop and check symbol signals you to stop and verify conditions before proceeding.



The contact Musco symbol appears in special situations where you may need to contact Musco for further information.



The go-to arrow indicates a branch in a procedure for special situations. In case of optional equipment, the instructions may be in another document.



The tip symbol points out advice that makes installation easier.



The recycle symbol identifies recyclable materials.

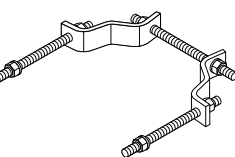
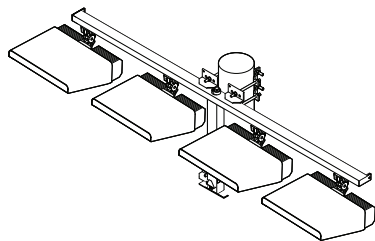
Installation Instructions: **SportsCluster®** Lighting System

Before You Begin

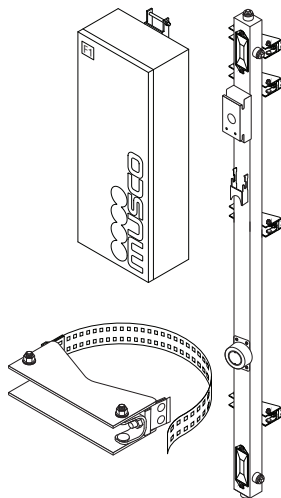
Standard Tools/Supplies

Contractor/installer supplies	Function	Page
Hammer, pry-bar, banding cutters	Unloading equipment	5
Measuring tape, 25 ft (7.5 m)	Identifying brackets and straps, locating components at proper height on pole	7, 8, 9, 16
Torque wrench	Torquing pole clamping hardware	10
Sockets: 3/8, 7/16, 1/2, 9/16 in standard and deepwell	Torquing pole clamping hardware and luminaire retaining cable stops	10, 15
Screwdrivers, standard and Phillips	Landing power, tightening enclosure hub screws	11, 31, 32
Marker	Marking hanger bracket mounting locations on pole	9
Paint, chalk, flags	Marking aiming points on field	21
Measuring tape, 300 ft (90 m)	Locating aiming points on field	21
1 1/8 in open-end torque wrench or torque wrench with 1 1/8 in crows-foot	Torquing pole clamping hardware, torque nuts	22, 25
1 1/8 in open-end wrench	Tightening pole clamping hardware	17–20, 22, 25
Stepped drill, hole saw, or die set	Cutting conduit entryways	29
Conduit, fittings, clamps, etc.	Conduit and supplies as needed for wiring routing	29
Electrical fish tape	Pulling conductors	30, 31
Main power disconnect and distribution panels	Power to lighting system	31
Electricians pliers		31
Grounding electrode and driving sleeve*	Pole lightning ground	32, 33
Grounding conductor, AL to CU splice (if required), saddle clamp, bonding jumper, exothermic weld kit*	Pole lightning ground	32, 33
Shovel	Excavating grounding electrode	32, 33
Musco supplies	Function	Page
Snips	Cutting steel strapping	10
1/2, 9/16 in offset combination wrench	Tightening strap hardware	10, 11, 32
7/16 in ratcheting combination wrench	Tightening luminaire captive bolts	15, 31
5 mm hex key	Landing primary feed wires on 125 A disconnect switch	31
3/16 in hex key	Ground bar	31, 32
5/16 in hex key	Grounding lug	30, 33
Wago brand LEVER-NUTS® wire connector	Connecting pole harness	30
Equipment needed	Function	Page
Load-rated crane and rigging	Unloading, lifting crossarm assembly	5, 22, 24
Aerial work platform	Attaching crossarm assembly to pole and other aerial work	22, 24
10 ft (3 m) stepladder or small line truck	Attaching enclosures and enclosure wiring	9, 27–33

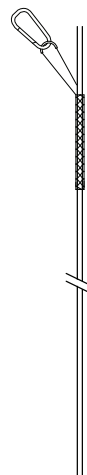
Components of SportsCluster® Lighting System



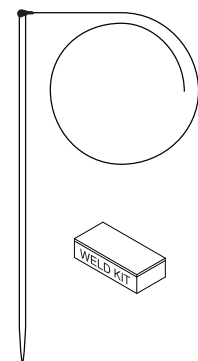
Poletop luminaire assembly
and mounting hardware



Electrical components enclosure
and mounting hardware



Wire harness
(contractor supplied)*



Lightning ground equipment
(contractor supplied)*

* May be supplied by Musco.

Before You Begin

Unloading Instructions

A typical shipment includes electrical components enclosures, poletop luminaire assemblies, luminaire cartons, attachment hardware, and may include wire harnesses. Unload and uncrate equipment. Stage for assembly placing all matched components and hardware at the proper pole location as noted on *Field Aiming Diagram*.

Tools/Materials Needed

- ☐ Crane or forklift
- ☐ Hammer
- ☐ Pry bar
- ☐ Banding cutters

As you unload, do the following:

- Check bill of lading to verify you have all materials.
- Inspect all materials for shipping damage.
- Store all lighting equipment in a dry location or cover with tarp until ready to install.



If you need additional information, contact your local Musco representative.



Please recycle.

Luminaires, hardware, and other components are shipped in recyclable cardboard packaging.

Electrical System Requirements

While portions of the SportsCluster® lighting system can be assembled by non-professionals, a qualified electrician must handle the electrical supply installation and hook-up in accordance with national, state, and local codes. Your electrician should review this information before installation begins.

The electrician is generally required to provide these items:

- Service entrance
- Main power disconnect and distribution panel(s)
- Supply wiring and insulated equipment grounding conductors
- Lightning grounding conductor and electrode, one per pole

Ensure supply wiring is rated for 90°C. Review the label inside the electrical components enclosure door and *Control System Summary* for voltage and phase requirements. All entrance hubs must be rated NEMA 3R (IP54) or better.

Other features that may affect the wiring supply requirements for this project include:

- Lighting contactor cabinets — refer to the supplemental installation instructions and the *Musco Control System Summary*.
- Control-Link® control system — refer to the supplemental installation instructions and *Musco Control System Summary*.

Always dispose of electronic waste in accordance with all applicable laws and regulations.

6

Electrical Components Enclosure and BallTracker® Luminaire

Overview

The electrical components enclosure is factory-wired and tested. It contains essential electrical components of the lighting system in an accessible location. It is ideally mounted on the pole about 10 ft (3 m) above grade to discourage tampering. You may mount it in another accessible location, however limitations on conductor length and size apply.

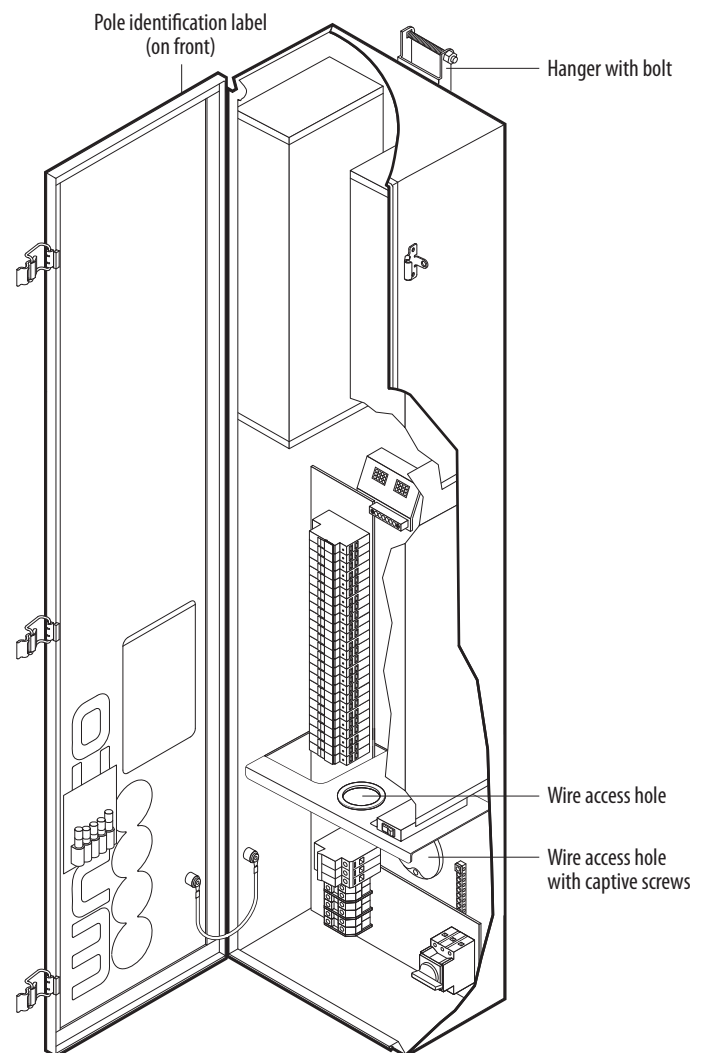
Tools/Materials Needed

Musco Supplied

- ☐ ½ and ⅝ in offset combination wrenches
- ☐ Snips
- ☐ *Field Aiming Diagram*

Contractor Supplied

- ☐ Torque wrench with ½ and ⅝ in sockets
- ☐ Large Phillips-head screwdriver
- ☐ Measuring tape
- ☐ Marker
- ☐ 10 ft (3 m) stepladder or small line truck



Electrical Components Enclosure and BallTracker® Luminaire



Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.

Assembly Procedure



Caution

Electrical components enclosures are heavy.

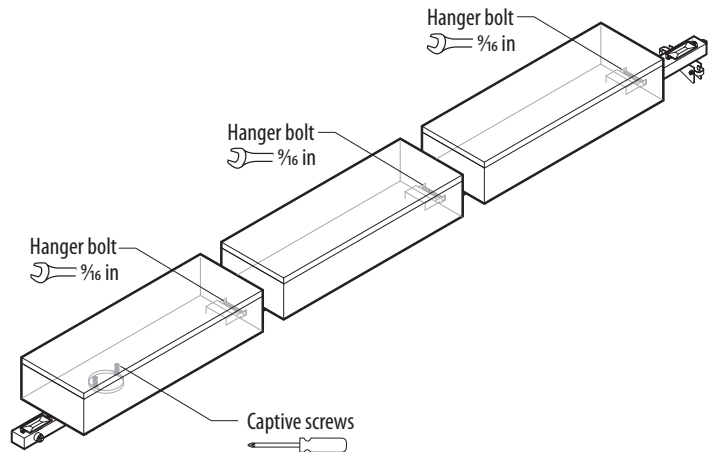
Electrical components enclosure may weigh up to 65 lb (30 kg). Lift carefully with two people to avoid injury.

1

Mount bottom enclosure on tube. Align wire access hole with hub. Tighten captive screw using Phillips-head screwdriver. Tighten hanger bolt with $\frac{5}{16}$ in wrench.

2

Mount middle and/or top enclosures. Align access hole with hub and slide box onto hanger bracket. Tighten hanger bolt with $\frac{5}{16}$ in wrench.



Electrical Components Enclosure and BallTracker® Luminaire

3 If pole includes a BallTracker® luminaire, attach bracket using $\frac{3}{4}$ in socket and torque wrench. Tighten captive bolts to 40 ft•lb (54 N•m).



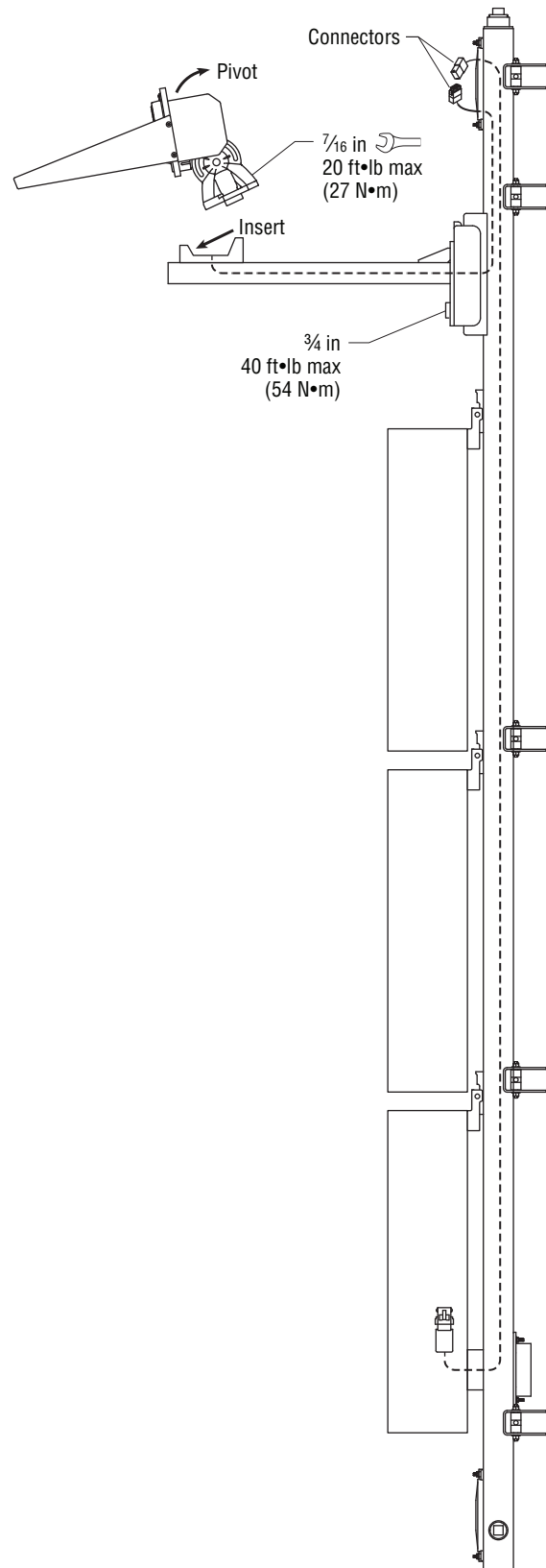
Ensure crossarm wire harness is not pinched between mating plates.

4 Attach luminaire using $\frac{7}{16}$ in wrench. Tighten captive screws until fully tight. Do not exceed 20 ft•lb (27 N•m).

5 Pull BallTracker® wire harness through tube. Feed bottom of harness into enclosure hub. Ensure protective sleeve extends through access hub and tuck harnesses behind subpanel.

6 Attach support grips at top handhole.

7 Mate quick-connectors at poletop and inside electrical components enclosure(s). Match driver/luminaire IDs.



Electrical Components Enclosure and BallTracker® Luminaire



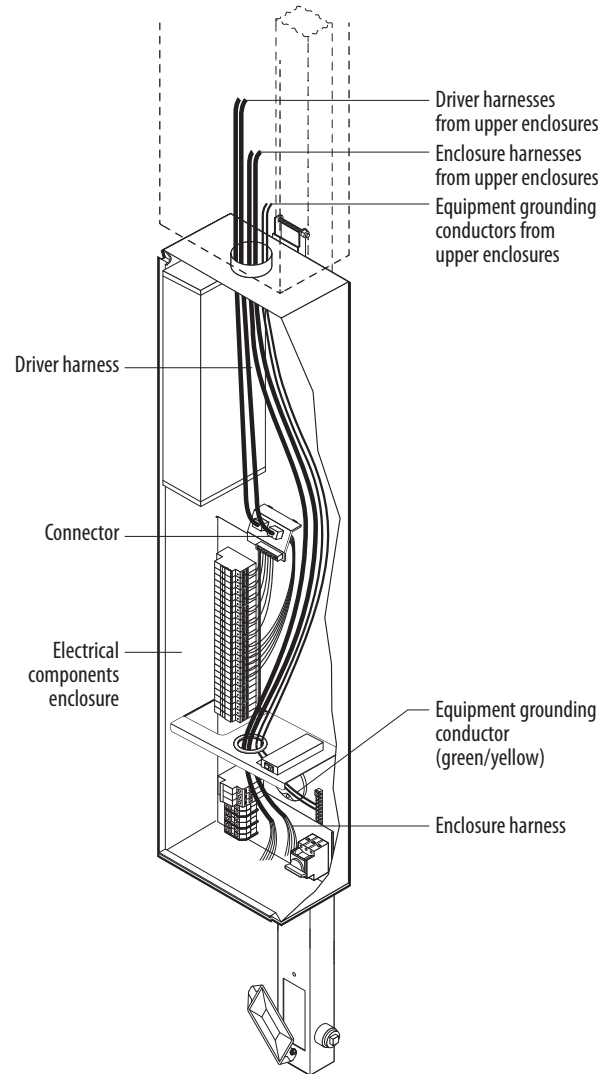
Only qualified personnel may perform wiring. Route wires as shown, but leave the final connections for your electrician.

8

Route driver harnesses from top and middle enclosures to bottom enclosure and plug into connector mounted in bracket.

9

Route equipment grounding conductor and enclosure harnesses from top and middle enclosures to bottom enclosure.



Electrical Components Enclosure and BallTracker® Luminaire



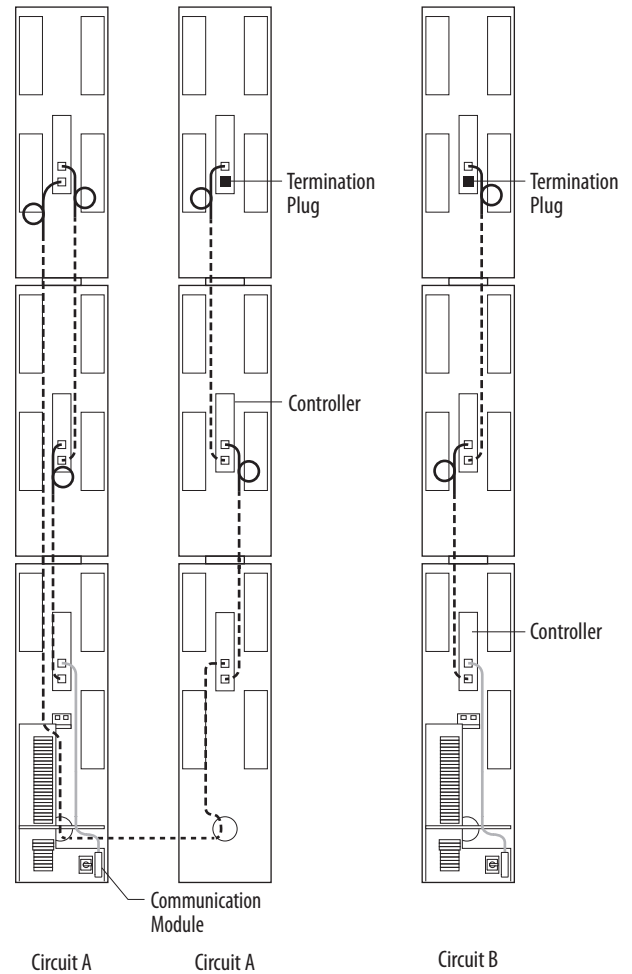
Skip Step 10–11 if controller not present

10

Pull communication cables down from top and middle boxes and plug into controller in enclosure below as shown.



Connections between stacks must be done after stacks are mounted on the pole.



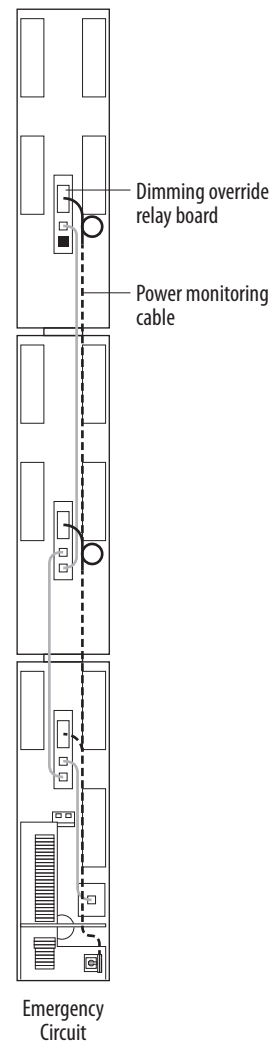
Electrical Components Enclosure and BallTracker® Luminaire



Skip Step 11 if emergency egress lighting dimming override relay board is not present.

11

Pull power monitoring cable from dimming override relay board in top and middle enclosures down to bottom enclosure and land black wire on terminal block M1 and blue/white wire on terminal block M2.



Electrical Components Enclosure and BallTracker® Luminaire

Installation Procedure



Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.

1

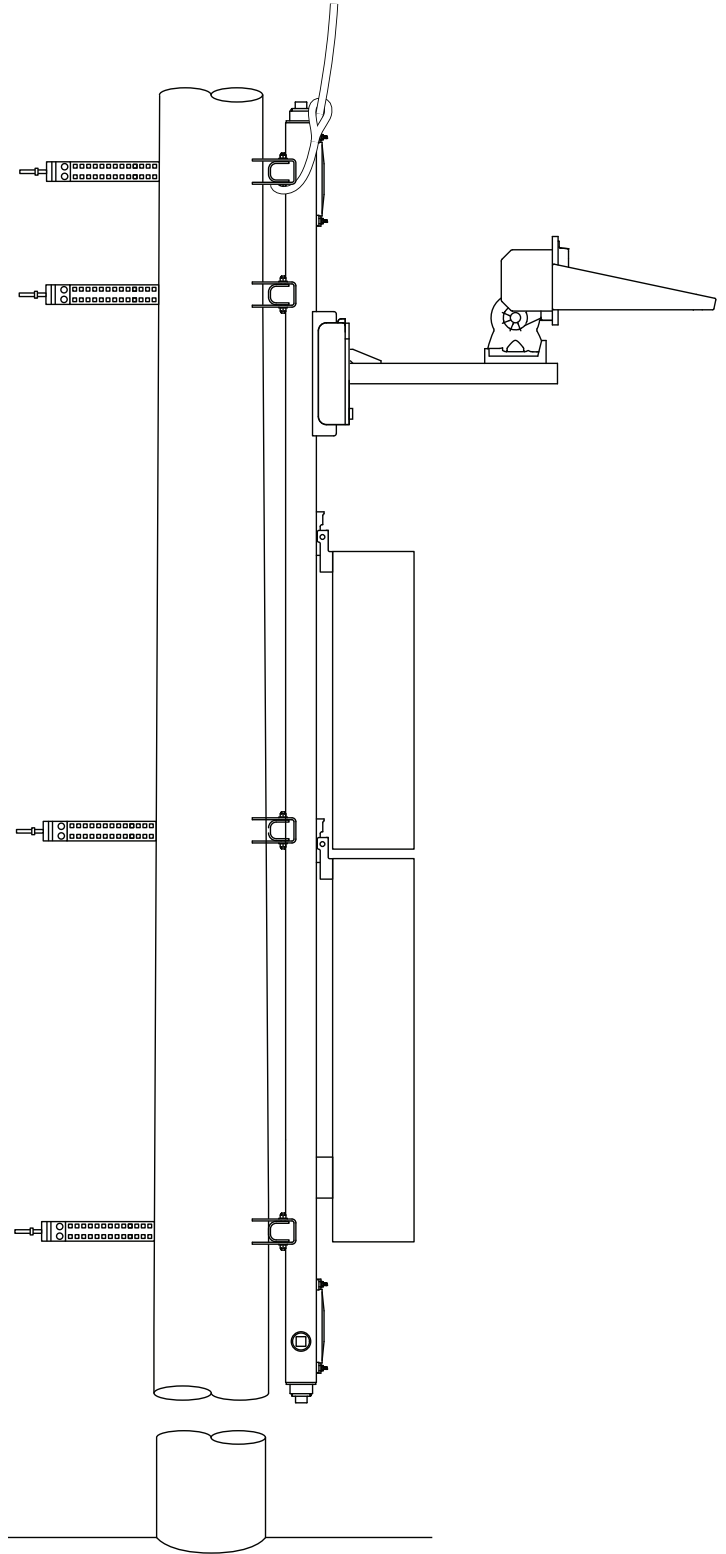
Sling enclosure stack under the welded arm for strapping connections (not under the BallTracker® luminaire crossarm) and lift enclosure stack.

2

Using the enclosure stack ID located on top of the enclosures, determine orientation of assembly. An orientation of "0" indicates the enclosures face the field. Position bottom enclosure hub at 10 ft (3m) above grade.



BallTracker® luminaires should face the field.



Electrical Components Enclosure and BallTracker® Luminaire

3 Cut straps to required length. Pull tight around pole and trim excess within 1 in (25 mm) of strap bracket. Cut across square holes, not between them.

4 Attach brackets to pole. Torque $\frac{5}{16}$ in strap bracket hardware A to 12 ft•lb (16 N•m) using $\frac{1}{2}$ in socket and torque wrench. Torque all $\frac{3}{8}$ in tensioning nuts B to 20 ft•lb (27 N•m) using $\frac{5}{16}$ in socket and torque wrench.



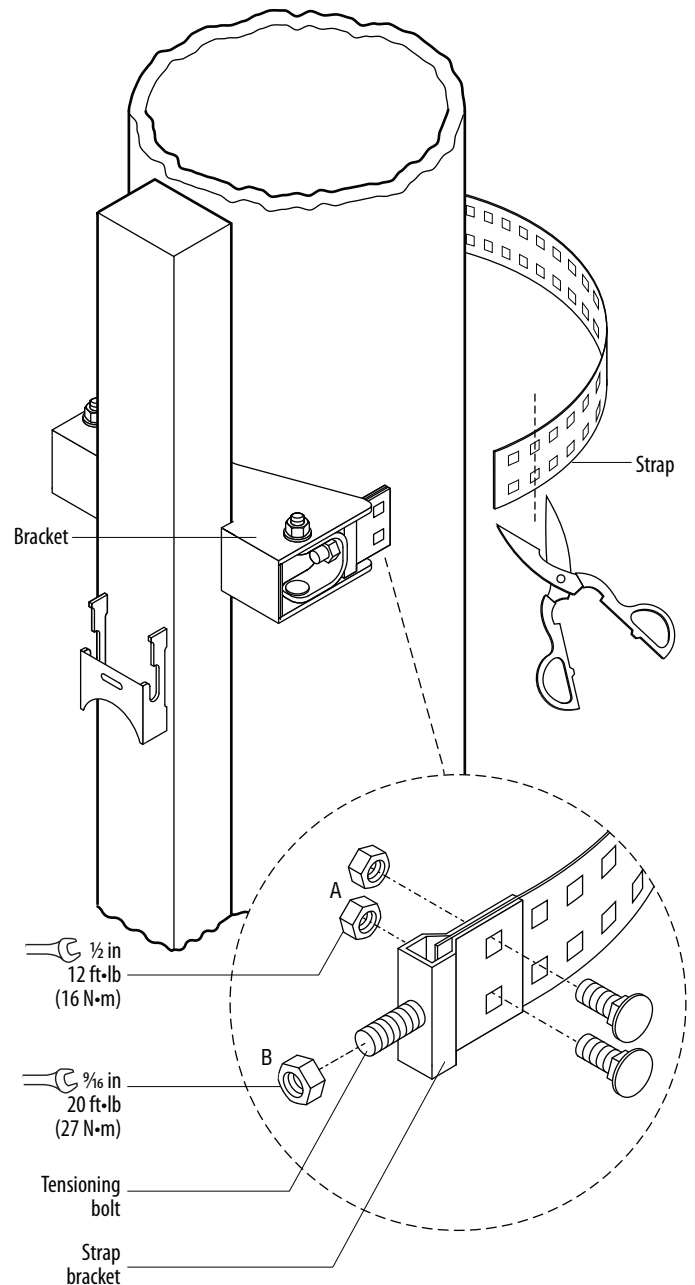
Caution

Falling equipment hazard

Ensure you meet torque values specified on all tensioning hardware.

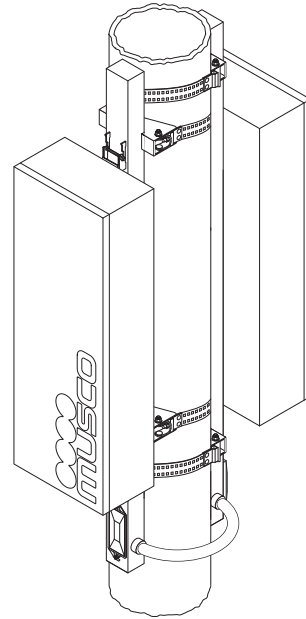


If tensioning bolt is fully seated and strap is not yet tight, trim strap at next set of holes and repeat step 4.



Electrical Components Enclosure and BallTracker® Luminaire

- 5** Repeat steps 3 and 4 for back-to-back or multiple stacks.



- 6** Use 1 1/4 in hubs provided to run flex conduit between electrical component enclosure stacks.

Electrical Components Enclosure and BallTracker® Luminaire

7

Route the conduit down the pole to the electrical components enclosure with wireless radio.

8

Cut the entry hole into side of enclosure above wireless radio.



**Caution
Equipment Damage**

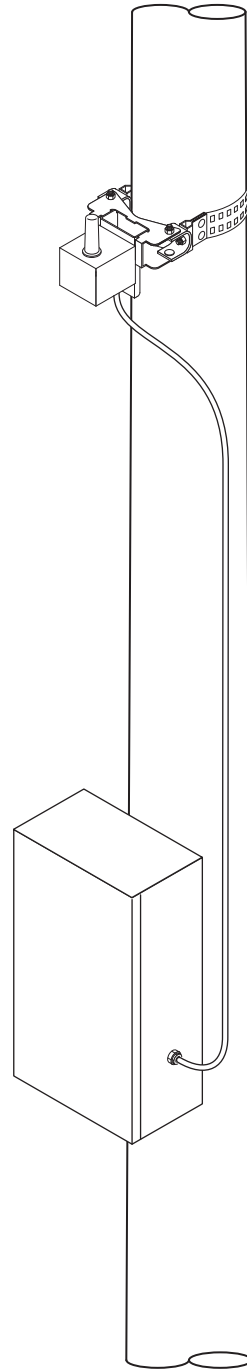
Protect equipment from metal shavings.

9

Route coaxial cable through hole and secure conduit to enclosure using provided liquid tight connector.

10

Install the coaxial cable on the wireless radio located in the electrical components enclosure.



Luminaire Attachment

Overview

The luminaire assembly conveniently allows mounting of luminaires on the pole as a unit. Luminaires are factory built and shipped in individual cartons. Luminaires are factory aimed and ready for installation to poletop luminaire assembly. Do not disassemble.

Tools/Materials Needed

Musco Supplied

- ☐ $\frac{7}{16}$ in ratcheting combination wrench

Contractor Supplied

- ☐ Torque wrench with $\frac{7}{16}$ in socket

*Note: Leave luminaires in box until ready to assemble.
Keep protective cover on luminaire until ready to attach to crossarm.
Do not leave luminaires unassembled from crossarm in wet conditions.*

Assembly Procedure

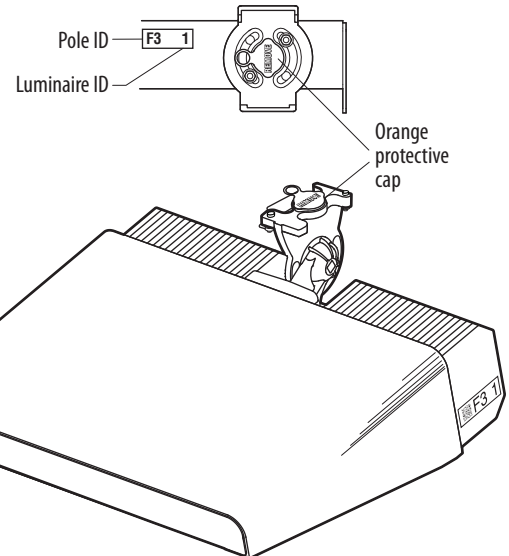


Verify pole ID on luminaire cartons matches pole and location on *Field Aiming Diagram*.

1

Remove and discard orange protective caps from luminaire knuckle and mounting plate that cover electrical connections. Do not remove orange tag around captive bolts.

Note: The luminaire style may vary from what is shown.



Luminaire Attachment

2

Match luminaire ID to crossarm and install luminaire onto mounting plate. Insert knuckle into mounting plate and pivot into position.

Note: The luminaire style may vary from what is shown.

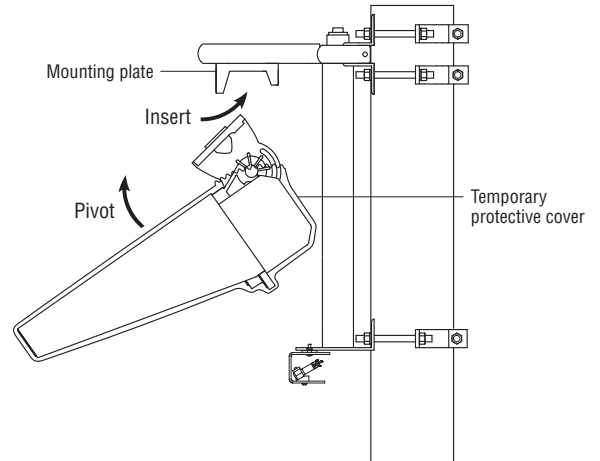
Luminaire	Weight
TLC-LED-400	40 lb (18 kg)
TLC-LED-550	25 lb (11 kg)
TLC-BT-575	34 lb (15 kg)
TLC-LED-600	40 lb (18 kg)
TLC-LED-900	40 lb (18 kg)
TLC-LED-900NB	114 lb (52 kg)
TLC-LED-1200	45 lb (20 kg)
TLC-LED-1400NB	106 lb (48 kg)
TLC-LED-1500	67 lb (30 kg)
TLC-RGB-U	20 lb (9 kg)
TLC-RGBW	40 lb (18 kg)



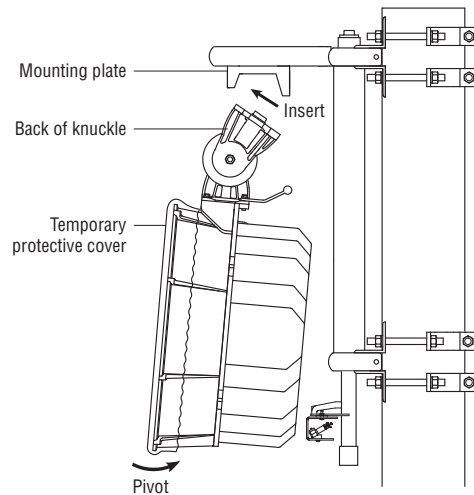
Caution

Luminaire may be heavy.

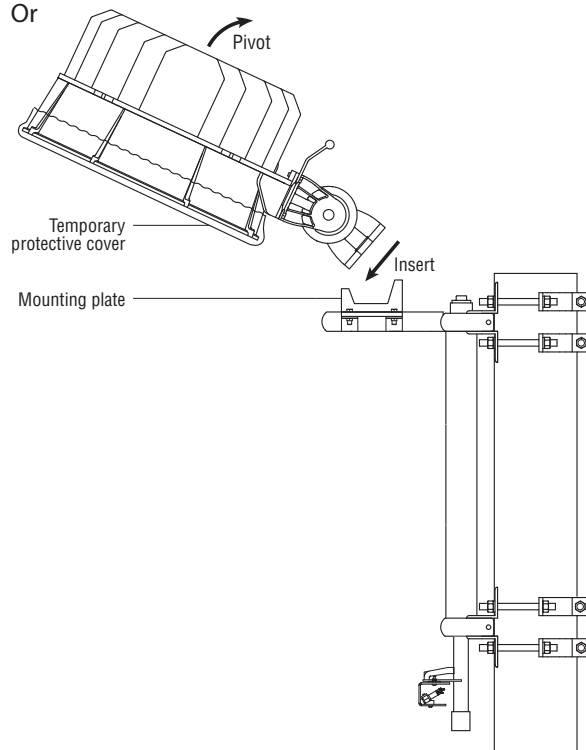
Lift carefully with two people to avoid injury.



Or



Or



Luminaire Attachment

3

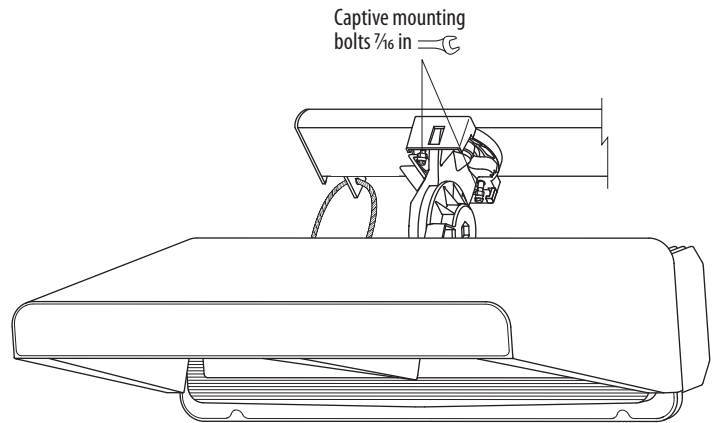
Tighten captive mounting bolts. Orange tag will break loose before all bolts are fully tight — continue tightening. Torque must not exceed 20 ft•lb (27 N•m). To avoid overtightening, use provided $\frac{7}{16}$ in combination wrench.



Warning

Luminaire may fall if bolts are not tight.

Do not remove tag before tightening bolts.

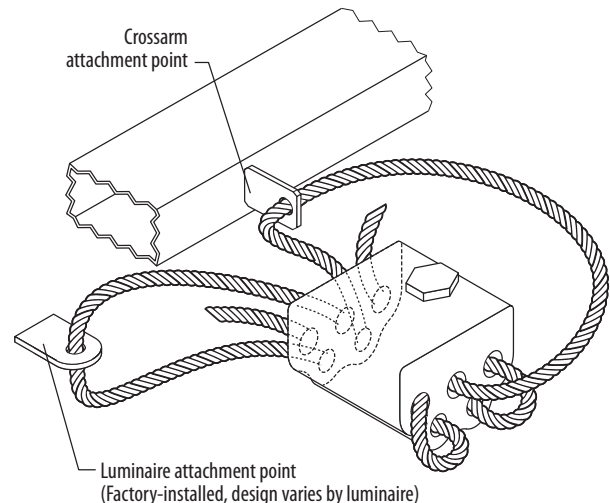


4

Attach luminaire retaining cable (if present). Route luminaire cable through crossarm anchor point, through luminaire block, and back through the block under the set screw. Luminaire attachment point will vary per luminaire design.

5

Using $\frac{7}{16}$ in socket and torque wrench, tighten cable set screw to 60 in•lb (6.8 N•m).



If pole has auxiliary equipment, refer to *Installation Instructions: Auxiliary Bracket*.

Installation Instructions: SportsCluster® Lighting System

Poletop Luminaire Assembly

Overview

All luminaires are factory aimed to their exact position on the field. To ensure proper poletop luminaire assembly alignment, a simple-to-use alignment beam completes the precision field aiming. The alignment beam is attached in the factory to one poletop luminaire assembly on each pole.

Tools/Materials Needed

Contractor Supplied

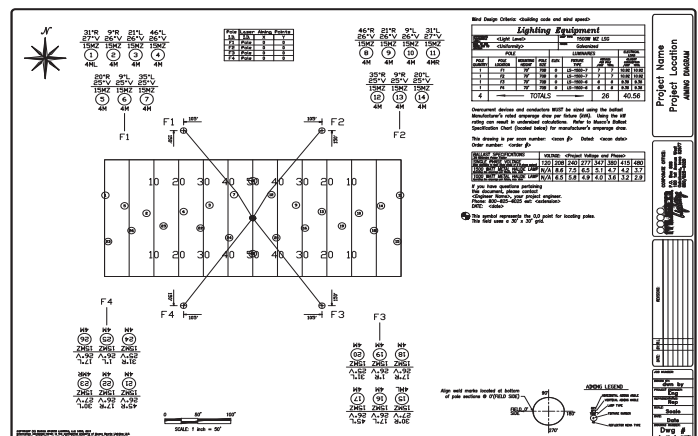
- ☐ $\frac{1}{2}$ in open-end torque wrench or torque wrench with $\frac{1}{2}$ in crows-foot
- ☐ $\frac{1}{2}$ in open-end wrench
- ☐ Chalk or flags to mark aiming points on field
- ☐ Measuring tape

Installation Procedure

- 1 Plot and mark aiming point(s) on field. Refer to *Field Aiming Diagram*.



If assembling pole on ground, ensure all pole clamping hardware is torqued to 80 ft•lb (108 N•m) using $\frac{1}{2}$ in open-end torque wrench before lifting pole (see step 5). Instead of turning luminaire assembly, turn pole to align with aiming point. Do not remove plastic wrap from luminaires until ready to lift the pole.



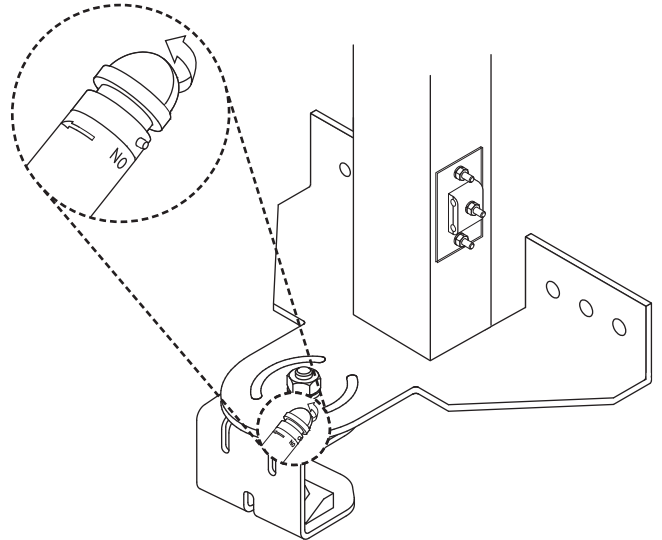
Poletop Luminaire Assembly

2

Remove plastic wrap from luminaires. Do not use knife.

3

Turn on pole alignment beam



Front side crossarms

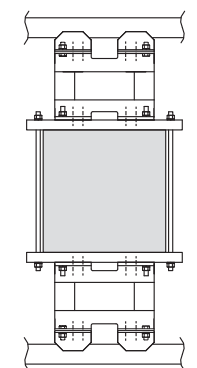
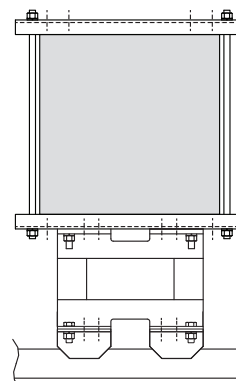
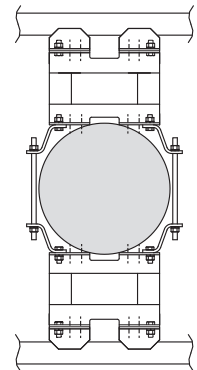
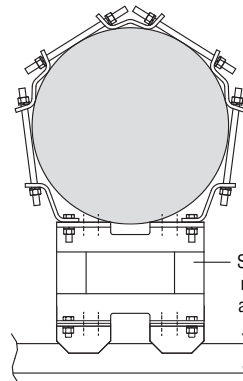
Front / Back crossarms



Mounting hardware for each poletop assembly will be packaged and labeled with the pole ID.

Hardware configuration will vary by pole size, shape, and crossarm configuration.

See example configurations for more detail.



Poletop Luminaire Assembly

4

Attach luminaire assembly to pole using provided pole clamping hardware in package labeled with the pole ID.

Hardware configuration varies with pole diameter. See sample configurations below.

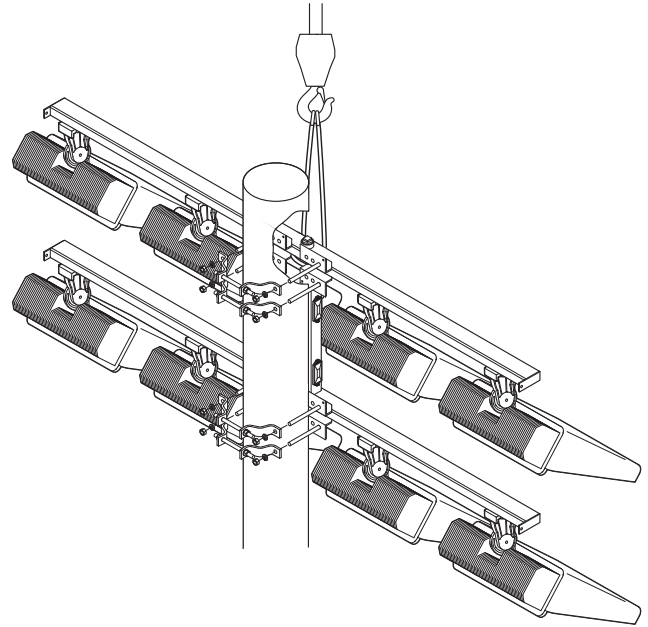
If pole is already standing, sling and lift luminaire assembly to poletop location.



Warning

Hazard of falling personnel and materials

Use separate lifting equipment for assemblers and materials. Sling luminaire assembly properly and do not release from suspension until all pole clamping hardware is installed and torqued.



Poletop Luminaire Assembly

5

Aim luminaire assembly using alignment beam. Device projects a narrow vertical beam of light that is only visible when you are aligned with it. This step requires two people.

Person A: Stand on field aiming point and look at pole alignment device. It is attached to a luminaire. Walk parallel to crossarms until you see beam. Signal person B to rotate luminaire assembly left or right until beam aligns with aiming point. Beam may be visible, however when pole is aligned, you will see a bright flash as you stand directly on aiming point.

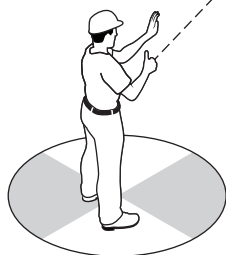
Person B: Following direction from person A, rotate luminaire assembly left or right until it is aligned.



Warning

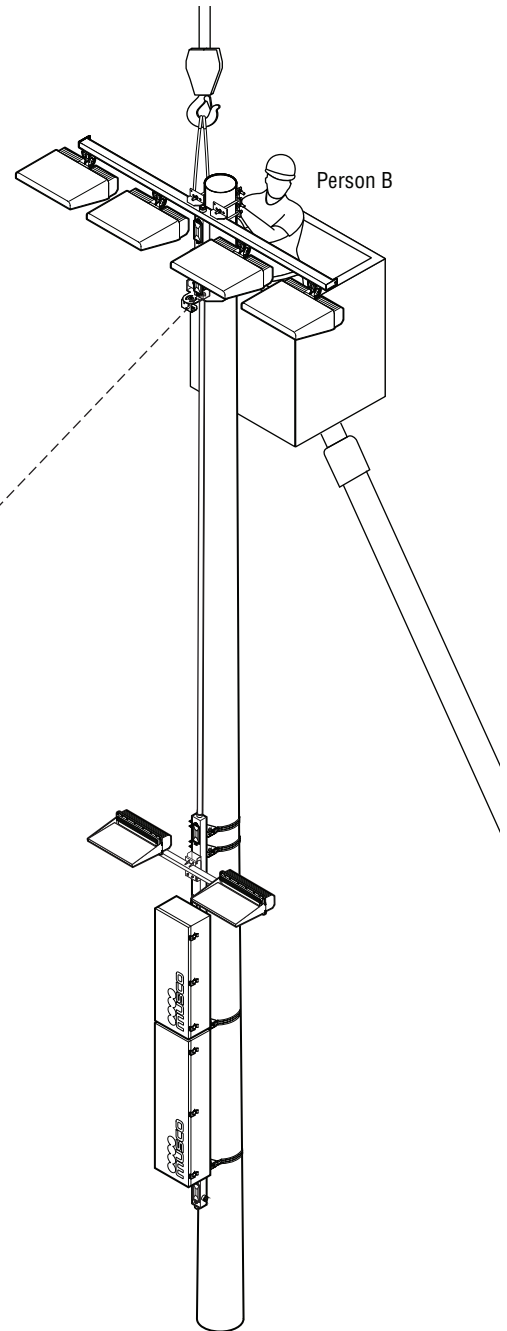
Falling material hazard

If erecting pole with luminaire assembly attached, do not attach rigging to luminaire assembly. Follow pole supplier instructions for lifting.



Aiming point

Person A



Person B



Warning

Laser radiation hazard

Pole alignment beam is safe for viewing at a distance of three feet (one meter) or more. Do not look into beam from closer than three feet (one meter). Do not use binoculars, camera, or telescope to view beam from any distance. Locator beam is a class 2M laser device. Wavelength: 635-660 nm, Laser power for classification: <1 mW continuous, divergence: <1.5 mrad x 1 rad. Using alignment beam in a manner other than as described here may result in hazardous exposure. Do not modify, dismantle, or attempt to repair.

Poletop Luminaire Assembly

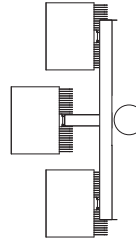
6

Tighten pole clamping hardware. Torque all nuts to 80 ft•lb (108 N•m) using $\frac{15}{16}$ in open-end torque wrench.

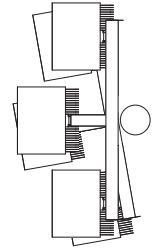


If assembling multiple poletop luminaire assemblies at same orientation ensure crossarms are aligned with crossarms above and below.

Correct

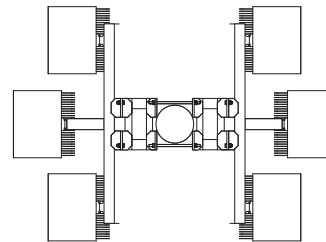


Incorrect

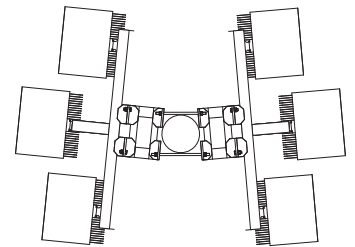


If assembling back-to-back poletop luminaire assemblies ensure crossarms are parallel.

Correct



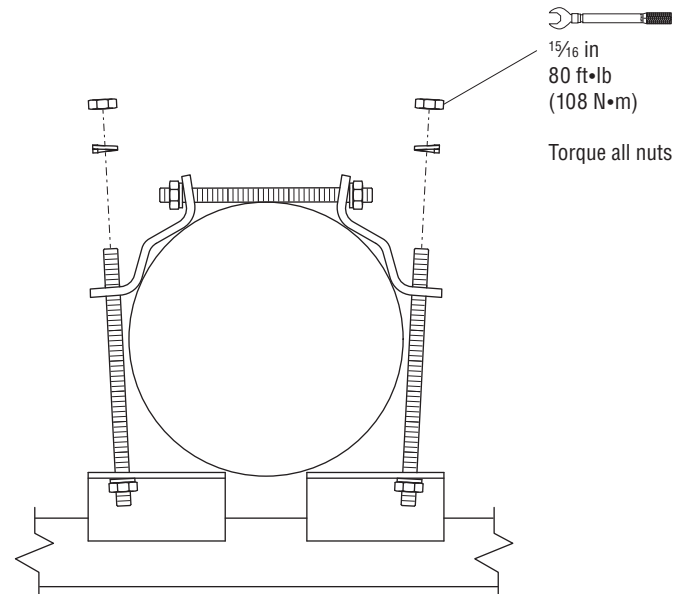
Incorrect



Ensure back-to-back crossarms remain parallel while tightening.

7

After all hardware is torqued and poletop luminaire assembly is secure, release rigging.

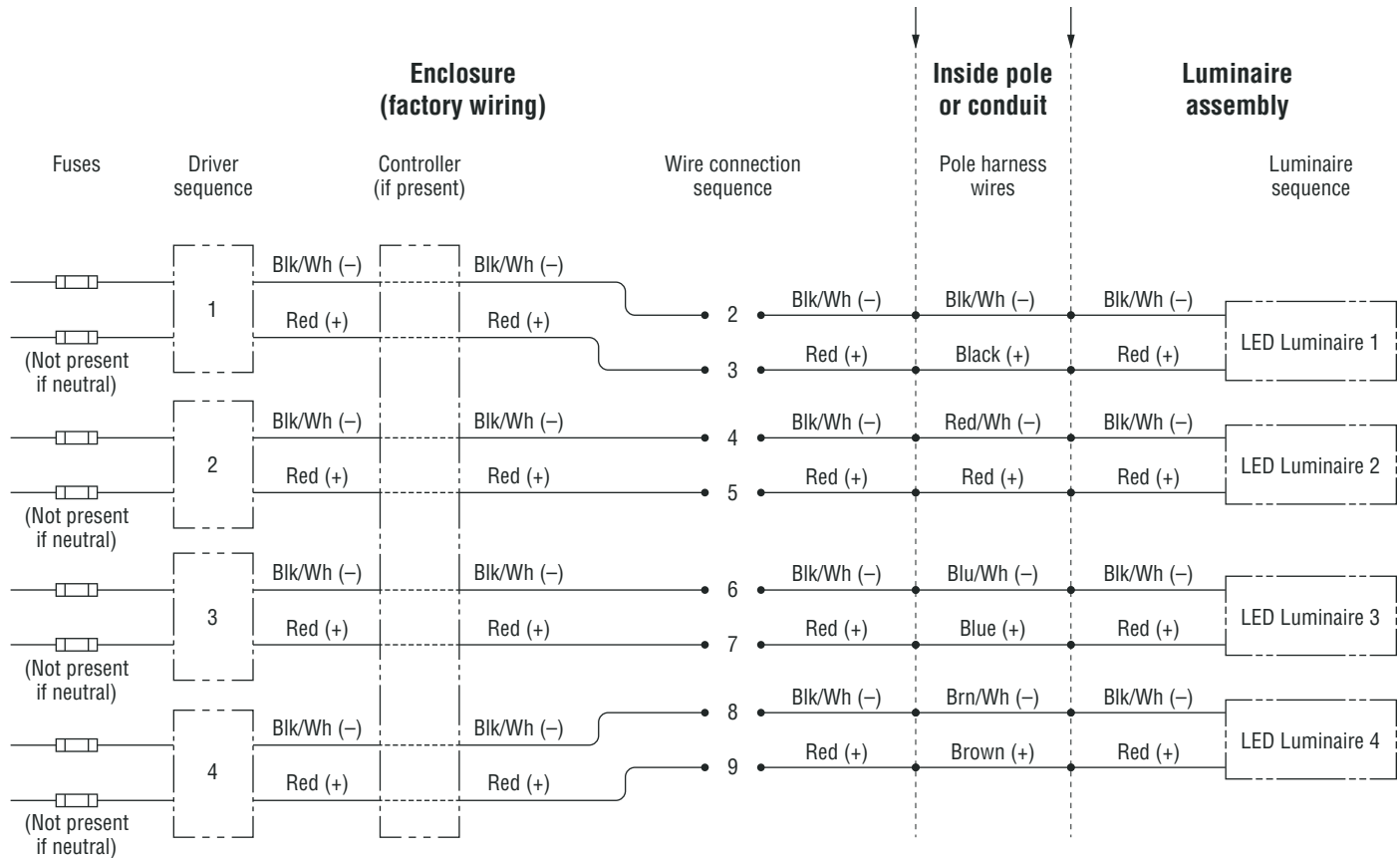


Note: Pole clamping hardware configuration varies with pole diameter and shape.

Wiring

Overview and System Diagram

A qualified electrician must install supply wiring for each lighting circuit and install harness between electrical components enclosure and crossarm assemblies. Depending on configuration, Musco may supply factory-built pole harness(es), and/or disconnect switch(es) in the electrical components enclosure. Each electrical components enclosure may contain up to four drivers. Each driver may power up to two luminaires.



Notes:

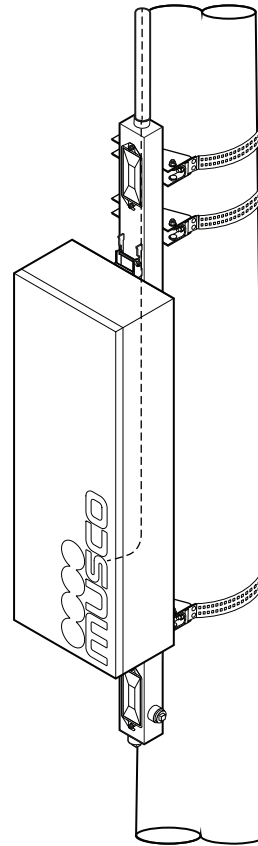
1. Pole harness wire color indicated if provided by Musco.
2. Enclosure factory wiring may be different than shown above. One pair of wires per luminaire is required in pole harness.

Wiring

Installation Procedure

1

Install conduit as needed for supply and/or luminaire wiring. Route wiring through hub in back of enclosure.



Wiring



Verify pole ID on wire harness matches pole location on *Field Aiming Diagram*.

2

Fish all pole wire harnesses between poletop and appropriate electrical components enclosure(s).

3

Attach support grips at poletop and midpole (if required due to pole height).

4

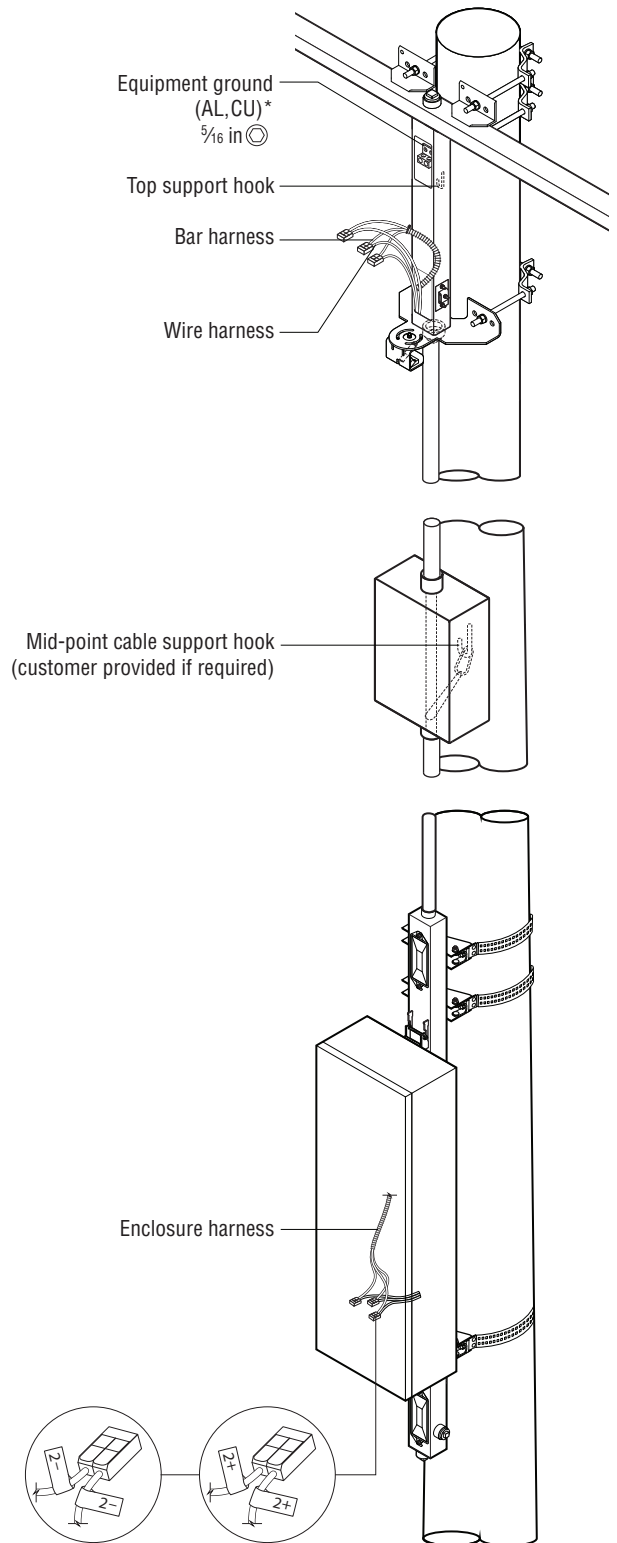
Trim wire harness to length (if required).

5

Connect pole harness at poletop and inside electrical components enclosure(s). Match luminaire ID and wire polarity per each wire label. Use the Musco-provided LEVER-NUTS® wire connectors.



Use electrical tape to ensure LEVER-NUTS® levers stay secure and don't snag on surrounding wires.



* Aluminum (AL), Copper (CU)

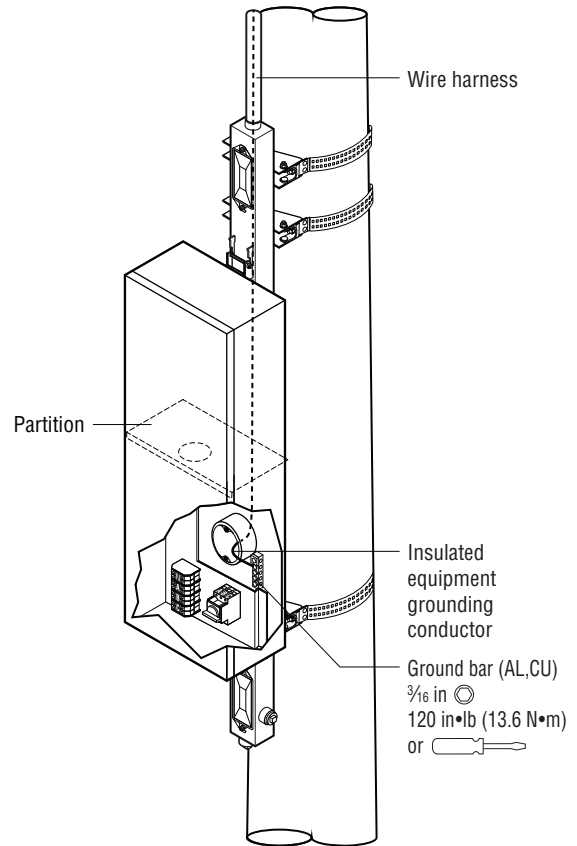
Wiring

6

Using $\frac{3}{16}$ in hex wrench, connect equipment ground wire in wire harness to ground bar inside electrical components enclosure.

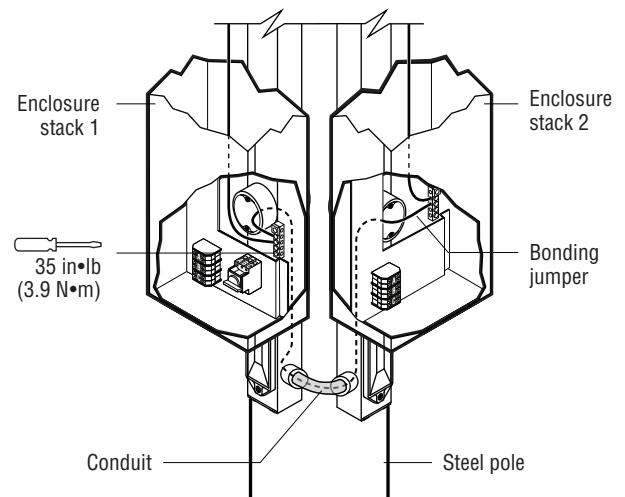


Musco *Control System Summary* or *Field Aiming Diagram* provides electrical loading information needed to size wire and switchgear. Musco provides instructions for installing Control-Link® control system or lighting contactor cabinet when these items are part of your project.



7

Connect equipment grounding conductors (green/yellow) from each upper enclosure to equipment ground bar in bottom enclosure. If pole has multiple stacks, connect bonding jumper from stack with circuit disconnect. Tighten lugs using $\frac{3}{16}$ in hex key.



Wiring

8

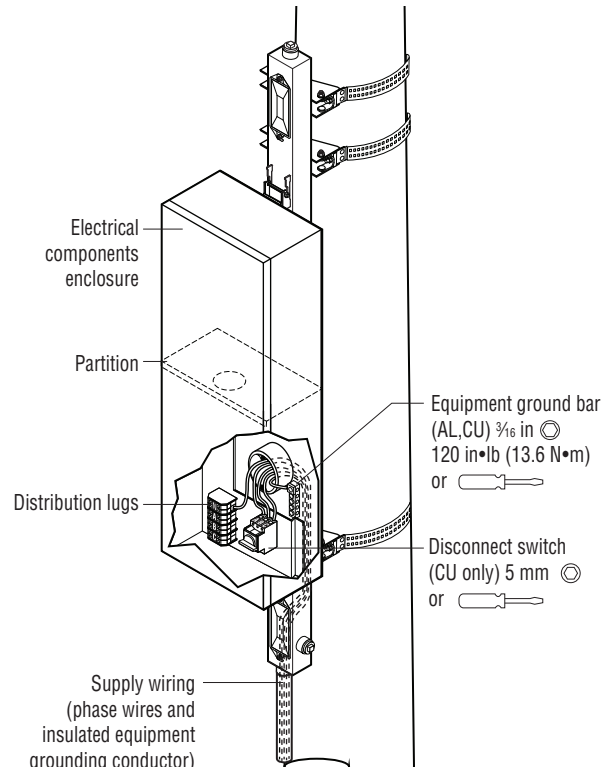
Pull supply wiring into enclosure below partition. Poles with multiple circuits have multiple disconnect switches, generally in separate enclosures.

9

Land insulated equipment grounding conductor from supply on ground bar.



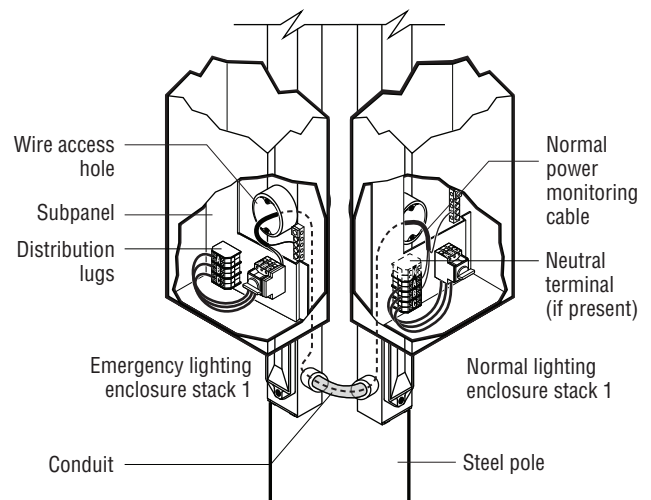
Disconnect is rated for copper wire only. Contact Musco for adaptor or use UL-listed adaptor for aluminum wire.



Skip Step 10 if no emergency lighting circuit present.

10

Route cable for normal power to adjacent enclosure stack. Connect black wire and blue/white wire to any two active terminals A, B, C, or neutral, if present, and green wire to ground bar.



Lightning Ground


Installation Procedure

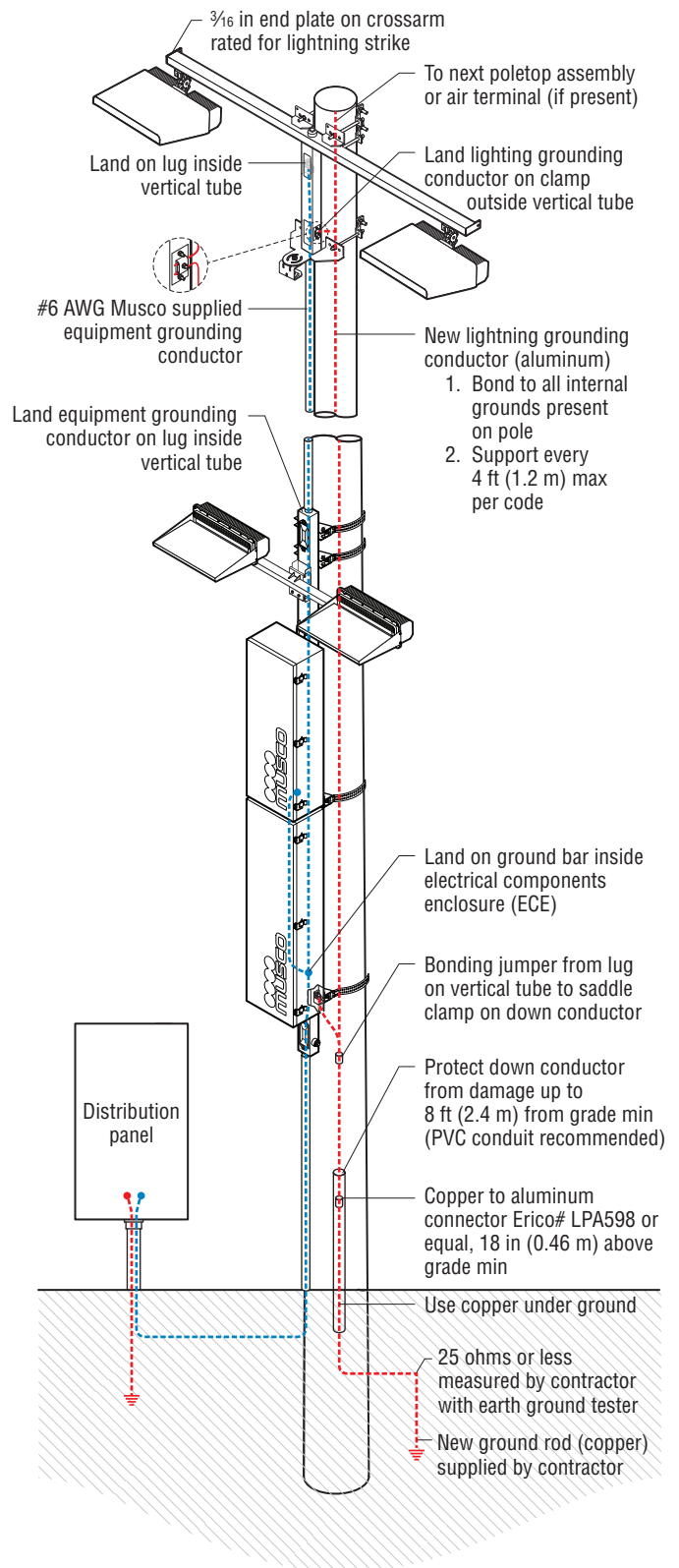
- 1** Installer needs to ensure grounding meets minimum standards required by code.
- 2** All existing poles are required to be supplied with a new lightning grounding conductor for lightning protection. See *Lightning Grounding Conductor Sizing* below.

Concrete and wood poles: full length down conductor from poletop to grounding electrode.

Steel poles: down conductor from bottom of steel to grounding electrode.
- 3** Support external grounding conductor every 4 ft (1.2 m) max.

Protect from damage 8 ft (2.4 m) from grade. PVC conduit recommended.

When routing below grade, do not allow conductor to dip below top of grounding electrode.
- 4** If concrete pole, bond existing internal ground to new ground conductor at all available locations (per code requirements.)
- 5** Ensure all components of the lighting system are bonded to **both** the lightning ground (shown in red) and the equipment grounding conductor (shown in blue). See *Bonding Jumper Sizing* below.
- 6** Excavate location near pole to depth of at least 2 ft (0.6 m). Drive grounding electrode into ground. In case of shallow bedrock or obstruction, you may drive electrode at 45° or shallower angle.
-  Use driving sleeve to prevent deforming end of electrode. Trim any deformed portion for proper exothermic fusion-welding.
- 7** Bond conductor to electrode using exothermic fusion-welding kit with ignitor and brush. Follow instructions inside kit.
- 8** Ground resistance must be 25 ohms or less and verified by a 3-point test with an earth ground tester.



Lightning Ground

Lightning Grounding Conductor Sizing

Attach to external lightning grounding lug (rated for aluminum only) or to internal lightning grounding lug (dual-rated).

Mounting Height	Bare Stranded Aluminum ¹	Bare Stranded Copper ²
Up to 75 ft (23 m)	1/0 AWG (cross-sectional area of 53.5 mm²)	2 AWG (cross-sectional area of 33.6 mm²)
Over 75 ft (23 m)	4/0 AWG (cross-sectional area of 107.2 mm²)	2/0 AWG (cross-sectional area of 67.4 mm²)

1. Copper grounding conductor required for underground connection to grounding electrode. Use properly rated AL to CU connector.
2. If using copper for lightning, supply copper to aluminum adapters for clamps (rated for aluminum only).

Bonding Jumper Sizing

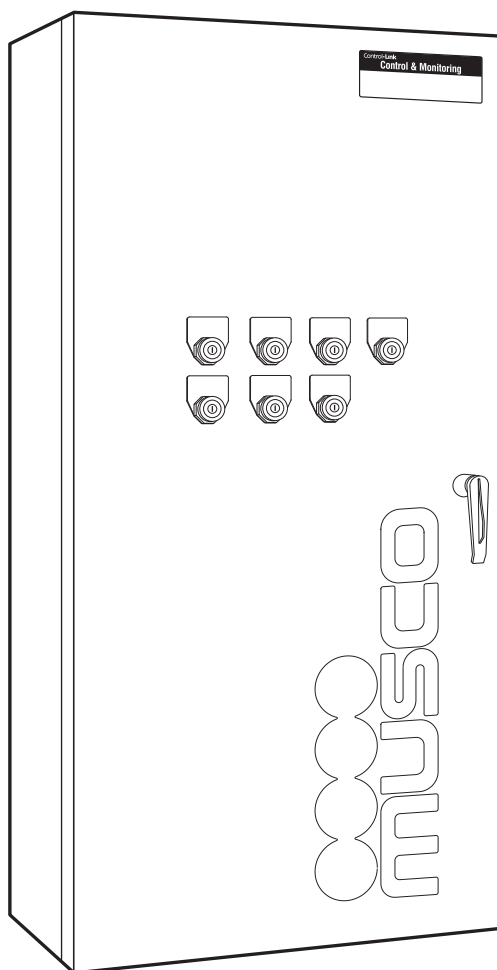
Length	Bare Aluminum	Bare Copper
< 6 ft (1.8 m)	4 AWG (cross-sectional area of 21.2 mm²)	6 AWG (cross-sectional area of 13.2 mm²)



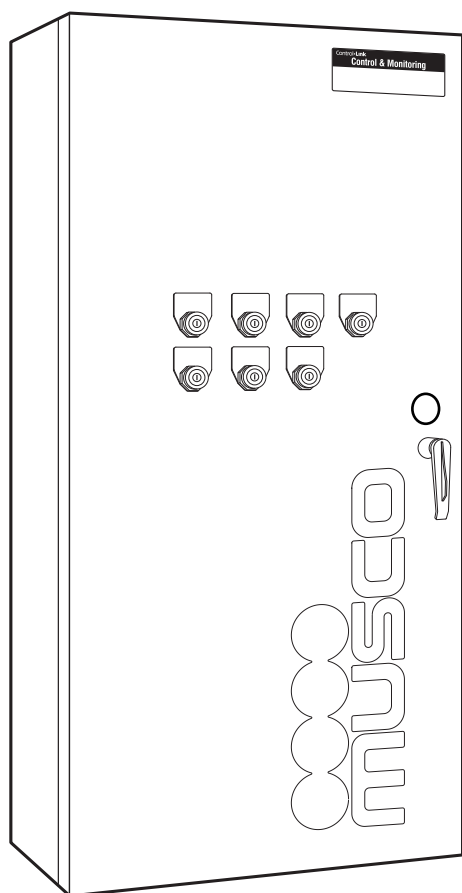
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Musco SportsCluster® product referenced or shown may be protected by one or more of the following patents. United States Patent(s): D794244, D841854, D841855, D841856, D873462, D880035, D882141, D882850, D882860, D892375, D892376, 7956556, 8300219, 8508152, 8575866, 9066401, 9781780, 10267491, 10344948, 10356886, 10378732, 10549384. Benelux Patent(s): 8754601, 8754701, 8754801, 8799001, 8799101, 8799201, 8799301, 8799401, 8799501, 8853501, 8853601. China Patents for Design 中国外观设计专利: ZL201830262493.5, ZL201830262495.4, ZL201830262588.7, ZL201930115887.2, ZL201930115888.7, ZL201930115891.9, ZL201930116074.5, ZL201930116087.2, ZL201930116089.1, ZL202030157575.0. Germany Patent(s): 4020181004500001, 4020181004510001, 4020181004520001, 4020191003430001-0004, 4020191003440001, 4020191003450001-0004, 4020191003460001-0004, 4020191003470001-0004, 4020191003480001, 4020201004190001, 4020201004210001. Republic of Korea Patent(s): 301014229, 301014230, 301014231, 301037776, 3010377830001-0004, 3010377880001-0004, 301037795, 3010377960001-0004, 3010378020001-0004, 301110351, 301110358, 301110362. United Arab Emirates Patent(s): 5678, 5679, 5680, 5984, 5985, 5986, 5987, 5988, 5989. United Kingdom Patent(s): 6032011, 6032022, 6032023, 6056943, 6056944, 6056945, 6056946, 6056947, 6056948, 6088584, 6088586, 6088587. U.S. and foreign patents pending. [Pat_059M]

Installation Instructions: **Control-Link®** Control and Monitoring System



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Electrical System Requirements	4
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Please provide locking cabinets

Training for software system is part of post commissioning process with Musco.

Before You Begin

Safety Information

Electrical Safety Guidelines

Use extreme caution near overhead power lines or underground utilities. Observe all safety precautions for high-voltage equipment. Only qualified personnel may perform wiring. Follow all applicable building and electrical codes.

General Safety Guidelines

Follow proper safety procedures during installation. Installers must wear appropriate personal protective equipment, including eye protection.

Locate all underground utilities before digging.

All tools and equipment Musco supplies are designed for a specific use as described in these instructions. Do not use them in any other manner. Do not alter structural members in any way, such as bending, welding, or drilling, without prior authorization from Musco.

About These Instructions

These instructions detail basic installation procedures for the Control-Link® control and monitoring system. They are not a comprehensive guide to all possible situations. Direct any questions to Musco at +1-800-825-6020 or +1-641-676-2309 or call your local representative.

Throughout this manual, note these important symbols:

- | | | | |
|--|--|---|---|
|  | The safety alert symbol alerts you of situations that require care and caution to avoid serious personal injury. |  | The go-to arrow tells you where to find further instructions for special situations or optional features. |
|  | The stop and check symbol signals you to stop and verify conditions before proceeding. |  | The tip symbol points out advice that makes installation easier. |
|  | The contact Musco symbol appears in special situations where you may need to call Musco for further information. |  | The recycle symbol identifies recyclable materials. |

Before You Begin

Electrical System Requirements

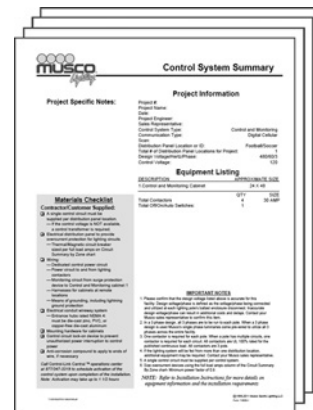
Only a qualified electrician may perform electrical work. Follow all applicable code requirements. Ensure your electrician reviews the following information before beginning installation.

- Ensure supply wiring is rated for 90 °C.
- Size circuit breakers for full load amperage draw of each circuit. Refer to cabinet interior door label for short circuit current rating information.
- A transformer may be required to supply control power. See *Control Power Consumption* table in *Control System Summary*.
- The control system requires power at all times for manual lighting control, scheduling, monitoring, and communication with Musco's Control-Link Central™ service center. Only switch off power for maintenance. Supply a breaker lock-on device.

Control System Summary

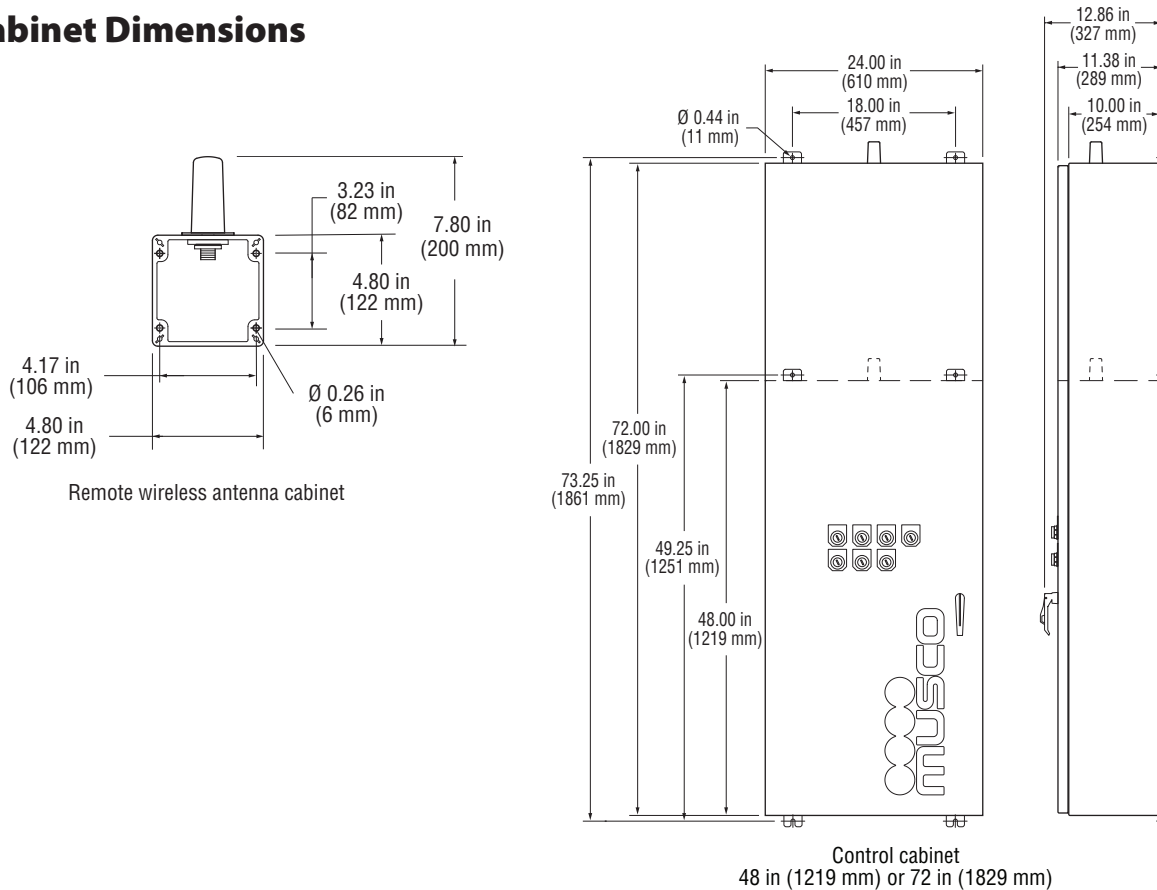
Musco supplies a *Control System Summary* for every project. This document is necessary for system design and pre-installation planning. It contains project-specific details you need for installation. Here are the contents:

- Project information
 - Project details
 - Contact information
 - References to documents such as lighting design scan
 - Voltage, frequency, and phase
 - Control voltage
- Materials checklist
 - A quick reference of everything you supply for the project
- Equipment listing
 - Cabinets
 - Contactors and sizes
 - Switches
- Important installation notes
- Control system diagram
 - Cabinet layout
 - Wire runs and conduit details
- Switching schedule
 - Fields and lighting zones
- Control power consumption
 - Control voltage and phase requirements
 - Volt-amp loading of control system
- Driver specifications
 - Luminaire current by voltage
 - Driver power factor
- Circuit summary by zone
 - Switching zone details (pole, number of luminaires, field, contactor ID, zone)
 - Full load current draw for each circuit
- Panel summary
 - Panel layout by circuit
 - Service Control module location for each circuit/contactor
- Zone schedule
 - Field/circuit grouping by zone/selector switch



Before You Begin

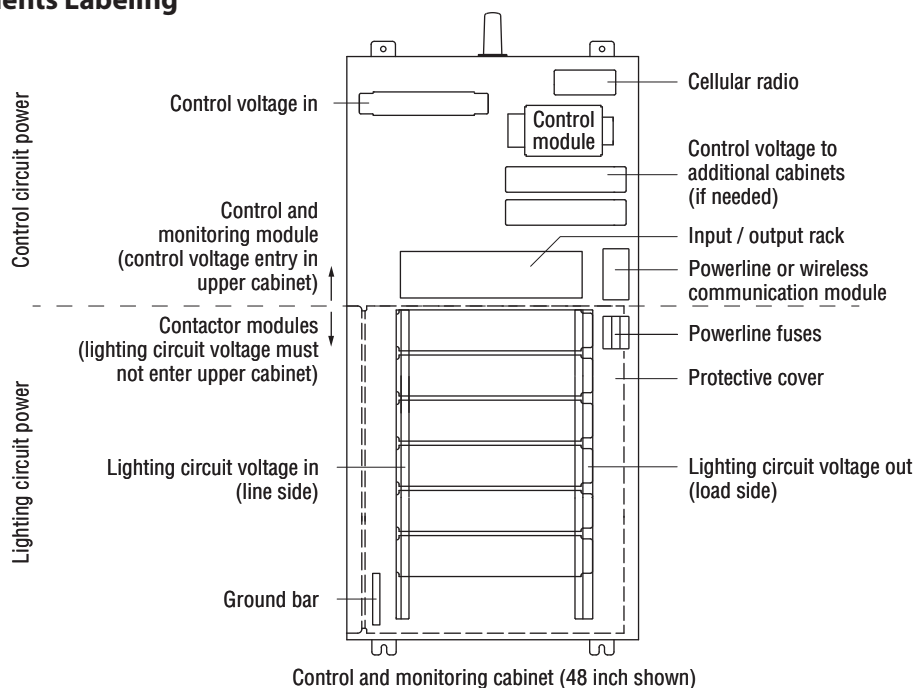
Cabinet Dimensions



Component Matching and Labeling

Musco labels all equipment to make installation easy. Components, cabinets, wiring, and connectors are all clearly marked with location, function, or any information needed for proper installation.

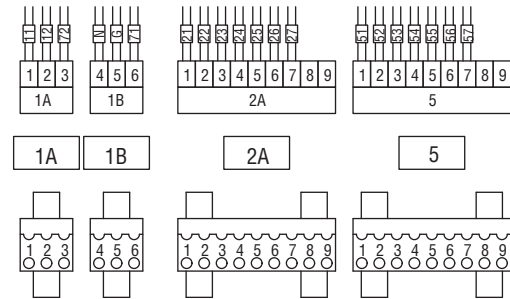
Electrical Components Labeling



Before You Begin

Wire and Connector Labeling

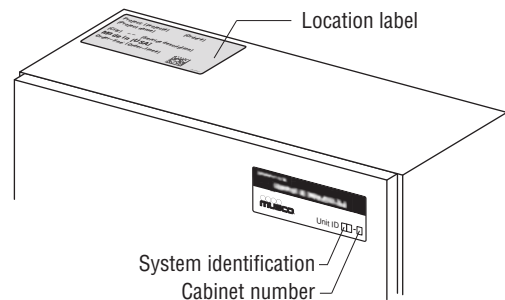
All cabinets are factory wired. Musco provides plug-in connectors to run harnesses between cabinets. The connectors are clearly labeled for easy installation.



Cabinet Labeling

Each enclosure is custom fabricated for a specific location in your facility. To ensure installation at the correct location, the top of each cabinet is labeled with the facility name and electrical service.

A label in the upper right corner of the door identifies each cabinet. This label gives the control module ID and cabinet sequence. For example: 01-1 (first control module, first cabinet), 01-2 (first control module, second cabinet). See *Control System Summary* for a complete list of all supplied equipment.



Installation Instructions: **Control-Link®** Control and Monitoring System

Installation Procedure



Warning Shock hazard

Disconnect power from distribution panel before opening. Take measures to ensure power remains disconnected until all installation steps are completed.



Installation steps vary by control system configuration. Consult your *Control System Summary* to determine your configuration before continuing.



Refer to *Control System Summary* for specific conduit runs and wire sizing needed in your project.

1

Mount cabinets in desired locations.

Note: If you are installing optional manual switches cabinet, you may locate it up to 300 ft away (75 m with 2.5 mm² wire) but not farther.

2

Cut entryways. Run conduit and wireway as needed for all cabinets and lighting circuits. Open protective cover over contactors using 8 mm hex key.

3

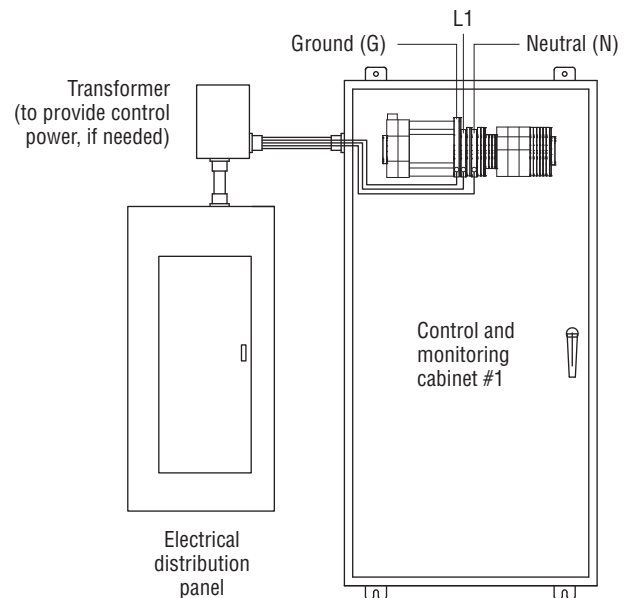
Install dedicated 20 amp circuit breaker in distribution panel to supply control circuit power. Install transformer if needed. See *Control System Summary* for information on breaker and transformer sizing.

4

Install lock-on device to control power circuit breaker. Apply provided label *Leave Breaker On Unless Performing Maintenance* to panel beside breaker.

5

Run control circuit power wires to contactor control cabinet. Land on terminals provided (L1, N, G).



Installation Procedure

- 6** Connect factory-supplied control harnesses as needed between cabinets. Route wires through conduit and plug connectors into matching sockets as labeled.

Note: Musco supplies control harnesses in standard lengths of 8 ft (2.4 m). If needed, disconnect and rebuild with longer wire: 12 AWG (4 mm²). The table gives wire and connector identification for reference.

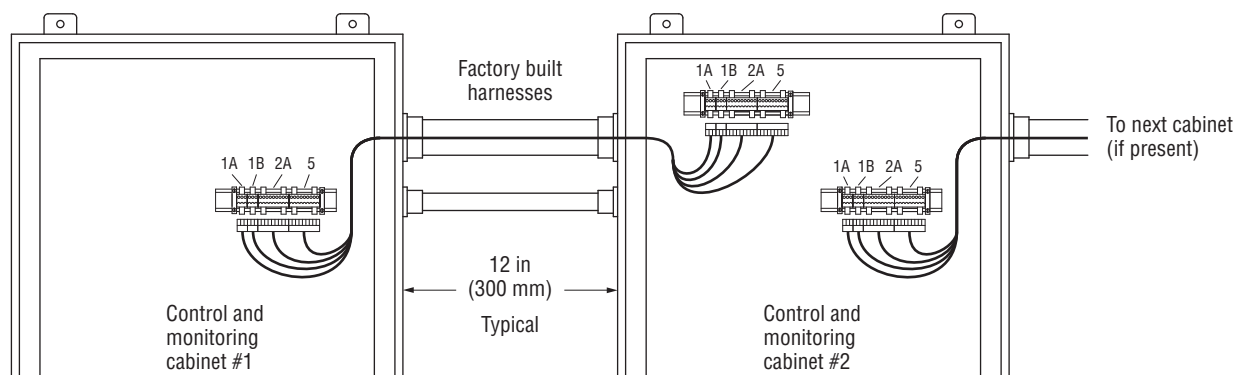
Control Harnesses

Harness series	Wire #	Wire color	Function	Cabinet to cabinet
1A	11	Black	Control power to switches 1 – 4	Connector 1A, pos. 1
1A	12	Red	Control power to switches 5 – 8	Connector 1A, pos. 2
1A	72	Brown	Filtered control power	Connector 1A, pos. 3
1B	N	White	Neutral	Connector 1B, pos. 4
1B	G	Green	Ground	Connector 1B, pos. 5
1B	71	Blue/white	Filtered neutral	Connector 1B, pos. 6
2A	21-24	Black	Switched power to contactor coil	Connector 2A, pos. 1-7
	25-27	Red		
5	51-57	Orange	Contactor status feedback	Connector 5, pos. 1-7



Important: If combined length of all harnesses exceeds 30 ft (9 m), then subsequent cabinets need additional surge protection. Contact Musco for assistance.

Example: Cabinet 1 to 2 is 20 ft (6 m), cabinet 2 to 3 is 20 ft (6 m), total harness length is 40 ft (12 m). Cabinet 3 needs additional surge protection device.



Installation Procedure

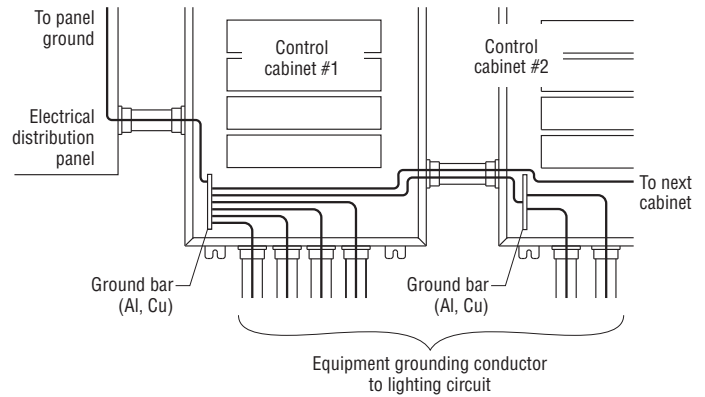
- 7** For best powerline communication signal, connect lighting circuit equipment grounding conductors in the following configuration:

Connect lighting circuit equipment grounding conductors to ground bar in associated control cabinet.

Connect secondary cabinet ground bars to primary cabinet ground bar using 4 AWG (25 mm²) insulated copper ground wires.

Connect primary cabinet (with powerline communication module) ground bar to service ground bar using a 4 AWG (25 mm²) insulated copper ground wire.

See table *Ground Bar Wire Range and Torque* for torque requirements.

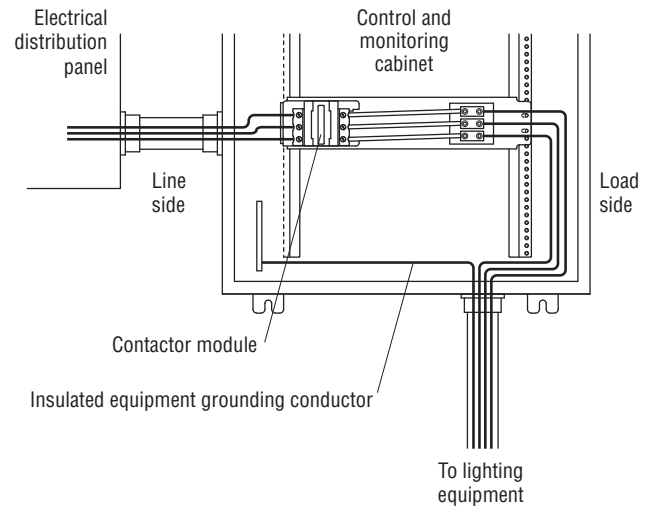


Ground Bar Wire Range and Torque

Wire range	Torque
6 – 4 AWG (16 – 25 mm ²)	35 in-lb (4.0 N-m)
14 – 10 AWG (2.5 – 10 mm ²) 2 wire	25 in-lb (2.8 N-m)
14 – 10 AWG (2.5 – 10 mm ²) 1 wire	20 in-lb (2.3 N-m)

- 8** Connect lighting circuits to load side of contactor modules. See table *Contactor Module Wire Range and Torque* for torque requirements.

- 9** Connect power from electrical distribution panel to lighting contactor modules. See table *Contactor Module Wire Range and Torque* for torque requirements. Close and secure protective cover.





Contactor Module Wire Range and Torque

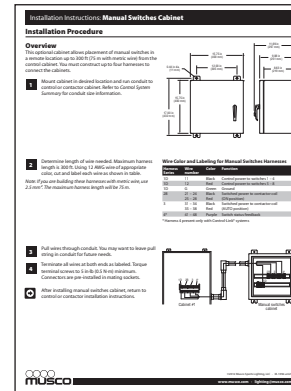
Contactor rating	Line side	Torque	Load side	Torque
	Wire size range* Rated Cu only		Wire size range** Rated Al, Cu	
30 amp [LC1D40]	10 – 3 AWG (6 – 25 mm ²)	45 in-lb (5 N-m)	14 – 10 AWG (2.5 – 6 mm ²)	35 in-lb (4 N-m)
			8 AWG (10 mm ²)	40 in-lb (4.5 N-m)
			6 – 2/0 AWG (16 – 50 mm ²)	120 in-lb (13.5 N-m)
60 amp [LC1D80]	10 – 2 AWG (6 – 25 mm ²)	100 in-lb (11 N-m)	14 – 10 AWG (2.5 – 6 mm ²)	35 in-lb (4 N-m)
			8 AWG (10 mm ²)	40 in-lb (4.5 N-m)
			6 – 2/0 AWG (16 – 50 mm ²)	120 in-lb (13.5 N-m)
100 amp [LC1D115]	14 – 2/0 AWG (2.5 – 50 mm ²)	100 in-lb (11 N-m)	6 AWG – 350 MCM (16 – 150 mm ²)	275 in-lb (31 N-m)
			6 AWG – 350 MCM (16 – 150 mm ²)	375 in-lb (42 N-m)
			Neutral block only	


* Stranded cable, single conductor, copper only.

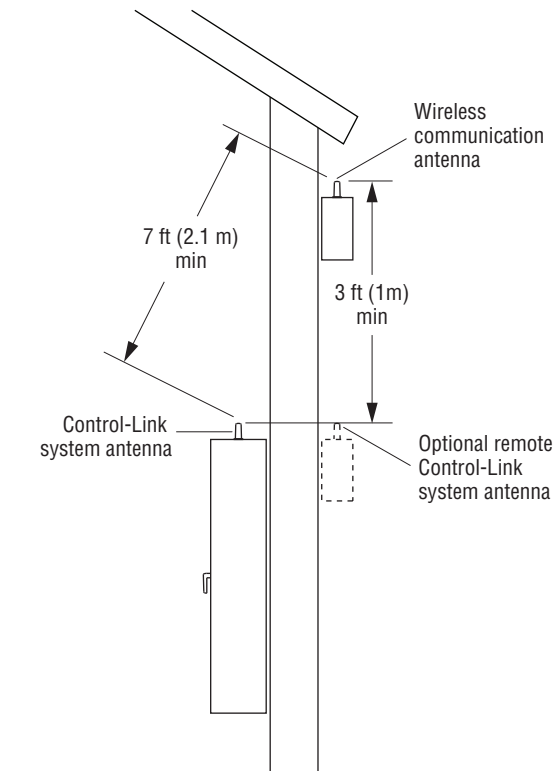
** Stranded cable, single conductor, copper or aluminum.

Installation Procedure

-  If your project includes optional manual switches cabinet, follow provided instructions for installation, then proceed to step 10.
-  If your project utilizes powerline communication, skip to step 11.



- 10** Mount wireless communication antenna cabinet in desired location. Antenna must have line-of-sight to antenna mounted on light poles. To avoid interference, antenna must be at least 3 ft (0.91 m) above control and monitoring cabinet and a minimum of 7 ft (2.1 m) away, total distance.
-  If Control-Link® system antenna is remote mounted, adjust wireless communication antenna location to maintain minimum distances.



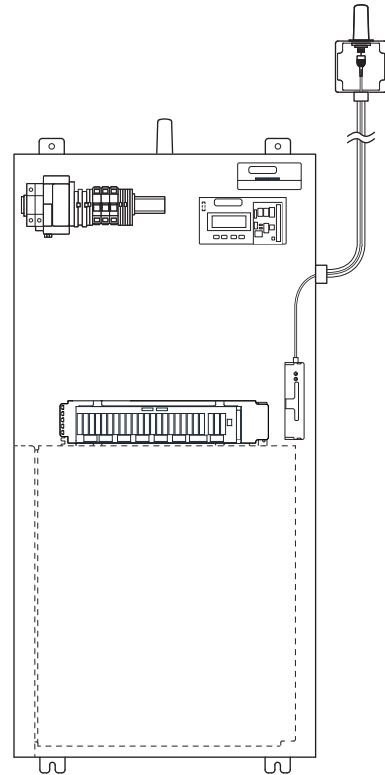
Installation Procedure

11 Cut entryways. Run conduit and wireway as needed.

12 Pull and install supplied coax cable on remote antenna to wireless radio in control and monitoring cabinet.



Do not coil excess coax cable inside cabinet as this can cause signal interference.



13 After all circuits are completed, test entire lighting system.

- Turn off all manual switches.
- Turn on control system power.
- Turn on manual switches to test each circuit.
- Verify contactor pulls in and lights illuminate.



Call Musco Control-Link Central™ service center at +1-877-347-3319 or +1-641-676-2309 two weeks prior to anticipated project completion to schedule commissioning time.

14 Commission the lighting system. Set all manual switches to auto position and call Musco Control-Link Central service center at the scheduled date and time.

Commissioning is the process required to bring the remote control system on-line. It takes approximately one to two hours. The electrical installer must be present for assistance and trouble-shooting. During this process, the service center operator:

- Establishes communication
- Remotely switches each circuit and checks status
- Verifies with you each circuit is operating as expected
- Operates all circuits and luminaires approximately 3 minutes to establish baseline readings for system monitoring



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United States Patents: 7209958, 7778635, 9026104. [Pat_040B] Control-Link® is a registered trademark of Musco Corporation in the US. Control-Link Central™ is a trademark of Musco Corporation.



Project Safety Plan 2022

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I. Project Safety Program

I.1 Overview

This Project Safety Plan establishes policies and procedures for the prevention of injury, occupational illness, and property damage at the project site. The goal is to provide a healthy and safe working environment for everyone as well as to protect the site and the environment to the best of our ability. There is never an acceptable reason for compromising safety, and it is *The Albert M. Higley Co.*'s intent to commit itself each day to maintaining an accident-free workplace.

It is *The Albert M. Higley Co.*'s policy, and indeed one of our core values, to provide a safe place to work at all times and to conduct every operation in a manner as to provide protection for property and for each individual who might come into contact with these operations. We expect everyone employed on the project to conduct his or her work in a safe manner and in compliance with this Safety Plan. By contract, every Subcontractor on this site is obligated to perform all work in a safe manner and obligated to conform to the requirements of the Federal Occupational Safety and Health Act of 1970, as amended, and all Federal, State, Municipal and local laws and regulations. If a conflict occurs between this Safety Plan and any Federal, State, Municipal and local laws and regulations, the most stringent requirement shall prevail. This document is referenced in all contracts, and, therefore, is contractually binding in its entirety. It is not intended to be all inclusive, but rather, just to highlight several of the safety challenges that are seen most in our line of work.

I.2 Policy Statement

All persons who come onto the site for any reason during construction will be required to comply with the established safety regulations that govern the project.

Subcontractors must commit by contract to observe and comply with all applicable safety regulations and procedures. Each Subcontractor and their subcontractors will participate in the Project Safety Program, hereafter referred to as the "Program".

If *The Albert M. Higley Co.* finds Subcontractor areas of work or individuals being, or acting in noncompliance with the Occupational Safety and Health Act of 1970 (OSHA), as amended, or any other applicable regulations, it shall have the authority to order immediate correction and cessation of the non-compliant occurrence. Non-compliance with Project Safety Plan or any Law or Regulations will be grounds for Subcontractor dismissal and/or forbidding employee(s) access to the project site. All costs of correction and catch up of schedule shall be borne by the Subcontractor deemed responsible.

I.3 Higley Safety Requirements Beyond OSHA

I.3.1 Requirements

- Scaffolding- Fall protection required at or above 6'
- Steel Erection- Fall protection required at or above 6'
- Assembly/Disassembly of cranes – Fall protection required at or above 6'
- Scissor Lift - Body harness with self-retracting lanyard required while elevated at or above 6'
- Scissor Lift – Scissor lifts without manufacturer equipped anchor points will not be permitted
- All body harnesses must be equipped, and worker trained to use suspension trauma safety straps
- All self-retracting lanyards or horizontal lifelines used on or near a leading edge must be ANSI Leading Edge (LE) rated
- No use of 6' shock-absorbing lanyard at any elevation below 18 ½' and never in any MEWPs
- Safety Monitor- No use of safety monitor in lieu of fall protection permitted without specific approval from AM Higley safety team personnel and documented in the Safety Plan
- Controlled Decking/Access Zone/Rope Grab - No use of controlled decking/access zones or rope grabs without specific approval from AM Higley safety team personnel and documented in the 3SP/Safety Management Plan
- The Onsite Safety Coordinator must have an OSHA 30 card that was issued no more than 5 years ago, or an OSHA 8 hr. refresher course (Cleveland Area only) issued by an authorized Safety Forum trainer within the past 3 years, and a First Aid/CPR certification no more than 2 years old
- The Competent Person shall have documented training for each area named as competent from a qualified person and this documentation shall be included in the Safety Plan submittal: Trench Excavation, Confined Space, Silica, Fall Protection, and Scaffolding are non-negotiable, and others may apply as scope of work dictates.

- All excavations that come within 36" of an underground utility shall have hydro vacuuming potholing to exactly identify the location and depth of the buried utility prior to proceeding with powered equipment or machinery. Hydro vacuuming is to be conducted every 50 linear ft or where other utilities could be reasonably expected.
- All subcontractors entering into a contract with AMHigley shall ensure that all workers entering onto the project site shall be equipped with a new style helmet that is in compliance with EN 12492 or ANSI Type 2 specifications. All workers shall keep chinstrap secured at all times. Contractor shall submit documentation as a part of their safety management plan on which make and model(s) their company has and the plan for implementation if not fully fielded to workers at the time of mobilization.

I.3.2 Safety Plan Approval

- All subcontractors shall submit and make requested edits to obtain an approved Safety Management Plan, previously called the 3SP/Safety Management Plan, prior to starting work and subcontractor shall not be paid for work without achieving this requirement. This plan shall be submitted for review no later than **15 days prior** to mobilization. Approval is required prior to mobilization.

I.4 Onsite Safety Coordinator

I.4.1 Requirements

The Subcontractor shall designate an Onsite Safety Coordinator for this project not less than **15 days prior** to the Subcontractor starting work at the project and be named in the safety plan.

The Albert M. Higley Co. reserves the right to disallow a contracted or hired safety professional from entering the jobsite.

I.4.2 Qualifications

The recommended candidate shall, at a minimum:

- Achieve an OSHA 30-hour construction hazard recognition certification within the past five years, or have attended an OSHA 8 hour refresher course (Cleveland Only) which was provided by an authorized safety forum instructor
- Be experienced and certified as a competent person in the type of work being performed, and who possesses certification by a qualified person for each area deemed as a competent person

- Achieve First Aid and CPR certification within the past two years

I.4.3 Consideration

Subcontractors shall anticipate that the safety aspects of this Onsite Safety Coordinator position will encompass several hours of the workweek and may occasionally require full-time attention. For this reason, Subcontractors should consider the ability of a superintendent or foreman to meet the responsibilities of both positions simultaneously. The person fulfilling this position shall be present on the job site at all times when employees from their company are present, for the duration of the project. In the event a subcontractor has 30 or more employees on the jobsite, the subcontractor shall have a dedicated full-time safety coordinator present in addition to the foreman/superintendent running the crew. AM Higley reserves the right to disallow certain contracted safety representatives on projects. The subcontractor is required to get approval of 3rd party safety representatives or consultants from an AM Higley Safety Team member.

I.4.4 Responsibilities

The selected Onsite Safety Coordinator shall be required to:

- Assure that prior to the start of any work activity, a Job Hazard Analysis is created, reviewed, and accurately reflects all work tasks, hazards, and hazard mitigation techniques for their scope of work. JHAs must be signed-off on.
- Participate in weekly safety meetings/training held between *The Albert M. Higley Co.* Superintendent and all Subcontractor safety coordinators and any other safety meetings as requested.
- Participate in accident and incident investigation involving their work and that of their Subcontractors.
- Recognize hazards and take appropriate corrective action, especially stop all hazardous work whenever imminent danger to life and health exists.
- Conduct daily site safety inspections for their work areas, document this once per week.
- As soon as possible, but no later than the end of the day, document and communicate all accident/incident/near hit events to *The Albert M. Higley Co.* Project Superintendent or Safety Manager. Prepare and submit a written accident/incident/near hit incident investigation detailing the root causes within 24 hours of the event.

- Conduct and documentation “tool box” training each week and submit subject outline with sign-in document to the AM Higley Superintendent by the end of each week.
- Upon communication of any hazard, cause to have mitigated or eliminated any hazard brought to their attention by the AM Higley representative resulting from a safety audit or other means of notification.
- After attending the AM Higley safety orientation, the Onsite Safety Coordinator shall review the safety plan submitted by their corporate office.
- All foremen must review and revise their company’s JHA after sitting through the safety orientation.
- Assure that prior to the start of any work activity every foreman reviews each task assignment and conducts and documents a Weekly Huddle (job hazard assessment) with each affected employee to assure a comprehensive understanding of the necessary safety requirements and precautions.
- Assure that Subcontractor’s employer provides appropriate personal protective equipment and enforce its use. 100% hard hat/helmet with chinstrap and safety eyewear are required.
- Assure that every Subcontractor employee receives training and provides written acknowledgements that they understand the Subcontractor’s site-specific safety plan.

1.5 Safety Management Plan

Not less than 15 days prior to starting work, the subcontractor shall submit for approval by The Albert M. Higley Co. a 3SP/Safety Management Plan, which addresses all the applicable safety elements the Subcontractor, its Subcontractors, vendors and suppliers shall implement.

- This document shall be applicable to the scope of work performed on this project.
- Submit the original document electronically to one of The Albert M. Higley Co.’s Project Engineers or safety professionals.
- This plan must be approved prior to starting work.
- Any hardcopy lists of Safety Data Sheets of 4 or more shall be tabbed and a table of contents included.
- The Subcontractor shall generate the safety plan in the following format. This format can be provided by The Albert M. Higley Co. in a MS Word document.

2022

Safety Management Plan

AKA Site Specific Safety Plan (3SP)

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Executive Summary: As our safety culture grows and additional resources become available, we adapt and evolve. The latest growth efforts focus on the available technology resources which have not always been available to the construction industry. On most of the newer projects, AMHigley will be utilizing a safety software called HammerTech. It is at no cost to the subcontractor and other than having all foremen competent on the use of and in possession of a cell capable iPad. The significant benefit is the lack of any paperwork or physical documents to fill out or turn in. All shall be accomplished electronically.

For those projects utilizing HT, the safety management plan, JHA and SDSs shall be submitted electronically on the HT website. Look for the mention of HT in your contract and if there is any doubt, ask your AMHigley PM if HT will be utilized on this project. As with all things new, there is a learning curve. However, on the initial projects where used, the benefits of HammerTech have proven to far outweigh the costs.

Thank you for your support.

**Please refer to the AM Higley Project Safety Plan (PSP)
for the specific safety requirements.**

**For Projects Using HammerTech (HT), all safety management plans,
JHAs and SDSs shall be uploaded onto the HT website no later than 15
days prior to mobilizing.**

SECTION 1: SCOPE OF WORK

1. Describe scope of work_____
2. Identify any sub-contractors_____

Note: All requirements of the 3SP/Safety Management Plan and PSP must be flowed down to your sub-contractors. The prime contractor is responsible for overseeing their performance.

SECTION 2: COMPETENT PERSON/ON-SITE SAFETY COORDINATOR

Attach necessary training certificates in Appendix B

1. Name of On-Site Safety Coordinator: _____
 - a. Attach OSHA 30 training within the past 5 years or the 8 Hour Refresher certification (Cleveland area only) within the past 3 years.
 - b. Attach 1st aid/CPR certification within the past 2 years.
2. Name of Competent Person: _____
 - a. Attach certifications for competent person for all high-risk activities.
 - b. Some examples of high-risk activities are:
 - i. Trenching & Excavating
 - ii. Exposure to an unprotected edge 6' or more off the ground
 - iii. Confined Space
 - iv. Lock out / tag out

SECTION 3: DRUG-FREE WORKPLACE

1. All workers must attend AMH Safety Orientation or complete the HammerTech (where the project is using HT) orientation with documentation of a current drug test and photo ID (See the Project Safety Plan for more information on the drug test standards). All workers without the appropriate drug test will be denied work access.
2. Please list the union hall(s) of all tradesmen, including subs:

SECTION 4: JOB HAZARD ANALYSIS

1. Please consider each task that your company will perform and identify each hazard for that task, followed by your plan to mitigate each of these hazards.
2. It is up to each contractor to fit your specific safety hazards and mitigation efforts to this JHA.
3. Please include any subcontractors work within your JHA.

4. Attach JHA at Appendix A or complete in HammerTech (where the project is using HT)

SECTION 5: EXPOSURE CONTROL PLAN

Please create and attach an Exposure Control Plan if you have **any** silica dust generating work. This can be created at plan.silica-safe.org and be sure that each of your tasks follows Table 1 or has an accompanying Exposure Assessment (air sampling).

SECTION 6: SAFETY DATA SHEETS

In accordance with OSHA 1910.1200(g)(8) The employer shall maintain in the workplace copies of the required safety data sheets for each hazardous chemical, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access and other alternatives to maintaining paper copies of the safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.)

Attach SDSs in Appendix C or complete in HammerTech (where the project is using HT).

SECTION 7 ABOVE AND BEYOND

While working for AM Higley, there are some requirements that are in addition to the OSHA minimums. Plan for success by planning to meet these requirements:

- All elevated work at or above 6' must have positive fall protection to include scaffold, steel erection, decking operations, etc.
- Work inside a scissor lift & boom lift requires a body harness, suspension trauma straps and a self-retracting lanyard.
- No rope-grabs, controlled decking zones, or controlled access zones without specific request through and approval by the AM Higley safety team.
- All self-retracting lanyards or horizontal lifelines used on or near a leading edge must be ANSI Leading Edge (LE) rated.
- All excavations that come within 36" of an underground utility, shall have hydro vacuuming potholing to exactly identify the location of the buried utility prior to proceeding with powered equipment or machinery. Hydro vacuuming is to be conducted every 50 ft or where other utilities could be reasonably expected.
- See complete list of above and beyond requirements in the Project Safety Plan
- All workers shall wear a helmet that is EN 12492 or ANSI Type 2 Certified with chin strap secured at all time while on the jobsite. If on order but not on hand yet, submit a copy of a paid invoice with the safety plan.

Appendix A Job Hazard Assessment (JHA)

Attach JHA here or upload into HammerTech (where the project is using HT).

Appendix B Competent Person and On-Site Safety Coordinator Certifications

Attach training documents here

Appendix C Safety Data Sheets

Provide a Table of Contents and attach all SDSs here to be printed off in the 3SP/Safety Management Plan binder. Upload into HammerTech (where the project is using HT).

1.6. Subcontractor Responsibilities

The Subcontractor shall ensure that each of its supervisors is aware of their responsibilities under this Safety Plan, including:

- Becoming familiar with the requirements of all accident prevention standards and safety rules pertaining to the job
- Being responsible for carrying out the procedures required by this Safety Plan
- Assuring that each employee under their supervision and subcontractors **on his/her first day on the project** completes the initial project safety orientation provided by *The Albert M. Higley Co.* and provides proof of a current drug test and photo identification to this orientation
- Explaining to all employees under their supervision, all applicable safe practice rules and regulations
- Must constantly monitor their work areas for hazards
- Supervising the instruction and training of new employees either personally or through delegated experienced persons until the new employee satisfactorily demonstrates their ability to perform the work in a safe and efficient manner
- Being responsible for **continuous** housekeeping in their area and for the use and maintenance of all personal protective devices, equipment, and safeguards. Failure to maintain adequate housekeeping shall result in AM Higley causing effected area to be corrected and back-charging the responsible contractor.
- Conducting and documenting weekly "toolbox" safety training for all employees under their supervision which at a minimum must include discussions surrounding any incidents/accidents/near misses in the past week and the corrective actions and preventative steps taken by the Subcontractor as well as any upcoming activities identified as hazardous to be discussed during pre-shift job hazard assessment talks and submitted via HammerTech.
- Incident investigation shall be conducted immediately after the incident.
- Preliminary results of any incident shall be shared with AM Higley by the end of the day
 - Property damage exceeding \$1,000 or any incident requiring medical attention greater than 1st aid requires sub to do a full root-cause analysis and submitted to Higley within 72 hours.
 - Any injured person requiring medical attention above on-site first aid or needing to be away from the jobsite when otherwise scheduled to work, is required to take a substance abuse test immediately following the incident but no more than 24 hours later. Without this drug test, the employee shall not return to work.
- Weekly Huddle - Required for each contractor to conduct and document a 10-minute discussion with their crew on the tasks for the day, hazards associated with those tasks, and how they will mitigate or eliminate those hazards. All is documented in HammerTech.
- Pre-Use Inspections - All equipment that can carry a worker must have a pre-use inspection conducted using HammerTech prior to use daily.
- Excavation Permit - Prior to any excavation, subcontractor must fill out and gain approval from the AM Higley project superintendent.
- Excavating and Trench Inspection Form – Excavation/trench inspection form must be completed daily. Required prior to any employee entering an excavation or trench 5' or deeper and must be re-verified prior to any persons re-entering a trench. May be required if trench is shallower than 5' if soil conditions are unstable, or presence of water conditions exist.
- Silica Exposure Control Plan – Regularly update description of silica dust generating tasks being performed that includes engineering, work practice, and respiratory protection needed for each task including qualitative fit testing.

1.7. Emergency Action Plan

Subcontractor's program shall conform to OSHA requirements to generate, communicate and rehearse an Emergency Action Plan (EAC). If greater than ten (10) employees under subcontractor's oversight will work on this project, this plan shall be in writing. See a sample template of *The Albert M. Higley Co.'s EAC at Appendix C*.

1.8. Applicable Fire Standards

Subcontractor's program shall conform to OSHA and NFPA standards of fire protection and prevention practices. Subcontractors shall also comply with all fire and safety rules and regulations applicable by law, regulation or policy not otherwise covered in this document.

1.9. Remedies for Subcontractor Failures

In the event of the Subcontractor's failure to correct any safety violations, *The Albert M. Higley Co.* may issue the Subcontractor written notification outlining the safety violation(s) (see ENFORCEMENT below). Failure of the Subcontractor to abate may result in the removal of the employee, the employee's supervisor, or the Subcontractor from the Project site and/or other appropriate measures.

1.10. Meetings

1.10.1. Preconstruction Meetings

The Subcontractor, before starting work at the project site, shall attend a pre-construction meeting with *The Albert M. Higley Co.* to understand the project conditions and safety requirements. The Subcontractor shall participate in a project site tour to confirm its awareness of potential safety hazards. To assure a safe work place the Subcontractor shall provide appropriate methods, equipment, devices, material and actions, which may be required to establish and maintain safe working conditions at the project site.

Additionally, each subcontractor's foreman shall attend a preconstruction meeting with the work plan and JHA in completed detail for all mid/high risk activities to include but not limited to:

- Trenching & Excavating
- Confined Space
- Lockout/Tagout
- Elevated work requiring PFAS or a Fall Protection Plan
- Silica Producing Activities
- Crane Operations
- Demo
- MEP disruption/transition to live

1.10.2. Regular Safety Meetings

- *The Albert M. Higley Co.* will conduct safety meetings on a regularly scheduled basis. All Subcontractors working on the Project site are to send their on-site safety representative to attend and maintain awareness of all safety requirements.
- All Subcontractors shall hold weekly 10-15 minutes “tool box” safety training for all employees under their supervision. Topics shall include safety issues related to work assigned. *The Albert M. Higley Co.* will monitor “tool box” training through personal attendance or by reviewing a copy of the training documentation which is required to be turned in to *The Albert M. Higley Co.* no later than Thursday each week.
- Prior to starting any major operation, which would involve lock-out/tag-out procedures, the Subcontractor must schedule a meeting involving *The Albert M. Higley Co.*, and every Subcontractor Superintendent and Subcontractor Safety representative affected by the work. The purpose of the meeting is to review and adopt specific procedures prior to commencement of the work.
- Prior to bringing a crane onto the jobsite and prior to any pick that may reach 75% of the crane’s maximum capability, the Subcontractor shall schedule and hold a meeting which includes the Subcontractor, necessary Sub-Subcontractors, and *The Albert M. Higley Co.*

1.11. Employee Responsibilities

Subcontractors shall not require employees nor knowingly permit employees to work in an unsafe environment except for the purpose of making safety corrections and then only after the Subcontractor takes proper precautions for their protection.

Each employee is responsible for learning and abiding by those rules and regulations, which are applicable to the assigned tasks and for reporting observed or anticipated hazards to their immediate supervisor. If the Subcontractor does not immediately abate the hazard, the affected employee is to report the hazard to *The Albert M. Higley Co.*

All employees shall observe the following rules of conduct:

- **Courtesy:** Employees shall observe standards of behavior and conduct their work in a manner to avoid offending any Owner or Tenant employees or visitors. Each individual on this Project must be given the courtesy that he would extend to one's family or friends.
- **Personal Protective Equipment:** All persons on the project site are to wear EN 12492 or ANSI Type 2 hard hats/helmets, eye protection, and work boots with substantial soles at all times. Safety vests are required when ground guiding or working around motor vehicles or other moving equipment and operations that warrant increased visibility. All other personal protective equipment, including respirators, hearing protection, gloves, or as appropriate to assigned tasks, shall be used in the proper manner at all times while there is exposure to a hazard. Face shields must be worn when any cutting, grinding or other hazard may cause injury to the face or activity that may generate a projectile.
- **Clothing:** Workers shall wear clothing suitable for the weather and the work to which they receive assignment. *The Albert M. Higley Co.* does not permit torn or loose clothing - cuffs or neckwear, which

may be a hazard. Shirts with sleeves are required at all times. We do not permit shorts or cut-off trousers. Clothing shall be maintained in a clean, neat and repaired fashion.

- **Vehicles:** Employees shall park their vehicles in areas that *The Albert M. Higley Co.* designates. Operation of vehicles to and from the project site shall conform to all local traffic laws.
- **SMOKING IS NOT PERMITTED ON SITE UNLESS OTHERWISE SPECIFICALLY STATED IN THE ONSITE SAFETY ORIENTATION**
- **Intoxicants:** *The Albert M. Higley Co.* does not permit the consumption or allow employees to work on site who exhibit the residual effects of alcoholic beverages or drugs. All workers who are taking physician-prescribed or over-the-counter medication must be fit for work. All employees are specifically directed to the "Substance Abuse Policy" which is a part of this Project Safety Plan
- **Accidents/Incidents:** All employees must immediately advise their Supervisor of any injury on the project or any non-injury accident/incident to include near hits. Failure to report any injury on the day of the injury may result in denial of any worker's compensation claim. All injuries requiring medical attention shall result in a substance abuse test within 24 hours. Failure to do so shall result in denial of any worker's compensation claim.
- **Housekeeping:** Good housekeeping on the project is mandatory and every employee must do their part daily to minimize dust and to clean up their work area to keep the project clean for safety and efficiency. Controls shall be observed which keep dirt from being tracked into areas outside the workspace.
- **Fire Protection:** Employees shall adhere to all fire protection regulations and shall conduct their work in a manner to preserve the fire safety integrity of the building. Fire extinguishers shall be in the immediate vicinity for all hot work.

1.12. Enforcement of Safety Policies

Repeated violations or lack of cooperation regarding the Project Safety Plan by employees of a Subcontractor indicates non-compliance with provisions included in the contract and may be grounds for the employee's suspension from the project site and/or for termination of the Subcontractor's contract. Failure of an employee to sign a violation form will be cause for dismissal not only from the assigned project, but all AMH projects.

Subcontractors must provide this Project Safety Plan to all employees during orientation and explain these rules to new employees who start after the initial orientation. Subcontractor employees who fail to follow the safety laws, regulations and policies will receive warnings (described below) prior to permanent suspension from the project site; less if the offense concerns the potential for serious injury or significant property damage.

The Albert M. Higley Co.'s Safety Violation Policy and Safety Violation Notification Form, in their entirety, are located in Appendix B of this document.

Immediate removal from the property will result when any of the following takes place:

- Any employee, supervisor or manager exposes themselves or other employees to imminent danger, which could result in loss of life.

- Any employee, supervisor or manager openly exhibits disregard, defiance or disrespect for the Safety Plan, Program, or Safety Professionals.
- Any employee, supervisor or manager who knowingly falsifies or withholds any investigative document or testimony involved in a safety investigation.
- Physical encounters to include but not limited to fighting, pushing, and shoving. All individuals involved in the incident are subject to immediate removal with potential permanent suspension for repeat violators or violations of blatant disregard for safety.
- Threats made against any safety personnel performing their duties.
- Theft or destruction of property.
- Any employee, supervisor or manager consumes, possesses, distributes or is under the influence of alcohol and/or drugs.
- Sabotage or tampering on another employee or company's materials, tools or equipment.
- Knives and tools like knives, especially those used by insulators, shall be in a protective sheath when not in their hand.
- The employee brings any weapon outside of a common pocketknife larger than four (4") inches onto the project.
- The employee uses a construction tool or other object as a weapon. *The Albert M. Higley Co.* expressly prohibits firearms or ammunition whatsoever on the project site.
- Safety Violation – if an employee fails to sign a violation form, they are dismissed from the project

1.13. Incident Investigation

- Subcontractors and/or their employees shall immediately notify *The Albert M. Higley Co.* of any incidents, injuries, property damage over \$1,000 or near hits.
- Subcontractors must submit written copies of all incident/accident reports to *The Albert M. Higley Co.* as soon as possible, but not later than the end of the day of the event.
- Where an incident results in medical care at a medical facility or the loss/damage of property over \$1,000, a full root cause analysis shall be conducted and provided to *The Albert M. Higley Co.* within 48 hours after the incident.
- The Project Superintendent, Project Safety Engineer, the Subcontractor's Safety Coordinator or Supervisor and anyone familiar with direct knowledge of the incident that can contribute to the analysis and make recommendations to prevent its reoccurrence shall participate in incident investigations.
- *The Albert M. Higley Co.* defines an incident as any unintended event resulting in a fatality, an injury requiring medical attention, lost-time injury, first aid, damage to property or equipment exceeding \$1,000, a near miss that may have resulted in the same, or the recognition of a potential hazard to health and environment.
- Any incident fitting the above definition shall result in each worker involved in the incident, whether or not they contributed to the cause of the incident, immediately completing a post-incident substance abuse test no later than that same work day.
- Subcontractors shall detail their process of handling incident investigations and provide a sample of the incident investigation documentation as a part of the site-specific safety plan.

2. GENERAL REQUIREMENTS

2.1. Confined Space Entry

Each Subcontractor shall develop a site-specific entry procedure for use when Subcontractor's employees are required to enter confined areas or spaces. Confined Space entry procedures are to conform to OSHA 1926.1200 Subpart AA.

A confined space entry permit must be completed and posted at the entrance to the confined area. The Subcontractor shall submit documentation of appropriate formal training for all involved in the confined space activity to *The Albert M. Higley Co.* prior to entry into the subject space. Confined Spaces include but are not limited to manholes, crawl spaces, tanks, silos, elevator pits, electrical cabinets, air handling units, attics, etc. A checklist classifying the confined space shall be completed prior to entry by the competent person and provided to and approved by the project superintendent.

2.2. Crane Safety and Rigging

Subcontractors whose activities require the use of cranes shall be responsible for their proper set-up and operation in accordance with the revised crane standard as of October 2018 and shall advise *The Albert M. Higley Co.* of their plan for the same prior to the arrival on-site. The Subcontractor shall document these activities in the job hazard analysis plan and 3SP/Safety Management Plan. The Subcontractor shall indicate how it plans to meet the very specific requirements of the new OSHA crane standard (1926 Subpart CC) including rigging, signaling operations. Qualifications and certifications of the operator shall be in accordance with the latest revised regulations.

2.2.1. Documentation

The Subcontractor shall:

- Supply *The Albert M. Higley Co.* with documented evidence of their assembly/disassembly director competent person's training. This shall include but is not limited to certifications of completion for trade or task specific training.
- Provide *The Albert M. Higley Co.* evidence of the crane's annual inspection by a third-party certification or audit. This applies to each crane and lifting device and associated rigging equipment that the Subcontractor brings onto the site. If one year has elapsed since the last inspection, or if the crane or its associated rigging has sustained any incident, which may have resulted in damage, the Subcontractor shall order a re-inspection of the crane and its associated rigging and provide proof of inspection to *The Albert M. Higley Co.* If only an inspection sticker is present, and not a copy of the inspection certificate, the crane's owner shall provide to *The Albert M. Higley Co.* in writing certification that the inspection was completed any all identified issues are resolved.

- Provide *The Albert M. Higley Co.* evidence of the crane operator's certification by a third-party accredited evaluator. Additionally, the employer shall produce written documentation of the employer's evaluation of the operator in the type/model of crane used for this project.
- Rigging hardware must be marked with distinctive manufacturer ID as per ANSI B30
- Not proceed with crane work without evidence of all these requirements. *The Albert M. Higley Co.* will not accept claims for losses sustained by the Subcontractor for delays caused by failure to comply with these requirements.

2.2.2. Daily and Pre-Shift Crane Inspections

The Subcontractor shall designate a competent person to perform daily and pre-shift inspections in accordance with the manufacturer's recommendations and ANSI B30 Standard for the type of crane under inspection and the most current version. The Subcontractor shall complete and document this inspection prior to the start of each shift and make available to *The Albert M. Higley Co.* upon request. A copy of inspection sheets shall be included in the Site-Specific Safety Plan.

2.2.3. Crane Operation

The Subcontractor shall submit a Lift Procedure to *The Albert M. Higley Co.* prior to the lift for all Critical Lifts (defined as when lifting a load where the weights are at or over 75% of the rated capacity of the crane and rigging as determined by the manufacturer) and the following:

- Multi-Crane Lifts
- 100 Tons or Greater Lifts
- Any application that deviates from the manufacturer's recommendations
- When special or unique hazards are under or adjacent to the load at any time during the lift

The Subcontractor shall develop a Job Hazard Analysis for the Lift procedure and submit it *The Albert M. Higley Co.* The Subcontractor shall conduct and document Pre-Lift meetings at the following intervals: 2 days prior to the lift, and immediately prior to the lift with the actual workforce doing the lift. All concerned parties must be present for the meetings.

The Lift Procedure shall include documentation of calculations, which incorporates weight deductions of all rigging equipment, a load chart for the crane(s) that are to be used, a site plan, and layout sheet which will include the path of travel of the load, weight of loads, load distance from crane, swing radius protection and any other necessary factors.

The Subcontractor erecting or dismantling a crane must use fall protection at and above 6' rather than the OSHA allowed 15'.

2.2.4. Rigging

The Subcontractor shall:

- Use a qualified Rigger to inspect all rigging equipment and document the same prior to each shift. Provide proof of this training and certification prior to the lift.
- Immediately remove all rigging equipment that is defective, damaged or missing load tags from the project site.
- Not use chain slings for any lifting operation unless specifically designed for a unique application.
- Use tag lines on all loads.
- Use hooks for overhead lifting equipped with safety latches or alternate lifting methods such as clamps.
- Use shake-out/sorting hooks only for unloading materials from trucks; hooks may not be used for overhead lifting.

2.3. Substance Abuse Policy

This is a drug free project. All workers, supervisors, staff, salary employees and companies on this project must voluntarily comply with the requirements of the latest version of this policy or a more stringent program. *The Albert M. Higley Co.* prohibits the use, possession, distribution, or sale on the project premises, facilities, or work places of any alcoholic beverages, intoxicants, drugs or related drug paraphernalia.

2.3.1. Purpose

The Albert M. Higley Co. is committed to protecting people and property and to providing a safe working environment for all that come on site. The purpose of this policy is to establish a zero-tolerance policy and drug-free work environment.

2.3.2. Policy

Workers must not report for duty or perform work while under the influence of any drug, alcoholic beverage, or intoxicant. All new workers to the site are required to show evidence that they have passed their most recent valid drug/alcohol test in accordance with this plan (see Appendix A) or a more stringent standard and this test was within the preceding twelve (12) months. They must retain this currency status throughout the project. Workers unable to show such evidence along with a state issued photo identification at the initial safety orientation are not eligible to work on the project site until they are in compliance.

2.3.3. Definitions

When used herein, the following terms will have the meanings given below:

Project Premises – Includes all property, facilities, land, building, structures, automobiles, trucks and other vehicles owned, leased or used or under the control of the company.

Prohibited Substances – Include illegal drugs (including controlled substances, look-alike drugs and designer drugs), legal drugs used without a prescription or used in abuse, designer or synthetic drugs that are not yet illegal but impair, and alcoholic beverages in the possession of or being used by an employee on the job.

Employee – Individuals, who perform work for *The Albert M. Higley Co.* or any of its Subcontractors, including, but not limited to, management, supervision, engineering, craft workers, vendors, suppliers, and clerical personnel.

Accident – An unfortunate event resulting from unforeseeable circumstances and usually results in harm, injury, damage, or loss.

Incident – Any unplanned and unintended event that interferes with or influences planned activity, caused directly or indirectly by an employee that occurs where the actual effect may or may not result in harm to person or property. This includes the category of near hit/miss where there was no damage or injury as well as accidents.

Reasonable Cause – The determination that an employee may be under the influence of a prohibited substance which warrants a substance abuse test. This includes an employee's excessive absenteeism or tardiness, slurred speech, glassy eyes, alcohol smell, smell of burnt rope, and changes in behavior which may include, but are not limited to noticeable evidence of imbalance, incoherence and disorientation. A more extensive list of reasonable suspicion indicators may be found in Appendix A.

Retest – Testing required by this policy after a positive drug test. Retesting is at the expense of the employee. It must take place at an approved Substance Abuse and Mental Health Services Administration (SAMHSA) facility.

Re-analyze – The employee may request to challenge a positive drug test. In such a challenge, a certified SAMHSA laboratory of the employee's choice may examine the split sample of the original test. This retest is at the employee's expense.

Computer Generated Selection Testing (CGST) – Means a computer-generated process that a third-party administrator uses to select participants for testing.

Split Sample – The approved Substance Abuse and Mental Health Services Administration (SAMHSA) facility separates the sample provide by the employee into two samples. Both samples are appropriately marked with the employee's identification.

Positive Drug Test – A test result, which exceeds the cut-off limits established guidelines by the U.S. Department of Health and Human Services; or a test result that indicates that

indicates tampering or adulteration of the specimen provided by the employee. *The Albert M. Higley Co.* policy equates an employee's refusal to submit to a drug test for any reason, at any time, as a positive drug test result. An employee's refusal to participate in a drug test or any positive test results in permanent suspension from the project.

2.3.4. Drug and Alcohol Testing

Independent Substance Abuse and Mental Health Services Administration (SAMHSA) certified laboratories conduct all drug and alcohol testing. The testing may consist of blood, breath, saliva, or urine tests, as required. In the case of a positive test result, the employee will have the opportunity to contest the result by having an appropriate portion of the split sample retested at a SAMHSA certified laboratory selected by the employee.

2.3.5. Prescription Drugs

Any employee using a prescription drug, which may impair mental or motor function, shall notify their employer as soon as the drug is prescribed, who is then to notify *The Albert M. Higley Co.* For the safety of all workers, *The Albert M. Higley Co.* may direct the Subcontractor to prohibit the employee from the project premises until the prescribing physician releases the employee as fit for duty. *The Albert M. Higley Co.* reserves the right to obtain a confirming medical opinion before allowing the worker to return to duty. Again, this is an employee duty to self-report prescriptions that may influence job performance.

2.3.6. Employee Pre-Assignment Testing

All employees, salaried or hourly, who are assigned to the project, shall conduct substance abuse testing in accordance with applicable Appendix A guidelines prior to coming onto the project premises.

2.3.7. Post-Accident Testing

After an incident injury requiring any medical treatment, the Subcontractor shall cause to have substance abuse tested all those involved. Documentation of tests shall be provided to *The Albert M. Higley Co.* the results within 24 hours of the incident. A supervisor is to accompany the injured employee or those employees involved in the incident involving the Subcontractor worker to the approved SAMHSA clinic or medical facility. Where there is reasonable suspicion, the Subcontractor shall certify any employee(s) involved in an incident tested negative for substance abuse prior to allowing them to return to the project premises. A third-party administrator facility that can facilitate a /MUST standard drug test must be used.

If the injured employee refuses to give a specimen of body fluid, the Subcontractor supervisor is to notify *The Albert M. Higley Co.* In such case, the employee will again

receive notification that refusal to submit to drug screening is a violation of this/MUST and that refusal will result in permanent removal from the site.

2.3.8. Reasonable Cause Testing

The Albert M. Higley Co. may ask Subcontractors and Subcontractors shall take the initiative to test workers when a reasonable suspicion exists that an employee has been using or is under the influence of drugs or alcohol. The Subcontractor shall share all test results with *The Albert M. Higley Co.* Where there is reasonable cause and an employee is tested for substance abuse, the employee shall not return to the project site until the results from the test are shown with the finding of negative.

2.3.9. Random Testing

In accordance with State laws and applicable PLA's, *The Albert M. Higley Co.* may have 3rd party conduct urine, blood saliva, or other types of drug screening analysis of employees and others on the project premises on a random basis at periodic, unannounced intervals during the construction of the project. Subcontractors must certify negative test results to *The Albert M. Higley Co.* as soon as available but never more than 3 working days.

2.3.10. Confidentiality

The Albert M. Higley Co. will take steps to maintain the confidentiality of information generated by the implementation and enforcement of this policy and these procedures. Disclosure occurs only in appropriate circumstances. The Subcontractor shall be responsible for maintaining the confidentiality of all information generated by the implementation and enforcement of this policy and these procedures for their own workers. *The Albert M. Higley Co.* shall have the right to audit compliance with this policy and these procedures by the Subcontractor, which shall include access to this confidential information.

2.4. Overhead Hazards

The Subcontractor Shall:

Subcontractors shall secure all debris, tools, sparks or materials from falling.

Subcontractors shall use nets, catch tarps, straps, or lanyards to keep items from falling. If these efforts cannot completely contain all possibility of falling items, subcontractors shall post a watch person below **and** cordoning off the area with high visibility tape and signs reading "DANGER, HAZARDS ABOVE!"

Subcontractors shall provide protection to its employees from falling debris, tools, sparks, or materials especially when working in areas of demolition.

All work shall be scheduled and coordinated to avoid working above another crew.

Demolition operations shall employ Top Down, Bay to Bay... No operations may be performed over open bays.

2.5. Elevated Work

2.5.1. Concrete and Masonry

All equipment and materials used in concrete construction and masonry work shall meet the applicable requirements as prescribed in ANSI-A10.9-1970 (or most recent version) "Safety Requirements for Concrete Construction and Masonry Work".

2.5.2. Stairways

Upon delivery to the project site, The Subcontractor shall provide all office trailers and material storage trailers with stairway access to all doorways and shall have landings with railings, which allow for at least 30" deep by 22" wide landing and have at least a clearance of 20" in front of any door swing. Stairway placement shall follow placement of the upper floor deck, as soon as practical. Any elevation change of 19" or more must have stairs or a ladder to facilitate the change in elevation. Any stairs rising more than 30" must have guard rail.

2.5.3. Ladders

Subcontractor shall:

- Use manufactured ladders on the project that comply with the regulations of ANSI-A14.3-2008 (or most recent version), Safety Code for Portable Wood ladders or ANSI-A14.4-2008 (or most recent version).
- Use all ladders in the manner and for the purposes for which the manufacturer specifies and in accordance with OSHA 1926 Subpart X.
- Use side rails or extensions, which must extend 36 inches above the landing; when this is not possible, the subcontractor shall install grab rails, and secure at the top to a rigid support that will not deflect.
- Require that each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder and not stand on the top or top step.
- Require that an employee shall not carry any object or load that could cause the employee to lose balance and fall.
- Maintain all required sticker/placards on ladders in a condition that enables clear viewing of required ANSI information.
- Where adequate anchorages are available, tie off using a Personal Fall Arrest System or utilize a different means of gaining access (i.e., scissor lift, scaffold, etc.).

2.5.4. Scaffolding

All OSHA 1926 Subpart L regulations apply with the **more restrictive requirement** for all employees to adhere to a six (6') feet fall protection limitation. Subcontractors using scaffolding shall:

- Train all employees about the potential hazards and the safe procedures to follow to erect, use and dismantle scaffolds to eliminate exposure to those hazards.
- Provide fall protection to every employee working above **any** elevation of six (6') feet or greater.
- Require the Scaffold Competent Person to inspect and document inspections of all scaffolds prior to each work shift. All scaffolds shall bear a tag and be signed and dated by the subcontractor's scaffold competent person, denoting that the scaffold inspection is complete and is safe to use prior to any employee utilizing that scaffold that day. If a tag is not used, alternate documentation shall be approved by *The Albert M. Higley Co.* prior to use.
- Require all individuals engaged in scaffold erection or dismantling to be protected from fall hazards and from striking the ground with fall protection. There shall only be an exception if the scaffold competent person successfully demonstrates this is not feasible and receives in writing an exception from *The Albert M. Higley Co.*'s safety team for each scenario.
- Provide to *The Albert M. Higley Co.* the name of their Scaffold Competent Person in their Site- Specific Safety Plan.
- Not use ladder jack scaffolds.
- Require scaffolds with a width less than 60 inches to have guardrails (top, mid and toe) installed when the work platform is in excess of 48 inches above the floor or lower work area.
- Require scaffolds with a height greater than 60 inches to have exterior outriggers installed to increase the base width of the scaffold below a ratio of 4 to 1 in circumstances where an eccentric load such as a cantilevered work platform is applied or is transmitted to the scaffold.
- Not permit scaffold cross bracing as a sole substitute for guardrails. Cross bracing may be used for one of the guardrails, but not both.
- Require engineered end swing gates at all ladder or stair access points.
- Require engineered end guard rails on all outriggers. Outrigger support brackets are not authorized as fall protection.
- Not permit the outrigger extension to support the material where material is being landed on a scaffold unless it is deemed adequate by the manufacturer and a factor of safety of 4 is provided.
- Require all non-mobile scaffold frames to have base plates installed.
- Require all mobile scaffolds to have wheels locked when in use and stationary.
- Not permit nominal grade lumber as scaffold planking.
- Require all individuals who are in articulated boom lifts to wear a full body harness and to tie-off by a self-retracting lanyard to a manufacturer's approved anchorage point.

- Not permit employees to stand on guardrails.
- Require only approved anchorages for fall arrest anchorage points (5,000 lb. capacity).
- Require that mast climbing elevating work platforms that may be adjustable by manual or powered means, meet the requirements of ANSI/SIA Standard A92.9-1993, American National Standard for Mast - Climbing Work Platforms.
- Know the load ratings of all mast climbing scaffolds.
- Employees shall have tool lanyards when there is any chance of harm coming to people or materials beneath them.

2.5.5. Hoists and Elevators

Temporary personnel elevators and material hoists shall be constructed, installed and maintained in compliance with the manufacturer's instructions and the provisions of applicable statutes and regulations of governing authorities. Subcontractors shall not use elevators or hoists for the movement of materials or personnel until a certified and licensed third-party inspector approves the equipment. No employees or other persons shall be permitted to ride on a material only hoist, except for the purposes of inspections and maintenance.

No man-baskets on a fork lift without safety team approval and manufacturers endorsement.

2.5.6. Aerial Work Platforms

All aerial work platforms to include boom lifts and scissor lifts shall have each occupant tied off with a body harness and self-retracting lanyard (SRL) to an approved anchorage point while the vehicle is in use. Scissor lifts are required to have manufacturer equipped anchor points. Employees shall have tool lanyards when there is any chance of harm coming to people or materials beneath them.

Subcontractors shall develop and execute a daily inspection checklist that shall be included in the Site-Specific Safety Plan and made available upon request.

2.6. Fall Protection

The Subcontractor shall:

- Develop a Fall Protection Plan for **all work with a fall exposure at or greater than six (6') feet** where Personal Fall Arrest Systems (PFAS) or a guardrail system cannot completely mitigate fall hazards and provide a copy of the same to *The Albert M. Higley Co.* as an appendix to its Safety Plan **15 days prior to start of work**. "Controlled Access Zones," "Controlled Decking Zones" and "Safety Monitoring" are not permitted unless a written approval is obtained by *The Albert M. Higley Co.*'s safety team only after the competent person adequately demonstrates that it is not feasible to implement a Personal

Fall Arrest System (PFAS) or guardrail fall protection. These requirements apply to steel erection as well as all other construction activities.

1926.503(b)(1)

The employer shall verify compliance with paragraph (a) of this section by preparing a written certification record. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the employer. If the employer relies on training conducted by another employer or completed prior to the effective date of this section, the certification record shall indicate the date the employer determined the prior training was adequate rather than the date of actual training.

- All employers who utilize Personal Fall Arrest Systems must generate a plan and have all necessary resources to implement a plan for prompt rescue of employees in the event of a fall in accordance with 1926.502(d)(20).

1926.502(d)(20)

The employer shall provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves.

1926.502(k)(1)

The fall protection plan shall be prepared by a qualified person and developed specifically for the site where the leading-edge work, precast concrete work, or residential construction work is being performed and the plan must be maintained up to date.

- Require all of its employees to wear and use PFAS when working at or above six (6') feet from the ground/floor or whenever working in a precarious position, unless other adequate fall protections such as guardrails or safety nets are provided.
- Require that at any elevation below 18 ½ feet, only self-retracting lanyards shall be implemented with PFAS. If shock absorbing lanyards are used above 18 ½ feet, they are to be as short as possible, but in no event longer than six (6') feet. *The Albert M. Higley Co.* prohibits the use of any lanyards for fall arrest without a shock absorbing feature.
- Require all employees to wear Personal Fall Arrest System and attach to the manufacturer's approved anchorage when working in aerial lifts.
- Require fall protection when working from suspended scaffold.
- Fall Protection system components must be inspected prior to each use.
- Permit only one individual to use each vertical life line at a time.
- All body harnesses shall be outfitted with suspension straps and each employee must be trained on their use so that an employee is not subject to suspension trauma should they be a fall victim
- Snap hook to ANSI 359.12 360 lb. standards
<https://www.osha.gov/laws-regs/standardinterpretations/2010-09-30>

- No Pelican Hooks are permitted
- Any self-retracting lifeline used on or near a leading must be “LE (leading edge)” rated
- Rope-grabs are not permitted on any AM Higley projects unless specifically authorized by a safety team member.
- Inspection of fall protection system components prior to each use.
- All fall protection must restrict **free fall** from distances at or greater than 6’.
 - **Free fall** is defined as the vertical displacement of the fall arrest attachment point on the employee's body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.
- Require, when using wire rope as a guardrail providing fall protection, that all connections and splices be loop-type connection with a minimum of two (2) wire rope clamps. A qualified person must design this system and a competent person inspect the installation.
 - Require installation of turnbuckles at suitable intervals to maintain the required tautness of the wire rope but in no instance less than one per side.
 - Require a turnbuckle at any point where the wire rope makes a 90 degree or more turn.
- All Horizontal lifelines are required to be a manufactured, “Off the Shelf” product or designed by a registered Professional Engineer and installed and maintained by a competent person. It shall be designed, installed and maintained to meet, at a minimum, the requirements of OSHA as contained in 29 CFR 1926.502. Any HLL that may come into contact with a leading edge of metal or concrete shall be so rated with the LE designation.
- Eliminate the potential of a fall when working on a low slope, flat roof or deck with an unprotected side or edge six (6’) feet or more above a lower level. Any fall protection other than PFAS or guardrail systems must be incorporated into a fall protection plan and be preapproved by *The Albert M. Higley Co.’s* safety team prior to implementation.
- Require a positive means of fall protection if an employee is between a warning line and a fall hazard. *The Albert M. Higley Co.* does not permit warning tape as a warning line and does not accept a safety monitoring system as adequate fall protection.
- Require warning lines consisting of ropes, wires or chains, and supporting stanchions erected no less than six (6’) feet from the unprotected leading edge for roofing operations and fifteen (15’) feet for all other activities, and are only used when in conjunction with a safety net system or PFAS and incorporates the following:
 - The rope, wire, or chain shall be flagged at not more than 6-foot intervals with high-visibility material

- The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches from the walking/working surface;
- After being erected, with the rope, wire, or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge;
- The rope, wire, or chain shall have a minimum tensile strength of 500 pounds, and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions as prescribed; and
- The line shall attach at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.
- All self-retracting lanyards or horizontal lifelines used on or near a leading edge must be ANSI Leading Edge (LE) rated

2.7. Emergency Medical Services

The Subcontractor shall:

- Prior to commencement of work make provisions for prompt medical attention in case of serious injury.
- Designate at a minimum one First Aid/CPR trained individual on the project and inform The Albert M. Higley Co. of their name in the Site-Specific Safety Plan.
- Conspicuously post the telephone numbers and addresses of the physicians, hospital and other emergency services.
- Have adequate and accessible first aid supplies appropriate for the number of employees.
- Complete and provide to The Albert M. Higley Co. a notice of injury within 24 hours of any/all incidents involving work activities associated with the Project. The Albert M. Higley Co. requires subcontractors to maintain their own OSHA 300 Log in conformance with OSHA requirements.
- Provide for the prompt transportation of the injured person to a hospital or other emergency facility. A representative of the subcontractor shall drive the injured employee to the medical facility and remain at the facility until the employee is ready to return. If the employee is able to return to the project site the same day, he/she must return with a doctor's release form stating return date.
- Require a compliant substance abuse test for all injuries requiring medical attention at a medical facility. If this test is not possible prior to seeking medical attention, it shall be completed no later than 24 hours after the incident.
- Copy of the hospital report to include the prescribed medications, physical restrictions, follow up appointments and physician's recommendations and a Medco-14 form.
- Assure that each of its lower-tier sub-subcontractors meet these requirements.

2.8. Excavation

The Subcontractor shall:

- Designate a competent person trained in soil classification and the recognition of trenching and excavation hazards. This person must be on-site during excavating or trenching operations and at the excavation when water is present, or conditions are subject to change or as required by OSHA 1926 Subpart P.
- Name their competent person in the Site-Specific Safety Plan, as well as the depth of excavations or trenches, classifications of soil present and types of trench protective systems to be used on the project with specific detail.
- Complete an AMHigley Excavation Permit and gain the approval of the site superintendent prior to breaking ground
- All excavations activities require the competent person to fill out the excavation permit. Where a person will enter a trench, this requires the competent person to conduct a soil classification by two methods, and to complete the trench inspection checklist prior to worker entering and each time they reenter on a new day, or if there is water present, or there is high vibration in the area.
- Conduct an environmental assessment if there is any potential for a hazardous environment inside the excavation. Documented readings from a 4 or 5 gas tester shall be provided to the AM Higley superintendent prior to any persons entering the excavation.
- All excavations that come within 36" of an underground utility, shall have hydro vacuuming potholing to exactly identify the location of the buried utility prior to proceeding with powered equipment or machinery.
- When digging around sewers only, there shall be no digging with powered equipment or machinery within 36" of the utility. This distance may be decreased to 18" with onsite electronic sensor or probe, which determines location and depth.
- Maintain appropriate documentation to meet the OSHA trenching and excavation standards on site. Any time a person must descend into an excavation, a competent person must certify that no hazard exists and must document a trench inspection and proper mitigation of the hazards. The trench inspection shall at a minimum include the following information:
 - Name of the competent person, location of trench, date of inspection
 - Depth of trench
 - Soil Classification and what visual and manual methods were used to determine soil classification
 - Protective measures used to protect workers having to enter trench
 - Where protective systems as defined in 29 CFR 1926.650-652 are designed by a licensed Professional Engineer, shall provide the resulting design documents to The Albert M. Higley Co.'s safety team for review prior to the commencement of the work.
 - Notify OUPS to determine potential underground installations; i.e. sewer, telephone, fuel, electric lines, etc., and where they are located at least 48 hours but no more than ten days prior to digging.
 - Properly barricade all trenches and excavations to prevent persons from walking into them. If depth of an excavation presents a fall hazard, safeguard appropriately.
 - Erect and maintain, for the duration that an excavation remains open, a barrier sufficient to protect people from falling into the excavation at a minimum of six (6') feet from the excavation.

- Direct its competent person to assess if a confined space hazard exists prior to any person entering the excavation. This includes but is not limited to toxic fumes caused by natural or manmade sources.
- 1926.651 (b) (3)
 - When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.
- The responsibility of locating the underground utilities always falls on the excavation subcontractor.
- Physical location of the underground utility must include depth of the utility, along the run of the utility. No excavation may begin until the subcontractor conducting excavation first presents to the AM Higley superintendent the excavation plan and verification of physical locations including depths of all utilities.
- Depth determination may be accomplished through probing, potholing, or electronic monitoring, which provides depth.
- OUPS or private utility locator must mark all utilities prior to excavation, and the digging contractor must exactly identify the location prior to digging in the immediate vicinity.
- Operators shall have exposure monitoring and respirators if the vehicle is not equipped with 95% air filtration system.
- Periodic depth determination is required to validate that the utility depth is unchanged.

2.9. Eye and Face Protection

The Subcontractor shall:

- Require its employees to wear appropriate eye protection with side shields meeting the requirements of ANSI Z87 (most recent version) to protect the eyes while in construction areas at all times.
- Require its employees requiring prescription glasses to meet the requirements of ANSI Z87 (most recent version), or to use over-the-glass safety glasses or goggles.
- Require its employees to properly wear goggles, welding hoods, or face shields when in the area of operations, such as when cutting, welding, burning, grinding, drilling, chipping, chemical handling, corrosive liquids or molten materials, drilling, sawing, driving nails, power actuated tools, concrete pouring, tampers and gasoline fueled hand operated equipment (i.e. chain saws). This also applies to those employees of subcontractors who are assisting any worker as an apprentice or helper. Carpenters precision cuts may wear dust proof goggles instead of full face-shields.
- Require its employees to follow all manufacturers' specifications for PPE.

2.10. Impalement Hazard Protection

The Subcontractor Shall:

- The Subcontractor shall protect all impalement hazards, including but not limited to rebar, anchor bolts, steel formwork stakes/pins, all-thread, metal dowels etc.
- These impalement hazards may be protected with 2x4 troughs, rebar caps, orange cones, or whatever may safeguard a worker from falling onto these hazards.

2.11. Fire Protection

The Subcontractor shall:

- Complete hot work permits for all hot work onsite. Each area and type of hot work requires a separate permit.
- Be responsible for fire protection with appropriate type, size, and quantity of fire extinguishers throughout its work and operational areas, including offices, tool rooms, and storage areas twenty-four (24) hours per day, seven days per week through the duration of the Project.
- Maintain a fire watch with a dedicated person to survey permitted area for no less than 30 minutes after work is complete; 60 minutes for torch applied roofing.
- Provide, as required by OSHA and NFPA standards and the local fire protection code, appropriate fire suppression equipment.
- Require only safety containers approved by UL and the local Fire Marshall, and properly labeled as to their contents, for handling and/or storage of flammable liquids in quantities more than one gallon.
- Require that all tarpaulins and plastic used for temporary covers shall be of fire-resistant materials.
- Required a fire extinguisher of the following size and type for the following circumstances:
 - Immediately available when any hot work is conducted
 - A fire extinguisher rated not less than 10B shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 points of flammable gas are being used. This does not apply to integral tanks of motor vehicles
 - At least one portable fire extinguisher having a rating of not less than 20-ABC shall be located not less than 25 feet nor more than 75 feet from any flammable liquid storage or dispensing area located outside.
 - Coverage, no less than one 20lb ABC for every 3000sqft, every 100'
 - Not store more than 25 gallons of combustible liquid indoors that is outside of an approved cabinet meeting OSHA 1926.152(b)(2)(i) requirements.

2.12. Re-Fueling Stations

The Subcontractor Shall:

- Install Jersey Barriers on all sides of fuel tanks facing vehicular or equipment traffic.
- Place fuel tanks in a tub/catch basin that has the ability to contain $\frac{1}{2}$ the quantity as the container can contain unless the fuel tank is a double-walled container.
- Maintain an appropriate spill kit that is suitable for sustaining a spill dependent on the size of the tank/container as well as a mat or catch basin for under the fuel transfer location.
- Install and connect grounding rods to minimize the hazards associated with static electricity.
- Install and connect bonding cables between fuel container and the equipment/ container prior to the fuel transfer.
- Post conspicuous and legible signs prohibiting smoking near refueling operations.
- A minimum of 20-pound ABC Fire Extinguisher must be placed no less than 25' but no more than 75' from the tank.
- The tank may be located no closer than 20' to any building/structure to include mobile office trailers.

2.13. Hazardous Communication Program

The Subcontractor shall:

- Provide a spill kit for use on site in the event of a hazardous material spill.
- Be responsible for establishing, communicating and training a program that identifies all material hazards to employees in accordance with OSHA 1910.1200 and the Globally Harmonized System. The program shall:
 1. Require hazardous substances present in the workplace be properly identified and labeled.
 2. Require employees have access to information on the hazards of these substances.
 3. Require employees be provided with information on how to prevent injuries or illnesses due to exposure to these substances.
 4. Identify by job title who has the responsibility for maintaining the program, the Safety Data Sheets (SDS), conduct training, etc.

2.13.1. Safety Data Sheets (SDSs)

The Subcontractor shall:

- Be responsible for development and maintenance of a list of hazardous chemicals utilized within the project operations and will be further responsible for obtaining and maintaining SDSs for all such hazardous chemicals. Employees may access this information and the specific SDSs for chemicals utilized in their work areas.
- Shall deliver a copy of each SDS to *The Albert M. Higley Co.* prior to transporting that substance onto the project site.

2.13.2. Employee Information and Training

The subcontractor shall give all employees information regarding the requirements of the Hazard Communication Program; the hazardous chemicals present in their work place; and the physical and health risks of these chemicals. The Subcontractor may meet this requirement through orientation sessions for new employees and refreshers for all during toolbox safety training.

2.13.3. Container Labeling

The Subcontractor shall:

- Clearly label all chemical containers at the site. Labels must state the contents, the hazards involved, and the name and address of the manufacturer.

- Clearly label all secondary containers of chemicals with a Hazardous Materials Identification System (HMIS) or National Fire Protection Association (NFPA) label.
- Require the superintendent or safety coordinator to perform the above responsibilities for all their materials.

2.13.4. Audit and Review

The Subcontractor shall:

- Require the foreman/superintendent and safety coordinator to review the entire Hazard Communication Program, and to revise and update the material contained herein to reflect all changes in the purchase, use, storage, and handling of hazardous chemicals at the project.
- Require the superintendent and safety coordinator to audit its hazardous chemicals use procedures periodically to meet the requirements as set forth in the Hazardous Communication Program.

2.14. Housekeeping

The Subcontractor shall:

- Remove, on a daily basis, all debris and scrap material from the work area. Debris and other loose materials shall not be allowed to accumulate anywhere on the project.
- Notify *The Albert M. Higley Co.* of any hazardous waste it will generate during performance of its work.
- Assume direct responsibility of maintaining proper storage of wastes while on-site.
- Verify to *The Albert M. Higley Co.* in writing that the wastes have been disposed of in a legal manner by providing copies of waste disposal records.
- Not pour, bury, burn, nor in any way dispose of a chemical on the project.
- Store materials and supplies in locations, which will not block access-ways, and arranged to permit easy cleaning of the area.
- Shall provide a protective cover between the equipment and the floor surface of heavy gauge, flame resistant, oil proof sheeting in areas where equipment might drip oil or cause other damage to the floor surface, so that no oil or grease contacts the concrete. This requirement applies to both finished and unfinished floors.
- Locate, store, arrange and group all hoses, cables, extension cords, and similar materials so that they will not block any access-way and will permit easy cleaning and maintenance.
- Shall NOT dry sweep any silica containing materials

NOTE:

The Albert M. Higley Co. shall cause any housekeeping to take place and back-charge the Subcontractor if it fails to perform daily housekeeping. This notification serves as sufficient notification and no additional warning or notification is necessary prior to assessing the back-charge.

2.15. Electric

The Subcontractor shall:

- Perform all electrical work, installation and wire capabilities shall be in accordance with the pertinent provisions of the National Electrical Code (most current version), ANSI and OSHA Standards.
- When using permanent power, once established in new construction or in renovation work, use Ground Fault Circuit Interrupters in conjunction with the AEGC inspections.
- Make inaccessible all necessary open wiring to unauthorized employees or visitors and not be subject to damage. Open wiring is not acceptable for temporary lighting circuits.
- Encase lighting on barricades, fences, or sidewalk coverings in metal raceways.
- Install guards on temporary lighting to prevent accidental contact with the bulb except where the bulb is deeply recessed in the reflector.
- Not suspend temporary lights by the cord unless the fixture was specifically designed in that manner. Portable electric lighting used in moist or other hazardous locations such as drums, tanks, vessels, bunkers, etc., shall be operated at a maximum of 12 volts (non-explosive and intrinsically safe).
- Require covers and guards on all shop lighting and portable task lighting.
- Require extension cords used with portable tools must be of a heavy-duty 3-wire type. *The Albert M. Higley Co.* prohibits flat extension cords or damaged extension cords on the project site. Extension cords found without proper ground prong shall have the male ends cut.
- Not permit extension cords to be fastened with staples, hung from nails, or suspended by non-insulated wire.
- Require grounding or an approved double-insulated setup for all non-current carrying parts of electrical equipment. Grounded circuits must have enough capability to carry all predicted loads.
- Identify equipment and conductors that require de-energization and notify *The Albert M. Higley Co.* of the same. *The Albert M. Higley Co.* will arrange to de-energize the equipment under the Lockout and Tagging procedure/system.
- Require its employees to use the Lockout/Tagout procedure and strictly adhere to the use of this requirement.
- Require installation of covers on all temporary power panels at all times. All open or exposed breaker spaces shall be adequately covered and labeled.
- Require all electrical equipment and wiring in hazardous locations to conform to the National Electrical Code standards. The frames of all cutting, welding (arc, heli-arc, gas-plasma-arc) machines shall be grounded.
- Prohibit the use of fish tapes or lines made of metal or any other conductive medium. Nonconductive tapes and lines are required.

- Require grounding of all temporary wiring in accordance with the National Electrical Code (Articles 305 and 310). All wiring used for temporary lighting shall be in accordance with the most recent NEC.
- Immediately render inoperative all electrical tools and extension cords found to be defective (Examples: missing or broken ground pins, exposed internal conductors) by cutting off the plug end or by immediately removing the item from the project. AM Higley reserves the right to cut cords or confiscated any electrical equipment found non-compliant.
- Require electrical tie-ins only on de-energized (locked out and tagged out) systems. If existing conditions make this procedure impossible then a pre-task safety meeting with The Albert M. Higley Co. is required.
- Not permit welding leads to be used if damaged or the sheathing is damaged, cut, worn or any internal wiring is exposed. Daily pre-use inspection shall be conducted on all welding leads to ensure all leads are serviceable.
- Not permit the use of any extension cord or welding lead with repairs that are not in accordance with ANSI and other appropriate NEC regulations.
- Any laborer cutting through walls or studs must have a 'ticker' to test electrical circuits to see if they are de-energized.
- All temporary electrical panels, junction boxes and other enclosures shall have a NEMA 3R or greater enclosure rating to protect against water, ice, dirt/dust, etc. All existing electrical panels that will be exposed to moisture must be upgraded to NEMA 3R panels.
- Temporary power connections in a junction box shall be covered, and there shall be no wire nuts exposed, even if over 8' in height. All connections must be water-proof if not in a dry area or outside.
- Electrical contractor is required to be on site during all demo operations, even at night.

2.16. Lock Out Tag Out

The Subcontractor shall:

- Adhere and strictly follow either the Project Lockout and Tagout requirements, or the Subcontractor's own requirements, whichever is the most stringent.
- Not permit employees to work on any energized circuit. All circuit disconnects must be locked in the open position or otherwise appropriately identified with affixed tags stating "DANGER - DO NOT ENERGIZE" or other equivalent wording prior to working on the system or equipment.
- Have a written plan in the 3SP/Safety Management Plan any time working on an energized system.

2.16.1. Lockout Devices

The Subcontractor shall:

- Require only use of individually keyed padlocks.
- Paint padlocks are per the craft color code for easier detection and craft identification.

- Require a lockout device of the standard scissor type that will allow the placing of more than one padlock, when more than one individual is working on a circuit or mechanical process.
- Require employees to use a piece of chain or cable to complete a lockout on some valves or controls when necessary.

All electrical panels that do not have an integrated locking mechanism (such as residential panels) must be locked by the electrician by means of using an electrical lockout bar or equivalent device to control exposure to breakers. This applies especially in residential working environments such as apartments.

2.16.2. Danger Tags

"Danger Tags" are not "Danger Signs". The Subcontractor shall:

- Not use "Danger Tags" where a sign is necessary. Use of the tag is primarily for padlocks, tools, equipment, vehicles. Etc.
- Shall use only two standardized Danger Tags on this project -- they are:
- "DANGER - DO NOT USE": This tag must be attached to each padlock on a lockout.
- "UNSAFE - DO NOT USE": This tag may be attached to each padlock but is not required.

2.16.3. Danger Tags Procedure

The Electrical Subcontractor shall be the check, log, and tag systems consisting of electrical components. The Electrical Subcontractor will be the first lock on, and the last lock off. Where placing of lock is not feasible, the Electrical Subcontractor shall disconnect the circuit conductor, the breaker and Tagout that circuit.

The Subcontractor shall:

- Attach a "Danger Tag" to designate the lockout of a device, valve, switch, or piece of equipment.
- Not operate a device, valve, switch or piece of equipment with a "Danger Tag" and/or lockout attached regardless of circumstances.
- Require the panel cover must be of the type that will cover all breakers when it is closed and must be equipped with a hasp to secure a lock to prevent employees from opening the panel door. If the panel cover is of a type that is not possible to lock in the closed position, the Subcontractor shall secure a cover over the panel cover, lock, and tagout the panel whenever work is taking place on any of its circuits.
- If the above is not possible, require tagout of each circuit as prescribed with an electrician standing by the panel board to prevent breakers from being tampering. This physical presence must continue daily until the work is complete.
- Require signatures and dates on all "Danger Tags" indicate the intended work and specific equipment.

- If employees of more than one craft or crew are to work on a system, circuit, machinery, or component, require the supervisor from that craft shall place his individual lock and tag; and verify that the system, circuit, machinery or component being tagged, is indeed the system that is to be worked on.
- Require that only the person that placed the lock and tag shall remove it unless the Subcontractor receives special authorization from the Project Superintendent.
- Require color-coded padlocks for identification by craft for lockout purposes, i.e. valves, switches, electrical components, etc.; be responsible for assuring all padlocks are personally identified, that will be used for lock and tag purposes; and maintain a padlock sign in/out log. The Subcontractor of each craft discipline is responsible for ordering its own craft padlock. The Subcontractor shall provide a master key.
- Any employee(s) or person(s) found to have removed another's lock and/or tag will be subject to disciplinary action up to and including dismissal from the project site.

2.17. Masonry

In addition to the requirements contained in OSHA 1926 Subpart Q and D, the following is required. The Masonry Subcontractor shall:

- Appoint an individual who meets the OSHA definition of a Competent Person and identify this person in the Site-Specific Safety Plan.
- Review prior to start work each shift the Job Hazard Analysis for that day's tasks.
- Require that its competent person shall approve all changes in the Job Hazard Analysis.
- Maintain a copy of the Job Hazard Analysis at the project site showing all approved changes and provide a copy to *The Albert M. Higley Co.*
- Require that each employee working on the masonry project review the Job Hazard Analysis each day prior to starting work.
- Require that all grinders, drills, jackhammers and saws must utilize dustless shrouds with vacuums with HEPA filters as required in OSHA 1926 Subpart D or wet cutting methods.
- Require respiratory protection on all employees engaged in cutting, grinding, drilling, jack hammering, dressing or other abrasive applications to Portland cement creating dust that is not fully contained by a vacuum system or wet cutting. Unless air samples prove otherwise, this protection shall be no less than a half face respirator.
- Provide protections to prevent tools and material from striking any person below the work/storage level.
- Require all workers engaging in or working near mortar to wear half face respirators at a minimum. These employees shall meet all OSHA respiratory protection program regulation requirements. The only exception is if subcontractor has air sample test results, and results detail processes by which PEL or action level is not reached which would otherwise warrant respiratory protection.
- Require use of a tag line to control all loads.
- Prohibit all personnel from walking underneath the areas where loads are being hoisted.
- Prohibit all personnel from riding with a load being hoisted under any circumstances.

- The Subcontractor shall protect all impalement hazards, including but not limited to rebar, steel stakes, all thread, metal dowels, etc.

2.17.1. Masonry Wall Bracing

The Masonry Subcontractor shall:

- Provide a design, prepared by a Professional Engineer, meeting the requirements of OSHA 1926.706 (b) and the Standard Practice for Bracing Masonry Walls under Construction as developed by the Council for Masonry Wall Bracing.
- Not permit any persons within the limited access zone of an un-braced or braced wall subjected to winds of more than 35 mph (20 mph if during the initial period of construction).
- Place a “DANGER” sign on every unsupported masonry wall that is more than six (6’) feet in height, whether braced or un-braced and 50 feet or less in length. The Masonry Subcontractor shall place signs at each end of the wall and at intervals of not more than 100 feet along each side of the wall. The sign shall contain the words “DANGER” and “THIS UNSUPPORTED WALL IS UNSTABLE IN WINDY CONDITIONS”.

2.17.2. Masonry Fall Protection

The Masonry Subcontractor shall:

- Require and provide fall protection equipment for all employees engaged in masonry work, including overhand brick/block laying or any other activity that exposes them to a fall of six (6’) feet or greater. This protection shall be either a personal fall arrest system consisting of a full-body harness, self-retracting lanyards, shock-absorbing lanyard (if fall distance is over 18 ½ feet) and anchorage, a safety net or a guardrail, “Controlled Access Zones” are not permitted.
- Rigorously enforce fall protection requirements with any violation resulting in removal from the project. See Safety Violation Policy and Notification form in Appendix B.
- Fall protection system components must be inspected prior to each use.
- Not permit body belts as part of a fall restraint system. Only full body harnesses are acceptable as part of a personal fall arrest system.
- Provide fall protection while erecting and dismantling scaffolding unless written approval is obtained from *The Albert M. Higley Co.* only after demonstration by the competent person of a greater hazard by requiring fall protection.
- Identify to *The Albert M. Higley Co.* in the Site-Specific Safety Plan the name of the subcontractor’s competent person.
- Require its Competent Person to prepare an erection plan and reviewed the same with *The Albert M. Higley Co.* Project Superintendent prior to start of work.

- Require the competent person to be present and supervising all erection and dismantling of scaffolding. All employees conducting erecting and dismantling shall be protected with fall protection unless AM Higley safety professional agrees with the competent person's demonstration and puts in writing that PFAS causes a greater hazard.

2.17.3. Perimeter Protection

The Masonry Subcontractor shall:

- Construct a guardrail system in accordance with OSHA 1926.502, or provide alternative fall protection consisting of safety nets or personal fall arrest equipment on all work platforms at or over six (6') feet. Any other protection must be incorporated into a fall protection plan which shall be submitted for approval by *The Albert M. Higley Co.* in the Site-Specific Safety Plan.

2.18. Motor Vehicles and Equipment

The Subcontractor shall:

- Complete inspections at 30-day intervals documenting results and making them accessible at the project site. The Subcontractor shall make copies available to *The Albert M. Higley Co.* upon request.
- Inspect and document all equipment daily before use by its operator.
- Immediately repair or remove from service all defective motor vehicles and equipment.
- Require all operators to wear seatbelts on equipment as directed by the manufacture's specifications.
- Designate a competent person to certify that all operators of its construction equipment are properly licensed. The Subcontractor shall maintain copies of the certifications at the project and make copies available to *The Albert M. Higley Co.* upon request.
- Require that vehicles used to transport employees shall have seats firmly secured, have seatbelts, and are adequate for the number of employees and passengers specified by the vehicle manufacturer. *The Albert M. Higley Co.* prohibits any person from standing/kneeling/sitting on the back of moving vehicles.
- Review with *The Albert M. Higley Co.* locations for the storage of all fuels, lubricants, starting fluids, etc. prior to use and to assure that these locations conform to the requirements of the NFPA as well as the local Fire Marshal and all SDSs are present.
- Provide equipment diapers to protect from environmental spills, when required.
- Require drivers of motor vehicles to have a valid state driver's license (CDL when applicable) and instruct them to exercise judgment as well as observe posted speed limits.
- Use properly trained and equipped flag persons whenever construction traffic accesses or exits from public roads as well as when construction traffic and deliveries interfere with the planned flow of traffic on public roads.

- Prohibit any operator from leaving the door and/or ignition key on or near any piece of equipment. To discourage theft or vandalism, all keys shall be secured by individuals personally or in a key box in a locked work trailer.
- Require all equipment subject to theft to be secured by locking mechanisms or to a secure fixture so as not to be subject to theft.

2.19. Respiratory Protection

When employees may potentially be subjected to breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the Subcontractor shall:

- Require the creation, communication and training of a respiratory protection program in accordance with OSHA 1910.134 to address hazards leading to occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination.
- Accomplish this as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used.
- Prevent atmospheric contamination.
- Provide respirators to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program, which shall include the requirements outlined in paragraph (c) 1910.134. The program shall cover each employee required by this section to use a respirator.
- All employees required to wear respiratory protection must have documented fit tests, medical clearances and training, prior to use in the field.
- Air Hogs are required to eliminate or minimize dust affecting other trades even if workers performing work are in compliance with Table 1 of the silica standard.
- AM Higley reserves the right to place air pumps for exposure assessments on any employee or equipment on an AM Higley project to monitor Crystalline Silica levels.
- Operators shall have exposure monitoring and respirators if the vehicle is not equipped with a 95% air filtration system
- Site contractors / dirt moving equipment Table 1, Item 17 & 18
- Employers must follow guidelines of 1926.1153, Table 1 specifically, or have representative data to support tasks and respiratory protection plan.
- Strictly comply with all facets of OSHA 1926.1153(a)
Scope and application. This section applies to all occupational exposures to respirable crystalline silica in construction work, except where employee exposure will remain below 25 micrograms per cubic meter of air (25 µg/m³) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.

2.20. Protection of the Public

2.20.1. Access to the Site

The Subcontractor shall:

- Take such necessary action as is needed to protect and maintain public use of sidewalks, entrances to buildings, lobbies, corridors, aisles, doors, exits and vehicular roadways.
- Protect the public with appropriate sidewalk sheds, canopies, catch platforms, fences, guardrails, barricades, shields, and adequate visibility as required by laws and regulations of governing authorities. Such protection shall guard against flying materials, falling or moving materials and equipment, hot or poisonous materials, flammable or toxic liquids and gases, open flames, energized electric circuits, snow/ice buildup or other harmful exposures. Guardrails shall be made of rigid materials complying with the requirements for standard guardrails as defined by OSHA and the Project Safety Plan.
- Provide temporary sidewalks, ramps or stairs with guardrails on both sides whenever the work obstructs permanent sidewalks, ramps or stairs. *The Albert M. Higley Co.* may authorize barricades, secured against accidental displacement, meeting the requirements of local authorities, where fences, sheds, walkways and/or guardrails are impractical.
- Require a watchman placed at each opening to the jobsite when any barricade, fence, shed, walkway, or guardrail is removed for the purpose of work.
- Conspicuously post appropriate warnings, signs and instructional safety signs where necessary.
- Require a signalman to control the moving of motorized equipment in areas where the potential for interactions with the public is possible.
- Require from dusk to dawn the use of warning lights, including lanterns and electric lights, meeting the requirements of governing authorities along guardrails, barricades, temporary sidewalks and at every obstruction to the public.

The Albert M. Higley Co. limits access to the site to the entrance designated for construction traffic as indicated on the site plans issued with the construction documents. At no time are Subcontractor personnel or vehicles to obstruct traffic on public streets.

2.20.2. Authorized Visitors

The Albert M. Higley Co. requires all visitors to register upon arrival. Subcontractors shall regulate their visitors accordingly.

2.20.3. Parking

Parking shall be in designated areas only. Fire hydrants and all designated fire lanes shall remain clear at all times for the use of emergency vehicles. *The Albert M. Higley Co.*

reserves the right to have unauthorized vehicles removed. In this event, all towing charges are the responsibility of the vehicle Owner.

2.21. Steel Erection

2.21.1. Erection Plan

The Steel Erector Subcontractor shall:

- Follow all requirements in section 2.6: Fall Protection, of this place as well as the additional requirements listed below.
- Require fall protection be provided to **all** employees working at or above six (6') feet while on this project regardless of the Subpart R limitations of 15' and 30'.
- Not allow any controlled access zones.
- Appoint a Competent Person as defined in OSHA 1926.751 and identify this person in the Site- Specific Safety Plan. This person shall have training and experience in both steel erection and fall protection to serve as subcontractor's onsite expert.
- Require its Competent Person to prepare a site-specific erection plan which shall be included in the Site-Specific Safety Plan and reviewed with *The Albert M. Higley Co.* Project Superintendent prior to start of work. Refer to OSHA 1926, Subpart R, Appendix A for a sample site specific erection plan.
- Require its Competent Person to approve all changes in the site-specific erection plan. The Steel Erection Subcontractor shall maintain a copy of the erection plan at the project site showing all approved changes and provide each updated copy to *The Albert M. Higley Co.*
- Require implementation of the erection plan under the supervision of the Competent Person.
- Maintain a safe means of access to the level under construction. The Albert M. Higley Co. prohibits climbing and sliding on columns or diagonals.
- Provide a means to prevent accidental displacement of a falling hazard when bolts, driftpins, or rivet heads are removed. Must post a person or rope off area below.
- Secure tools, materials, debris or other items used during the steel erection process in such a manner as to prevent their falling.
- Analyze during shop drawing preparation how to incorporate fabricated pieces and attach safety lines or devices prior to erection wherever possible.
- Require the use of a tag line to control all loads.
- Provide for the protection of other crafts on the project, by posting signs in the erection area reading "Danger – Work Overhead"
- Prevent all persons from walking under the area where loads are being hoisted.
- Prohibit person from riding a load under any circumstances.
- Not hoist material to a structure unless it is ready to be put into place and secured.
- Secure bundles of metal decking or small material to prevent their falling out from the rigging.

2.21.2. Steel Erection Fall Protection

The Steel Erector Subcontractor shall:

- Require fall protection provisions, such as lifeline attachments, dynamic fall restraints and other such devices at six (6') feet or above.
- Prohibit the use of six (6') foot lanyards below a height of eighteen and a half (18 ½') feet.
- All fall protection must restrict **free fall** from distances at or greater than 6'.

Free fall is defined as the vertical displacement of the fall arrest attachment point on the employee's body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

- Provide fall protection and require all workers engaged in steel erection activities to utilize fall protection including connecting, bolting-up, detailing, decking, welding or any other activity that exposes them to a fall of six (6') feet or greater. This fall protection shall be either a personal fall arrest system consisting of a full-body harness, retractable lifeline, shock-absorbing lanyards, and anchorage, a safety net or a guardrail.
- "Controlled Access Zones," "Controlled Decking Zones" and "Safety Monitoring" are not permitted unless a written approval is obtained by *The Albert M. Higley Co.*'s safety team only after the competent person adequately demonstrates that it is not feasible to implement a Personal Fall Arrest System (PFAS) or guardrail fall protection.
- The *Albert M. Higley Co.* does not accept metal deck as a valid form of fall protection.
- ALL workers on bare beams must use an engineered or a purchased horizontal lifeline or use double self-retracting lanyards and two beam clamps to properly maintain 100% fall protection while erecting and traveling on beams. This must also be done when entering and exiting an aerial work platform.
- Prohibit use of body belts as part of a fall restraint system. Only full body harnesses are acceptable.
- Unload trucks without exposing workers to a fall of 6' or greater.
- Rigorously enforce fall protection requirements during steel erection with any observed violation cause for removal from the project. See Safety Violation Policy and Safety Violation Notification Form at Appendix B.

2.21.3. Perimeter Protection

The Steel Erector Subcontractor shall:

- Provide a guardrail system of a minimum of two (2) 1/4-inch diameter new wire rope cables erected at approximately 42 (plus or minus 3)-inches from the floor deck and at the

intermediate point immediately following the erection of connected beams and columns to achieve adequate strength. All sequence breaks require a two (2)-cable assembly.

- Require that all connections include a minimum of two wire rope clamps. Require use of a minimum of two (2) wire rope clips at all connections. All connections shall be loop-to-loop style. Guardrails are not acceptable as a horizontal lifeline as part of a personal fall arrest system unless designed and drawings stamped by a Registered Professional Engineer and installed under the supervision of the steel erector's competent person.
- All wire clamps shall be in compliance with ANSI standards to have manufacturer's name and size stamped on the clamp
- Require installation of turnbuckles at suitable intervals to maintain the tightness of the wire rope but in no instance less than one per length of cable.
- Retain full fall protection at or above six (6') feet.
- Not use "Controlled Decking/access Zones" or "Safety-monitor systems".

2.22. Welding, Cutting and Burning

2.22.1. Electric Arc Welding

The Welding Subcontractor shall:

- Require and provide a suitable, approved fire extinguisher to be ready for instant use in any location where welding or cutting is to take place.
- Require and provide screens, shields, barricaded areas or other personal protection equipment and safeguards to protect men and materials, below or otherwise exposed to sparks, slag, falling objects, or the direct rays of the arc.
- Require a dedicated fire watch present at all welding operations and remain for at least 30 minutes after the hot work completes.
- Require welders to wear approved eye and head protection. Individuals assisting the welder shall also wear protective glasses, head protection and protective clothing. Adequate exhaust ventilation shall be maintained at all welding and cutting work areas.
- Require that all electric welding equipment, including cables, shall meet the requirements of the National Electric Code. All arc welding and cutting cables shall be of the completely insulated flexible type, capable of handling the maximum current requirements of the work. Cables in need of repair are not acceptable for use on the project site.
- Require the ground of the frames of all arc welding and cutting machines through a third wire either in the cable connecting the circuit connector or through a separate wire which is grounded at the source of the current.
- Require inspections of all ground connections to ensure that they are mechanically strong and electrically adequate for the required current.
- Not permit welding leads to be used if damaged or the sheathing is damaged, cut, worn or any internal wiring is exposed. Daily pre-use inspection shall be conducted on all welding leads to ensure all leads are serviceable.

2.22.2. Cutting and Burning

The Welding Subcontractor shall:

- Inspect at the beginning of each work shift, all hoses used for carrying acetylene, oxygen or other fuel gas shall. The Subcontractor shall immediately remove defective hoses from service.
- Require that its employees use oxygen cylinders and fittings away from areas covered with oil and grease. *The Albert M. Higley Co.* prohibits the use of oxygen directed at oily surfaces, greasy clothes or hands.
- Require that its employees keep regulators, gauges, backflow check valves, and torches in proper working order. Flash arrestors are required on the oxygen and acetylene hoses, at the regulators.
- Require, at the end of each work day or when work is suspended for a substantial period of time, that compressed gas cylinder valves are closed, regulators removed, capped and secured in a vertical position.
- To require that cylinders containing oxygen or acetylene, or other fuel gas are not taken into confined spaces.
- To store cylinders containing oxygen or acetylene or other fuel gas shall in approved areas that *The Albert M. Higley Co.* designates, outside the structure.

2.23 Demolition Operations

The foreman directing any demo operations or supporting work to demolition operations shall secure the demo plan from the AMH superintendent and comply with the plan.

Some guidelines to successful demolition operations that shall be followed are:

- Top Down, Bay to Bay with no operations over open bays
- Laborer cutting through walls/studs must have a 'ticker' to test electrical circuits to see if they are de-energized
- When silica dust producing activities are conducted with other trades in the affected area, Air Hogs are required to eliminate or minimize dust affecting other trades even if workers performing work are in compliance with table 1 of the silica standard
- Electrical contractor is required to be on site during all demo operations, even at night

2.24 Crystalline Silica

Some portions of this section are duplicated in other sections where appropriate.

The Subcontractor shall:

- Strictly comply with all facets of OSHA 1926.1153

- Scope and application. This section applies to all occupational exposures to respirable crystalline silica in construction work, except where employee exposure will remain below 25 micrograms per cubic meter of air (25 µg/m³) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.
- Air Hogs are required to eliminate or minimize dust affecting other trades even if workers performing work are in compliance with Table 1 of the silica standard.
- Shall NOT dry sweep any silica containing materials
- AM Higley reserves the right to place air pumps for exposure assessments on any employee or equipment on an AM Higley project
- Employers must follow guidelines of 1926.1153 specifically, or have representative exposure assessment data to support:
 - Tasks conducted not in accordance with Table 1 or
 - Tasks that are not on Table 1 or
 - Workers exposed to visible silica dust without respiratory protection
- Complete the Exposure Control Plan and include a plan covering your silica dust generating tasks.
 - A template is found at: plan.silica-safe.org
 - NOTE: The new OSHA regulation requires a significant amount of air sampling data.
 - Plan for some expense for air sampling, respiratory physical evaluations, and outfitting all employees with respirators for any silica generating tasks.
- Subcontractors who may potentially generate crystalline silica dust, or have workers exposed to the hazard also must generate this exposure control plan for their specific scope of work. This plan shall be incorporated into each subcontractor's 3SP/Safety Management Plan.
- Subcontractors must regularly update this exposure control plan so that it accurately reflects the jobsite silica hazards and effectively addresses all mitigation efforts.
- Subcontractors must perform area exposure assessments, if their work is exposing or has the potential to expose silica dust to others or pedestrians nearby.
- Special attention shall be paid to contractors moving material(s) that may generate silica dust
 - Dewatering of the site and or silica producing materials during dry periods shall be included in all bids
 - Equipment shall be equipped with 95% filtering HVAC systems or else exposure assessment and respiratory protection shall be incorporated IAW
- For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:
 - Is maintained as free as practicable from settled dust;
 - Has door seals and closing mechanisms that work properly;
 - Has gaskets and seals that are in good condition and working properly;
 - Is under positive pressure maintained through continuous delivery of fresh air;
 - Has air intake that is filtered through a filter that is 95% efficient in the 0.3-10.0 µm range (e.g., MERV-16 or better); and
 - Has heating and cooling capabilities

I. Appendix A Substance Abuse Policy

All Contractors engaging in contracts with The Albert M. Higley Co. shall ensure all workers remain current with an 11 panel drug test meeting the standards set forth in this policy within the past year.

If a worker is tested in July of 2021, the project starts in the following May of 2022 and lasts 6 months, in July of the 2022 the worker will need to test again to remain in compliance.

II. POLICY STATEMENT

The Parties recognize the problems created by drug and alcohol abuse and the need to develop prevention and treatment programs. **"Unions & Contractors Associations"** have a commitment to protect people and property, and to provide a safe working environment. The purpose of the following program is to establish and maintain a drug free, alcohol free, safe healthy work environment for all of its employees. All tests are for the sole purpose of drug and alcohol screening and cannot be used for any other screening or identifying medical information about the employee.

III. DEFINITIONS

- A) Accident/Incident –For the purpose of this policy, an accident/incident is considered to be an unplanned or unintended event that occurs on company property, during the conduct of company's business, or during scheduled work hours, or which involves company supplied motor vehicles that are used in conducting business, or is within the scope of employment, and which results in any of the seven (7) situations:
- 1) A fatality of anyone involved in the accident/incident;
 - 2) Bodily injury to the employee and/or another person that requires off-site medical attention away from the company's designated place of employment/worksites;
 - 3) Any accident/incident in which the driver is cited and there is disabling damage to the vehicle(s) requiring tow-away;
 - 4) Any accident/incident in which the driver is cited and off-site medical attention is required;
 - 5) Vehicular damage in apparent excess of \$1000.00;
 - 6) Non-vehicular damage to any company property (i.e. – tools, materials, etc.) in apparent excess of \$750.00;
 - 7) Any event resulting, or could have resulted, in injury to a person or property to which an employee, or contractor/contractor's employees, contributed as a direct or indirect cause.
- B) Adulterated or Substituted Specimen – A urine screening, which has been substituted or tampered with to cover the true results. This will be considered a positive test.
- C) Collection Facility/Site – Approved location where participants can provide a specimen for testing.

- D) Company Premises – The term “Company Premises” as used in this policy includes all property, facilities, land, building, structures, automobiles, trucks and other vehicles owned, leased or used by the company. Construction job sites for which the company has responsibility are included.
- E) Computer Generated Selection Testing (CGST) – Third party administrator will randomly select participants to be tested through a computer generated selection process.
- F) CGST Testing Pool – All participating members (labor and management) will be subject to CGST selection.
- G) Designated Representatives (DR's) - Are contact persons appointed by companies and unions to work directly with the program's Third Party Administrator (TPA). A company's DR and union's DR are to work together for the successful management of the program. All DR's are to keep privileged substance abuse information confidential.
- H) Dilute Specimen - A dilute specimen with a valid, negative laboratory result shall be treated as a negative program test. A dilute specimen with a MRO confirmed positive laboratory result, shall be treated as a positive program test. Recollection of a dilute specimen shall be deemed necessary only when the creatinine concentration of the original specimen is equal to or greater than 2mg/dl but less than or equal to 5mg/dl.
- I) Drug Paraphernalia - Equipment, products and materials of any kind which are used, intended for use or designed for use in planting, propagating, cultivating, growing, harvesting, manufacturing, compounding, converting, producing, processing, preparing, testing, analyzing, packaging, repackaging, storing, containing or concealing, or ingesting, inhaling or otherwise introducing into the human body, any controlled substance.
- J) Eligible - Database system status referring to an employee who is validated as a participant in this policy.
- K) Employee – Individuals, who perform work for (Company Name), including, but not limited to, management, supervision, engineering, craft workers and clerical personnel.
- L) Employee Assistance Program / Member Assistance Program (EAP/MAP) An EAP/MAP is intended to prevent or address substance abuse problems and may assist employees/union members and their eligible family members with interpersonal conflicts, family problems, workplace crises, eldercare stresses, psychological problems and financial management. The EAP/MAP is able to provide voluntary and confidential counseling services.
- M) Gas Chromatography/Mass Spectrometry (GC/MS) – A state-of-the-art test used to confirm the presence and amount of an identified drug/metabolite in a urine specimen.

- N) Inactive Status - A participant can request an inactive status when leaving the area or employment with a contractor. Inactive Status requires confirmation from a union Designated Representative or a Contractor Designated Representative.
- O) Incident – An event, which has all the attributes of an accident, except that no harm was caused to person or property.
- P) Ineligible - Database system status referring to an employee who is not validated as a participant in this policy. (An ineligible employee should contact the third party administrator or his or her Designated Representative.)
- Q) Intoxicant – A substance that alters a person's mental and/or physical acuity.
- R) Medical Review Officer (MRO) – A licensed physician, qualified by either AAMRO or MROCF, who is responsible for receiving laboratory results and determining if there is a medical explanation for the presence of drugs/metabolites in the donor's urine. This physician must have knowledge of substance use disorders and appropriate medical training to interpret an individual's confirmed positive test result, together with his/her medical history and any other relevant medical information.
- S) Negative Drug Test – A test acceptable for employment.
- T) Positive Drug Test – A test, which exceeds the cut-off limits, within the established guidelines as defined under definition EE. Or a test that has been tampered with in any way (adulterated specimen). Medicines prescribed or purchased in a foreign country may cause a positive drug test.
- U) Prohibited Substances – Prohibited substances include illegal drugs (including controlled substances, look-alike drugs and designer drugs), and alcoholic beverages in the possession of or being used by an employee on the job.
- V) Reasonable Cause – When a trained supervisor has reason to believe that an employee has reported to work under the influence of alcohol, or an illegal/controlled substance.
- W) Re-analysis – A challenge of a positive drug test can be requested by the employee who is responsible for payment. A split sample of the original test can be examined by a SAMHSA certified laboratory of the employee's choice. If the re-analysis reverses the result, the program will absorb the cost and the employee will be reimbursed all costs associated with reanalysis. There is no appeal procedure for alcohol collected by a Breath Alcohol test.
- X) Return-to-Duty Test – Testing required to reinstate eligibility in the program after a positive test. The Return-to-Duty Test is taken at the expense of the employee.

- Y) Split Specimen – Specimen taken at the collection site will be separated into two samples. Both samples will be appropriately marked with the employee's identification.
- Z) Substance Abuse Professional (SAP) – A qualified professional includes: licensed physicians, licensed/certified psychologists, social workers, employee assistance professionals and certified addiction counselors with knowledge of and clinical experience in the diagnosis and treatment of alcohol/drug-related disorders.
- BB) Synthetic / Designer Drugs - Synthetic substances that mimic legal or illegal drugs that are made in laboratories where the molecular structure is altered to create a drug that may or may not be specifically banned by law. These can cause seizures, hallucinations and death. Many states have banned the sale, use or possession of these substances, but the legality is not the determining factor
- CC) Third Party Administrator (TPA) - An independent entity that administers this's collections, analysis, reporting, maintenance of records and all confidential information for each participating group. The TPA is pre-qualified and determined by each union and its corresponding Contractor's Association.

DD) Under the Influence of a Prohibited Substance – “Under the influence of a prohibited substance” as used by this policy, means the following:

- 1) Alcohol – Blood or Breath alcohol level of .04 or as determined by the owner.
- 2) Other Prohibited Specimen – Positive results based on the following thresholds for urine split sample testing

***NOTES**

- Medicines purchased in a foreign country may cause a positive drug test.
- This program recognizes some state laws permit the use of marijuana either for medical or recreational purposes. However, the Federal Government continues to classify Marijuana as a Schedule 1 Controlled Substance, thereby making it illegal to use for any purpose under federal law. Therefore, any marijuana use is strictly prohibited under the terms of this program.

- | | | |
|----|---|---|
| a) | <u>Marijuana (Incl. Medical)</u> | 50 ng/ml initial screen and
15 ng/ml confirmatory test |
| b) | <u>Cocaine (Metabolite)-</u> | 150 ng/ml initial screen and
100 ng/ml confirmatory test |
| c) | <u>Opiates</u> | 300 ng/ml initial screen and
300 ng/ml confirmatory test |
| | <u>6-Acetylmorphine</u> | 10 ng/ml initial screen and
10 ng/ml confirmatory test |
| d) | <u>Phencyclidine</u> | 25 ng/ml initial screen and
25 ng/ml confirmatory test |
| e) | <u>Amphetamines</u> | 500 ng/ml initial screen and
250 ng/ml confirmatory test |
| | <u>Ecstasy</u> | 500 ng/ml initial screen and
250 ng/ml confirmatory test |
| f) | <u>Barbiturates</u> | 300 ng/ml initial screen and
200 ng/ml confirmatory test |
| g) | <u>Benzodiazepines</u> | 300 ng/ml initial screen and
300 ng/ml confirmatory test |
| h) | <u>Methadone</u> | 300 ng/ml initial screen and
300 ng/ml confirmatory test |
| i) | <u>Propoxyphene</u> | 300 ng/ml initial screen and
300 ng/ml confirmatory test |
| j) | <u>Oxycodone</u> | 100 ng/ml initial screen and
100 ng/ml confirmatory test |
| k) | Levels for other prohibited substances shall be according to accepted scientific standards. | |

EE) Initial Test vs. Confirmation Test -

There are two types of urine drug tests: an initial screening and a confirmatory test. The initial test uses an immunoassay to look for the parent drug and/or metabolite. The confirmatory urine drug test is done by gas chromatography/mass spectrometry (GC/MS); this test is highly specific and is typically used when testing for the presence of a specific drug is needed.

- 1) Initial test: an immunoassay screen to eliminate “negative” urine specimens from further consideration.
- 2) Confirmatory Test: a second analytical procedure to identify the presence of a specific drug which is independent of the initial drug test and which uses a different technique and chemical principle in order to ensure reliability and accuracy.

FF) Voluntary Drug/Alcohol Test-

The parties to this policy and program agree that under certain circumstances, the employer will find it necessary to conduct drug and alcohol testing. Program testing will be administered by a pre-qualified TPA determined by each union and its corresponding Contractor’s Association. Records of such tests shall be maintained by the Third Party Administrator. For all participants covered by the appropriate collective bargaining agreement, all costs for collection, analysis, reporting, maintenance of records, and notifications shall be borne by Union / Contractor’s Associations unless otherwise noted in this program. Securing the drug screen test shall be the applicant’s responsibility and shall be performed on his/her time. The primary testing methodology for this is urinalysis, alternative collection methods can be utilized on a case by case basis. The frequency of program testing may be increased based on requirements legitimately mandated by owners.

IV. PROGRAM TEST TYPES

Testing may be initiated under the following circumstances. A refusal to test is considered a positive test and the individual will be subject to corrective actions. An additional drug and/or alcohol test(s) outside of the policy requirements may be administered at the cost of the owner. Each participant will be required to sign a consent and a chain of custody form, assuring proper documentation and accuracy.

A) Initial Test

An initial/pre-employment test is required to participate in the program.

B) Annual Test

In order to remain eligible, the participant must resubmit before his/her test expires.
Negative tests are valid one year from test date.

C) Computer Generated Selection Testing (CGST)

Selection of employees for CGST Drug testing will be conducted through the use of a CGST number generator or other neutral selection process. The Third Party Administrator will randomly select and test a minimum of 25% of the participants annually by CGST.

- 1) Excused from Testing – A participant is allowed two (2) lifetime validated excuses for missing a Computer Generated Selection Test (CGST/Random), after which failure to show up for a CGST would be considered a policy violation (refer to VI Corrective Action, B) 5).)
- 2) Reason for missing a CGST must be validated and required documentation be provided to the Designated Representative to justify granting an excuse.

D) Post-Accident/Incident

An employer is required to conduct post-accident/incident alcohol and other drug testing for anyone who may have caused or contributed to an accident/incident. An employer does not have to conduct a post-accident/incident drug test if ALL of the following conditions exist:

- i) The accident/incident resulted in no injury or a minor injury
- ii) There was no violation of work rules
- iii) An accident/incident investigation determined there was no reasonable suspicion related to the accident/incident
- iv) The accident/incident is considered normal in relationship to the job functions of the injured employee

Post-accident/incident testing is at the cost of the employer.

E) Reasonable Cause

A test may be administered in the event a trained supervisor has reasonable cause to believe that an employee has reported to work under the influence, possesses drug paraphernalia, or is or has been under the influence while on the job; or has violated this drug policy. During the process of establishing reasonable cause for testing, the employee has the right to request his onsite union representative to be present. If on-site representation is not available, all efforts will be made to contact representation from the employee's union. For cause testing is at the expense of the employer. The Testing Procedures are:

- I) Step 1: Preparation
 - i. Where appropriate remove employee away from safety-sensitive activity

- ii. Complete documentation (for Reasonable Suspicion use Check List)
 - iii. Determine which test(s) to order (drug and/or alcohol)
 - iv. Gather necessary paperwork and supplies to give the employee
 - v. Call TPA to send authorization forms to the collection site
 - vi. Arrange for transportation
- 2) Step 2: Communicate with the appropriate persons present - Union Representative, Human Resources, Designated Representatives, etc.
- 3) Step 3: Inform the Employee
- i. Give necessary forms and supplies to employee and be sure you are taking the employee to a TPA collection facility
 - ii. Inform employee that he/she must show photo ID
- 4) Step 4: Transportation: Union representative or employer shall provide transportation to and from collection facility then arrange transportation home
- 5) Step 5: Follow up
- i. Ensure that the test was completed
 - ii. Monitor the confidential transmission of the test results
 - iii. Document any problems and proceed according to policy guidelines.

Note: This requires that a checklist report be completed and submitted within 24 hours to the TPA, as well as union & employer Designated Representatives for any Reasonable Cause test. A form is attached as Appendix A. Employers are responsible to request and pay for reasonable suspicion and post-accident/incident testing.

F) Return to Duty

The return to duty test is required for a participant to reinstate into the program after a positive test and completion of a prescribed treatment program. The employee is responsible for the cost of the Return-to-Duty test.

G) Accelerated Random Testing

Testing may be required as part of a follow-up to counseling or rehabilitation for substance abuse. Employees returning to work after successfully completing a rehabilitation program will be subject to additional drug/alcohol tests without prior notice. The participant will be subject to a minimum of four (4) additional random tests as prescribed by the Employee Assistance Program (EAP) for a period of one year as a condition of further employment.

H) Re-analysis

In the case of a positive test result, the employee shall have the opportunity to contest the result within 72 hours of the MRO notification by having an appropriate portion of the split sample reanalyzed at a SAMHSA certified laboratory selected by the employee. If a donor did not provide specimen quantities required for a split specimen (45-60ml) the donor will waive their right to have the “B” sample reanalyzed but may use the original “A” sample. There is no appeal procedure for alcohol collected by a Breath Alcohol test.

V. TESTING PROCEDURES

A) Samples

All samples for testing will be taken by appropriately qualified personnel. Urine specimens taken will be split into two samples. Each sample will be appropriately marked with the employee’s identification.

B) Privacy

To the greatest extent possible, the privacy of the employee will be preserved while the sample(s) to be tested are taken. However, some precautions will help to ensure that pure specimens are obtained.

C) Screening

The initial screening will be by immunoassay and require gas chromatography/mass spectrometry (GC/MS) for confirmation

D) Adulteration or Substitution

Adulteration or Substitution of a specimen shall be treated as a positive test. If a sample is unable to be analyzed by the laboratory (inadequate, dilute, lack of sample, , out of temperature, etc.) employees will have the option of having one additional test within 72 hours. A second sample unable to be analyzed by the laboratory may require another type of test; this will be at the employee’s expense unless a valid medical reason by a medical professional for the inadequate samples is provided.

E) Reports

Reports shall be made in writing and sent to the single person designated by the employer and designated by the union after The Medical Review Officer (MRO) review.

F) Medical Review Officer (MRO)

The MRO is a licensed physician who has knowledge of substance abuse disorders. The MRO must be certified by either the American Association of Medical Review Officers (AAMRO) or the American College of Occupational and Environmental Medicine (ACOEM). The MRO shall:

- 1) Review and verify a laboratory positive test result.
- 2) Contact the individual within 24 hours to discuss the reasons why their test result might be positive.
- 3) Review the individual's medical record as provided by or at the arrangement of the tested individual as appropriate.
- 4) Confirm the laboratory result.
- 5) In the case of urine testing, only those specimens which show positive results on both the initial screening and the confirmatory test shall be reported as positive, pending MRO review and verification. The completed chain of custody form shall accompany any positive report, and copies of analytical reports shall be available to the employee.
- 6) Notify the Third Party Administrator (TPA) of all positive tests results. All records of test reviewed by the MRO and supporting documentation will be forwarded to and maintained by the TPA.

Samples shall be properly stored at all times. All samples reported as positive will be stored frozen for at least 365 days. All handling and transportation of each specimen will be properly documented through strict chain of custody procedures.

VI. CONFIDENTIALITY

All actions taken under this program will be strictly confidential and disclosed only to those with a "need to know".

VII. RULES – CORRECTIVE ACTIONS – GRIEVANCE PROCEDURES

A) Rules

All employees must report to work in a physical condition that will enable them to perform their jobs in a safe and efficient manner. Employees shall not:

- 1) Use, possess, dispense or receive prohibited substances on or at the job site; or

- 2) Report to work while under the influence of an intoxicant, a prescription medication or a prohibited substance which may impair the performance of their job duties, either mental or physical.

B) Corrective Action

When the company has reasonable suspicion to believe an employee is under the influence of an intoxicant or a prohibited substance, for reasons of safety, the employee may be suspended until test results are available. If the test results prove negative, the employee shall be reinstated with back pay for all hours missed. In other cases:

- 1) Individuals testing positive for drug and/or alcohol use under III. A) may be suspended from consideration as required by the customer or facility owner.
- 2) Employees will be required to cooperate with testing requests, testing procedures, and to sign the required consent and chain of custody forms as a condition of continued employment or will otherwise be terminated.
- 3) Employees found in possession of drugs Synthetic/Designer, or Unauthorized Drugs on the work site shall be in violation of this policy and shall be subject to corrective action.
- 4) Employees found to be under the influence of a prohibited substance, including alcohol, while on duty or operating a company vehicle shall be subject to corrective action as provided by subsection 5 of this section.
- 5) The following stages of corrective action shall be imposed:
 - a) On the first violation of this policy, the employee will be ineligible to work under this program. To be eligible to return to work the employee must participate in a Substance Abuse Education/Treatment Program and provide a negative return to duty test. The SAP must provide written authorization for the return to duty test. The employee must complete the Substance Abuse Education/Treatment Program. The employee will be subject to CGST testing a minimum of four times or as recommended by the testing medical health professional over a one year period as a condition of further employment.
 - b) On the second violation of this policy, the employee will be suspended by the employer for thirty (30) days without pay. To be eligible to return to work the employee must complete a Substance Abuse Education/Treatment Program and provide a negative return to duty test. The SAP must provide written authorization for the return to duty test. The employee will be subject to CGST testing a minimum of four times or as recommended by the testing medical health professional during over a one year period as a condition of further employment.
 - c) On third and subsequent violations of this policy, the employer will terminate the employee. The employee shall be suspended from the program for one year. To

be eligible to return to work the employee must complete a Substance Abuse Education/Treatment Program and provide a negative return to duty test. The SAP must provide written authorization for the return to duty test. The employee will be subject to CGST testing a minimum of four times or as recommended by the testing medical health professional over a one year period as a condition of further employment. After the one year period the employee can be considered for employment by participating employers.

- 6) The Corrective Action procedure will revert back to “first violation” described in Section VI, paragraph B) 5) following three consecutive years of negative tests providing the employee continually participated in the program.
- 7) Sale and Distribution - Any sale and/or distribution of a prohibited substance on Company property is grounds for immediate termination.
- 8) All aspects of this policy and program will be subject to the grievance procedure of the applicable collective bargaining agreements.

VIII. REHABILITATION AND EMPLOYEE ASSISTANCE PROGRAM

Employees are encouraged to seek help for a drug or alcohol problem before it requires corrective action. If an employee voluntarily notifies supervision that he or she may have a substance abuse problem, the company and/or union will refer the employee to their employee assistance program. In the absence of a current EAP contract, the company and/or union will assist in locating a suitable treatment provider and will counsel the employee regarding medical benefits available under the company or union health insurance program.

If treatment necessitates time away from work, the company shall provide the employee an unpaid leave of absence for purposes of participation in an agreed upon treatment program. An employee who successfully completes a rehabilitation program may be reinstated to his/her former employment status, if work for which he/she is qualified is available.

IX. EMPLOYER AND EMPLOYEE TRAINING

Training Programs are intended to meet the requirements of the Ohio Bureau of Workers Compensation Drug Free Safety Program (BWC-DFSP) initiative regardless of the size of the company. All Contractor and Worker participants will be required to meet BWC-DFSP requirement in the first year regardless of the BWC-DFSP participation Level. It is the responsibility of the contractor to meet the training requirement at the appropriate participation level.

For more information on educational and training materials call your TPA, your trade Designated Representative (DR), or www.ohiobwc.com.

X. POLICY

The Policy and Program will be reviewed periodically by a joint Committee. The Committee will be comprised of equal representation from the participating unions and contractor association representatives. Any changes must be approved by this Drug, Alcohol Committee.

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XI. Appendix A Reasonable Cause Checklist

Employee's name _____

Title: _____

Local: _____

Location: _____

Date(s): _____

Employer: _____

KNOWING THE SIGNS: The indicators listed below are "warning signs" of drug and/or alcohol abuse and may be observed by supervisors. Please check all observed indicators:

Moods:

- ☐ Depressed
- ☐ Anxious
- ☐ Irritable
- ☐ Suspicious
- ☐ Complains about others
- ☐ Emotional unsteadiness (e.g., outbursts of anger/frustration/crying)
- ☐ Mood changes after lunch or break

- ☐ Has exaggerated sense of self-importance
- ☐ Avoids talking with supervisor regarding work issues
- ☐ Weight Loss

Accidents:

- ☐ Taking of needless risks
- ☐ Disregard for safety of others
- ☐ Higher than average accident rate on and off the job – accident prone

Absenteeism:

- ☐ Acceleration of absenteeism and tardiness, especially Mondays, Friday, before and after holidays
- ☐ Frequent unreported absences, later explained as "emergencies"
- ☐ Unusually high incidence of colds, flus, upset stomach, headaches
- ☐ Frequent use of unscheduled vacation time
- ☐ Leaving work area more than necessary (e.g., frequent trips to water fountain and bathroom)
- ☐ Unexplained disappearances from the job with difficulty in locating employee
- ☐ Requesting to leave work early for various reasons

Work Patterns:

- ☐ Inconsistency in quality of work
- ☐ High and low periods of productivity
- ☐ Poor judgment/more mistakes than usual and general carelessness
- ☐ Lapses in concentration
- ☐ Difficulty in recalling instructions
- ☐ Difficulty in remembering own mistakes
- ☐ Using more time to complete work/missing deadlines
- ☐ Increased difficulty in handling complex situations

Actions:

- ☐ Withdrawn or improperly talkative
- ☐ Spends excessive amount of time on the telephone
- ☐ Argumentative; Displays violent behavior

Relationship to Others on the Job:

- ☐ Overreaction to real or imagined criticism (paranoid)
- ☐ Avoiding and withdrawing from peers
- ☐ Complaints from co-workers
- ☐ Borrowing money from fellow employees
- ☐ Persistent job transfer requests
- ☐ Complaints of problems at home such as separation, divorce and child discipline problems

OBSERVING AND DOCUMENTING CURRENT INDICATORS

Patterns of any of the above conduct or combinations of conduct may occur but must be accompanied by indicators of impairment in order to establish "reasonable cause." Please check all indicators listed below that are **currently** present:

- | | | |
|--|---|--|
| <input type="checkbox"/> Constricted pupils | <input type="checkbox"/> Excessively active | <input type="checkbox"/> Bizarre behavior |
| <input type="checkbox"/> Drowsiness | <input type="checkbox"/> Inability to verbalize | <input type="checkbox"/> Violent behavior |
| <input type="checkbox"/> Dilated pupils | <input type="checkbox"/> Nausea or vomiting | <input type="checkbox"/> Needle/Burn marks |
| <input type="checkbox"/> Odor of alcohol | <input type="checkbox"/> Irritable | <input type="checkbox"/> Possession of |
| <input type="checkbox"/> Scratching | <input type="checkbox"/> Flushed skin | paraphernalia (such as syringe, |
| <input type="checkbox"/> Nasal secretion | <input type="checkbox"/> Argumentative | bent spoon, metal bottle cap, |
| <input type="checkbox"/> Red or watering eyes | <input type="checkbox"/> Sweating | medicine dropper, glassine bag, |
| <input type="checkbox"/> Dizziness | <input type="checkbox"/> Difficulty concentrating | paint can, glue tube, nitrite bulb, |
| <input type="checkbox"/> Involuntary eye movements | <input type="checkbox"/> Yawning | or aerosol can) |
| <input type="checkbox"/> Muscular in-coordination | <input type="checkbox"/> Slurred speech | <input type="checkbox"/> Possession of substance |
| <input type="checkbox"/> Sniffles | <input type="checkbox"/> Twitching | that appears to possibly be a |
| | | drug or alcohol |

Others: _____

DETERMINING REASONABLE CAUSE

If you are able to document one or more of the indicators above, ask yourself these questions to establish reasonable cause:

Y N

☐ ☐ Has some form of impairment been shown in the employee's appearance, actions or work performance?

☐ ☐ Does the impairment result from the possible use of drugs or alcohol?

☐ ☐ Are the facts capable of documentation? Y N

☐ ☐ Is the impairment current, today, now?

☐ ☐ Are the facts reliable? Did you witness the situation personally, or are you sure that the witnesses are reliable and have provided firsthand information?

☐ ☐ Are the facts capable of explanation?

TAKING ACTION

☐ Reasonable cause established

☐ Reasonable cause NOT established

☐ Refer to Drug Test ☐ Refer to Employee Assistance Program (EAP) ☐ No Further Action
Required

Comments: _____

Prepared by (Name & Position): _____

Also witnessed by (Name & Position): _____

Signature(s): _____

Date(s): _____

Within 24 hours, email or fax to your TPA

Mobile Medical Corp dglazer@mobmed.com or fax 440.356.9238 SCT ggrueser@sct.us.com or fax 440.473.1586

Appendix B Safety Violation Policy and Safety Violation Notification Form

Title: Safety Violation Policy

PURPOSE

The Albert M. Higley Co. believes all incidents are preventable and that most incidents are a result of personal choice, behavior or a lack of education. The purpose of the violations policy is to modify those behaviors and attitudes that could contribute to personal, material or environmental loss, before the loss occurs.

SCOPE

This policy applies to all employees, subcontractors and projects of *The Albert M. Higley Co.*

Repeated violations or lack of cooperation regarding safety regulations may result in disciplinary actions, termination from employment, suspension from a project and/or termination of a contract.

Multiple violations under the same superintendent or foreman will result in the citation and /or suspension of all respective personnel.

RESPONSIBILITIES

All superintendents and supervisors are responsible for enforcing and documenting safety violations.

DEFINITIONS

1. Serious Injury – An injury which results in loss of life, limb, body function, eyesight, or has permanent, long-lasting impact on a person's life (disease).
2. Significant Property Damage – An event which results in financial damages to equipment, tools, structures, materials, vehicles or any type of property at or above \$750.

PROCEDURE

- I. All safety violations must be documented in a timely manner utilizing Safety Violation Notification Form (F-SFTY-0004).
- II. Violations will remain on file until project completion or two years, whichever is longer.
- III. All safety violations will follow the progressive disciplinary system outlined in this Policy unless the person:
 - a. Exposes themselves or others to an imminent loss of life; or
 - b. Exhibits disregard, defiance or disrespect for *The Albert M. Higley Co.*'s safety rules and regulations; or refuses to sign the safety violation form; or
 - c. Makes violent physical encounters (fighting); or
 - d. Makes threats against any safety personnel performing their duties; or
 - e. Theft or destruction of property occurs; or
 - f. Uses, possesses, distributes or is under the influence of drugs or alcohol.
- IV. Should any of these events occur, they will be documented on the Safety Violation Notification Form and the person will be immediately removed from the property.
- V. Violations are broken into two categories based on possible consequence of exposure to hazards.

Safety Violation Category 1 - Exposure, if not corrected immediately, could result in an incident leading to serious injury or significant property damage (high risk). Examples include, but are not limited to, inadequate fall protection, confined space entry, excavation protection, lock-out/tag-out procedures, etc. Unlike category two offenses, category one offenses do not reset for any reason.

- a. 1st Offense – The employee in violation shall be suspended from the jobsite for the rest of the day plus the next scheduled workday and a verbal warning to the supervisor responsible for the employee. The employee must be retrained prior to resuming work. Or if AM Higley safety recommends,

Employee may choose the option to create a toolbox training concerning the violation and then conduct the training to the rest of their crew prior to returning to work. The training must be reviewed by *The Albert M. Higley Co.* safety team or superintendent.

- b. 2nd Offense – Indefinite suspension of the employee from project and a written warning to the supervisor responsible for employee.

Safety Violation Category 2 – Exposure, if not corrected immediately, could result in an injury or property damage (low-mid risk)

- a. 1st Offense – Verbal warning but documented. Notification to the employee’s supervisor.
- b. 2nd Offense – Written Warning to the employee and a verbal warning documented on the Safety Violation Notification Form to the supervisor. The employee must also be retrained prior to resuming work.
- c. 3rd Offense – Suspension from the project for a duration that is commensurate with severity of the violation(s) for the employee and a written warning to the supervisor responsible for the employee. The employee and the employee’s supervisor must also be retrained prior to resuming work. Once an individual receives his/her third offense, a calendar year must pass, with no received violations, before that individual’s offenses reset.

VI. *The Albert M. Higley Co.* reserves the right as authorized in all subcontracts to cause to have immediate remediation of unsafe conditions at the subcontractor’s expense with no prior notification. Any subcontractor found to be in violation of any portion of subcontractor’s contract regarding safety shall jeopardize continued performance on current and future efforts.

a|m HIGLEY
Beyond Bricks and Mortar
Safety Violation Form

Name of Person in Violation: _____ Violation Date: _____

Company Name: _____ Project: _____

Violation Description: _____

Check appropriate category based on violation:

Safety Violation Category 1: Exposure, if not corrected immediately, could result in serious injury or significant property damage (*high-risk*). Examples include, but are not limited to, inadequate fall protection, confined space entry, excavation protection, lock-out/tag-out procedures, etc.

☐ **1st Offense-** Suspension from the project for rest of the day plus the following workday. Employee must be retrained prior to resuming work. With the approval of AMH leadership, employee may choose the option to create a toolbox training concerning the violation and then conduct the training to the rest of the crew. The training must be reviewed by AMH leadership. Supervisor may receive a violation at the discretion of AMH leadership.

Dates of Suspension: _____

☐ **2nd Offense-** Indefinite suspension of employee from all AMH projects. Supervisor retrained prior to resuming work.

Safety Violation Category 2: Exposure, if not corrected immediately, could result in an injury or property damage (*low-mid risk*).

☐ **1st Offense**

☐ **2nd Offense**

☐ **3rd Offense-** Suspension from the project for rest of the day plus the following workday.

Dates of Suspension: _____

FAILURE TO SIGN VIOLATION WILL RESULT IN IMMEDIATE SUSPENSION FROM AMH PROJECT

Comments: _____

Violator's Signature: _____

Supervisor of Violator's Signature: _____

Individual Issuing Violation Signature: _____

2021

Appendix C – Emergency Action Plan

Generate an Emergency Action Plan, and include it with your contracts, from the Template provided at:

K/Safety/Site Specific Safety Plan

Appendix C Emergency Action Plan (See Attached)

Company Logo

Job No.: Job Number
Contract No.: Subcontract Number
Contact: Vendor PM Name
Phone: Vendor PM Phone
Email: Vendor PM Email

SUBCONTRACT AGREEMENT

THIS AGREEMENT made as of the Contract Date day of Contract Date Month in the year of Contract Date Year.

BETWEEN the Contractor:

Company Name
Company Address
Company Phone Number

and the Subcontractor:

Vendor Name
Federal Employer Identification No.
Vendor Address

The Project is:

Job Name
Job Address

The Owner is:

Contract Customer Name
Contract Customer Address

The Architect is:

Architect Name
Architect Address

The Contractor and Subcontractor in consideration of the terms, covenants and conditions herein contained agree as set forth below:

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ADDITIONAL ATTACHMENTS:

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SCHEDULE B – SCOPE OF WORK

SCHEDULE C – CONTRACT DOCUMENTS

SCHEDULE D – PERFORMANCE SCHEDULE

REFERENCE ARTICLE 34 FOR ANY OTHER ADDITIONAL ATTACHMENTS

ARTICLE 1 SUBCONTRACT SCOPE AND AMOUNT

- 1.1 The Subcontractor agrees to furnish all supervision, labor, materials, tools, scaffold, falsework, equipment, layout, hoisting, supplies, submittals, clean-up, permits, fees, licenses, Project records, temporary services, inspections, protection, warranty, safety, bonds, insurance, maintenance, indemnification and all other things necessary to perform all work and work incidental thereto as set forth in Section 1.2 for the amount set forth in Section 1.3, for the construction of the Project for the Contractor and the Owner in strict and complete accordance with the Contract Documents identified in Section 2.1, and all subsequently and duly issued modifications thereto by the Architect and/or the Contractor. This Agreement is contingent upon the Contractor entering into a General Contract with the Owner and contingent upon the Owner's approval and acceptance of the Subcontractor. The Subcontractor is not authorized to perform any Work under this Agreement until the Contractor enters into a General Contract with the Owner. Any work performed or preparations to perform Work by the Subcontractor prior to such time shall be at the sole risk and expense of the Subcontractor.
- 1.2 The work to be performed by the Subcontractor including all supervision, labor, materials, tools, scaffolds, falsework and equipment, (hereinafter called the Subcontractor's Work), is as identified and described in Schedule B attached hereto.
- 1.3 The Subcontractor's Work is not limited by any titles on the Plans or headings in the Specifications, it being the intention of the parties that all work customarily performed with the Subcontractor's Work and required by the Contract Documents shall be performed by the Subcontractor, including any and all items and services consistent with and contemplated by and reasonably inferable from the Contract Documents, whether such items and services are specifically mentioned therein.
- 1.4 In consideration whereof, the Contractor agrees to pay the Subcontractor for the full and faithful performance of the Subcontractor's Work the sum of Original Contract Amount Description (**\$Original Contract Amount**) (hereinafter "the Subcontract Amount") as is further described in Schedule B. The Subcontract Amount includes all Federal, State, County, Municipal and other taxes imposed by law and based upon labor, services, materials, equipment or other items required, performed, furnished or used for or in connection with the Work, including but not limited to sales, use and personal property taxes payable by or levied or assessed against the Owner, the Contractor or the Subcontractor. Where the law requires any such taxes to be stated and charged separately, the total price of all items included in the Work plus the amount of such taxes shall not exceed the Subcontract Amount.

ARTICLE 2 THE CONTRACT DOCUMENTS

- 2.1 The Plans, Specifications, General Conditions, Addenda and General Contract, including this Agreement, are available for examination by the Subcontractor at all reasonable times at the office of the Contractor, and are hereinafter sometimes referred to as the Contract Documents. The Subcontractor certifies, represents and agrees that it has carefully examined and understands this Agreement and the other Contract Documents, has investigated the nature, locality and site of the Work and the conditions and difficulties under which it is to be performed, and that it enters into this Agreement on the basis of its own examination, investigation and evaluation of all such matters and not in reliance upon any oral or written opinions or representations of the Contractor, or of the Owner, or of any of their respective officers, agents, servants, or employees.
- 2.2 With respect to the Subcontractor's Work to be performed and furnished by the Subcontractor hereunder, the Subcontractor agrees to be bound to the Contractor by each and all of the terms and provisions of the General Contract and the other Contract Documents, and to assume towards the Contractor all of the duties, obligations and responsibilities that the Contractor by those Contract Documents assumes towards the Owner and be bound to the Contractor in the same manner as the Contractor is bound to the Owner. The Subcontractor agrees further that the Contractor shall have the same rights and remedies against the Subcontractor as the Owner under the terms and provisions of the General Contract and other Contract Documents has against Contractor with the same force and effect as though every such duty, obligation, responsibility, right or remedy were fully set forth herein. The Subcontractor agrees that the Subcontractor's right and remedies against the Contractor, as opposed to the Subcontractor's obligations, risks,

responsibilities, liabilities and limitations, shall be limited solely to the rights and remedies provided to the Subcontractor in this Agreement without regard to any rights or remedies afforded by any of the other Contract Documents. The terms and provisions of this Agreement with respect to the Subcontractor's Work to be performed and furnished by the Subcontractor hereunder are intended to be and shall be in addition to and not in substitution for any of the terms and provisions of the General Contract and the other Contract Documents.

- 2.3 This Agreement, the provisions of the General Contract and other Contract Documents are intended to supplement and complement each other and shall, where possible, be thus interpreted. If, however, any provisions of this Agreement irreconcilably conflicts with a provision of the General Contract and the other Contract Documents, the provision imposing the greater duty or obligation on the Subcontractor shall govern.

ARTICLE 3 CONTRACT TIME

- 3.1 The Subcontractor shall commence the Subcontractor's Work when notified to do so by the Contractor and shall diligently and continuously prosecute and complete the Subcontractor's Work and coordinate the Subcontractor's Work with the other work being performed on the Project, in accordance with the Project Schedule, all Milestone Dates (as identified in Article 6) and any other scheduling requirements listed in this Agreement, so as not to delay the commencement, progress or completion of the whole or any part of the Subcontractor's Work or other work on the Project (hereinafter "Subcontract Time"). THE TIME OF THE SUBCONTRACTOR'S PERFORMANCE IS OF THE ESSENCE.
- 3.2 The Subcontractor shall prepare and submit a detailed schedule identifying in ample detail, as required by The Contractor, the activities which comprise Subcontractor's schedule of Work required under this Agreement (hereinafter the Subcontractor's Schedule). The Subcontractor shall identify all manpower equipment and material requirements required to support the activity durations of the Subcontractor's Work and other information as requested by the Contractor. The Subcontractor's schedule shall include Subcontractor's Work for the entire Project and shall provide for the expeditions and practicable execution of the Subcontractor's Work in a coordinated fashion which provides for the performance of predecessor activities to be performed by others upon which the Subcontractor's Work is dependent upon in the time required by the General Contract between the Contractor and the Owner. The Subcontractor's Schedule shall identify the start and completion dates of all activities and stages of the Subcontractor's Work. The Subcontractor's Schedule shall be as required by the status and conditions of the Subcontractor's Work and the overall project and shall be subject to the Contractor's approval. The Subcontractor shall promptly inform the Contractor of any delays encountered and anticipated in the Subcontractor's Schedule and shall identify same at Project meetings. The Subcontractor shall furnish to the Contractor in such detail and as often as required by the Contractor, full reports of the progress of the Subcontractor's Work irrespective of the location of such Subcontractor's Work. The Contractor's receipt, review and/or acceptance of the Subcontractor's Schedule shall not constitute an amendment or modification of this Agreement nor satisfy any notice requirements of this Agreement or of the Contract Documents. The Contractor shall have the right, but not the obligation, to coordinate the Subcontractor's schedule with the schedules of the Contractor and the other subcontractors (hereinafter "Project Schedule"). The Subcontractor agrees to abide by and perform its obligations in accordance with the Project Schedule.
- 3.3 The Subcontractor acknowledges that the Subcontract Amount reflects the Contractor's right to coordinate and manage all of the Work required by the Contract Documents, including the Subcontractor's Work, and the Contractor has the right to require the Subcontractor to begin the Subcontractor's Work before all scheduled predecessor work is complete, to resequence the Subcontractor's Work and to allocate site access, work area access, utilities, storage and lay down areas and other site resources and Project work ("Site Resources") and provide certain trades and work preference to Site Resources in order to maintain the schedule of Project work as determined by the Contractor. Notwithstanding any other provision of this Agreement or the Contract Documents, the Subcontractor waives, except for claims identified in Article 12, any and all claims for damages, extensions of time for an increase to the Subcontract Amount as the result of any delay, change or other cause arising from the Contractor's allocation of Site Resources, based upon reasonable business judgment. The Subcontractor and the Contractor agree that Section 3.3 shall not be interpreted as a no damage for delay provision. The Subcontractor acknowledges that the Subcontractor

Amount includes the Subcontractor's assessment of the potential impacts of Section 3.3 on its ability to recover additional compensation caused by the Contractor's allocation of Site Resources that are inconsistent with the Subcontractor's Schedule and agrees that the provision of Section 3.3 will apply regardless of the accuracy of the Subcontractor's assessment of the potential costs incurred by the Subcontractor.

- 3.4 The Subcontractor agrees to assist the Owner and the Contractor in expediting and tracking of the Owner-furnished items that the Subcontractor is to install to ensure that the delivery of same coincides with the Subcontractor's Schedule.

ARTICLE 4 PROGRESS PAYMENTS

- 4.1 Within ten (10) days after the notice of award, the Subcontractor shall submit to the Contractor for its approval, a schedule of values of all portions of the Work, divided and segregated so as to facilitate Progress Payments under this Agreement (a "Schedule of Values"). To the fullest practical extent, the Schedule of Values shall be based on the Subcontract Amount as supported by subcontracts and purchase orders. The Subcontractor shall also provide the Contractor with all supporting data reasonably requested by Contractor to substantiate the accuracy of the Schedule of Values. Unless otherwise agreed by Contractor, each Change Order which increases or decreases the Subcontract Amounts shall be accounted for as a separate line on the Schedule of Values. Each Application for Payment shall report the status of each Change Order in addition to the original Schedule of Values. The Schedule of Values shall not be changed, modified, altered, or amended without the express written consent of the Contractor.
- 4.2 The Contractor may retain from each progress payment sums otherwise due the Subcontractor until final payment. Such retention shall be in addition to such other sums which the Contractor has a right to withhold from the Subcontractor pursuant to this Agreement and the Contract Documents. Retention is applicable to all labor and all materials whether stored on or off-site.
- 4.3 On or before the 20th day of each month during the performance of the Subcontractor's Work, the Subcontractor shall submit to the Contractor through the online portal, the Contractor's Application for Payment. Upon approval from the Contractor, the Approved Application for Payment will automatically be considered Final for that period. Such Application for Payment, shall set forth the Subcontract Amount incurred to the date of such Application for Payment, allocated among the categories set forth in the Schedule of Values and separately stating that portion of the Subcontract Amount that constitutes the labor, materials, supplies, systems, appliances, equipment, fixtures and other items required for or in connection with the construction, furnishing, or equipping of, or for inclusion in, the Subcontractor's Work and all sales and use taxes payable with respect to such items. To the extent not previously furnished, each Application for Payment shall be accompanied by such supporting evidence required by the Contractor to verify the Amount included in each Application for Payment and by original, executed Partial Waivers of all Liens for all the Subcontractor's Work performed and all services and materials provided with respect to the Project, to the extent the Contractor has made payment to the Subcontractor for such items pursuant to all prior Applications for Payment. Each Application for Payment shall contain an allocation of the percentage of completion of each portion of the Subcontractor's Work as of the end of the period covered by the Application for Payment. Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:
- .1 Take that portion of the Subcontract Amount properly allocable to the completed Subcontractor's Work as determined by multiplying the percentage completion of each portion of the Subcontractor's Work by the share of the Subcontract Amount allocated to that portion of the Subcontractor's Work in the Schedule of Values, less retainage of **Retainage Percentage**%.
 - .2 Add that portion of the Subcontract Amount properly allocable to materials and equipment delivered and suitably stored at the Site, or stored off-site (if provided by the General Contract, for subsequent incorporation in the completed Subcontractor's Work), less retainage of **Retainage Percentage**%.

- .3 Subtract the aggregate of previous payments made by the Contractor.
 - .4 Subtract amounts for which the Contractor, the Owner, or the Architect has withheld or nullified in a previous Application for Payment.
 - .5 Billing and payment of retainage to be at project completion or as agreed upon by the project Owner.
- 4.4 Without impairing the Subcontractor's mechanic's lien and payment bond rights, if any, to the fullest extent permitted by law, if the Subcontractor is in compliance with this Agreement and if, and only if, the Owner pays Contractor, which is an express condition precedent to the Contractor's duty to pay the Subcontractor, which the Subcontractor acknowledges and agrees that it expressly assumes the risk of the Owner's nonpayment, Payment shall be due to the Subcontractor no later than ten (10) days after receipt of payment from the Owner by the Contractor, provided the Subcontractor remains in compliance with the terms of this Agreement. Should the foregoing condition precedent be unenforceable in the jurisdiction where the Project is located, the Subcontractor agrees that the Contractor and the Contractor's surety shall have a reasonable period of time within which to tender payment, and such reasonable period includes, but is not limited to, the time necessary for the Owner to process and make a progress or final payment or decide an Owner Related Dispute, or for the Contractor to fully adjudicate any disputes, claims, causes of action or other matters associated with or related to this Agreement and/or the General Contract. For purposes of this section, "fully adjudicate" means the completion of mediations, arbitrations, trials or any combinations thereof, together with such appeals as may be taken from any decisions, orders, judgments, opinions or such similar rulings as may result therefrom. The Owner and the Contractor's surety are an express third-party beneficiary of this provision. No final or interim Payment made under this Agreement shall be considered an acceptance of Subcontractor's Work, in whole or in part. The Contractor may, at its sole discretion, unilaterally deduct or set off, as allowed in this Agreement, or overpay or pay all or any part of the Subcontract Amount in a greater amount or at an earlier time than otherwise allowed, required, or specified herein, either as an advance or otherwise in which event, all other terms and conditions hereof, and any bonds furnished hereunder by the Subcontractor, even if such payment or deduction is prejudicial to the Subcontractor's surety, shall be unaffected thereby and shall remain in full force and effect, and the Subcontractor's surety shall not be entitled or permitted to assert that such overpayment or greater or earlier payment or unilateral deduction or set off as a defense, either partial or otherwise, to any claim by the Contractor.
- 4.5 Payment will be made by Contractor after: (i) inspection and acceptance of the Subcontractor's Work; (ii) receipt by the Contractor of the executed original copy of this Agreement and insurance and bond required from the Subcontractor and warehouseman if payment is for Stored Material; (iii) receipt of Subcontractor's approved Application for Payment; (iv) receipt of Partial Waivers of all Liens and affidavits from the Subcontractor and the Subcontractor's lower tiers as required elsewhere by this Agreement; (v) consent of surety to payment and letters from the unions which state, if required by and to the satisfaction of the Contractor, that the Subcontractor is current with its payment obligations to the unions, (vi) receipt of the Subcontractor's updated Project Records required by this Agreement and in a form acceptable to the Contractor; and (vii) receipt by the Contractor, of payment from the Owner, for the Subcontractor's Work.
- 4.6 Unless otherwise provided in the Contract Documents, and if approved in advance by the Owner, applications for payment may include materials and equipment not incorporated in the Subcontractor's Work but delivered and suitable stored at the Project site or at some other location agreed upon in writing by the Contractor. Approval of an Application for Payment for such stored items on or off the Project Site shall be conditioned upon the satisfaction of the terms of this section of the Agreement, or such other procedures satisfactory to the Owner and the Contractor and in accordance with the Contract Documents to establish the Owner's and the Contractor's title to such materials and equipment otherwise protect the Owner's and the Contractor's interests therein, including transportation to the Site. Approval and payment by the Owner to the Contractor for said stored material and stored equipment is an absolute express condition precedent to payment by the Contractor to the Subcontractor for such stored materials. The Contractor, at its sole discretion, shall require one or more of the following from the Subcontractor as part of an Application for Payment for stored materials:

- .1 Warehouse Agreement and Non-Negotiable Warehouse Receipt. The materials to be stored shall be placed into the possession of a warehouseman subject to a warehouse lease or agreement, which document shall be provided to the Contractor. The warehouseman shall not be in the business of buying and selling the materials of the nature to be stored. The liability of the warehouseman for failure to deliver shall be covered by insurance or a performance bond acceptable to the Contractor. Upon placing the materials into the possession of the warehouseman, a non-negotiable warehouse receipt, in a form acceptable to the Contractor, shall be issued to the Contractor. The warehouse receipt must provide that the materials are to be delivered only at the Contractor's written direction and follow the Contractor's written instructions.
- .2 Bill of Sale with Additional Storage Provisions. The Contractor, at its sole discretion, may allow the Subcontractor to provide the Contractor a Bill of Sale for the material to be stored and not in the possession of the Subcontractor, in a form provided by the Contractor. The Subcontractor shall separate the stored material from any other goods in the possession of the Subcontractor which are either identical or of a similar nature. The Subcontractor shall maintain the separate and exclusive storage of the stored material in an open and notorious manner providing public notice that the stored material are the property of the Contractor. The Subcontractor shall maintain the stored material in a condition such that at all times the stored material is ready for immediate delivery and incorporation into the construction project upon demand of the Contractor. The Subcontractor represents and warrants that the stored material shall remain free and clear from any security interest, lien, pledge, encumbrance, option, conditional sales contract, lease or other title retention agreement, or any other adverse claim whatsoever. Subcontractor shall specifically, permanently, mark the stored material covered by the Bill of Sale as the exclusive property of the Contractor. The Subcontractor shall procure insurance on the goods for the full value of the stored material, in a form satisfactory to the Contractor, naming the Contractor and the Owner as insured.
- .3 UCC Financing Statement. In the event title to the stored material will not pass to the Contractor at the time of payment to the Subcontractor, the Contractor may require the Subcontractor to properly file a UCC Financing Statement Form 1 with the Secretary of State's Office.
- .4 If required by the Contractor, the Subcontractor shall submit a separate Application for Payment for the quantity of material and equipment placed in storage. If required by the Contractor, the quantity of material or equipment for which payment is requested shall be equal to a discrete activity within the Project progress schedule in order that the Contractor may subsequently bill the Owner for said material or equipment. The Owner and/or Contractor shall determine, at their sole discretion, the acceptability of the storage conditions and the Subcontractor shall correct any noted deficiencies. By submitting its Application for Payment for stored materials or equipment to the Contractor, the Subcontractor expressly represents and warrants that no security interest by a lending institution or any other entity exists in the stored materials or equipment covered by such Application for Payment.
- .5 Regardless of any dispute between the Contractor and the Subcontractor, if the Contractor has partially or fully paid the Subcontractor for material or equipment as part of this Agreement, either as stored material or otherwise, upon written demand by the Contractor, the Subcontractor shall immediately ship, as directed by the Contractor, the material and equipment to be purchased under this Agreement. The Subcontractor acknowledges and agrees that the Contractor may have no adequate remedy at law for the Subcontractor's refusal to immediately ship the material or equipment as directed by the Contractor, and that the Contractor shall be entitled to enforce its demand for immediate shipment against Subcontractor by temporary or permanent injunctive relief or mandamus obtained in any court of competent jurisdiction, without posting any bond or other security, and without prejudice to or diminution of any other rights or remedies which may be available to the Contractor at law or in equity, and any attorneys' fees and costs incurred by the Contractor in such instance shall be due from the Subcontractor.
- .6 Application for Payments for stored material or equipment off-site must reflect a minimum of ten percent (10%) withholding, in addition to any other retention, for transportation costs associated

with delivery to the jobsite, which shall be withheld until the stored material or equipment has been incorporated into the Project and accepted by the Owner.

- .7 Regardless of any payment, the risk of loss for stored materials or equipment at all times shall remain upon the Subcontractor until final acceptance of the Project by the Owner. Notwithstanding that the risk of loss for stored materials or equipment remains upon the Subcontractor, and regardless of which entity maintains or controls any location(s) where materials or equipment are stored, the Subcontractor acknowledges and agrees that the Contractor and/or the Owner have and shall be deemed to have exclusive possession of all stored materials or equipment included within any invoice submitted by Subcontractor.
 - .8 The Subcontractor must be prepared, at all times, to prove within commercial norms, the exact quantities and qualities of the materials or equipment purchased, used, or to be used in the Subcontractor's Work. Unless authorized by the Owner, the Subcontractor shall not be reimbursed by the Contractor or the Owner for any of the costs associated with stored materials.
 - .9 The Subcontractor shall defend, indemnify, and hold harmless the Contractor, the Contractor's surety, and the Owner against all claims, judgments, settlements, damages, losses, demands, suits, actions, liability, fines, penalties, costs and expenses (including but not limited to attorneys and expert fees and costs of litigation, arbitration, or mediation) arising out of or relating in any way to any third party's assertion of a lien, encumbrance or interest in stored materials or equipment.
- 4.7 Where this Agreement anticipates that the Subcontractor's Work, or a portion thereof, shall be paid for at an agreed rate per unit of work in place, then the Subcontractor agrees that the unit prices stated shall represent full payment for all such Subcontractor's Work, including Subcontractor's overhead and profit and that the Owner and/or the Contractor may make a final and binding determination regarding the quantity of Subcontractor's Work for which payment is to be paid subject to the Owner Related Disputes provisions of this Agreement. All quantities stated as unit price quantities are approximate. Actual payment quantities are subject to field verification by the Owner and/or the Contractor and acceptance of required documentation, and may vary significantly from original estimated quantities, and quantity variation will not be reason to renegotiate a unit price, unless required by the Owner.
- 4.8 All payments made by the Contractor, its surety, or the Owner, to the Subcontractor are made to, and accepted by the Subcontractor as trustee for the benefit of the Subcontractor's employees, material suppliers and lower tier subcontractors. All payments received by the Subcontractor shall first be used to satisfy any indebtedness owed by the Subcontractor to persons or entities furnishing labor or materials for use in performing or incorporation into the Subcontractor's Work. The Contractor shall have the right at all times to contact the Subcontractor's sub-tiers and suppliers, vendors, materialmen and others to ensure that they are being paid by the Subcontractor for labor, equipment and materials furnished for use in performing the Subcontractor's Work. The Subcontractor shall ensure that all amounts owed to or on behalf of its employees are timely paid, including, without limitation, all wages, employee benefits, withholding taxes, and all other amounts.
- 4.9 When required by the Contractor, and as a prerequisite for payment, the Subcontractor shall provide, waivers and affidavits from the Subcontractor in forms as shown in an Exhibit of this Agreement, as specified by applicable statute, and as required by the Owner and the Owner's lender (collectively "Waivers"). The Subcontractor agrees that if, without the written consent of the Contractor, the Subcontractor has modified the Waivers in any manner ("Modified Waivers") and has received payment from the Contractor in exchange for the Modified Waivers, the modifications shall have no force and effect and the language required by the Waivers shall be deemed reinserted into the Modified Waivers, and the Contractor shall not have been deemed to have accepted the Modified Waiver and the Subcontractor shall be deemed to have executed unmodified Waivers. The Subcontractor must present unconditional Waivers from all of its lower tier subcontractors (hereinafter "Sub-tiers"), suppliers, or other entities arising from the Subcontractor's Work for the value of all prior payments, including the immediately preceding Application for Payment before the Subcontractor is entitled to be paid by the Contractor for the current Application for Payment. Also, as a prerequisite for payment, the Contractor may require the Subcontractor to provide copies of subcontracts and purchase orders from Subcontractor's sub-tiers and suppliers. The Subcontractor warrants and represents that

the individual signing the Waivers and affidavits for the Subcontractor has the authority to waive and release the Subcontractor's rights, including but not limited to its Miller Act rights to sue, that the Contractor may rely on the aforesaid warrants and representations, and that the information contained in the Waiver and affidavit is correct.

- 4.10 The Subcontractor and the Subcontractor's surety shall indemnify, defend and hold harmless the Contractor, the Owner, the Project funds, Project site and the Contractor's surety harmless from and against any claim for, or notice of, lien, encumbrance, payment bond claim, or other claim for payment or notice of non-payment (collectively "Lien"), any suit to enforce or recover or foreclose upon a Lien, and from any costs, expenses, attorney's fees, consultants' fees and litigation costs incurred by the Contractor in connection with any Lien, which arises in connection with the Subcontractor's Work or is asserted by any of Subcontractor's Sub-tiers, suppliers, employees, sureties, creditors, labor unions, or laborers ("Subcontractor's Lien Costs"). The Contractor may discharge the Lien or withhold from the Subcontractor's Progress or Final Payment any Subcontractor's Lien Costs incurred or anticipated to be incurred to defend and discharge any Lien and Subcontractor and Subcontractor's surety shall reimburse the Contractor for any Subcontractor's Lien Costs incurred to discharge or defend any Lien if not deducted from a Progress or Final Payment. The Subcontractor and the Subcontractor's surety shall also reimburse the Contractor for any Subcontractor's Lien Costs paid under any Contractor's surety bond and all additional amounts paid by the Contractor pursuant to any indemnity to the Contractor's surety. This Paragraph is solely for the benefit of the Contractor and the Subcontractor and is not intended to benefit any persons or entities not parties to this Agreement including the Subcontractor's surety, creditors, Sub-tiers or suppliers of any tier and creates no rights in them.
- 4.11 In the event the Contractor has reason to believe that labor, material or other obligations incurred in the performance of the Subcontractor's Work are not being, or may not be, paid, the Contractor may take any steps Contractor deems necessary to ensure that such obligations are paid and that the Subcontractor is fulfilling its obligations as trustee with respect to the payments earned under this Agreement, including, but not limited to, issuance of checks jointly to the Subcontractor and the person or entity to whom the Subcontractor owes an obligation, or direct payment to such person or entity unless the Subcontractor supplies evidence to the satisfaction of the Contractor, that such obligations have been satisfied. Any such payments made by the Contractor shall be credited against funds otherwise due the Subcontractor under this Agreement. Subcontractor also agrees, if required by the Owner, to execute the documents provided by the Owner pertaining to the issuance of joint checks to its Sub-tiers and suppliers.
- 4.12 Regardless of the terms of payment provided for herein, the Contractor shall not be required to make any payments that would leave a balance due to the Subcontractor which is insufficient to cover the retained percentage plus an amount sufficient to satisfy all obligations of the Subcontractor for labor, materials, equipment and services furnished or to be furnished by the Subcontractor hereunder.

ARTICLE 5 FINAL PAYMENT

- 5.1 Upon acceptance of all of the Subcontractor's Work by the Owner and the Contractor and upon the Subcontractor furnishing evidence of fulfillment of all of the Subcontractor's obligations under this Agreement and the Contract Documents, the Contractor shall forward the Subcontractor's Application for Final Payment to the Owner.
- 5.2 Before the Contractor shall be required to forward the Subcontractor's Application for Final Payment to the Owner, the Subcontractor shall submit to the Contractor: (i) an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Subcontractor's Work for which the Owner or its property or the Contractor or the Contractor's surety might in any way be liable, have been paid or otherwise satisfied, and unconditional final Waivers from all of Subcontractor's Sub-tiers, suppliers, or other entities arising from the Subcontractor's Work; (ii) consent of the Subcontractor's surety to final payment, if required by the Contractor; (iii) satisfaction of required close-out procedures and documentation; and (iv) other data if required by the Contractor or the Owner, such as receipts, releases, and waivers of liens to the extent and in such form as may be designated by the Contractor or the Owner. If the Subcontractor is in compliance with this Agreement and if, and only if, the Owner pays the Contractor which is an express condition precedent to the Contractor's duty to pay the Subcontractor and that the Subcontractor intends to assume the

risk of nonpayment, final payment shall be due to Subcontractor no later than thirty (30) days after receipt of payment from the Owner to the Contractor.

- 5.3 Final payment shall constitute a waiver of all claims by the Subcontractor relating to the Subcontractor's Work. All of Subcontractor's obligations pursuant to this Agreement shall be preserved notwithstanding final payment or termination of this Agreement. Final payment shall not be deemed an acceptance of Subcontractor's Work.

ARTICLE 6 PROGRESS AND COMPLETION.

- 6.1 The Subcontractor acknowledges that performance of the Subcontractor's Work and achieving Substantial Completion of the Project within the Subcontract Time is an essential condition of this Agreement. Following commencement, the Subcontractor shall carry the Subcontractor's Work forward with competent, adequate, properly skilled forces to maintain progress in accordance with the Subcontractor's and the Project Schedule. The Subcontractor's Work shall not be suspended or shut down, but shall progress continuously and expeditiously, unless otherwise approved by the Contractor.
- 6.2 The Subcontractor agrees to prosecute and complete the Subcontractor's Work in accordance with the Milestone Dates set forth in the Contract Documents or as otherwise set forth in Schedule D, attached hereto.
- 6.3 To the extent provided in the General Contract, should the progress, performance or completion of any portion or portions of or the whole of the Subcontractor's Work contemplated in this Agreement be delayed or extended as the result of:
- .1 Any act or neglect of the Owner or any of its agents, affiliates, or representatives;
 - .2 Any acts or omissions of any separate contractor engaged by the Owner to work on the Project;
 - .3 Any Change Order requested by the Owner if the Change Order included additional time;
 - .4 Labor strikes, work slowdowns or stoppages, or other actions intended to adversely affect the transportation of materials or equipment or the progress of the Subcontractor's Work, which is not the result of strikes or work stoppages prohibited by Article 18;
 - .5 Tornado, fire, hurricane, blizzard, earthquake, flood, other acts of God, or any other natural event not within the control of the Subcontractor that prevents the progress of the Subcontractor's Work;
 - .6 Delay authorized by the Owner pending resolution of a dispute;
 - .7 Acts of the public enemy, acts of the State, Federal or local Government in its sovereign capacity;
 - .8 Any other cause which the Contractor or the Owner determines may justify a delay;
 - .9 Removal of asbestos and toxic or hazardous substances from the Project Site that is not within the scope of the Subcontractor's Work;
 - .10 Delays for a reasonable period incurred to investigate any claim by the Subcontractor for concealed conditions;
 - .11 The occurrence of unusually severe weather-related delays in excess of forty (40) work days per twelve (12)-month period;
 - .12 Order of any court of competent jurisdiction enjoining the performance of the Subcontractor's Work that is not proximately caused by the actions or inactions of the Subcontractor; or

- .13 Delays proximately caused solely by the actions or inactions of the Contractor and not otherwise caused, in whole or in part, by any event listed in Sections 6.3.1 through 6.3.12 above.
- 6.4 The time of completion of the portion or portions of the Subcontractor's Work directly affected by such delay, and the Subcontract Time, shall, upon request of the Subcontractor as provided in Section 6.4, be extended by a reasonable period, in no event to exceed the time lost thereby. The Subcontractor and the Contractor agree that the existence and duration of any delay in the progress, performance or completion of any portion or portions of the whole of the Work shall be exclusively established through the Project Schedule as affecting or impacting the Critical Path of the Contractor's performance. The Subcontractor agrees that delays which do not affect or impact the Critical Path of Contractor's performance as reflected on the Project Schedule shall not be eligible for an extension to the Subcontract Time.
- 6.5 Should the Subcontractor reasonably believe, in accordance with Section 6.3, that it is entitled to an extension of time for completion of any portion or portions of the Subcontractor's Work, the Subcontractor shall, within forty-eight (48) hours after the occurrence of the cause of the delay, notify the Contractor, in writing, of such belief, setting forth (a) the cause for the delay, (b) a description of the portion or portions of the Subcontractor's Work affected thereby, (c) an estimate of the probable effect of such delay on the progress and completion of the Subcontractor's Work, and (d) all details pertinent thereto. A subsequent written application for the specific number of days of extension of time requested shall be made by the Subcontractor to the Contractor within seven (7) days after the effects of the delay can be ascertained through use of the Project Schedule. Any change in the Subcontract Time resulting from such claim(s) shall be authorized only through a Change Order.
- 6.6 It is a condition precedent to the consideration or prosecution of any Subcontractor claim for an extension of time that the foregoing provisions regarding the timing of notice be strictly adhered to in each and every instance and, if the Subcontractor fails to comply, the claim for an extension of time shall be conclusively deemed to have been waived.
- 6.7 To the extent any authorized change in the Subcontractor's Work significantly affects the time and progress of the Subcontractor's Work in the opinion of the Subcontractor, the Subcontractor shall make a request for time extension no later than when the related Change Order request is first submitted to the Contractor.
- 6.8 Provided that the Subcontractor has fully complied with the provisions of Section 6.4, the Subcontractor agrees that it shall have no claim for an increase in the Subcontract Amount for delay, disruption, interference, acceleration, obstruction, suspension, out of sequence work, cumulative impacts, mismanagement, or hindrance caused, in whole or in part, by reason of the events set forth in Sections 6.3.4 through 6.3.7, and 6.3.9 through 6.3.12. The Subcontractor agrees to accept, as its sole and exclusive remedy with respect to such events, an extension of time unless the Contractor elects to accelerate Subcontractor's performance hereunder in lieu of providing said extension of time. If Contractor elects to accelerate Subcontractor's performance, Contractor agrees to adjust the Subcontract Amount for the premium portion of any wages and associated benefits incurred by the Subcontractor attributable to the acceleration in performance that the Contractor receives or recovers from the Owner attributed to the Subcontractor's acceleration of performance.
- 6.9 It is recognized and agreed by the Subcontractor that no claim for an increase in the Subcontract Time for either acceleration, delay disruption, interference or hindrance will be allowed based on changes in the Project Schedule which are of the type ordinarily experienced in projects of similar size and complexity or pursuant to Sections 3.3 and 3.4.
- 6.10 Provided that the Subcontractor has fully complied with the provisions of Section 6.4, if the Subcontractor is delayed, accelerated, disrupted, interfered, obstruction, suspension, out of sequence work, cumulative impacts, mismanagement, or hindered on account of or resulting from the conditions set forth in Sections 6.3.1 through 6.3.3 or 6.3.8, the Subcontractor agrees that it shall have no claim nor right to any cost reimbursement, compensation or damages from the Contractor except to the extent that the Contractor is entitled to and actually receives a corresponding cost reimbursement, compensation or damages from the Owner pursuant to the General Contract for said delays, acceleration, disruption, interference or hindrance.

The Subcontractor agrees that any claim or right to any cost reimbursement, compensation or damages for the above shall be governed by the terms and conditions of Article 12 and the Subcontractor agrees to accept, as its sole and exclusive remedy, the amount, if any, actually received by the Contractor from the Owner, less the costs and expenses set forth in Article 12.

- 6.11 Provided that the Subcontractor has fully complied with the provisions of Section 6.4, if the Subcontractor is delayed, accelerated, suspended, impacted by out of sequence work, cumulative impacts, mismanagement or hindered on account of or resulting from the conditions set forth in Section 6.3.13, the Subcontractor agrees that its claim(s) for an increase in the Subcontract Amount shall be limited to the actual cost incurred by the Subcontractor for maintaining an extended presence on the Site for the period of delay, any increase in the cost of labor or materials and any Contractor approved demobilization and remobilization costs. The Subcontractor agrees that any claim or right to a cost reimbursement, compensation or damages for the above shall be governed by the terms and conditions of Article 12 and the Subcontractor agrees to accept, as its sole and exclusive remedy, the amount, if any, actually received by the Contractor from the third party subcontractor(s) identified by the Subcontractor as responsible for the subcontractor's delay, acceleration, suspension, out-of-sequence work, cumulative impacts, mismanagement of hindrance, less the costs and expenses identified in Article 12. The Subcontractor agrees that it shall have no claim(s) and waives recoverability for same against the Contractor for consequential, special, incidental or indirect loss, cost or expense on account of or resulting from the conditions set forth in Section 6.3.13.
- 6.12 The Subcontractor shall furnish such manpower, materials, facilities and equipment and shall work such hours, including night shifts and premium time operations, as may be necessary to ensure the prosecution and completion of the Subcontractor's Work within the Subcontract Time. If the Subcontractor's Work actually in place falls behind the Project Schedule for reasons that are the responsibility of the Subcontractor, and it becomes apparent that the Subcontractor's Work will not be completed within the Subcontract Time, as adjusted, the Subcontractor agrees that it will, as necessary, accelerate its effort at no additional cost to the Contractor to improve its progress. Such acceleration shall include as necessary some or all of the following actions:
- .1 Increase manpower and crafts;
 - .2 Increase the number of working hours per shift, shifts per working day, working days per week, or the amount of equipment, or any combination of the foregoing; and/or
 - .3 Reschedule activities.
- 6.13 The Contractor may also require the Subcontractor to submit, within forty-eight (48) hours, a revised Subcontractor Schedule and description of the corrective actions it intends to take to assure completion of Subcontractor's Work within the Subcontract Time. If the Contractor reasonably finds the proposed plan not acceptable, it may require the Subcontractor to submit, within forty-eight (48) hours, a subsequent revised Subcontractor Schedule.
- 6.14 Failure of the Subcontractor to substantially comply with the requirements of Sections 6.11 and 6.12 shall be deemed sufficient proof for a determination by the Contractor that the Subcontractor is failing to prosecute the Subcontractor's Work with such diligence as will ensure its completion within the Subcontract Time specified. Such a determination shall constitute a material breach of this Agreement and the Subcontractor agrees that such a determination is sufficient grounds for termination of this Agreement.
- 6.15 The Contractor may, at the Contractor's convenience and without cause, order the Subcontractor in writing to suspend, delay or interrupt the Subcontractor's Work in whole or in part for such period of time as the Contractor may determine. If the Contractor suspends, delays or interrupts the Subcontractor's Work for the Contractor's convenience, the Contractor shall pay to the Subcontractor the actual direct cost of such suspension, delay, or interruption, taking into account all relevant facts, and the Subcontract Time shall be increased by the period of such suspension, delay, or interruption. The Subcontractor agrees that any claim or right to a cost reimbursement, compensation or damages for the above shall be governed by the terms and conditions of Article 12 and the Subcontractor agrees to accept, as its sole and exclusive remedy, the amount,

if any, actually received by the Contractor from the Owner or other third party subcontractor(s), less the costs and expenses identified in Article 12. No adjustment shall be made to the extent:

- .1 That performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Subcontractor is responsible; or
- .2 That an equitable adjustment is made under another provision of this Agreement.

ARTICLE 7 CONSIGNING

- 7.1 The Subcontractor in making or ordering shipments shall not consign or have consigned materials, equipment or any other items in the name of the Contractor. The Contractor is under no obligation to make payment for charges on shipments made by or to the Subcontractor but may, at its option, pay such charges, in which case the Subcontractor shall reimburse the Contractor for the amount of such payments plus a service charge of twenty-five percent (25%) of the amount so paid.

ARTICLE 8 SHOP DRAWINGS

- 8.1 Notwithstanding the dimensions given on the Plans, Specifications and other Contract Documents, it shall be the obligation and responsibility of the Subcontractor to take such measurements as will ensure the proper matching and fitting of the Subcontractor's Work covered by this Agreement with contiguous work.
- 8.2 The Subcontractor shall prepare and submit to Contractor such shop drawings as maybe necessary or required by the Contract Documents to describe completely the details and construction of the Subcontractor's Work within thirty (30) days of the execution of this Agreement, unless otherwise stated in this Agreement. The Subcontractor is required to ensure its initial submission is complete and meets the requirements of the Contract Documents. Approval of such shop drawings by the Contractor and/or the Owner shall not relieve the Subcontractor of its obligation to perform the Subcontractor's Work in strict accordance with the Plans, Specifications, the Additional Provisions hereof and other Contract Documents, nor of its responsibility for the proper matching and fitting of the Subcontractor's Work with contiguous work.
- 8.3 The Subcontractor shall submit to the Contractor, with sufficient promptness and in such sequence as to cause no delay in the progress of the Subcontractor's Work or the work of the Contractor or any separate third party subcontractor, all Shop Drawings, Product Data and Samples required by the Contract Documents. The Subcontractor shall indemnify the Contractor from all loss, cost and expense (including all attorney's fees and expenses) incurred by the Contractor that may arise from or relate to any claim or allegation that the Subcontractor's submission of Shop Drawings, Product Data and Samples was incomplete or not in compliance with the Contract Documents or otherwise affected the progress of the Subcontractor's Work or the work of the Contractor or any separate third party subcontractor.
- 8.4 The Subcontractor's submission of Shop Drawings to the Contractor shall constitute the Subcontractor's representation that the Subcontractor has reviewed the submission for accuracy, completeness, and compliance with all Contract Documents. The Subcontractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Contractor's or the Owner's review of Shop Drawings, Product Data or Samples unless the Subcontractor has specifically informed the Contractor or the Owner, in writing, of such deviation at the time of submission and the Contractor or the Owner has given written approval to the specific, identified deviation(s). The Subcontractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples, including, without limitation, any failure to comply with the Contract Documents, by the Contractor's or the Owner's review thereof.
- 8.5 The Subcontractor shall make any corrections required by the Owner and/or the Contractor and shall resubmit the required number of corrected copies of Shop Drawings or new Samples. Resubmittal of Shop Drawings necessitated by required corrections shall not be sufficient grounds for an extension of Subcontract Time.

The Subcontractor shall direct specific attention in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than the corrections requested on previous submittals.

- 8.6 When professional certifications or calculations of performance criteria for materials, systems, designs or equipment is required by the Contract Documents, the Contractor shall be entitled to rely upon the accuracy and completeness of such calculations and certifications as furnished by the Subcontractor. The Subcontractor agrees to defund, indemnify and hold harmless the Contractor from all loss, cost and expense (including attorney's fees and expenses) incurred due to any allegation that the certifications or calculations of performance criteria for materials, systems, designs or equipment is inadequate, in error or not in conformance with the Contract Documents.
- 8.7 No substitutions shall be made in the Subcontractor's Work unless permitted in the Contract Documents and only upon the Subcontractor's receipt of all written approvals for substitutions required by the Contract Documents. In the event the substitution(s) causes, in whole or in part, additional cost and expense to the Contractor or other third party subcontractors, the Subcontractor shall be responsible for and immediately reimburse the Contractor for such additional cost and expense.

ARTICLE 9 SUITABILITY OF OTHERS WORK

- 9.1 Should the proper and accurate performance of the Subcontractor's Work hereunder depend upon the proper and accurate performance of other work not covered by this Agreement, the Subcontractor shall carefully examine such other work, determine whether it is in fit, ready and suitable condition for the proper and accurate performance of the Subcontractor's Work hereunder, and before proceeding with the Subcontractor's Work hereunder, report promptly to the Contractor, in writing, any such improper conditions and defects and allow the Contractor a reasonable time to have such improper conditions and defects remedied. Should the Subcontractor fail to provide written notice to the Contractor, as required herein, before proceeding or taking remedial action, the Subcontractor shall assume the full and sole responsibility and liability for all cost, expense or damage incurred by the Subcontractor for said installation or remedial action and/or incurred by the Contractor in correcting said defect in the Subcontractor's Work (including replacement of the Subcontractor's Work or material) and the Subcontractor releases the Contractor from all liability and agrees to indemnify the Contractor from all costs, expenses or damages, (including attorney's fees and expenses), incurred thereby.

ARTICLE 10 PLANS

- 10.1 The Work hereunder is to be Performed and furnished under the direction and to the satisfaction of the Owner, the Architect and the Contractor. The decision of the Owner or the Architect as to the true construction, meaning and intent of the Plans and Specifications shall be final and binding upon the Subcontractor. The Contractor will furnish to the Subcontractor such additional information and drawings as may be prepared by the Architect to further describe the Subcontractor's Work. The Subcontractor shall conform and abide by such additional information and drawings. The Subcontractor shall not make any changes, additions and/or omissions in the Subcontractor's Work except upon written order of the Contractor as provided in Article 11 hereof.
- 10.2 The Subcontractor shall maintain and produce, upon request by the Contractor, the manpower count, equipment usage and a description of the Subcontractor's Work that was performed on each day of work. The Subcontractor shall conform to all prevailing wage and certified payroll requirements applicable to the Subcontractor's Work and required by the Contract Documents. The Subcontractor shall submit, each week, complete daily payroll records for that week for all of Subcontractor's employees working on the Project. The payroll records shall include: name, last four (4) digits of the applicable social security number, hours worked, employer, all applicable hourly rates and corresponding hours for same, benefits paid, gross wage paid, all deductions and net wages paid per employee.
- 10.3 The Subcontractor shall maintain Plans and other documents at the Project Site and update them daily to reflect the current progress of the Subcontractor's Work. The Subcontractor shall make the Plans and other documents available for inspection upon request by the Contractor. The Subcontractor shall furnish final As-

Built Plans to the Contractor as part of its final payment obligations upon completion of the Subcontractor's Work. The Subcontractor's compliance with the requirements of Section 10.3 is a condition precedent to the Contractor's obligation to make interim progress and final payment to the Subcontractor. The Subcontractor's records and documents related to this Agreement shall be subject to audit by the Contractor and shall be available to the Contractor upon two (2) days written notice. The Subcontractor shall retain all of its records related to this Agreement and Project for a period of ten (10) years after the date of Substantial Completion for the General Contract. The Subcontractor agrees that the failure to abide by the provisions of Section 10.3 shall be deemed a material breach of this Agreement.

10.4 At completion of the Subcontractor's Work and before final certificate of completion is issued, the Subcontractor shall turn over to the Contractor, all sets of Plans which were stamped and approved by the Building Department, and all permits or certificates issued for the Subcontractor's Work.

10.5 The parties hereby agree that the Contractor shall have the irrevocable, nonexclusive right to utilize and/or copy any designs, Plans, Specifications, Contract Documents, documents and copyrightable work representing Design Services pursuant to Article 31 of this Agreement, coordination and other documents prepared by the Subcontractor for the Subcontractor's Work in the event the Contractor completes the Subcontractor's Work with another subcontractor upon the material and continuing default of the Subcontractor after written notice thereof and termination by the Contractor in accordance with this Agreement, expands the Project, corrects any deficiencies, or makes any renovations or repairs to the Project. The Contractor agrees that it shall remove all identification legends and symbols including all seals, stamps and other items which identify Subcontractor as the author of the Plans and Specifications. The Contractor shall neither hold out nor attribute any altered, modified, or revised Plans and Specifications to be the work product of Subcontractor. Any alteration, modification or revision to the Plans and Specifications will be performed by architects and/or engineers suitably licensed who will be deemed architects or engineers of record for all work performed with the altered Plans and Specifications. The Subcontractor shall have no responsibility for the Contractor's use of designs, Plans, Specifications, or other Contract Documents as permitted herein.

ARTICLE 11 CHANGES

11.1 The Contractor reserves the right to make changes, additions and/or omissions in the Subcontractor's Work, from time to time, whether the Subcontractor's Work, or any part thereof, shall or shall not have been completed, as it may deem necessary, upon written order to the Subcontractor. The value of the Subcontractor's Work to be changed, added or omitted shall be stated in said written order and shall be added to or deducted from the Subcontract Amount.

11.2 The value of the Subcontractor's Work to be changed, added or omitted shall be determined by the lump sum or unit prices, if any, stipulated herein for such work. If no such prices are stipulated, such value shall be determined by whichever of the following methods or combination thereof that the Contractor may elect:

- .1 By adding or deducting lump sum cost agreed to between the Contractor and the Subcontractor that has been properly itemized and supported by sufficient data to permit evaluation.
- .2 An amount determined by the unit prices listed in Schedule B attached hereto, or as may be otherwise agreed upon between the Contractor and the Subcontractor.
- .3 By adding (1) the actual net cost to the Subcontractor of labor, in accordance with established rates, including required union benefits and payroll taxes and insurance, (3) the actual cost of the Subcontractor's Sub-tiers, (3) the actual cost to the Subcontractor of materials and equipment and such other direct costs as may be approved by the Contractor, (4) an allowance of the permitted overhead and profit markup, refer to Schedule C, section D.2 to cover all direct, indirect, consequential and impact costs incurred thereby.

- 11.3 Should the parties hereto be unable to agree as to the value of the Subcontractor's Work to be changed, added or omitted, the Subcontractor shall proceed with the work promptly under the written order of the Contractor on an agreed upon cost plus basis, not to exceed a pre-determined maximum amount, subject to final determination pursuant to the provisions of Articles 12 or 30 herein.
- 11.4 In the case of omitted Subcontractor's Work, the Contractor shall have the right to withhold from payments due or to become due to the Subcontractor an amount which, in the Contractor's opinion, is equal to the value of such omitted Subcontractor's Work until such time as the value thereof is determined by agreement of the Owner or the provisions of Articles 12 or 30 herein.
- 11.5 All changes, additions or omissions in the Subcontractor's Work ordered in writing by the Contractor shall be deemed to be a part of the Subcontractor's Work hereunder and shall be performed and furnished in strict accordance with all of the terms and provisions of this Agreement and the other Contract Documents.
- 11.6 A Change Order signed by the Subcontractor with no change in the Subcontract Time shall establish the Subcontractor's agreement that there is no change in Subcontract Time associated with the specific Change Order. The Subcontractor acknowledges that any attempt to preserve a future request for a time extension due to the performance of any Subcontractor's Work associated with a Change Order or the cumulative effects of multiple change orders is ineffective and has no force or effect pursuant to this Agreement. The Subcontract Price and the Subcontract Time may be changed only a written Change Order signed by the Contractor and the Subcontractor shall provide or perform additional Subcontractor's Work, make other Changes in the Subcontractor's Work and comply with the provisions of a Change Order the same as though the Change Order had been a part of the original Contract Documents, according to the terms of the Change Order.
- 11.7 It is an express condition precedent to the Contractor's payment to the Subcontractor on account of changes made or directed by the Owner that the Contractor shall have received such payment from the Owner for the change in the Subcontractor's Work. Each payment by the Contractor to the Subcontractor on account of such Change Order shall be equal to the Subcontractor's allocable share of the Contractor's payment from the Owner for the change as determined by the Contractor. In no event, however, shall the overhead and profit charged by the Subcontractor pursuant to Section 11.2.3 on a Change Order exceed the overhead and profit awarded the Contractor by the Owner for the Change Order.

ARTICLE 12 EXTRAS

- 12.1 If the Subcontractor makes a claim for an increase to the Subcontract Amount (Claim), the Subcontractor shall give the Contractor written notice of same, by email providing confirmation of receipt, within five (5) days (but in no event more than one (1) day less than the period of time necessary for the Contractor to comply with the notice provisions of the General Contract as set forth in the Contract Documents) after the occurrence of the event giving rise to such claim. This notice shall be given by the Subcontractor and approval to proceed issued by the Contractor, in writing, before the Subcontractor proceeds to perform said extra work or incur said extra expense. The Subcontractor agrees that said written notice and written approval to proceed are conditions precedent to the Subcontractor's right to assert said claim against Contractor and Subcontractor waives any claim if the Subcontractor fails to comply with the above provisions. The Subcontractor further agrees not to proceed with the performance of any extra work or incur said extra expense hereunder unless the same shall be fully agreed upon in writing by the Contractor prior to the performance of any such extra work or incur said extra expense. In the event that agreement cannot be reached as to the value of said extra work or extra expense, at the Contractor's direction, the Subcontractor shall proceed with said extra work or extra expense under protest and may seek redress in accordance with the procedures as stated in this Agreement and the other Contract Documents.
- 12.2 Subsequent to the notice required by Section 12.1, the Subcontractor must provide a submission providing further documentation and support for the Claim referenced in Section 12.1 (Submission) to the Contractor by the earlier of: (1) three (3) days prior to the date by which the Contractor is obligated to submit a similar Submission to the Owner; or (2) within fifteen (15) days from the written notice required by Section 12.1. The Submission must include: (1) the amount of money and/or time extension sought by the Subcontractor,

and the contractual and factual basis for each. A time extension request must be based on a CPM-based time impact analysis; (2) a general statement of the basis for the Claim; (3) the facts underlying the Claim; (4) the written Section 12.1 notice to the Contractor; (5) reference to the applicable Contract Documents; and (6) all documentation that describes, relates to, and/or supports the Claim and all documents required to be submitted for a Claim under the Contract Documents. Where the Owner or some entity requires further information or documentation of any Claim, the Subcontractor shall submit such information or documentation to the Contractor no later than one (1) week prior to the date by which Contractor is obligated to provide such information or documentation to the Owner or entity.

- 12.3 The Submission must be sent by email providing confirmation of receipt. As part of the Submission requirements, the Subcontractor shall keep complete, written records of the labor, materials and equipment used to perform any Claim work and shall submit, by hand-delivery, the written Claim records to the Contractor's superintendent or project manager, on every business day that any Claim work has been performed, or the Subcontractor waives any right for compensation for Claim work on any day for which said written records are not kept and submitted as required herein. If requested by the Contractor, Subcontractor shall permit Contractor to inspect and copy any of Subcontractor's documents pertaining to the Claim, failure of which shall be deemed a waiver of such Claim. The Subcontractor expressly acknowledges, consents, and agrees to the time, content, records, and delivery requirements of both the written notice and Submission requirements of Sections 12.1, 12.2 and 12.3 and that the written notice, Submission and documentation requirements will be strictly enforced, are material terms of this Agreement, are necessary for the Contractor to mitigate adverse consequences arising out of or related to Subcontractor's Claim, that the Contractor will be prejudiced if the notice, Submission and documentation requirements are not followed by the Subcontractor, and agrees that any failure on the part of the Subcontractor to submit the written notice Submission and documentation in strict accordance with the requirements contained within this Article, will constitute a waiver of the Subcontractor's right to pursue the Contractor or the Contractor's surety for the Claim. The Subcontractor agrees that, notwithstanding case law decisions or statutes to the contrary, Contractor's actual or constructive notice of the Claim or the Contractor's knowledge of any facts or circumstances supporting the Claim, does not satisfy the written notice Submission and documentation requirements for a Claim, nor prevent the Subcontractor's waiver of the Claim. Pending final resolution of a Claim or any other dispute between the Subcontractor and the Contractor, unless otherwise agreed in writing, the Subcontractor shall proceed diligently with performance of the Subcontractor's Work, including Claim or disputed work, without interruption, deficiency, or delay. The Subcontractor agrees, until such time as the Contractor has exhausted its dispute provisions with the Owner, third party subcontractor or such other third-party, to toll and stay its rights under the Contractor's bond, including its Miller Act or other statutory bond rights, and Subcontractor also agrees to file no litigation pertaining to a Claim or the Subcontractor's Work or this Agreement or the Project, whether sounding in contract, tort, equity, or other non-contractual theory. If the Contractor or the Contractor's surety is the prevailing party, even partially, against the Subcontractor's Claim, claim against the Contractor's bond or a mechanics lien, the Subcontractor shall reimburse all of the Contractor's and the Contractor's surety's costs incurred in investigating, responding to, defending against, and resolving such Claims, claims, and mechanics liens including, but not limited to, their reasonably estimated in-house costs, outside attorneys' fees, and the cost to bond over the lien.
- 12.4 Notwithstanding the above, the Subcontractor agrees that it shall accept, as full and complete satisfaction of any and all Claims against the Contractor for extras or extra expense, pursuant to this Agreement, the amount, if any, that the Contractor actually receives by settlement, negotiation, judgment or otherwise from the Owner, a third party subcontractor or such other third party for said extras or extra expense. The Subcontractor acknowledges and agrees that it has no claim or demand and will not seek recovery from the Contractor except to the extent of the recovery actually obtained by the Contractor from the Owner, a third party subcontractor or such other third party. The Contractor agrees to submit the Subcontractor's Claim for extras or extra expense in accordance with the terms and conditions of the General Contract or any other applicable agreement in the form and substance as presented by the Subcontractor to the Contractor. The Subcontractor agrees to provide the Contractor with all necessary assistance required by the Contractor to advance the Subcontractor's Claim for extras or extra expense including, but not limited to, expert advice and assistance. The Subcontractor agrees to promptly reimburse the Contractor, upon demand, for all cost and expense (including attorney's fees and expenses) incurred by the Contractor in advancing the Subcontractor's Claims for extras or extra expense to the Owner, a third party subcontractor or such other

third party. Should the Subcontractor fail to promptly reimburse the Contractor within fourteen (14) days from demand, the Subcontractor acknowledges that it has waived said claim for extras or extra expense and has fully and completely released the Contractor from any further responsibility to the Subcontractor for such Claim(s) unless the Contractor agrees in writing otherwise.

- 12.5 The Subcontractor waives its right to recover consequential damages including, but not limited to, loss of use, revenue or profit, actual or anticipated or otherwise, special, incidental, indirect, exemplary, multiple or punitive damages, legal fees and interest arising from this Agreement, Project or a Claim. The Subcontractor acknowledges that in agreeing to the Subcontract Amount it has assessed the potential impact of Article 12 on its ability to recover additional compensation in connection with a future Claim, and agrees that these limitations on recovery will apply regardless of the accuracy of the Subcontractor's assessment or actual costs incurred by the Subcontractor.

ARTICLE 13 INSPECTION/REJECTION OF THE WORK

- 13.1 The Subcontractor shall at all times provide sufficient, safe and proper facilities for the inspection of the Subcontractor's Work by Contractor, the Owner, and their authorized representatives in the field, at shops, or at any other place where materials or equipment for the Subcontractor's Work are in the course of preparation, manufacture, treatment or storage. The Subcontractor shall notify the Contractor, in writing, when portions of the Subcontractor's Work are ready for inspection or testing. The Subcontractor shall be responsible for all cost and expense incurred by the Contractor or the Owner if Subcontractor's Work fails such inspection or testing and requires re-inspection. The Subcontractor shall at all times furnish the Contractor, the Owner and their representatives adequate facilities for inspection or testing materials or equipment at the Project site or any materials or equipment under this Agreement may be in the course of preparation, manufacture, fabrication or treatment. The Subcontractor shall, within twenty-four (24) hours after receiving written notice from Contractor to that effect, proceed to take down all portions of the Subcontractor's Work and remove from the Project Site all materials, whether worked or unworked, which the Owner or the Contractor shall condemn as unsound, defective or improper or as in any way failing to conform to this Agreement or the Plans, Specifications or other Contract Documents, and the Subcontractor, at its own cost and expense, shall replace the same with proper and satisfactory Subcontractor's Work and materials and make good all damaged or destroyed Subcontractor's Work by or as a result of such unsound, defective, improper or nonconforming materials or by the taking down, removal or replacement thereof. If requested by the Contractor, the Subcontractor shall also correct any work of the Contractor or the Owner or other third party subcontractors which is affected by the Subcontractor's correction of the Subcontractor's defective or deficient Work (collectively Affected Work). All costs incurred with performing, correcting and replacing Subcontractor's defective and deficient Work or Affected Work in a manner and time acceptable to the Contractor shall be borne by the Subcontractor without any increase in the Subcontract Amount or the time to perform the Subcontractor's Work. If the Subcontractor, by its actions or words, indicates that it is unable or unwilling to correct the Subcontractor's defective or deficient Work or perform the Affected Work in a time and manner acceptable to the Contractor, the Contractor may immediately after written notice to the Subcontractor, correct the Subcontractor's defective or deficient Work and perform the Affected Work and the Subcontractor shall immediately reimburse the Contractor for all cost and expense incurred thereby. No inspection, acceptance or review of the Subcontractor's Work by the Contractor, the Owner or their representatives, nor any failure to inspect, accept or review, including punchlists, shall relieve the Subcontractor of its obligation to perform the Subcontractor's Work in strict compliance with the Contract Documents, nor be used by Subcontractor's surety as a defense to the Contractor's claim on the Subcontractor's bond.

ARTICLE 14 TERMINATION

- 14.1 Upon the Subcontractor becoming insolvent, upon the appointment of a receiver for the Subcontractor, or upon the Subcontractor making an assignment for the benefit of creditors, this Agreement shall, without notice or right to cure, be terminated, and the Contractor shall be deemed to have declared, and Subcontractor agrees, that Subcontractor is in default of this Agreement. If an order for relief is entered under Title 11 of the United States Code (i.e. the Bankruptcy Code) at the behest of the Subcontractor, the Contractor may terminate this Agreement by giving written notice of such termination to the Subcontractor and/or, if

applicable any examiner or trustee appointed pursuant to or in accordance with the Bankruptcy Code, it being the agreement of the parties hereto that, in addition to whatever other requirements were imposed upon and/or undertaken by the Subcontractor and agreed to by the Contractor herein, this Agreement was awarded to the Subcontractor, in part, due to the peculiar and specialized talents, skills, competencies and attributes of the Subcontractor that made and/or make it uniquely suited to the needs of the Contractor and/or the Owner with respect to the completion of the Project. The Contractor reserves all of its rights and remedies, at law and equity, with respect to this Agreement and its nature, including the right of recoupment, and including, but not limited to, whether or not it is an executory contract, may be assumed and/or assigned, and whether or not the Subcontractor, any receiver, assignee, examiner, trustee, custodian, or other appointed or to be appointed or approved, by law, equity or court of competent jurisdiction, including any proposed successor to the Subcontractor, can provide adequate assurances of future performance. Upon the Subcontractor becoming insolvent, upon the appointment of a receiver for the Subcontractor, upon the Subcontractor making an assignment for the benefit of creditors, or upon the entry of an order for relief at the behest of or with respect to the Subcontractor under the Bankruptcy Code, the Subcontractor shall, in addition to any and all other remedies to which the Contractor is or becomes entitled, compensate the Contractor within a reasonable time for any and all actual pecuniary loss resulting from such event(s) as well as any and all reasonable attorney's fees and legal cost incurred by the Contractor in connection therewith.

- 14.2 If the Subcontractor is not maintaining the schedule for the Subcontractor's Work as required by the Contractor at the time of entering an order for relief, or at any subsequent time, the Contractor, while awaiting the decision of the Subcontractor or its trustee to reject or to accept this Agreement and provide adequate assurance of its ability to perform hereunder, may avail itself of such remedies under this Article 14 as are reasonably necessary to maintain the Project Schedule. The Contractor has the right of recoupment and may also offset against any sums due or to become due the Subcontractor all costs incurred in pursuing any of the remedies provided herein, including, but not limited to, reasonable overhead, profit, loss, and reasonable attorney's fees and legal costs. The Subcontractor and/or any successor(s) thereto, including any estates, Bankruptcy or otherwise, and Subcontractor's surety shall be liable to Contractor for the payment of any amount by which such expense may exceed the unpaid balance of the Subcontract Amount.
- 14.3 If the Contractor determines at its sole discretion that the Subcontractor has: (i) refused or failed to supply enough properly skilled workers, proper materials, or maintain the schedule for the Subcontractor's Work as required by the Contractor; (ii) failed to make prompt payment for, or failed to prevent claims of non-payment from, its workers, Sub-tiers or suppliers of any tier; (iii) disregarded Laws or orders of any public authority having jurisdiction; (iv) otherwise materially breached, a provision of this Agreement; or (v) if Contractor has a reasonable doubt that this Agreement can be completed for the balance then unpaid or if the Subcontractor owes funds to the Contractor due to Set-off or otherwise at any time, including but not limited to after Substantial or Final Completion of the Project, the Subcontractor shall be in default of this Agreement. If the Subcontractor fails within seventy-two (72) hours after receipt of written notice from the Contractor to commence and continue to satisfactory correct such default with diligence and promptness, the Subcontractor shall have materially breached this Agreement, and the Contractor, without prejudice to any other rights or remedies, shall have the right to any or all of the following remedies: (i) supply such number of workers and quantity of materials, equipment and other facilities to perform all or such part of the Subcontractor's Work as the Contractor shall determine will provide the most beneficial completion of the Project, and charge the cost thereof to the Subcontractor, who shall be liable for the payment of same including reasonable overhead, profit and attorney's fees; (ii) contract with one or more additional subcontractors to perform all or such part of the Subcontractor's Work as the Contractor shall determine will provide the most beneficial completion of the Project and charge the cost thereof to the Subcontractor who shall be liable for the payment of same including reasonable overhead and profit; (iii) discharge the claim of non-payment; and/or (iv) withhold payment of any moneys due the Subcontractor pending corrective action to the extent required by and to the satisfaction of the Contractor and the Owner. Any costs and damages incurred by the Contractor under this Section 14.3 or the Agreement, including attorney fees, shall be unilaterally deducted from funds otherwise due the Subcontractor under this Agreement, and the Subcontractor and the Subcontractor's surety shall be liable for the payment to the Contractor of the amount by which such costs and damages exceed the unpaid balance of the Subcontract Amount. The Contractor may use any materials, implements, equipment, appliances, or tools furnished by or belonging to the Subcontractor to complete the Subcontractor's Work. The Subcontractor shall provide the Subcontractor's surety with all notices from the Contractor relating to

deficiencies, or alleged deficiencies, in the Subcontractor's performance of this Agreement, including but not limited to those referred to in this Section 14.3, and the Subcontractor's surety agrees that if the Subcontractor fails to provide the surety with such information, the Subcontractor's surety will not use lack of notice from the Contractor as a defense to any claim by the Contractor on the Subcontractor's bond. In instances where the Subcontractor is failing or having difficulty in fulfilling its obligations under the Agreement, the Contractor, either prior to or after the Subcontractor's default, may allow the Subcontractor to continue performance under this Agreement, and such actions by the Contractor may not be used by the Subcontractor's surety as a defense, either partial or otherwise, to a subsequent claim by the Contractor on the Subcontractor's bond. In the event of, or subsequent to, an emergency affecting the safety of persons or property, the Contractor may proceed as outlined above without notice or an opportunity to cure the default. If the Contractor shall have reasonable grounds to question the Subcontractor's intent or ability to perform, the Contractor may, in writing, demand that the Subcontractor give adequate assurance, in writing, of its intent or ability to perform. If such a demand is made and no written assurance adequate to the Contractor is given within five (5) calendar days, the Contractor may treat this failure to give such adequate assurance as a default or an anticipatory repudiation of this Agreement. In the event of a default, the Contractor, without prejudice to any other rights or remedies, shall have the right to any or all of the remedies stated above.

- 14.4 If the Subcontractor fails to commence and satisfactorily continue correction of a default within seventy-two (72) hours after the notice is issued under Section 14.3, then the Contractor may, in lieu of or in addition to the remedies provided therein, terminate this Agreement or a portion thereof, and use any materials, implements, equipment, appliances or tools furnished by or belonging to the Subcontractor to complete the Subcontractor's Work. The Contractor also may furnish those materials, equipment and/or employ such workers or subcontractors as the Contractor deems necessary to maintain the orderly progress of the Project Schedule. In the event of termination, the Subcontractor shall immediately discontinue performance of the Subcontractor's Work and demobilize from the Project. The Subcontractor shall take the steps necessary to preserve and protect the Subcontractor's Work in progress and mitigate any damages. Subcontractor shall receive no further payment of any unpaid portion of the Subcontract Price until such time as the Subcontract Work is completed, at which time Subcontractor will be entitled to the unpaid portion of the Subcontract Price, less all of the costs incurred by the Contractor in so performing the Subcontractor's Work, including reasonable overhead, profit, liquidated or consequential damages, and attorney's fees, which shall be deducted from any moneys due or to become due the Subcontractor. The Subcontractor and the Subcontractor's surety shall be liable for the payment of any amount by which such expense may exceed the unpaid balance of the Subcontract Amount.
- 14.5 Should the General Contract between the Contractor and the Owner be suspended or terminated, or should any part of the Contractor's work which includes the Subcontractor's Work be suspended or terminated, or should the Owner direct the Contractor to terminate this Agreement, the Contractor shall so notify the Subcontractor, in writing, and upon receipt of said notice, this Agreement shall be, as directed by the Contractor at Contractor's sole option, either assigned to another person or entity, suspended, terminated or reaffirmed (either in full or for a specific time period, as determined by the Contractor). If the Contractor notifies the Subcontractor that this Agreement is suspended or terminated, the Subcontractor shall immediately stop the Subcontractor's Work, unless directed otherwise by the Contractor. To the extent the Agreement is reaffirmed, all rights and obligations under the Agreement will remain in full force and effect during the reaffirmed period of time. In the event of such Owner suspension or termination, the Contractor's liability to the Subcontractor is limited to the extent of the Contractor's recovery on the Subcontractor's behalf as provided in Article 12 of this Agreement.
- 14.6 The Contractor shall have the right to terminate for convenience the Subcontractor's performance of all or a part of the Subcontractor's Work by providing the Subcontractor with a written notice of termination of convenience which shall be effective upon receipt by the Subcontractor. The Subcontractor shall immediately discontinue performance of the Subcontractor's Work and demobilize from the Project. Subcontractor shall take the steps necessary to preserve and protect the Subcontractor's Work in progress and shall use its best efforts to mitigate its costs in connection with the termination. If the Contractor's contract with the Owner has not been terminated and the Subcontractor is not in default on any provision of this Agreement, the Subcontractor shall be paid the reasonable value to the Contractor of the Subcontractor's Work performed prior to termination plus reasonable direct close-out costs if and when payment therefore is received by the

Contractor from the Owner, which is a condition precedent to the Contractor's obligation to pay the Subcontractor, less setoffs, less the Contractor's cost (plus a reasonable markup for overhead and profit) to repair the Subcontractor's Work previously completed by the Subcontractor, less the cost to complete the Subcontractor's Work (plus a reasonable markup for overhead and profit) which the Subcontractor inaccurately stated was complete and payment made, but in no event shall the Subcontractor be entitled to payment for unperformed Subcontractor's Work, unabsorbed overhead, lost profits on unperformed Subcontractor's Work, or indirect or consequential damages of any kind.

- 14.7 If it is determined upon adjudication that the Contractor wrongfully exercised the Contractor's remedy options under any of the provisions of Article 14, that action shall be deemed, upon such determination, as a deductive change order. If upon adjudication that the Contractor wrongfully exercised the Contractor's termination options under any of the provisions of Article 14, that termination shall be deemed, upon such determination, as a termination for the Contractor's convenience pursuant to Section 14.6 and the Subcontractor shall be entitled to the applicable compensation provided for in Section 14.6 of this Agreement. The Subcontractor's remedies under this paragraph shall be exclusive.
- 14.8 The Subcontractor, by execution of this Agreement, contingently assigns to the Contractor all of the Subcontractor's Sub-tier agreements and purchase orders relating to the Subcontractor's Work, and consents to this Agreement being assigned to the Owner in accordance with the terms of the General Contract. The assignment of each of the Subcontractor's Sub-tier agreements and purchase orders shall take effect only upon the Subcontractor's termination or default under Article 14 and the Contractor's affirmative acceptance of the assignment of the specific Sub-tier agreements or purchase order by written notice to the Subcontractor and the Subcontractor's Sub-tiers or material supplier. The Contractor shall have no liability to any of the Subcontractor's Sub-tiers or material suppliers unless and until the Contractor affirmatively accepts the assignment as provided above and then such liability shall relate to the Subcontractor's Work performed and material or supplies ordered only from the date of the Contractor's acceptance of the assignment after the Subcontractor's termination. The Subcontractor shall ensure that each of its Sub-tier agreements and purchase orders relating to the Subcontractor's Work are assignable to the Contractor.
- 14.9 Termination of this Agreement by the Contractor or abandonment by the Subcontractor shall not relieve the Subcontractor from the Subcontractor's obligations in connection with the Subcontractor's Work performed prior to termination or abandonment nor will such termination or abandonment abrogate any obligations of the Subcontractor under, or rights or remedies afforded to the Contractor by this Agreement or the Contract Documents including without limitation, the Subcontractor's indemnity obligations.

ARTICLE 15 DAMAGE TO THE WORK

- 15.1 The Subcontractor shall secure and protect the Subcontractor's Work and all materials, and shall bear and be liable for all loss and/or damage of any kind in connection therewith, at any time prior to Final Completion and acceptance thereof, unless said damage or loss is subject to the provisions of the Builder's Risk Property Insurance as they may apply. The Subcontractor agrees to assume the responsibility to determine whether Builder's Risk Insurance is in force. The Subcontractor shall be responsible for all Builder's Risk and Property insurance deductibles that the Contractor has assumed responsibility therefore in the General Contract with the Owner.
- 15.2 The Contractor shall not be responsible for loss of or damage to materials, tools, equipment, appliances, falsework, scaffolds or other personal property owned, rented or used by the Subcontractor or anyone employed by it in the performance of the Subcontractor's Work, however caused.
- 15.3 Builder's Risk Insurance (with extended coverage, if specified or otherwise required) may be maintained by the Owner or the Contractor upon materials supplied for permanent use or incorporation in the Project or incident to the construction thereof, the capital value of which is included in the cost of the Subcontractor's Work. Unless otherwise stated the Builder's Risk Insurance coverage will not extend to the Subcontractor's machinery, tools, equipment, appliances or other personal property owned, rented or used by the Subcontractor or anyone employed by it in the performance of the Subcontractor's Work.

- 15.4 The total value of the property described above as insurable under this Article and which is shown on the approved monthly Application for Payment provided for in Article 4, plus the total value of similar property incorporated in the Project or delivered to the Project Site during the month but not included in said Application for Payment, as reported by the Subcontractor to the Contractor for insurance purposes only, shall determine the total value of the Subcontractor's Work, materials and equipment to be insured under Section 15.3.
- 15.5 The Contractor's maximum liability to the Subcontractor under Section 15.3 shall be for not more than that proportion of any loss which the last reported value of the Subcontractor's Work bore to the actual value of said Subcontractor's Work at the time of such last report, and in no event for more than the actual loss.
- 15.6 In the event of a loss insured under this Article 15, the Subcontractor shall be bound by any adjustment which shall be made between the Contractor or the Owner and the insurance company or companies. Loss, if any, shall be made payable to the Contractor and/or the Owner as their interests may appear, for the account of whom it may concern. It is an express condition precedent that the Contractor's obligation to reimburse the Subcontractor for any insurable loss hereunder is contingent upon the Contractor's actual receipt of said insurance proceeds attributable to said insurable loss from the Owner or the applicable insurance company or companies.

ARTICLE 16 CLEANING UP

- 16.1 The Subcontractor shall, at its own cost and expense, follow the Contractor's clean-up directions and (1) keep the Project site free at all times from all waste materials, packaging materials and other rubbish, dirt and debris accumulated in connection with the execution of the Subcontractor's Work and shall remove said materials and rubbish as directed by the Contractor; (2) clean and remove from the Subcontractor's Work and from all contiguous work of others any soiling, staining, mortar, plaster, concrete or dirt caused by the execution of Subcontractor's Work and make good all defects resulting therefrom; (3) at the completion of Subcontractor's Work in each area, perform such cleaning as may be required to leave the area "broom clean"; and (4) at the entire completion of its Work, remove all of its tools, equipment, scaffolds, shanties and surplus materials. Should the Subcontractor fail to perform any of the foregoing to the Contractor's satisfaction, the Contractor shall have the right to perform and complete such work itself or through others and charge the cost thereof to the Subcontractor as determined by the Contractor in its sole discretion.

ARTICLE 17 RULES AND REGULATIONS

- 17.1 The Subcontractor shall obtain and pay for all necessary permits and licenses pertaining to the Subcontractor's Work and shall comply with all Federal, State, Municipal and local laws, ordinances, rules, regulations, standards, orders, notices and requirements, including, those relating to safety and with the requirements of the American Insurance Association, whether or not provided for by the Plans, Specifications, General Conditions or other Contract Documents, without additional charge or expense to the Contractor, and shall also be responsible for and correct, at its own cost and expense, any violations thereof resulting from or in connection with the performance of the Subcontractor's Work. The Subcontractor shall, at any time upon demand, furnish such proof as the Contractor may require showing such compliance and the correction of such violation. The Subcontractor agrees to defend, save harmless and indemnify the Contractor from and against any and all loss, injury, claims, actions, proceedings, liability, damages, fines, penalties, costs and expenses, including legal fees and disbursements, caused or occasioned directly or indirectly by the Subcontractor's failure to comply with any of said laws, ordinances, rules, regulations, standards, orders, notices or requirements or to correct such violations.
- 17.2 The Subcontractor warrants and represents that it possesses all licenses and meets all the requirements of the Contract Documents, which are required to perform the Subcontractor's Work. The Subcontractor shall give sufficient and timely notice to all authorities having jurisdiction over Subcontractor's Work and secure and pay for all permits, fees, licenses, assessments, inspections, tests, and taxes related to the Subcontractor's Work. The Subcontractor shall cooperate and assist the Contractor in securing building and occupancy permits. The Subcontractor shall immediately notify the Contractor of any deficiency in Subcontractor's Work reported by any authority have jurisdiction or the denial of any permit, licenses, certificate of testing,

inspection, and occupancy. Upon request by the Contractor, the Subcontractor shall submit applicable permits, licenses certificates of testing, inspection, and occupancy to the Contractor.

ARTICLE 18 STRIKES AND WORK STOPPAGES

- 18.1 The Subcontractor shall not employ any class of labor, means, materials, methods or equipment, including improper classification of employees as independent contractors which may cause strikes, work stoppages, bannerings, labor demonstrations, informational picketing or any disturbances by labor employed by the Subcontractor, the Contractor or other contractors or subcontractors on or in connection with the Subcontractor's Work or the Project or the location thereof. The Subcontractor agrees that all disputes as to jurisdiction of trades shall be adjusted in accordance with any plan for the settlement of jurisdictional disputes which may be in effect either nationally or in the locality in which the Subcontractor's Work is being done and that it shall be bound and abide by all such adjustments and settlements of jurisdictional disputes, provided that the provisions of this Article 18 shall not be in violation of or in conflict with any provisions of law applicable to the settlement of such disputes. Should the Subcontractor fail to carry out or comply with any of the foregoing provisions, the Contractor shall have the right, in addition to any other rights and remedies provided by this Agreement or the other Contract Documents or by law, after three (3) days written notice mailed or delivered to the Subcontractor's last known address, to terminate this Agreement or any part thereof or the employment of the Subcontractor for all or any portion of the Subcontractor's Work, and, for the purpose of completing the Subcontractor's Work, to enter upon the Project Site and take possession of the Subcontractor's materials, implements, equipment, appliances or tools, in the same manner, to the same extent and upon the same terms and conditions as set forth in Article 14 of this Agreement.
- 18.2 To the fullest extent not prohibited by law and without limitation of any other provision hereof, the Subcontractor agrees that if for any reason labor employed by the Subcontractor (or any other person or entity engaged by the Subcontractor in connection with the Subcontractor's Work or for whose work the Subcontractor is responsible), with the intent of impeding or stopping the progress of the Subcontractor's Work, individually or in connection with others, unlawfully strikes, slows down or otherwise engages or participates in any other withholding of or interference with services (including, without limitation, honoring pickets or picket lines, improperly performing work required to be performed under the Contract Documents or making claims resulting in work jurisdiction disputes), and all or any of such actions impede or stop the progress of the Subcontractor's Work (and being herein referred to as an "Improper Labor Practice"), the Contractor shall have the right to require that the Subcontractor and/or any such other person or entity take immediate action to bring about a return to normal operations and in any event maintain the progress of the Project.
- 18.3 In the event of any such Improper Practice, the Subcontractor agrees to discipline any of the Subcontractor's employees or such other person or entity engaged in the above-described conduct in a manner consistent with lawful labor practices and calculated to bring about an end to such conduct.
- 18.4 In addition, if the Improper Practice is subject to grievance and/or arbitration procedure under an applicable labor agreement between the Subcontractor or such other person or entity and a union, the Subcontractor shall be required, at the Subcontractor's own expense, (and the Subcontractor shall require all such other persons or entities to) to take all action, including legal action, as may be required to have the dispute resolved by such grievance or arbitration procedure (including, but not limited to, obtaining prompt injunctive relief under State or Federal law). Notwithstanding such procedures, the Subcontractor shall not be relieved of the Subcontractor's obligation to maintain the progress of the Project.
- 18.5 In the event that the Subcontractor or any other such person or entity fails, in the opinion of the Contractor, to take prompt remedial action as provided above, the Contractor shall have the right to (1) take such action in the name of the Subcontractor and/or other person or entity as may be reasonably necessary to obtain an end to the Improper Practice, including legal action, and (b) charge all costs and expenses connected therewith to the Subcontractor (including, but not limited to, legal, accounting, administrative and other direct, indirect, general and special expenses).

ARTICLE 19 TAXES AND CONTRIBUTIONS

- 19.1 The Subcontractor, for the Subcontract Amount herein provided for, hereby accepts and assumes exclusive liability for and shall indemnify, protect and save harmless the Contractor and the Owner from and against the payment of:
- 19.2 All contributions, taxes or premiums, (including interest and penalties thereon), which may be payable under the Unemployment Insurance Law of any State, the Federal Social Security Act, Federal, State, County and/or Municipal Tax Withholding Laws, or any other law, measured upon the payroll of or required to be withheld from employees, by whomsoever employed, engaged in the Subcontractor's Work to be performed and furnished under this Agreement.
- 19.3 All sales, use, personal property and other taxes, (including interest and penalties thereon), required by any Federal, State, County, Municipal or other law to be paid or collected by the Subcontractor or any of its sub-tiers or vendors or any other person or persons acting for, through or under it or any of them, by reason of the performance of the Subcontractor's Work or the acquisition, ownership, furnishing or use of any materials, equipment, supplies, labor, services or other items for or in connection with the Subcontractor's Work.
- .1 All pension, welfare, vacation, annuity, and other union benefit contributions payable under or in connection with labor agreements with respect to all persons, by whomsoever employed, engaged in the Work to be performed and furnished under this Agreement.

ARTICLE 20 PATENTS

- 20.1 The Subcontractor hereby agrees to indemnify, protect and save harmless the Contractor and the Owner from and against any and all liability, loss or damage and to reimburse the Contractor and the Owner for any expenses, including legal fees and disbursements, to which the Contractor and the Owner may incur because of claims or litigation on account of infringement or alleged infringement of any letters patent or patent rights by reason of the Subcontractor's Work or materials, equipment or other items used by the Subcontractor in its performance of the Subcontractor's Work.

ARTICLE 21 MECHANIC'S LIENS

- 21.1 If any Sub-tier, laborer or materialman of the Subcontractor or any other person directly or indirectly acting for, through or under it files or maintains a mechanic's lien or claim against the Project or Premises or any part thereof or any interests therein or any improvements thereon or against any monies due or to become due from the Owner to the Contractor or from the Contractor to the Subcontractor, for or on account of any work, labor, services, materials, equipment or other items performed or furnished for or in connection with the Subcontractor's Work or under any Change Order or supplemental agreement for extra work in connection with this Agreement and the Project, the Subcontractor agrees to cause such liens and claims to be satisfied, removed or discharged at its own expense by bond, payment or otherwise within ten (10) days from the date of the filing thereof, and upon its failure to do so the Contractor shall have the right, in addition to all other rights and remedies provided under this Agreement and the Contract Documents or by law, to cause such liens or claims to be satisfied, removed or discharged, by whatever means the Contractor chooses, at the sole cost and expense of the Subcontractor, (such cost and expense to include legal fees and disbursements). The Subcontractor agrees to defend, indemnify, protect and save harmless the Contractor and the Owner from and against any and all such liens and claims and actions brought by judgements rendered thereon, and from and against any and all loss, damages, liability, costs and expenses, including legal fees and disbursements, which the Contractor and the Owner may sustain or incur in connection therewith.
- 21.2 The Contractor shall have the right to retain from any payment then due or thereafter to become due to the Subcontractor twice the amount which it deems sufficient to: (1) satisfy, discharge and/or defend against any such claim or lien or any action which may be brought or judgement which may be recovered thereon; (2) make good any such nonpayment, damage, failure or default; and (3) compensate the Contractor and the

Owner for and indemnify them against any and all losses, liability, damages, costs and expenses, including legal fees and disbursements, which may be sustained or incurred by either or both of them in connection therewith.

- 21.3 The Contractor may withhold and unilaterally deduct amounts otherwise due and payable to the Subcontractor under this Agreement, or any other agreement in which the Contractor and the Subcontractor or any affiliate, subsidiary, affiliation of common ownership are parties thereto, to cover the Contractor's reasonable estimate of costs (including reasonable overhead and profit), damages or liability that the Contractor has or may incur for which Subcontractor is or may be responsible for pursuant to this Agreement or the Contract Documents or other agreements, and to reimburse the Contractor for the Contractor's costs to perform or cure any defect or deficiency in Subcontractor's Work, pursuant to Section 14.3, incurred prior to the Subcontractor's termination pursuant to Section 14.4.

ARTICLE 22 ASSIGNMENTS

- 22.1 Neither this Agreement nor any monies due or to become due hereunder shall be assignable without the prior written consent of the Contractor, nor shall the whole or any part of this Agreement be sublet without like prior written consent. Any such assignment or subletting without such prior written consent shall be void and of no effect and shall vest no right or right of action in assignee of the Subcontractor against the Contractor. The Contractor's consent to any assignment or subletting shall not relieve the Subcontractor of any of its agreements, duties, responsibilities or obligations under this Agreement and the other Contract Documents, and the Subcontractor shall remain fully responsible and liable for the defaults, neglects, acts and omissions of its assignees and Sub-tiers and all persons directly or indirectly employed by them as it is for its own defaults, neglects, acts and omissions and those of its own officers, agents, servants and employees. The Subcontractor shall bind each of its Sub-tiers to all of the terms, provisions and covenants of this Agreement and the other Contract Documents with respect to the sublet Subcontractor's Work. The Contractor's consent to any such subletting shall not be deemed to create any contractual relationship between the Contractor and any of the Subcontractor's Sub-tier(s) to whom the Subcontractor's Work or any portion thereof is sublet, and shall not vest any right or right of action in such subcontractor against the Contractor.

ARTICLE 23 SUBCONTRACTOR PROVISIONS

- 23.1 The Subcontractor shall submit a list of proposed sub-subcontractors and material suppliers ("Sub-tiers") to the Contractor for review and approval, per Article 36.1, with execution of this Subcontract.
- 23.2 The Subcontractor shall perform all required layout of the Subcontractor's Work in strict conformance with the Contract Documents and shall be strictly responsible for the accuracy of the Subcontractor's Work. The Subcontractor shall perform its layout responsibilities so that the actual and final condition of Subcontractor's Work shall result in the proper alignment of finished and adjacent surfaces.
- 23.3 All workmanship performed by the Subcontractor shall be first class to the standards required by the Contract Documents. All materials and equipment incorporated into the Subcontractor's Work shall be new, except as permitted by the Contract Documents and shall be furnished in ample supply to support the timely and expeditious execution of the Subcontractor's Work in strict conformance with the Project Schedule.
- 23.4 Should the Subcontractor's Work include the incorporation or installation of materials and equipment furnished by the Contractor or the Owner, it shall be the responsibility of the Subcontractor to examine the materials and equipment upon delivery and immediately report to the Contractor any damage or incomplete shipments. Thereafter the Subcontractor shall handle, protect, store, and install such material and equipment with the required skill and care as to ensure a satisfactory and proper installation. Loss or damage caused, in whole or in part, by the actions and/or inactions of the Subcontractor shall be acknowledged as a material breach of this Agreement and the Subcontractor accepts full responsibility for all resulting loss, cost or expense incurred by the Contractor in repairing or correcting the damage.

- 23.5 The Subcontractor shall schedule to receive, accept, and unload all material and equipment deliveries with the Contractor's on-site superintendent a minimum of seventy-two (72) hours in advance, unless the Contractor agrees to accept a shorter period of time. If the foregoing notification requirements are not adhered to, the Contractor, in its sole discretion, has the right to refuse delivery, warehouse or return to the carrier the shipment. If the Contractor exercises this right to warehouse the delivery, all costs incurred by the Contractor for handling, storage and protection of the materials and equipment shall be immediately paid by the Subcontractor. In the event the Contractor accepts the delivery on the Subcontractor's behalf, any written acknowledgement of the delivery shall not constitute the Contractor's acceptance of the material and equipment, until the Subcontractor inspects the material and equipment and the Subcontractor thereby assumes the complete responsibility for any and all damage, missing material or equipment or incorrect material and equipment. The Subcontractor acknowledges that the Contractor has no responsibility to verify quantities, types of material and equipment or the protection of any of the Subcontractor's deliveries.
- 23.6 The Subcontractor, its agents, employees, subcontractors, or suppliers shall not use the Contractor's equipment without the express written consent and upon the terms and conditions as established by the Contractor's designated representative. The Subcontractor shall only use the Contractor's equipment on an as is or where is basis after performing its own inspection and assuming complete responsibility for the adequacy and safe operating condition of the Contractor's equipment. The Subcontractor acknowledges that it shall indemnify, defend and hold the Contractor harmless from any and all loss, cost, expense or damage arising out of or related to bodily injury and property damage caused, in whole or in part, by the Subcontractor's use of the Contractor's equipment.
- 23.7 Until final completion of the General Contract, the Subcontractor agrees not to perform any work directly for the Owner, manager, tenants or their affiliated entities or directly deal with the Owner's representatives in connection with the Project, unless otherwise directed in writing by the Contractor. All work for this Project performed by the Subcontractor shall be processed exclusively through the Contractor.
- 23.8 The Subcontractor shall protect the Subcontractor's Work at all times during performance until final acceptance and protect the work, property or materials and equipment of the Owner, the Contractor, or other subcontractors from damages caused, in whole or in part, by the Subcontractor's operations. The Subcontractor acknowledges and assumes responsibility for the cost and expense incurred to repair said damage and shall promptly remedy such damage to the satisfaction of the Contractor and the Owner, or the Contractor, at its sole discretion, may remedy the damage and deduct the cost incurred, plus overhead and profit, from any amounts due or to become due the Subcontractor.
- 23.9 The Subcontractor acknowledges and agrees that it will execute any confidentiality or nondisclosure agreement required by the General Contract as requested by the Contractor. The Contractor may disclose Project related information to the Subcontractor which the Subcontractor and/or the Owner considers to be confidential ("Confidential Information"). In the absence of more stringent requirements contained in the General Contract, when the Contractor and/or the Owner discloses any information designated as Confidential Information to the Subcontractor, the Subcontractor agrees that: (i) the Confidential Information shall be used solely for the purpose of performing the Subcontractor's Work and disclosed only to the Subcontractor's employees who have a need to know the Confidential Information for that limited purpose; (ii) the Subcontractor shall not disclose the Confidential Information to any other party without the Contractor's written consent; (iii) the Subcontractor shall take all necessary precautions to preserve the secrecy of the Confidential Information; and (iv) the Subcontractor shall, within one (1) month of the completion of the Subcontractor's Work, return all copies of the Confidential Information to the Contractor. The confidentiality provisions of this Agreement shall remain in full force and effect after final completion of this Agreement. The Subcontractor agrees that the Contractor shall be entitled to equitable relief in order to enjoin any continued or threatened breach of Section 23.9 by the Subcontractor and all cost incurred by the Contractor in obtaining equitable relief, including attorney's fees and expenses, shall be immediately reimbursed by the Subcontractor to the Contractor.
- 23.10 If required by the Contractor, the Subcontractor shall sign the certifications confirming that the Subcontractor has and will comply with the Project General Permit for Stormwater Discharges. If required by the

Contractor, if Subcontractor performs earth work operations, the Subcontractor shall sign the NPDES and E&S Permits.

- 23.11 The Subcontractor acknowledges and agrees to immediately reimburse the Contractor for any and all penalties, fines, liquidated damages, disincentives or any forfeitures or monetary withholdings as assessed by the Owner that arises, in whole or in part, from the Subcontractor's Work, performance or workforce.
- 23.12 When the Subcontractor's Work requires road or lane closures, and the Contractor is responsible for traffic control, the Subcontractor shall schedule the Subcontractor's Work sufficiently in advance to permit the Contractor to install and remove the necessary traffic controls. When the Subcontractor's Work is adjacent to or within railroad property or right-of-way or within any easement property, the Subcontractor shall comply with the terms and conditions of the General Contract governing such work and any other rules or regulations associated with working in such areas at no additional cost to the Contractor.
- 23.13 If alternate pricing or scope is provided for in this Agreement, such alternates shall be accepted only in writing by the Contractor at its sole discretion.

ARTICLE 24 GUARANTEES

- 24.1 The Subcontractor warrants, certifies and guarantees to the Contractor and the Owner that the Subcontractor's Work will be free from defects and deficiencies in workmanship and materials and performed in strict conformity with the requirements of this Agreement. This warranty, certification and guarantee shall survive the termination, suspension or completion of this Agreement or Subcontractor's final payment and shall only be extinguished by the limitation periods imposed by applicable law and shall not be limited by any other provision contained in this Agreement.
- 24.2 The Subcontractor hereby guarantees the Subcontractor's Work to the full extent provided in the Plans, Specifications, General Conditions, Special Conditions and other Contract Documents and shall promptly perform warranty work, whether disputed or otherwise and Subcontractor's failure to correct a deficiency or defect after several attempts shall constitute a material breach of this Agreement. The Subcontractor agrees to satisfy such warranty obligations which appear within the guarantee or warranty period established in the Contract Documents without cost to the Owner or the Contractor.
- 24.3 The Subcontractor shall remove, replace and/or repair at its own expense and at the convenience of the Owner, any faulty, defective or improper work, materials or equipment discovered within one (1) year from the date of the acceptance of the Project as a whole by the Architect and the Owner or for such longer period as may be provided in the Plans, Specifications, General Conditions, Special Conditions or other Contract Documents.
- 24.4 Without limitation by the foregoing, the Subcontractor shall pay in addition for all damages to the Project resulting from defective Subcontractor's Work and all costs and expenses necessary to correct, remove, replace and repair the Subcontractor's Work and any other work or property which may be damaged in correcting, removing, replacing or repairing the Work.

ARTICLE 25 SAFETY

- 25.1 The Subcontractor agrees that between the Contractor and the Subcontractor, the prevention of accidents to workmen engaged upon or in the vicinity of the Subcontractor's Work is the Subcontractor's responsibility. The Subcontractor shall be responsible for initiating, maintaining and supervising safety precautions and programs in connection with the Subcontractor's Work in accordance with all Applicable Laws. The Subcontractor agrees to comply with the Occupational Safety and Health Act of 1970 ("Act"), as amended, and all other laws, in the performance of the Subcontractor's Work and agrees to abide by and comply with all regulations issued under this Act. In the event the Subcontractor is cited for violations, or failure to comply with the Act, the Subcontractor shall defend and hold harmless the Contractor from any and all costs, expenses, suits, penalties, or damages (including legal fees and expenses) arising, in whole or in part, from

any such citations or penalties and such sums shall be immediately payable to the Contractor. In addition, the Subcontractor shall comply with all safety requirements established by the Contractor and/or the Owner and will conduct the Subcontractor's obligations in a safe manner. All of the Subcontractor's crane operators shall have a valid certificate of competency issued in accordance with or by an accredited certifying entity for the type of crane used. The Contractor may, but is not obligated to, conduct safety inspections from time to time. Such inspections shall not relieve the Subcontractor from the Subcontractor's obligations to comply with all safety requirements nor shall such inspections create any Contractor liability to the Subcontractor, its Sub-tiers, vendors or their respective representatives, agents, or employees.

- 25.2 The Subcontractor shall maintain at the Site a current Safety Data Sheet ("SDS") Manual for all SDS received from the manufacturers or suppliers of all Hazardous Materials/Regulated Substances. If an SDS is not received by the Subcontractor, the Subcontractor shall contact the manufacturer or supplier to request one or contact OSHA for assistance in obtaining the SDS. The Subcontractor shall maintain the SDS Manual in the format required by the Contractor and shall ensure that the SDS form for each Hazardous Material/Regulated Substance contains the information required by the current OSHA Hazard Communication Standard. The Subcontractor's SDS Manual shall be made readily available, upon request, to the Contractor, the Owner and to OSHA representatives.
- 25.3 If Hazardous Materials/Regulated Substances of a type of which an employer is required by law to notify its employees are being used on the Site by the Subcontractor, its sub-tiers or anyone directly or indirectly employed by them, the Subcontractor shall, prior to harmful exposure of any employees on the Site to such substances, give written notice of the chemical composition to the Contractor and the Owner in sufficient detail and time to permit compliance with all Applicable Laws.
- 25.4 The Subcontractor shall take all necessary precautions for safety of, and shall provide all reasonable protection to prevent damage, injury or loss to: (1) all persons engaged by the Subcontractor, its Sub-tiers, suppliers and vendors in performance of the Subcontractor's Work on the Site and other persons who may be affected thereby; (2) the Subcontractor's Work and materials and equipment to be incorporated therein, whether in storage on or off the Site under the care and custody of the Subcontractor and/or its Sub-tiers, suppliers and vendors; and (3) other property within the Subcontractor's care, custody or control at or adjacent to the Site.
- 25.5 The Subcontractor shall obtain a copy of and maintain compliance with the Contractor's Project Safety Plan and all appendices and attachments. This includes all safety requirements that are above and beyond OSHA minimal requirements. All submittals and approval of Subcontractor's Site Specific Safety Plans and all necessary certifications and training shall be contractual obligations that must be met prior to the subcontractor mobilizing.
- 25.6 The Subcontractor shall give all required notices by all Applicable Laws of all authorities with jurisdiction there over bearing on the safety of persons and property and their protection from damage, injury, or loss.
- 25.7 When so ordered, the Subcontractor shall stop any part of the Subcontractor's Work which the Contractor and/or the Owner deems unsafe until corrective measures satisfactory to the Contractor have been taken. The Subcontractor agrees that it shall not have nor make any claim for adjustment in either Subcontract Time or the Subcontract Amount arising out of such stoppage to the Subcontractor's Work. Should the Subcontractor neglect to take such corrective measures, the Contractor may do so at the cost and expense of the Subcontractor and may deduct the cost thereof from any payments due or to become due to the Subcontractor. Failure on the part of the Contractor to stop unsafe practices shall in no way relieve the Subcontractor of its responsibility, therefore. The failure of the Subcontractor to implement its own Project Specific Safety Program and/or abide by, follow, properly implement or supervise any safety standards established during the progress of the Subcontractor's Work by Applicable Law shall constitute a breach of this Agreement by the Subcontractor and shall entitle the Contractor to seek indemnity from the Subcontractor to the full extent permitted by law and as further identified and described in Article 26 of this Agreement.
- 25.8 The Subcontractor shall promptly remedy damage or loss (other than damage or loss to property insured under property insurance provided by the Contract Documents) to property at the Site or stored in other

locations caused in whole or in part by the Subcontractor, its sub-tiers or anyone directly or indirectly employed by either of them, or by anyone whose acts they may be liable, except damage or loss caused by the acts or omissions of the Owner.

- 25.9 In the event that the Subcontractor encounters on the Project Site material reasonably believed to be Hazardous Materials/Regulated Substances which has not been rendered harmless, the Subcontractor shall immediately stop the Subcontractor's Work in the area affected and immediately report the condition to the Contractor in writing. The Subcontractor's Work in the affected area shall resume when such Hazardous Materials/Regulated Substances has been rendered harmless or removed as determined by the Owner.

ARTICLE 26 INDEMNITY

- 26.1 The Subcontractor hereby assumes entire responsibility and liability for any and all damages or injury of any kind or nature whatsoever, (including death resulting therefrom), to all persons, whether employees of the Subcontractor or otherwise, and to property, excluding the Subcontractor's Work, but only to the extent insured under an appropriate Builder's Risk Policy provided by the Contract Documents, caused by, resulting from, arising out of or occurring, in whole or in part, in connection with the execution of the Subcontractor's Work, and/or the use, misuse, erection, maintenance, operation or failure of any machinery or equipment (including, but not limited to, scaffolds, derricks, ladders, hoists, cranes and rigging supports) by Subcontractor whether or not such machinery or equipment was furnished, rented or loaned by the Contractor or its officers, employees, agents, servants or others, to the Subcontractor. Except to the extent expressly prohibited by statute, the Subcontractor agrees to indemnify, defend and save harmless the Contractor and the Owner, their officers, agents, servants or employees from and against any and all such claim, loss, cost, expense, liability, damage or injury, including legal fees and disbursements that the Contractor, the Owner, their officers, agents, servants or employees may directly or indirectly sustain, suffer or incur as a result thereof and the Subcontractor agrees to and does hereby assume, on behalf of the Contractor and the Owner, their officers, agents, servants and employees the defense of any action of law or in equity which may be brought against the Contractor and/or the Owner, their officers, agents, servants or employees upon or by reason of such claims and to pay on behalf of the Contractor and the Owner, their officers, agents, servants and employees upon demand, the amount of any judgement that may be entered against the Contractor and/or the Owner, their officers, agents, servants and employees in any such action. In the event that any such claims, loss, costs, expense, liability, damage or injury arise or are made or threatened against the Contractor or the Owner, their officers, agents, servants or employees, the Contractor shall have the right to withhold any payments due or to become due to the Subcontractor in twice the amount sufficient in the Contractor's sole judgement to protect and indemnify the Contractor and the Owner, their officers, agents, servants and employees from and against any and all such claims, loss, cost, expense, liability, damage, injury, including legal fees and disbursements. The Contractor's withholding of any amounts hereunder shall not be construed as a partial or total waiver of Subcontractor's indemnity obligations hereunder, but shall be in addition to said indemnity obligations. These indemnification obligations shall survive the termination of this Agreement or completion of the Subcontractor's Work.
- 26.2 The Subcontractor further agrees to indemnify, hold harmless, reimburse and defend Contractor from: (1) payments made by the Contractor under any applicable Workers' Compensation Act or Law for injuries, sickness, disease, death or disability claimed by Contractor's employees; or (2) claims made by employees of any subcontractor or any employee directly or indirectly employed by, any of them for injuries, sickness, disease, death or disability which arise, in whole or in part, out of the acts or omissions of the Subcontractor on the Project or pursuant to this Agreement. As between the Subcontractor and the Contractor, the Subcontractor waives its immunities under any applicable Worker's Compensation Act or Law for purposes of enforcing the indemnity obligations herein.
- 26.3 The Subcontractor further agrees to indemnify, hold harmless, reimburse and defend the Contractor from all direct or indirect loss, cost and expense (including attorney's fees and expenses) which arise out of or relate to any and all claims, demands and causes of action from the Owner, the Owner's separate contractors or the Contractor's separate third party subcontractors which allege that their respective activities were subject to delay, acceleration, disruption, interference or hindrance caused, in whole or in part, by the actions or inactions of the Subcontractor in failing to progress the Subcontractor's Work in accordance with the Project

ARTICLE 27 **INSURANCE**

- .1 WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY INSURANCE in accordance with the laws of the State in which the Subcontractor's Work is situated.
- .2 EMPLOYER'S LIABILITY INSURANCE ("Stop-Gap" Employer's Liability) with limits of not less than \$ 1,000,000.00 for injury to any one person.
- .3 COMMERCIAL GENERAL LIABILITY INSURANCE including contractual liability insurance against the liability assumed hereinabove, and including, contractors' protective liability insurance if the Subcontractor sublets to another all or any portion of the Work, written on an ISO Commercial/General Liability occurrence form with no supplemental exclusion endorsements attached with the following minimum limits:

Umbrella or excess coverage of at least **Subcontract Header Custom Field 2**.

.4 BUSINESS AUTOMOBILE LIABILITY INSURANCE covering any vehicle, with the following minimum limit:

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and Property Damage:

\$1,000,000 per accident

- .5 If the Subcontractor's Work includes Design Services in accordance with Article 31, the Subcontractor shall purchase and maintain professional liability insurance coverage in the amount of One Million Dollars (\$1,000,000) per claim/Two Million Dollars (\$2,000,000) annual aggregate covering the Subcontractor's Design Services obligations pursuant to this Agreement. If the policy is used on a "claims made" basis, the Subcontractor will keep such insurance in force for at least three (3) years after the Final Completion Date.
- .6 These limits or coverages are superseded by any higher limits or coverages specified in this Agreement, or imposed on the Subcontractor by the Contract Documents.
- .7 The Insurance must cover all additional insureds required per the Contract Documents or requested by the Project Owner.
- 27.2 Before commencing the Work, the Subcontractor shall furnish a certificate, satisfactory to the Contractor, showing that the above insurance is in force, stating policy numbers, dates of expiration, and limit of liability thereunder, and further providing that the Insurance will not be canceled or changed until the expiration of at least thirty (30) days after written notice of such cancellation or change has been mailed to and received by the Contractor. The Contractor and Owner shall be named additional insured under the general liability (using ISO forms CG 20 10 04 13 and CG 20 37 04 13 or equivalent), auto liability and umbrella/excess liability. The general liability, auto liability and umbrella/excess liability policies shall provide primary coverage, without right of contribution (via primary and non-contributory endorsements) of the Contractor's liability insurance policies for all claims against the Contractor arising out of the performance of the Work by the Subcontractor. Waivers of Subrogation are provided in favor of the Contractor and Owner on the general liability, auto liability, workers' compensation, and umbrella/excess liability policies. If Subcontractor subs out work to lower tier subs, subcontractor's general liability policy shall include an "amended definition of occurrence" endorsement (or equivalent). The Subcontractor's liability insurance policies shall further be endorsed to indicate cross-claim and severability of interest endorsements for loss due to the actions or inactions of the Subcontractor. The Contractor reserves the right to require the Subcontractor to submit a certified copy of the liability policies. Subcontractor shall keep insurance outlined under Article 27 for at least five (5) years after Final Completion Date.
- 27.3 If the Subcontractor fails to procure and maintain such insurance, the Contractor shall have the right, but not the obligation, to procure and maintain said insurance for and in the name of the Subcontractor and the Subcontractor shall pay the cost thereof and shall furnish all necessary information to bind and maintain such insurance.

ARTICLE 28 SURETY

- 28.1 Unless noted otherwise in this Agreement, the Subcontractor, at its sole expense, shall immediately upon execution of this Agreement, obtain and furnish surety bonds, in such form as provided by the Contractor or as required by the Owner. If the Subcontractor does not furnish such surety bonds within three (3) business days of execution of this Agreement, the parties agree that such failure constitutes a material breach and default under Article 14 of this Agreement for which the damages shall include but not be limited to termination and the Contractor's cost to secure a replacement subcontractor. Surety bonds shall be individual performance and payment bonds, and each individual performance and payment bond shall be in the amount of one hundred percent (100%) of the Subcontract Amount guaranteeing full performance of this Agreement and that the Subcontractor will promptly and fully pay for all work, labor and materials and other charges or costs in connection with the Subcontractor's Work. The definition of the Subcontractor's Work, as defined in this Agreement, shall be incorporated into the Subcontractor's bonds and is the definition of the term Contract Work as it appears in the Subcontractor's bonds. The payment bond shall be considered primary, and non-contributory, to claims which could be paid under either the payment or performance bond. The amount of the bonds shall increase directly with any Change Orders issued to this Agreement without the requirement of notice to the Subcontractor's surety for any such increase or amendment.

- 28.2 Payment bonds and performance bonds must be provided by a company listed in Federal Register Circular 570, latest revision, Surety Companies Acceptable on Federal Bonds, and a Financial Rating of A V or better as published by Best's Key Rating Guide, latest edition, and admitted in the state where the Subcontractor's Work is to be performed and shall conform to such other and further restrictions and conditions as the Contractor shall require. If the company issuing the Subcontractor's surety bonds falls below the criteria listed herein during the performance of the Subcontractor's Work, the Subcontractor shall immediately notify the Contractor and within fourteen (14) days of the bonds falling below the criteria, or upon demand by the Contractor, replace its surety bonds with bonds which meet the criteria contained herein. No change, alteration or modification in or deviation from this Subcontract, its terms, conditions, plans or specifications, or in the manner, time or amount of payment as provided herein, whether or not made in the manner as herein provided, shall release or exonerate, in whole or in part, any surety on any bond given in connection with this Agreement. In the event of any default by the Subcontractor, no surety on any performance bond given in connection with this Agreement shall, without the prior written consent of the Contractor (which consent shall not be unreasonably withheld or delayed), have any right to complete Subcontractor's Work hereunder or have any right to hire any other person, partnership or corporation to complete or in any way perform the Subcontractor's Work. The Contractor's right of approval hereunder is intended only to ensure the proper performance of the Subcontractor's Work and is not intended to interfere with any rights the surety might have under the bond or by operation of law. The surety under any performance bond provided to the Contractor under this provision shall not be relieved of any responsibility under said bond to the Contractor if the Subcontractor shall become insolvent or shall make an assignment for the benefit of creditors or be subject to any proceeding in bankruptcy. The Subcontractor's surety acknowledges that the Subcontractor is obligated under this Agreement to provide its surety with all notices, letters, or email, from the Contractor relating to deficiencies, or alleged deficiencies, in the Subcontractor's performance of this Agreement, and the Subcontractor's surety agrees that if the Subcontractor fails to provide the surety with such information, the Subcontractor's surety will not use lack of notice from the Contractor as a defense to any claim by the Contractor on the Subcontractor's bond. All provisions pertaining to indemnification and indemnity in this Agreement shall apply to, and bind, the Subcontractor's surety to the same extent the provision applies to, and binds, the Subcontractor. All provisions contained within Article 30 of this Agreement shall apply to, and bind, the Subcontractor's surety to the same extent the provision applies to, and binds, the Subcontractor, and the Contractor's statutes of limitation and repose relative to the Subcontractor's surety shall be the same as those relative to the Subcontractor. The Subcontractor's failure to comply with any of the terms of this Article 28 shall be deemed a material breach of this Subcontract.
- 28.3 Subcontractor Qualification Process. If the Subcontractor has engaged in the Subcontractor Qualification Process, then the Subcontractor recognizes a continuing duty to update the qualification process annually and with any material changes to the representations contained therein or at the request of the Contractor. Failure to maintain qualification shall be a violation of this Agreement. Failure of the Contractor to secure any requested or required information shall not be considered a waiver of this requirement.
- 28.4 If the Contractor elects a Subcontractor Default Insurance program for the Project, the Subcontractor shall identify and remove any and all bond costs should it be requested or pursuant to enrollment in the Subcontractor Default Insurance Program. The Subcontractor further recognizes that the Subcontractor Default Insurance is for the sole benefit of the Contractor and the Subcontractor shall not seek nor be entitled to any benefit therefrom. Furthermore, no waiver of subrogation or other term of this Agreement shall diminish the rights of the Contractor or his insurer to pursue contractual or other remedies in any claim against the Subcontractor who is enrolled in the Subcontractor Default Insurance who is held in default pursuant to the terms of this Agreement.
- 28.5 If indicated as such below, The Subcontractor shall at its own cost and expense furnish to the Contractor performance and payment bonds in the full amount of the Subcontract Amount:

Performance & Payment Bond is **Required/ Not required**

ARTICLE 29 NONDISCRIMINATION

- 29.1 The Subcontractor agrees to be bound and comply, at its own costs, with all federal, state and local laws, ordinances and regulations (hereinafter “Laws”) applicable to the Subcontractor’s Work, including, but not limited to, equal employment opportunity, minority business enterprise, women’s business enterprise, disadvantaged business enterprise, veterans business enterprise, local workforce employment, the provisions of Executive Order 13658 and 11246, as amended, and the regulations at 41 CFR Parts 60-1 through 60-50, Section 503 of the Rehabilitation Act of 1973, as amended, the regulations at 41 CFR Part 60-741, the non-discrimination and affirmative action provisions of the Vietnam Era Veterans’ Re-adjustment Assistance Act of 1974, as amended, 38 USC 4212, and the implementing regulations at 41 CFR Part 60-300, the Immigration Reform and Control Act of 1986; as amended, Title 1 of the Americans with Disabilities Act of 1990, as amended, and any subsequent years, the Fair Labor Standards Act of 1938, as amended, and the rules and regulations as may be established by the Secretary of Labor and all other Laws and Executive Orders which the Contractor must comply with according to the Contract Documents.
- 29.2 The Subcontractor agrees to comply with all Laws related to the supply of goods pursuant to this Agreement, including without limitation, all regulations related to the storage, transport, disposal or labeling of hazardous substance. If the Project is subject to the Federal Highway Authority (“FHA”) 1273 or subsequent provisions, the Subcontractor agrees to comply with FHA 1273 and to cooperate with the Contractor, by agreeing to periodic inspections, reviews, and the submission of documents and reports that may be required to ensure compliance with FHA 1273.

ARTICLE 30 ALTERNATIVE DISPUTE RESOLUTION PROCESS

- 30.1 The Subcontractor agrees to file no demand for arbitration or litigation related to a dispute pursuant to Section 30.2.3, whether sounding in contract, tort, equity or other non-contractual theory, until such time as the Contractor has: (1) exhausted its dispute provisions with the Owner, third party subcontractor(s) or other third party; and (2) the Owner has declared the Project to be substantially complete or some other similar declaration. The Subcontractor agrees that if for any reason this Agreement is not completed as contemplated herein or if any dispute shall arise over the rights of the Subcontractor pursuant to the Agreement, that no action shall be commenced by the Subcontractor based on any theory of unjust enrichment, quantum meruit, quantum valebant, quasi-contract, cardinal change or any other similar theory of law, tort or equity.
- 30.2 The Subcontractor and the Contractor covenant and agree in the event of any claim, dispute or other matter in question arising out of or relating to this Agreement or breach thereof, which does not involve, in whole or in part, the actions, directions or inactions of the Owner or its agents and representatives or the Contractor’s third party subcontractors or other third parties, (“dispute(s)”), the Subcontractor and the Contractor shall continue to perform (except to the extent performance is otherwise excused pursuant to the Contract Documents) all obligations as required under this Agreement notwithstanding the existence of such dispute(s) and that either party may seek such relief as may be permitted in accordance with the following terms and conditions:
- .1 The Subcontractor and the Contractor agree to negotiate, in good faith, in an attempt to resolve any dispute(s) for a period of at least sixty (60) days following the receipt of written notice from either party to the other which shall set forth, in specifics, the nature and description of the dispute(s), the actions or inactions of the other party which caused the dispute(s), and the relief or remedy requested by the notifying party;
- .2 Should the Subcontractor and the Contractor be unable to resolve said dispute(s) through good faith negotiation, the Subcontractor and the Contractor agree to attempt in good faith to resolve said dispute(s) through mediation administered by an organization offering commercial mediation services, which is acceptable to the Contractor, as a condition precedent to arbitration and/or litigation herein provided. All mediation proceedings shall be conducted in a location designated by the Contractor;

- .3 Should the Subcontractor and the Contractor be unable to resolve said dispute(s) through mediation, any and all dispute(s), at the sole discretion of the Contractor, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then pertaining. The organization providing arbitration services, which is acceptable to the Contractor, and any arbitrator(s) appointed thereby shall have no jurisdiction, power or authority to ignore or disregard the terms and conditions of this Agreement nor to decide or award punitive damages. The award(s) rendered by the arbitrators in accordance with this provision shall be final and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof. All arbitration proceedings or hearings shall be conducted in a location designed by the Contractor utilizing the law of the state in which the Project Site is situated.
 - .4 The Contractor may join any other party in the arbitration proceedings that the Contractor determines is necessary to reach a complete adjudication of any disputes arising under the terms of this Agreement, and/or disputes arising under the terms of any other agreement or contract entered into between Contractor and any other party performing work on the Project;
 - .5 All dispute(s) not resolved by arbitration pursuant to the terms of Section 30.2.3 will be resolved by litigation in any court having jurisdiction thereof, utilizing the law of the state in which the Project Site is situated, after compliance with Sections 30.2.1 and 30.2.2 hereof; and
 - .6 That the failure of either the Subcontractor or the Contractor to comply with the provisions of the foregoing shall be in contravention of the parties' express intention to implement this alternative means of dispute resolution, shall constitute a breach of these provisions, and the Subcontractor and the Contractor expressly stipulate that any court having jurisdiction over the parties shall be empowered to immediately enjoin any proceeding commenced in contravention of this Article 30 and the party failing to comply with these provisions shall reimburse the other parties for all costs and expenses (including legal fees) incurred in enforcing these provisions.
- 30.3 The Subcontractor and the Contractor hereby waive their right to a trial by jury in any and all disputes pursuant to Section 30.2 or claim against the bond provided by the Contractor, including any Miller Act bond, or in relation to how and in what fashion the Contractor's surety handled or processed the claim and regardless of whether the claim is based on contract, tort or equity basis or otherwise.
- 30.4 In the case of any dispute or claim between the Subcontractor and the Contractor or any of their respective sureties that relate to or arise out of this Agreement, which in the Contractor's sole determination, is in whole or in part: (1) relating to or arising from any act or omission of the Owner, third party subcontractors or other third party or involving the Contract Documents; or (2) should the Owner, third party subcontractors or other third party present a claim against the Contractor allegedly relating to arising out of, in whole or in part, the performance or non-performance of the Subcontractor's Work, the Subcontractor agrees to be bound to the Contractor and the Contractor's surety to the same extent that the Contractor is bound to the Owner, third party subcontractor or other third party, by the terms of the Contract Documents or such other agreements and any and all preliminary and final decisions, determinations or agreements made by or between the Contractor, the Owner, third party subcontractor or other third party or so authorized in the Contract Documents or by the court or arbitrator designated in the Contract Documents whether or not the Subcontractor is a party to such proceedings. In the event of a dispute subject to this Section 30.4, the Subcontractor shall continue to perform the Subcontractor's Work, whether disputed or otherwise, without interruption, deficiency or delay in accordance with the Project Schedule.
- 30.5 The Subcontractor shall certify all of its disputes and claims subject to Article 30 in the same manner and extent that the Contractor is required to certify a claim to the Owner pursuant to the General Contract. The subcontractor shall defend, indemnify and hold harmless the Contractor and the Contractor's surety from any assertion or allegation that the Subcontractor's claim violates or fails to meet the representations, warranties and certifications of the aforesaid certification regardless of whether the Contractor has also certified same in reliance on the Subcontractor's certification. If the Contractor is unable, in its sole discretion and in good faith, to certify the Subcontractor's dispute and claim and the Subcontractor is unable or unwilling to correct or modify the dispute and claim in a fashion that permits the Contractor to certify the Subcontractor's dispute

and claim, the Subcontractor waives its right to any additional compensation related to, in whole or in part, to the Subcontractor's dispute and claim and releases the Contractor and the Contractor's surety from any further responsibility or liability for same. The Subcontractor acknowledges and agrees that the Contractor and the Contractor's surety shall have no responsibility or liability to the Subcontractor in excess of any amounts actually received from the Owner or third party on behalf of the Subcontractor's claim and the Contractor and the Contractor's surety shall only be required to pay the Subcontractor if, and only if, the Owner, third party Subcontractor or third party pays the Contractor, which is an express condition precedent to the Contractor's payment to the Subcontractor, and the Subcontractor assumes the risk of the Owner's, third party Subcontractor's or other party's nonpayment. The Subcontractor agrees that the Contractor shall have the sole and exclusive authority to settle, prosecute or appeal the Subcontractor's dispute and claim and to adjust, on a *pro rata* basis, the Subcontractor's dispute and claim if it is resolved on a global basis with other claims and disputes or on an allocated basis in an amount that the Contractor, in its sole discretion, determines to be equitable after the Contractor's costs (including attorneys, consultant, expert and arbitration fees) and the Contractor's overhead and profit mark-ups are subtracted from the settlement amount, judgment or award. The Subcontractor and the Contractor agree to stay and toll Subcontractor's surety bond rights against the Contractor's surety (including Miller Act or other statutory rights) until the Contractor has fully resolved any claim pursuant to Section 30.4 with the Owner or third party.

- 30.6 The Contractor, at its sole option, may: (1) present to the Owner, third party subcontractor or other third party, court or arbitrator, in the Contractor's name, or (2) authorize the Subcontractor to present to the Owner, third party subcontractor or other third party, court or arbitrator, in the Contractor's name, some or all of the Subcontractor's disputes and claim(s) subject to the provisions of Section 30.4 and to answer the claims of the Owner, third party subcontractor or other third party which involve, in whole or in part, the Subcontractor or the Subcontractor's Work. If the Subcontractor's disputes and claim is presented, prosecuted or defended by the Contractor, the Subcontractor, at the Subcontractor's sole cost and expense, agrees to furnish all documents, statements, witnesses and all other information required by the Contractor and to pay and immediately reimburse the Contractor for all costs incurred by the Contractor related to the presentment, prosecution and defense of the Subcontractor's disputes and claim, including all attorneys, expert, consultant and arbitration fees. The Subcontractor acknowledges that it has assessed the potential impact on its ability to recover additional compensation in connection with the claims and disputes subject to the provisions of Section 30.4 and agrees that the foregoing limitations on recovery will apply regardless of the accuracy of the Subcontractor's assessment of the actual costs incurred.

ARTICLE 31 SUBCONTRACTOR DESIGN OBLIGATIONS

- 31.1 Should the Subcontractor's Work require the Subcontractor to perform either Design-Build or Design Assist services, the provisions of Article 31 shall apply to this Agreement. The Subcontractor shall, consistent with applicable state licensing laws applicable to design professionals, provide the architectural, engineering and other professional design services required to perform either the Design-Build or Design Assist work required by this Agreement ("Design Services"). The Subcontractor agrees to provide such Design Services through qualified, licensed design professional that are: (1) employed by the Subcontractor, or (2) from qualified design consultants. The Subcontractor shall be responsible for the Design Services performed by its employees or design consultants and shall coordinate the services of its design consultants in order to satisfy the Subcontractor's obligations under the Contract Documents.
- 31.2 The Subcontractor shall provide all Design Services in accordance with the standards set forth in the Contract Documents but in no event shall that standard be less than the skill and care ordinarily used by members of the design profession practicing under similar conditions at the same time and locality of the Project providing the same or similar Design Services.
- 31.3 The Subcontractor shall submit, in accordance with the times set forth in the Contract Documents and the Project Schedule, all interim Design Services submissions and revisions as required by the Contract Documents. Such design submissions shall be in the form and quantity called for in the Contract Documents and may include design criteria, drawings, diagram, and specifications which set forth the Project requirements. The design submissions shall show the relationships of the Design Services to the overall Project design. The Contractor and the Subcontractor agree that prior to the scheduled date for the design

submissions, the Subcontractor and its employees or design consultant will review, discuss and monitor the Design Services for consistency to the requirements of the Contract Documents, as well as, Compliance with the Project's budget and current cost estimates. The Subcontractor shall, at its own cost, revise such interim Design Services submissions to correct any errors, mistakes, omissions and those necessary to either permit incorporation into the Contract Documents or obtain necessary permits, approvals, and licenses. The Subcontractor shall timely perform such revisions in accordance with the Contract Documents and the Project Schedule.

- 31.4 The Contractor's review and approval of the Subcontractor's Design Services submissions shall not make the Contractor responsible or liable for the content, accuracy and quality of the Design Services submissions nor relieve the Subcontractor for the professional responsibility for same, including the suitability of the Design Services submittals for the use intended.
- 31.5 The Subcontractor shall cause all Design Services submissions performed and prepared pursuant to this Agreement to be prepared in accordance with all applicable Laws, including all health, sanitary, environmental and building codes, all applicable zoning regulations taking into consideration regional and local climate and other conditions.

ARTICLE 32 ENTIRE AGREEMENT

- 32.1 This Agreement, the Contract Documents, the Exhibits and Attachments hereto set forth all of the covenants, promises, provisions, agreements, conditions and understandings between the parties and represents the entire and integrated agreement of the parties and supersedes all prior negotiations, representations or agreements, whether written or oral, and there are no covenants, promises, agreements, conditions or understandings, either oral or written, between the parties other than set forth herein.

ARTICLE 33 RIGHTS AND REMEDIES

- 33.1 No consent or waiver, express or implied, by the Contractor of any breach or default by the Subcontractor in the performance of any obligation hereunder shall be deemed or construed to be consent or waiver to or any other breach or default or course of conduct or action by the Contractor hereunder. Except as expressly provided herein, the failure of the Contractor to complain of any act or failure to act by the Subcontractor or to declare the Subcontractor to be in default hereunder, irrespective of how long such failure to complain continues, shall not constitute a waiver of the Contractor's rights hereunder. Inspection, payment or tentative approval or acceptance by the Contractor or the failure of the Contractor to perform any inspection, test or review hereunder shall not constitute a final acceptance of the Subcontractor's Work or any part thereof and shall not release the Subcontractor of any of its obligations hereunder.
- 33.2 The captions used for the Articles in this Agreement are inserted only as a matter of convenience and are for reference only and do not define, limit or describe the scope of the intent of this Agreement or any Article or Section hereof.
- 33.3 In the event that any provision of this Agreement or the Contract Documents is declared or adjudged to be unenforceable, void as against public policy or unlawful by any governmental authority or court having jurisdiction, then such unenforceable, void or unlawful provision shall be excised therefrom and the remainder of the Agreement or the Contract Documents so affected, together with all rights and remedies granted thereby, shall continue and remain in full force and effect.
- 33.4 This Agreement may be executed in one or more counterparts, each of which shall be deemed an original and all of which, taken together, shall be construed as a single instrument.
- 33.5 The Plans, Specifications and other Contract Documents shall be construed as supplementing one another. Any of the Subcontractor's Work shown in the Specifications and not on the Plans or shown on the Plans and not in the Specifications shall be performed as part of this Agreement. Dimensions given on the Plans and the Specifications are only approximation and the Subcontractor shall take all necessary measures in

order to ensure the proper matching and fitting of the Subcontractor's Work with contiguous work. Any omissions, mis-descriptions, insufficient details in the Plans or Specifications related to the Subcontractor's Work, which are necessary for the Subcontractor to perform the totality of the Subcontractor's Work or that are customarily performed by the Subcontractor or those subcontractors who perform the same or similar work shall not relieve the Subcontractor for full responsibility to perform such omitted, mis-described or insufficient detailed Subcontractor's Work. The Subcontractor shall perform such details and work as if same was fully and completely described in the Plans and the Specifications.

- 33.6 The Subcontractor warrants and represents that it has received and reviewed, or had the opportunity to receive and review, all of the Contract Documents in advance of the execution of this Agreement. The Subcontractor acknowledges and agrees that any error, ambiguity, inconsistency or omission therein, of which the Subcontractor had, should have or could have knowledge of based upon a reasonable review prior to the execution of this Agreement shall be deemed a patent ambiguity for which the Subcontractor is obligated to notify the Contractor and the Owner and the Subcontractor agrees that such patent ambiguity shall not be the basis for an increase in the Subcontract Amount or time of performance or any other relief pursuant to the Contract Documents.
- 33.7 In the event of a conflict between or among this Agreement, any modification thereto, any Exhibits thereto, or the Contract Documents, the later in date shall prevail; in the event of a conflict between or among the provisions of this Agreement, the higher standard, shorter notice provision or greater requirement for the subcontractor shall prevail and in the event of a conflict between or among the terms of the Contract Documents, the higher standard, shorter notice provision or greater requirement for the Subcontractor shall prevail.
- 33.8 There are no third party beneficiaries to this Agreement.

ARTICLE 34 ADDITIONAL PROVISION

- 34.1 See list below for additional attachments to be included in this subcontract agreement:

Subcontract Header Custom Field 3

ARTICLE 35 SIGNATURES & ACCEPTANCE

The said parties, for themselves, their heirs, executors, administrators, successors, and assigns, do hereby agree to the full performance of all of the terms and provisions herein contained.

Company Name

Signature: _____

Print Name: _____

Title: _____

Date: _____

Vendor Name

Subcontractor

Signature: _____

Print Name: _____

Title: _____

Date: _____

Failure to return this signed Agreement within ten (10) days of receipt of same by the Subcontractor constitutes full acceptance of the price, terms and conditions stated herein and Contractor may rely upon said acceptance.

ARTICLE 36 SUB-TIER CONTRACTORS & SUPPLIERS

- 36.1 The Subcontractor shall submit a list of proposed sub-subcontractors and material suppliers (“Sub-tiers”) to the Contractor for review and approval, with execution of this Subcontract. Use template below and return to Company Name Project Manager.

SUB-TIER CONTRACTORS & SUPPLIER LIST:

Name: _____

Address: _____

Scope of Work: _____

Subcontract Value: \$ _____

Diversity Tracking: MBE | WBE | SBE | VBE (circle all that apply)

Name: _____

Address: _____

Scope of Work: _____

Subcontract Value: \$ _____

Diversity Tracking: MBE | WBE | SBE | VBE (circle all that apply)

Name: _____

Address: _____

Scope of Work: _____

Subcontract Value: \$ _____

Diversity Tracking: MBE | WBE | SBE | VBE (circle all that apply)

Name: _____

Address: _____

Scope of Work: _____

Subcontract Value: \$ _____

Diversity Tracking: MBE | WBE | SBE | VBE (circle all that apply)

SCHEDULE A – GENERAL CONDITIONS AND PROCEDURESProject Name: **Job Name**Job No.: **Job Number**

These General Conditions and Procedures are incorporated into and are part of the Agreement between the Subcontractor, and Company Name (the “Contractor”). The Subcontractor, by execution of the Agreement, acknowledges and agrees to the General Conditions and Procedures as set forth herein.

The General Conditions and Procedures are intended to assist the Subcontractor in fulfilling the administrative requirements of the Agreement and describe certain rules of conduct of all employees assigned to the Project Site. The General Conditions and Procedures are intended to be complimentary and consistent with the terms and conditions of the Agreement. Should a conflict exist, the term or condition which imposes the greater responsibility or obligation upon the Subcontractor shall supersede and take precedence over any other conflicting term or condition.

A. GENERAL

1. All lump sum, alternate and unit prices set forth in the Agreement shall be firm and fixed for the duration of the Project. All pricing includes all necessary labor, equipment, materials, plus costs for delivery, storage, installation, insurance, taxes, supervision, overhead, profit and all other direct and indirect costs as required of the Contract Documents.
2. The Subcontract Amount includes all required mobilizations and demobilizations to complete the Subcontractor’s Work including, but not limited to, those necessitated by any resequencing of the Subcontractor’s Work pursuant to Section 3.3 of the Agreement.
3. The Subcontractor shall insure that any and all of Subcontractor’s sub-tier contractors (“Sub-tiers”) are bound by the Contract Documents to the same extent as the Subcontractor and that the Contract Documents govern and control the Sub-tiers scope of work. The Subcontractor shall enforce these General Conditions and Procedures upon each of its Sub-tiers. The Contractor is not responsible for the management, supervision and/or coordination of the Subcontractor’s Sub-tiers. The Subcontractor acknowledges and agrees to immediately reimburse the Contractor for all cost and expense incurred by the Contractor should the Contractor provide management, supervision and coordination to the Subcontractor’s Sub-tiers.
4. The Subcontractor shall submit a list of the Subcontractor’s Sub-tiers to the Contractor per Article 36.1 and within (3) days from when the Subcontractor adds or replaces a Sub-tier. The Subcontractor agrees that the Contractor may withhold payment of some or all of Subcontractor’s pending Application(s) for Payment until such time as Subcontractor submits the initial or any revised Sub-tier listing.
5. The Subcontractor, prior to commencement of the Subcontractor’s Work, shall submit to the Contractor a listing, with supporting resumes, of the Subcontractor’s proposed project management and supervision staff for the Contractor’s approval. The Contractor shall have the absolute right, in its sole discretion, to reject any member of the Subcontractor’s proposed project management and supervision staff. The Subcontractor shall immediately propose an acceptable substitute staff member to the Contractor for the Contractor’s approval. This representative is required to have a mobile phone and this person must be able to be contacted 7 days per week, 24 hours per day. This supervisor must be acceptable to and approved by Company Name and shall not be changed without prior written approval by Company Name.
6. By submitting a proposal, this Subcontractor agrees that it has carefully examined all drawings, specifications, addenda and associated Bid Documents and the site, and that from its own investigation he has satisfied itself as to the nature and location of the work, the conditions and

difficulties under which it is to be performed, the general and local conditions, and all matters which may in any way affect the work or its performance, and that as a result of such examination and investigation it fully understands the intent and purpose of the documents and conditions of bidding. Claims for additional compensation or extension of time because of this Subcontractor's failure to follow the foregoing procedure and to familiarize itself with the Contract Documents and all conditions which might affect the work will not be allowed. In the event of an inconsistency, the provisions of this Agreement control over any proposal, document, or other attachment.

7. This contractor shall provide full time supervision for all work performed by this contractor as well as its subcontractors. Failure to maintain full time supervision may result in a backcharge to this contractor for supervision and coordination of work performed by Company Name. This supervisor shall remain consistent for the duration of the project and any changes shall be agreed upon by Company Name.
8. The Subcontractor shall be responsible for all items of labor, equipment, and materials for Subcontractor's Work, even if another subcontractor's work provides for components which are the same or similar to the Subcontractor's Work.
9. Any notes or direction contained in the Contract Documents which assign the responsibility to install or supply materials, that are within the Subcontractor's Work to another trade package or subcontract are null and void with no force or effect to this Agreement. The description of the Subcontractor's Work contained in this Agreement overrides or supersedes any inconsistent note or direction contained in the Contract Documents. If the installation or supply of a material, product, equipment or service is not specifically identified in the description of the Subcontractor's Work but is noted in the Contract Documents as being provided or installed by the Subcontractor or the Subcontractor's trade, it shall be provided or installed by the Subcontractor without adjustment to the Subcontract Amount.
10. The Subcontractor acknowledges that all demolition products on this Project, regardless of value, are the property of the Owner. The Subcontractor, the Subcontractor's agents, employees or Sub-tiers shall not remove demolition products from the Project Site, unless the removal of demolition products is identified as the Subcontractor's Work, without the express written consent of the Contractor and the Owner. If the Subcontractor or the Subcontractor's agents, employees or Sub-tiers remove demolition products without the express written consent of the Owner and the Contractor, the Subcontractor agrees to immediately reimburse the Owner for the replacement value of the demolition materials wrongfully removed from the Project Site as determined by the Owner.
11. The Owner has the right to take possession of or use any partially or completed portion of the Project and such possession or use shall not be deemed as acceptance, in whole or in part, of the Subcontractor's Work.
12. This contractor shall meet or exceed all MBE, FBE, VBE, and SBE diversity program requirements for work force participation and contract participation.
13. The Contractor could be signatory to CBA's with local unions; therefore, the Contractor requires, and the Subcontractor agrees that all of the Subcontractor's Work which falls within the jurisdiction of these unions shall be performed by these respective union workers. This Subcontractor shall reconcile jurisdictional conflicts associated with the performance of this contract work. This shall be accomplished without delay, damage, or cost to Owner and without recourse or charge to Company Name, the Architect or Owner. Any work item claimed as being jurisdictional by the Trades that you employ will be considered as part of your scope of work and within the cost of your bid.

B. PAYMENT PROVISIONS

1. The Subcontractor acknowledges and agrees that the Subcontractor is not entitled to payment for the performance of the Subcontractor's Work from the Contractor of any monies the Contractor has received from the Owner unless and until the Subcontractor has executed this Agreement and provided the Subcontractor has submitted satisfactory proof to the Contractor of the Subcontractor's compliance with the insurance, bonding and safety requirements of this Agreement. Notwithstanding the foregoing, should the Contractor elect to make payment to the Subcontractor prior to the execution of this Agreement, the Subcontractor agrees that the acceptance and use of said payment shall be conclusively deemed an acceptance by the Subcontractor of all terms and conditions of this Agreement and an express waiver of any defense, in law and equity, that the Subcontractor has not accepted each and every term and condition of this Agreement.
2. The Subcontractor's Schedule of Values shall incorporate separate line items for labor and material for each separate area or location of the Project as required by the Contractor. Pay applications / schedule of values (SOV's) must be broken down in sufficient labor and material detail for the Construction manager to easily and promptly review the schedule of values. The initial schedule of values shall be submitted to the Construction manager with 10 days of the notice of award.
3. The Subcontractor shall submit a draft copy of the Subcontractor's Application for Payment ("Pencil Copy") to the Contractor by the date set forth in this Agreement for the Contractor's review and approval. The Subcontractor's Application for Payment shall reasonably forecast the Subcontractor's Work through the end of the month reflected in the Application for Payment.
4. The Subcontractor's Submission of an untimely, incomplete, or inaccurate Schedule of Values will cause delays in the submission or the omission of same in the Contractor's current Application for Payment.
5. The Subcontractor agrees it shall account for each and every change order as a separate line item on the Schedule of Values, showing the allocation for labor, material and total cost for each change order. The Subcontractor agrees that it will not include change orders on the Schedule of Values until the Contractor and the Subcontractor have accepted and executed the Change Order and the Contractor has approved, in writing, the revised Schedule of Values. Each Application for Payment thereafter shall separately report the progress of each change order.
6. If permitted by the Contract Documents, the Subcontractor may include in its Application for Payment materials not yet installed in the Subcontractor's Work provided that these materials are suitable stored onsite, at the manufacturer's plant or at an approved third-party storage facility. Invoices for such materials must be submitted with each Subcontractor Application for Payment and the amount so requested shall not include the Subcontractor's mark-up for overhead and profit. All applicable certificates of insurance, bills of sale, pictures, flood letter, and UCC-1 Statements must be provided with the Application for Payment. Sufficient proof shall be submitted to establish that the materials stored are for subsequent incorporation into the Subcontractor's Work pursuant to this Agreement.
7. Each Application for Payment must be submitted with: (1) such supporting evidence as required by the Contractor to verify the amounts requested; (2) an original, executed Partial Lien Waiver in the form required by the Contractor; (3) an original, executed Sub-tier Partial Lien Waiver in the form required by the Contractor for all labor, services, material and equipment provided by Sub-tiers for the Subcontractor's Work; (4) all prequalification forms, insurance certificates or documents required by the Contract Documents or any documents required by any applicable OCIP or CCIP programs for the Project; and (5) any additional documentation required by the Contractor.
8. The Subcontractor warrants and guarantees that title to all of the Subcontractor's Work, materials and equipment covered in an Application for Payment, regardless if it is incorporated into the

Project, shall pass to the Owner upon receipt of payment free and clear of all liens, claims, security interests or encumbrances whatsoever.

9. The Subcontractor agrees to hold in trust all payments received from the Contractor for the benefit of all persons or entities who furnished the labor, equipment, material or false work to or on behalf of the Subcontractor in the performance of the Subcontractor's Work pursuant to this Agreement through the most current period applicable to the payments received from the Contractor before it is used by the Subcontractor for some other obligation or purpose. The Subcontractor agrees that the failure to make payment to a Sub-tier, supplier, vendor, or materialman in a timely manner for the Subcontractor's Work constitutes a material breach of this Agreement. Upon receipt of payment from the Contractor, the Subcontractor shall promptly pay its Sub-tiers, suppliers, vendors and materialmen all amounts due. Should the Contractor reasonably believe that the Subcontractor has not promptly paid its Sub-tiers, suppliers, vendors or materialmen who furnished labor, equipment, materials, falsework or other obligations for the Subcontractor's Work, the Contractor, in its sole discretion and with or without written notice may take any action, including without limitation, direct payment or joint checks, necessary to insure that payments due the Subcontractor are utilized to satisfy such obligations. Any such action by the Contractor shall be conclusively deemed and it hereby acknowledged by the Subcontractor as a payment to the Subcontractor pursuant to this Agreement. This is to include use of electronic pay application software, if required per project.

C. ESCALATION

1. The Subcontractor agrees that the Subcontract Amount includes all labor and material escalation cost for the duration of the Subcontractor's Work unless otherwise noted in this Agreement.
2. The Subcontractor has assessed the potential impact of commodity price fluctuations, tariffs and/or taxes on the cost of materials and equipment required for the Subcontractor's Work and has reflected this assessment in the Subcontract Amount. The Subcontractor acknowledges and agrees that it shall have no claim pursuant to this Agreement for an increase in the base Subcontract Amount based, in whole or in part, upon any commodity price fluctuations, tariffs and/or taxes which are imposed throughout the duration of the Subcontractor's Work.

D. EXTRA WORK

1. Only the Contractor's Project Manager and Project Superintendent have the authority to represent the Contractor's interests on the Project Site. The Contractor's Project Superintendent is only authorized to verify any work performed by the Subcontractor and the Contractor's Project Manager, or higher, is the only individual that has the authority to modify this Agreement and, if applicable, the Subcontract Amount.
2. The value of the Subcontractor's Work to be changed, added, or omitted shall be determined by lump sum or unit prices, if any, stipulated in this Agreement for such work. If no such prices have been stipulated, such value shall be determined by whichever of the following methods or combination thereof that the Contractor may select:
 - a. By adding or deducting a lump sum amount as may be agreed upon by the Contractor and the Subcontractor.
 - b. By adding:
 - i. The actual net cost to the Subcontractor or to its Sub-tiers for labor in accordance with established rates, benefits, taxes and insurance applicable thereto;
 - ii. The actual cost to Subcontractor or to its Sub-tiers for materials and equipment and such other costs as supported by receipts and invoices as may be approved by the Contractor. The cost of equipment shall be based on the lesser of either

Contractor approved equipment rental guides or the actual cost as established by the Subcontractor in its Subcontract proposal to the Contractor;

- iii. The applicable mark-up for overhead and profit is as permitted by the Contract Documents or this Agreement, whichever is lower, but in no event shall it exceed fifteen percent (15%) for the Subcontractor performing the work. Total accumulative overhead and profit for this Subcontractor and its Sub-Tier Subcontractors shall not exceed twenty percent (20%).
3. The following costs are to be included in the Subcontractor's mark-up for overhead and profit:
- a. The Subcontractor's on-site foreman's time during normal working hours of the Subcontractor's or its Sub-tiers during the duration of the Subcontractor's Work;
 - b. Delivery trucks and corresponding driver's and personnel time;
 - c. The Subcontractor's work trucks, vans and vehicle time;
 - d. The Subcontractor's office personnel, including Superintendent and Project Manager;
 - e. The Subcontractor's small tools, Personal Protective Equipment, and consumables.
4. All time and material ticket extra work is subject to the following:
- a. The Subcontractor is not authorized to commence time and material ticket extra work until the Subcontractor has submitted a cost estimate of the potential additional cost for the extra work and the Contractor has approved same;
 - b. The Subcontractor has received a written approval to proceed; and
 - c. The Subcontractor acknowledges and agrees that it shall have no right to an adjustment in the Subcontract Amount if it proceeds with extra work in the absence of a written approval to proceed.
5. The value of all time and material ticket extra work can only be established through the use and verification of the Contractor's ticket form. The Contractor's Project Management Staff are the only individuals authorized to verify the Subcontractor's time and material ticket forms. All labor, equipment and material supplied by the Subcontractor on unverified time and material tickets are not compensable, are deemed to be ineligible costs and shall not be utilized by the Subcontractor as evidence to support an adjustment to the Subcontract Amount. All time and material tickets must be verified by the Contractor's Project Superintendent on a daily basis. All time and material tickets which are not verified on a daily basis shall be conclusively deemed to be unverified. Any extra work tickets must include verification of time worked, number of employees, itemized equipment, and materials purchased. Pricing for all T&M work must be submitted within 1 week of when the work was performed. Failure to get tickets signed and submitted as stated may result in rejection of all costs.
6. All Change order requests must include itemized unit breakdowns for all labor and materials. Supporting documentation including material invoices, equipment rental agreements, and wage rate breakdowns, must accompany all COR's. All wage rates must comply with Current negotiated union rates or agreed upon unit prices as a part of the contract documents.
7. Change Order Requests which have not been approved and have a corresponding formal change order issued by the Company Name. cannot be included in monthly pay applications.

8. All pricing by the Subcontractor for the effect on the Subcontractor's Work reflected in Proposals, ASI's, Bulletins, RFP's or other requests shall be submitted to the Contractor within five (5) working days from issuance or sooner if identified on the request. The Subcontractor acknowledges and agrees that if Subcontractor's pricing for the request is not submitted to the Contractor within the aforesaid five (5) working days, the Contractor may treat and so inform the Owner that there is no cost and/or time impact to the Subcontractor's Work created by the request and any subsequent claim by the Subcontractor asserting a cost and/or time impact caused by the request is waived and the Contractor released from all liability or responsibility for same.

E. DAILY REPORTS

1. The Subcontractor shall submit to the Contractor, on a daily basis, a copy of the Subcontractor's Daily Log Report. The Daily Log Report shall include the following: daily manpower counts by trade and classification, tasks accomplished, equipment on site and annotations of anticipated work, requirements, conflicts, and site conditions which have or will impact the Subcontractor's Work. The Subcontractor acknowledges and agrees that the Subcontractor's Daily Log Reports do not satisfy the notice provisions of this Agreement and shall not be used in any dispute proceeding as evidence of same. The Contractor shall be entitled to delay or defer the processing of the Subcontractor's Application for Payment until such time as the Subcontractor submits the Subcontractor's Daily Log Report on a timely basis.

F. PERMITS AND TESTING

1. The Subcontractor shall be responsible for securing all permits and licenses necessary to perform the Subcontractor's Work. If multiple permits are required from multiple jurisdictions which have authority over the Project Site, the Subcontractor shall obtain all permits from all jurisdiction with authority over the Project Site and the Subcontractor's Work. Copies of all permits to be sent to Company Name for project records.
2. In addition to other requirements enumerated in the Contract Documents, this Subcontractor shall be responsible for adhering to all local governing authorities associated with registration, bonds, fees, licenses, inspections, etc. The Contractor shall secure the general building permit. The Subcontractors shall secure permits for their work as applicable.
3. Subcontractors shall perform their work in compliance with all existing, codes, laws, and ordinances, governmental, OSHA and EPA regulations.
4. The Subcontractor shall be responsible to coordinate, and schedule all required inspections and secure approval of the Subcontractor's Work in a timely fashion that causes no delay or disruption to the Project Schedule or Subcontractor's Work.
5. The Subcontractor shall cooperate with all testing personnel and laboratories engaged by either the Owner or the Contractor. When testing or inspection is required by the Contract Documents, the Subcontractor shall: (i) assist the Contractor in scheduling the testing and inspection; (ii) insure that the Subcontractor's Work has sufficiently progressed to permit the testing and inspection; and (iii) provide the required access for the testing and inspection.
6. The Subcontractor shall be responsible for and reimburse the Owner and the Contractor for all retesting costs incurred that is caused, in whole or in part, by incomplete or deficient Subcontractor's Work. The Subcontractor shall also be responsible for any premium off-hours' inspection costs.
7. All testing and inspections are to be scheduled sufficiently in advance so that the Owner, the Contractor, and their representatives can attend. All testing and inspection dates must be coordinated through the Contractor.

G. COORDINATION

1. The Subcontractor shall coordinate the Subcontractor's Work with all other subcontractors and trades. All coordination by the Subcontractor with all other subcontractors and trades shall be through the Contractor, unless otherwise directed. If directed by the Contractor, the Subcontractor shall copy the Contractor on all written and confirm all verbal communications between the Subcontractor and all other subcontractors and trades.
2. The Subcontractor's Project Manager and On-Site Foreman shall attend the following Project meetings:
 - i. Kick-Off Meetings;
 - ii. Pre-Installation & Safety Meetings;
 - iii. Scheduling / Pull-Plan Meetings prior to the Commencement of a major work phase;
 - iv. Weekly Coordination and Progress Meetings – at least 4 weeks prior to commencement of the Subcontractor's Work;
 - v. Daily Foreman Meetings – (On-site Foreman required) at least 5 days prior to the commencement of the Subcontractor's Work.

The Subcontractor shall be held responsible for knowledge of the content of all progress meetings regardless of the Subcontractor's attendance. Minutes, at the Contractor's option, may be prepared and issued to the Subcontractor. Any exception by the Subcontractor to the contents of meeting minutes must be submitted to the Contractor not later than two (2) calendar days from the date of distribution, or in the absence of a timely exception, the meeting minutes will be deemed accurate and complete.

A contractor representative shall be present who is able to make decisions about manpower and cost. Failure to attend any of these meetings will result in a \$100 fine per occurrence.

3. The Subcontractor shall insure the attendance at Project Meetings of its material suppliers and manufacturers as required by the Contract Documents or required by the Contractor.
4. Prior to the start of work, certificates of insurance and Worker's Compensation shall be furnished to Company Name.
5. Project Information (RFI's, Bulletins, ASI's, submittals, and Proposals) will be distributed electronically. The Subcontractor shall insure that all required information is distributed to its field staff in a timely manner and responded to without delay to the Project Schedule. All Construction Drawings, including all revisions, will be uploaded to Bluebeam, PlanGrid, or another similar software depending on the project requirements. Each subcontractor will be required to access the drawings electronically for viewing and downloading from the app or any web browser. Each foreman on the project shall be in possession of, and know how to use, an iPad or equivalent smart tablet which has internet connectivity from a cellular network independent of Wi-Fi sources due to the remote nature of many jobsites. Buying a subscription, for enhanced mobile app usage, will be at the contractor's discretion. To gain access to the project the account holder's email must be provided to Company Name.
6. If the exact location of an item to be installed by the Subcontractor is not indicated by dimensions on the Plans or noted in the Specifications, the Owner reserves the right to determine the location in the field prior to rough-in. If the exact dimensions of a product to be supplied by the Subcontractor is not shown on the Plans or noted in the Specifications, the Owner reserves the right to determine

the dimensions prior to order placement or fabrication. Any such dimensional location or selections shall not be a basis for an adjustment in the Subcontract Amount.

7. The Subcontractor shall install systems, materials, and equipment in conformance to all approved submittals and coordination drawings. The Subcontractor shall install Subcontractor's Work to conform to the arrangements noted on the Contract Documents, approved submittals, and coordination drawings. The Subcontractor shall be responsible to confirm Drawings used for Construction include the most current revisions and bulletins. The Contractor is not responsible for the accuracy of Project Documents, drawings, or electronic files.

H. EMPLOYEE CONDUCT

1. The Contractor reserves the right to bar any employee of the Subcontractor, the Subcontractor's Sub-tiers or vendors that acts in any way to inhibit the safe and timely progress of the construction activities at the Project Site or elsewhere or is under the influence, uses or brings alcohol or drugs on the Project Site before, during or after working hours.
2. The Subcontractor shall not bring visitors to the Project Site without the express written consent of the Contractor.
3. Any Subcontractor employee or employees of the Subcontractor's Sub-tiers or vendors that does not use proper washroom facilities will be removed from the Project Site and the Subcontractor shall be responsible to repair or clean up any resulting damage.

I. SAFETY

1. The Subcontractor shall comply with the Contractor's Project Safety Plan. The Contractor requires adherence to all safety requirements set forth in the Contractor's Project Safety Plan that are above and beyond OSHA requirements, including but not limited to:
 - a. Scaffolding – Fall protection required at or above 6'.
 - b. Steel Erection – Fall protection required at or above 6'. Only self-retracting lanyards authorized for PFAS when in lifts or when anchor point is not overhead. Self-retracting Leading Edge (LE) lanyards required any time workers are walking beams or any other scenario where any lanyard may come into contact with a sharp edge and Double LE retractables if there may be a break in anchor point continuity.
 - c. The Subcontractor shall submit and gain approval of the Company Name excavation permit from the Contractor's Project Superintendent for all excavations required for the Subcontractor's Work. The Subcontractor shall determine the location of underground utilities by utilization of a public or private 811 utility location service prior to beginning excavations and must determine the exact location and depth of the underground utility.
 - d. All excavations that come within 36" of an underground utility shall have hydro vacuuming potholing to exactly identify the location of the underground utility prior to proceeding with powered equipment or machinery.
 - e. Scissor & Boom Lift – Body harness with self-retracting lanyard required while elevated at or above 6'.
 - f. Safety Monitor – No use of safety monitor permitted without specific approval from the Contractor.
 - g. Controlled Decking/Access Zone – No use of controlled decking/access zone without specific approval from the Contractor.

- h. No 6' shock absorbing lanyard shall be used at any elevation below 18-1/2 feet and never in any lift. Only self-retracting lanyards are permitted on all Company Name projects and when the possibility to come into contact with a metal or concrete edge, a leading edge (LE) certified retractable shall be utilized.
 - i. No rope-grabs shall be utilized in any capacity where the worker may be able to reach the leading edge of any exposed side or edge 6' or above from the next working level.
 - j. Any use of Personal Fall Arrest System (PFAS) shall include dual suspension trauma straps for each body harness.
 - k. Any use of PFAS shall also require the subcontractor to generate a rescue plan to promptly rescue any fallen worker.
 - l. The Onsite Safety Coordinate must have an OSHA 30 card that was issued no more than 5 years ago, or an approved 8-hour refresher card (to the OSHA 30) nor more than 3 years old, and a First Aid/CPR certification no more than 2 years old.
2. Each subcontractor is required to use the HammerTech safety software to submit all Safety Plans, JHA's, and SDS's 15 days prior to starting work, and have each item approved prior to their start date. The contractor is also responsible to have each of the following tasks completed within the HammerTech program: Safety Orientation, Weekly Toolbox Trainings, Weekly Huddles, Incident Reporting, and all Safety Issues will be resolved within the program. These items will be discussed in the welcome email that the contractors will receive. Each foreman on the project shall be in possession of, and know how to use, an iPad or equivalent smart tablet which has internet connectivity from a cellular network independent of Wi-Fi sources due to the remote nature of many jobsites.
 3. The subcontractor shall submit weekly safety inspection results, conduct and document daily inspections of all powered equipment, occupied trenches, and scaffolding, provide Company Name all Safety Data Sheets (SDSs), acknowledge the safety violation policy, generate daily huddle meeting minutes and meet all other requirements of the project safety plan. The Subcontractor shall hold weekly Tool-Box safety trainings with the Subcontractor's field employees, the Subcontractor's Sub-tier field employees and vendor field employees. All employees who disregard safety practices will be removed from the Project Site.
 4. A Safety Management Plan (AKA as a 3SP) template is included in the Project Safety Plan (Section 1.5) to assist subcontractors in completing their safety plan. For any subcontractor who has not previously obtained approval on a safety plan, meet with a member of the Company Name safety team prior to attempting to generate this document.
 5. All subcontractor employees are required to complete the Company Name safety orientation prior to going to work the first day on the project site.
 - a. Each worker must bring with them to the safety orientation a photo ID and a current (within the past year) 11 panel drug card equal to or more stringent than the substance abuse panel and thresholds listed in The Project Safety Plan.
 - b. For projects which have implemented HammerTech, this orientation and uploading of photo ID and proof of current drug testing must be accomplished prior to the worker arriving onto the project site.
 6. All workers on Company Name projects sites must remain current within the past year on all substance abuse tests.

- a. Post incident substance abuse test to the Project Safety Plan standards shall occur immediately but no later than the end of the workday should any injury require off-site medical attention, or an incident occur as defined in the Project Safety Plan. The Subcontractor shall immediately report all injuries, incidents and near misses upon occurrence and submit an Incident Report within twenty-four (24) hours of the occurrence.
 - b. For any subcontractor whose employees do not carry a drug card (out of town companies), this subcontractor shall coordinate with the Company Name safety team the process by which the subcontractor will demonstrate that all employees are, and shall remain, current throughout the term of the contract and their test meets equal or greater than Project Safety Plan Appendix A 11 panel standards.
- 7. Demolition - Contractor shall pay strict attention to 1926.850(a), which requires an "engineering survey" to be completed prior to starting demolition. When the Company Name Project Manager so invokes this requirement, at the expense of the subcontractor; a state-licensed third party Professional Engineer shall conduct and prepare specific documentation that records the Engineering Survey results. The Engineering Survey Report shall be signed and dated by the person conducting the survey. All projects with structural demo where an incidental collapse may cause injury or property damage, a sequenced demolition plan shall be generated by a PE and this plan shall be provided to the contractor which details the order in which structural members are demolished.
- 8. Crystalline Silica standards
 - a. Subcontractor shall complete the Exposure Control Plan and include a plan covering their silica dust generating tasks in the safety management plan. A template is found at: plan.silica-safe.org NOTE: The OSHA regulation requires a significant amount of air sampling data. Plan for some expense for air sampling, respiratory physical evaluations, and outfitting employees with respirators for any silica generating tasks.
 - b. Subcontractors who may potentially generate crystalline silica dust, or have workers exposed to the hazard also must generate this exposure control plan for their specific scope of work. This plan shall be incorporated into each subcontractor's safety management plan.
 - c. Subcontractors must regularly update this exposure control plan so that it accurately reflects the jobsite silica hazards and effectively addresses all mitigation efforts.
- 9. Proper personal protective equipment (PPE) shall be provided by the Subcontractor to all employees and worn at all times including PMs and management personnel.
 - a. All Subcontractors shall be required to outfit and sustain their employees with a helmet that has an ANSI Type 2 or EN 12492 front/side/rear impact rating.
 - i. All employees shall maintain the four point chinstrap secured at all times unless in an approved break area while on break.
 - ii. If the Subcontractor's employee does not arrive at the jobsite with a new style helmet, one may be provided to them at a cost equal to AMHigley's cost. The cost of any supplied helmet and visor shall be deducted from the next subcontractor's payment.
 - iii. Zenith X Air with integrated visor is AMHigley's strongly recommended helmet, however this is not a requirement.
 - b. Summary of all required PPE:

- i. ANSI Type II or EN 12492 tested Helmet with four point chinstrap
 - ii. Z-87.1 safety eyewear either as an integrated visor to the helmet, rated safety glasses or rated prescription safety glasses with side shields
 - iii. High Visibility Safety Vest (Class I) while outdoors
 - iv. Cut Level 4 (this is a minimum, more if task or hazard requires) hand protection gloves
 - v. Full face shields for all tasks that generate flying particles in addition to safety rated eyewear
 - vi. Shirts with sleeves (no cut-offs or tank tops), heavy denim or equivalent trousers, and appropriately protective footwear
 - vii. Employer shall comply with OSHA 1926.28(a) whereas the employer is responsible for requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions or where this part indicates the need for using such equipment to reduce the hazards to the employees
10. All Subcontractor tools shall meet OSHA and NEC specifications and requirements. All Subcontractor electrical tools and equipment shall conform to 110-120 volt circuits and be ground-fault protected.
11. The Subcontractor shall not remove any safety apparatus, handrail, perimeter cabling system, devices or equipment without submission to the Contractor of a written OSHA compliant, interim work plan, and notification and discussion at the preceding Weekly Coordination and Progress Meeting. The OSHA compliant interim work plan shall include all required and necessary provisions to maintain a safe work environment for all field personnel at the Project Site. The Subcontractor shall be responsible to securely replace all original safety apparatuses to their proper locations prior to vacating the affected work area.
12. The Subcontractor shall constantly and continuously monitor every aspect of its performance and practices to ensure that the Subcontractor is in strict compliance with its Site Specific Safety Program and all OSHA requirements. The Subcontractor shall conduct a documented weekly safety inspection of the Project Site and submit an inspection report to the Contractor. The Subcontractor shall conduct a documented daily inspection of all powered equipment, occupied trenches and scaffolding and submit an inspection report to the Contractor. This Agreement includes the supply of all required safety devices to protect the Subcontractor's Work. The Subcontractor shall develop, submit and install an OSHA compliant lockout/tagout program during testing, commissioning and as otherwise required.
13. The Subcontractor shall provide 100% impalement protection for the Subcontractor's Work, including any plastic or metal conduit, mechanical pipe, plumbing pipe, uni-sheet, rod, form pins, threaded rod, rebar that is 3 inches in diameter or less which is stubbed in height less than 4 feet above work surfaces or whenever field personnel are working above these installations and is exposed to same or is attached to or hanging down from ceilings and elevated surfaces. All fence posts for temporary fencing 4 feet in height or less shall have impalement protection regardless of diameter. All form ties that are located less than 7 feet from the work surface or extend more than 2 inches from the foam system shall have impalement protection.

J. SITE UTILIZATION

1. The normal work hours at the Project Site are as listed in the Schedule B, (exclusive of holidays). All requests for premium time performance of the Subcontractor's Work, outside of normal work hours, shall be preapproved by the Contractor. The Contractor may, at the Contractor's sole election, require the Subcontractor to reimburse the Contractor for the additional cost of utilities and supervision required during the Subcontractor's premium time performance.
2. The Subcontractor acknowledges that there may be limited space at the Project Site for the Subcontractor's field office or storage space and prior to occupancy of such space, the Subcontractor must receive the approval of the location assignment from the Contractor. If granted by the Contractor, the field office and/or storage space shall be kept clean, neat, and presentable by the Subcontractor. Any Subcontractor field office and/or storage space or materials stored at the Project Site must be removed and relocated when requested by the Contractor. The protection and security of the Subcontractor's material, tools, and equipment stored at the Project Site shall be the sole responsibility of the Subcontractor. Company Name and the Owner is not responsible for theft.
3. No deliveries will be accepted at the Project Site outside of normal working hours without the prior approval of the Contractor. All Subcontractor's deliveries shall be scheduled with the Contractor at least seventy-two (72) hours in advance. All Subcontractor deliveries shall be made to the designated Project Site delivery entrance or staging areas. The Subcontractor shall be responsible for all hoisting, flagman, and traffic control required for access and delivery of the Subcontractor's material and equipment.
4. The Subcontractor shall, at its sole cost and expense, keep the Project Site free at all items from all waste, packaging materials, rubbish, dirt and debris and waste and debris from Subcontractor's employees generated in connection with the Subcontractor's Work and shall remove same on a daily basis as required by the Contract Documents and the Contractor. The Subcontractor shall keep passageways, stairs and general walkways free of materials, debris and trip hazards and shall remove all unused materials from the Subcontractor's work areas on a daily basis unless required to immediately complete incomplete activities but said materials shall be stored without blocking general walkways. At the completion of the Subcontractor's Work in an area, the Subcontractor shall remove all of its tools, equipment, scaffolds and surplus materials and broom clean the area.
5. The Subcontractor shall supply, at its sole cost, the following for its use in performing the Subcontractor's Work, unless otherwise provided in this Agreement: (a) field office, storage, change and tool trailers and associated utility service; (b) drinking water and ice; (c) hoisting and movement equipment for materials and labor; (d) safety apparatus and barriers; (e) construction task lighting; (f) weather protection; (g) pumping and dewatering equipment; (h) scaffolding; and (i) telephone and internet service.
6. The Subcontractor shall notify the Contractor of all storage requirements for the Subcontractor's Work before mobilization to the Project Site. The Contractor shall coordinate the material storage areas and all material deliveries to the Project Site giving priority to scheduled just-in-time deliveries most critical to the Project Schedule.
7. The Subcontractor shall be responsible for any shipping, receiving, and unloading of materials and equipment to and from storage areas. The Subcontractor shall be responsible for all storage requirements for Subcontractor's material and equipment prior to delivery to the Project Site and the Subcontractor acknowledges that the Subcontractor Amount includes all storage requirements (both on and off the Project Site) necessary for the Subcontractor's Work.
8. The storage of materials and equipment at the site shall be permitted only to the extent approved in advance by Company Name Superintendent. No overstocking of materials shall be permitted. If materials and equipment so stored obstruct the progress of anyone's work on this project, they shall

be removed or relocated by this Subcontractor as may be directed by Company Name without reimbursement of cost.

9. The Subcontractor shall ensure that dust, mud, and other debris generated by the Subcontractor's Work do not interfere with or damage traffic operations, adjacent property or otherwise interfere with other work at the Project Site. The Subcontractor shall comply with the Site Erosion Control Plan and ensure that no dirt, mud, or other debris is tracked off the Project Site on to adjacent roadways. The Subcontractor shall clean all of the Subcontractor's vehicle tires before leaving the Project Site and shall clean all mud and debris from all adjacent roadways. The Subcontractor shall comply with all dirt and dust control plans. All trucks for the Subcontractor's Work which transports earth materials or loose materials to or from the Project Site shall be covered with a suitable covering fastened over the load.
10. The Subcontractor shall be responsible to repair or replace any damage to any erosion control device caused, in the Contractor's sole determination, by the Subcontractor's work.
11. The Subcontractor shall remove all snow or precipitation as required to perform the Subcontractor's Work. The Subcontractor is responsible for dewatering all work areas due to snow or precipitation required for the continued performance of the Subcontractor's Work in accordance with the Project Schedule. The Subcontractor's dewatering efforts must be sufficient to maintain the progress of the Subcontractor's Work in accordance with the Project Schedule and if insufficient, the Contractor may elect to perform the required dewatering and charge all cost incurred thereby to the Subcontractor.
12. The Subcontractor shall properly store material on floors in a fashion that will not impair the structural integrity of the building structure or otherwise crack concrete surfaces. The Subcontractor shall not move or store the Subcontractor's materials throughout all work areas to insure no structural impairment or concrete floor cracking occurs. The Subcontractor shall provide, at its sole cost, all required bracing to facilitate the storage or movement of the Subcontractor's materials and equipment throughout the Project Site to fulfill the Subcontractor's obligations herein.

K. PHOTOGRAPHY & PUBLICATIONS

1. The Subcontractor and its employees shall not be permitted to use any photography, images, video, or data from the Project Site without the prior written approval from Company Name, the Project Owner, and Architect. This includes any posting of photography, images, video, Project Documents, or data to any Company Website or Social Media account for any reason.
2. The Subcontractor shall not, without the prior written approval from Company Name, advertise, publish, issue a press release, or otherwise make known its affiliation with the Project, Owner, and/or any aspect of the Project, including, but not limited to, photography, advertising, publicity, or promotional materials. Subcontractor materials shall not include any project confidential or proprietary information of Company Name, Project Owner, Architect, or their respective affiliates.
3. The Subcontractor shall not be permitted to use a drone or unmanned aerial system ("UAS") on or around the Project Site without written approval from Company Name. If use of a drone has been approved, the Subcontractor agrees to share with Company Name the following: All edited and raw video or photography, flight logs, raw data, point clouds, and digital surface/terrain models. The Subcontractor shall be responsible for any required Permits and/or Licenses and shall follow all FAA and other local/state requirements.

L. UTILITIES

1. The Subcontractor agrees to assume sole responsibility to ensure that all existing utilities are not damaged by the Subcontractor's excavation, trenching, auguring, drilling, hoisting, or otherwise associated with the Subcontractor's Work. The Subcontractor shall contact the appropriate utility

or utility locator service to inspect the Subcontractor's work area and locate existing underground utilities sufficiently in advance of the commencement of the Subcontractor's Work. The Subcontractor shall preserve or re-establish the utility markings should they be disturbed or removed. All underground utilities shall be exposed by hand before commencing mechanical excavation. The Subcontractor accepts sole responsibility for all costs to repair or replace underground utilities, whether located or not, that are damaged by the Subcontractor's Work.

2. The Subcontractor shall determine the exact and final location and extent of any existing or proposed utilities at or adjacent to the Project Site. The Subcontractor's work which is adjacent or near to any utility shall not be commenced until all necessary arrangements to protect these utilities have been performed. All Subcontractor's Work that requires the disruption of utility services shall be scheduled to eliminate or minimize the impact on the Owner's and the Contractor's operations, including all third-party subcontractors. The Subcontractor shall provide the Contractor with at least seventy-two (72) hour notice prior to the Subcontractor's disruption of any utility service. Any required utility cutovers or interruptions needed to perform the Subcontractor's Work shall be performed after normal working hours or on weekends in accordance with the Contract Documents, regulations, and utility provider requirements. Under no circumstances shall any Subcontractors temporarily disconnect service without prior approval.
3. The Subcontractor agrees to be responsible for the cost to repair or replace all underground utilities at or adjacent to the Project Site that is damaged by the Subcontractor's equipment loading. The Subcontractor, upon the Contractor's request, shall transmit all equipment loading information for Subcontractor's equipment. The Subcontract Amount includes all temporary loading support required to ensure safety of all underground utilities at or adjacent to the Project Site from damage caused by the Subcontractor's equipment loading.
4. The Subcontractors are responsible for all necessary utilities required to perform their work, until temporary utility usage can be provided.
5. Power Other Than 120V: If Subcontractors requires power other than 120V for their work, that Subcontractor is responsible to provide that power.

M. HOISTING

1. Unless otherwise provided in this Agreement, the Subcontractor shall provide for the loading, unloading, rigging, hoisting and placement of all materials and equipment required for the Subcontractor's Work.
2. The Subcontractor shall identify and coordinate with the Contractor all necessary leave-outs of walls, windows, doors, fences, and other components for access of all materials and equipment required for the Subcontractor's Work sufficiently in advance for the Contractor's approval. The Subcontractor shall be responsible for all costs incurred to remove and replace all walls, windows, doors, fences, and other components which have been installed to provide the Subcontractor with access for all Subcontractor's materials and equipment.

N. SUBCONTRACTOR'S SCHEDULES

1. The Subcontractor shall include in the Subcontract Amount any out-of-sequence Subcontractor's Work required to meet the Project Schedule. All out-of-sequence work caused by temporary facilities, construction plant removal, trash or hoist installation or removal, material delivery openings or material staging shall be included. Subcontractor Work interruptions necessitated by special construction phasing, Owner operations, Owner material deliveries and installation shall be anticipated in the Subcontract Amount. The Subcontractor shall also include in the Subcontract Amount a reasonable amount of come-back operations to complete work in each work area.

2. The Subcontractor shall, on a weekly basis, submit a four (4) week look ahead schedule of the Subcontractor's activities, durations, manpower and equipment to the Contractor at the Weekly Coordination and Progress Meetings. The submission of the Subcontractor's weekly, four (4) week look-ahead schedules is a material requirement of this Agreement.
3. The Subcontractor shall include in the Subcontract Amount, the cost to perform reasonable premium time and out-of-sequence Subcontractor's Work due to trade coordination, temporary omissions, final tie-ins, commissioning, system adjustments, and/or the non-performance by the Subcontractor.
4. The Subcontractor shall furnish, within two (2) weeks from notice of award, a detailed procurement and work activity schedule. The Subcontractor's schedule submission shall be in critical path format that discloses all calendars, float, logic, sequences and activities, including, but not limited to the following: (i) a comprehensive listing of all material and equipment submittal packages including submittal dates and lead times required for approval, fabrication, manufacture and delivery; (ii) a comprehensive listing of each and every Subcontractor's Work activity broken to show maximum durations of no more than two (2) weeks which identifies the work days, labor, equipment and crew requirements to perform that activity; (iii) the scheduled monthly manpower and anticipated monthly billings; and (iv) any other information required by the Contract Documents or the Contractor. The items in this schedule must coincide with the overall master project schedule. Should the contractor fail to maintain the schedule all costs associated with the delay will be the responsibility of the contributing contractor. Should you fail to submit a schedule, it will be assumed that this contractor will conform to the logic and durations noted in the master schedule set out in Schedule D which is updated periodically. It is understood that multiple mobilizations may be required to complete the contract work, and additional compensation shall not be provided. Contractors are expected to review the schedule updates as sent out with meeting minutes. If contractors do not reply to schedule updates with any issues within 5 business days, it is assumed that no issues are present, and the schedule shall constitute the new contract schedule.

O. SUBMITTALS

1. The Subcontractor shall provide, within two (2) weeks of the notice of award, a submittal log which identifies all required submittals that are required to perform the Subcontractor's Work in accordance with the Contract Documents. The submittal log shall identify the material or equipment, the Contract Document reference and the necessary lead time in accordance with the Subcontractor's Schedule and a reasonable review time (no less than twenty (20) days) by the Contractor and the Architect. Failure to submit within in a timely manner to work within the project schedule will result in the contractor being responsible for all costs to recover the lost time as well as any other impacts to other contractors.
2. The Subcontractor shall submit, in electronic and/or written form as determined by the Contractor, each required submittal as a complete package of required information as identified in the applicable Contract Documents. All incomplete submittals may be returned with no review and if so the Subcontractor shall be solely responsible for any delay in the Project Schedule caused by the resubmission of a complete submittal.
3. The Subcontractor shall submit all submittal packages in accordance with the submittal forms as required by the Contractor. All submittals that are submitted without the required submittal forms may be returned to the Subcontractor without review and the Subcontractor shall be solely responsible for any delay in the Project Schedule caused thereby.
4. The Subcontractor shall list all deviations or modifications from the applicable Contract Documents on all submittals for products or systems that differ from the identified, acceptable suppliers or manufacturers or constitute a substitution request. The Subcontractor's submittal shall clearly identify all deviations or modifications from the applicable Contract Document requirements. The Subcontractor's failure to clearly identify the deviation or modification may result in the return of the submittal without review. The Subcontractor agrees that all submittals which do not clearly

identify the requested deviation or modification from the applicable Contract Document shall be conclusively deemed to be unapproved and constitute defective Subcontractor's Work even if the submittal was reviewed and approved by the Contractor and/or the Architect.

5. The Subcontractor shall re-submit, within ten (10) days, all submittals that have been returned or rejected in whole or in part. The Subcontractor shall be responsible for all review costs of the Contractor and/or the Architect attributable to the third or greater resubmissions of a Submittal package.
6. Should the Subcontractor encounter latent conflicts or issues in the Contract Documents that require additional information and/or clarification to permit performance of the Subcontractor's Work, the Subcontractor shall immediately submit a Request for Information (RFI) to the Contractor. The Contractor shall not prepare or generate an RFI on the Subcontractor's behalf. Verbal notifications of conflicts or issues in the Contract Document by the Subcontractor to the Contractor shall not be deemed compliance with the Subcontractor's obligation to submit an RFI. Each RFI shall be limited to a single conflict or issue and be written in a clear or concise manner. The Subcontractor shall, in each RFI, provide references to all applicable Plans and Specification sections to expedite the review of the RFI. As applicable, the Subcontractor shall provide suggested solutions and anticipated schedule and cost impacts for each RFI. The Subcontractor shall identify the required response date, no sooner than five (5) days from submission if expedited review is required to maintain the progress of the Subcontractor's Work.
7. The Subcontractor shall notify the Contractor, within twenty-four (24) hours of the receipt of a response to the RFI, should the Subcontractor believe that a potential cost or time impact to the Subcontractor's Work will be caused thereby. Should the Subcontractor fail to provide notification of potential cost or time impacts. The Subcontractor shall be deemed to have waived any entitlement to any cost or time impact resulting from the RFI response.
8. The Subcontractor shall receive all RFI's and all RFI responses. The Subcontractor shall immediately review all RFI's and all RFI responses to determine any and all potential impacts to the Subcontractor's Work. The Subcontractor acknowledges that the Subcontract Amount includes the cost required to review all RFI's and RFI responses. The Subcontractor agrees it shall be responsible to remedy the Subcontractor's Work should the Subcontractor perform the Subcontractor's Work in a manner which is inconsistent with an RFI response after the RFI response is issued.

P. QUALITY ASSURANCE/QUALITY CONTROL

1. The Subcontractor shall take all necessary precautions to protect the finished and unfinished work of other trades from damage or disturbance caused by the performance of the Subcontractor's Work and shall conduct the Subcontractor's operations in a fashion to minimize interference with work performed by others. The Subcontractor shall be responsible for all cost to remedy or repair all damage to the finished or unfinished work of others that is caused, in whole or in part, by the performance of the Subcontractor's Work.
2. If the Contractor is unable to determine the cause or causes of damage to the finished or unfinished work in a work area, the Subcontractor agrees that the Contractor shall have the right to assign the cost to remedy or repair the aforesaid damage to all subcontractors performing operations in the Work area on a pro rata basis in proportion to the percentage of manpower employed by each subcontractor to the total manpower employed by all Subcontractors in the work area during the time frame the damage occurred.
3. The Subcontractor shall perform all necessary field measurements for the proper fit of the Subcontractor's Work. The Contractor shall provide base building survey and control points. The Subcontractor shall measure from control points and confirm the accuracy of the Subcontractor's Work. The Subcontractor shall timely perform all field measurements, including multiple field

measurements, required to maintain the Project Schedule. The Subcontractor acknowledges that the Subcontract Amount includes all cost associated with all required field measurements including multiple field measurements, as required. All the Subcontractor's Work which is incorrectly installed due to improper field measurements will be immediately replaced at the Subcontractor's sole cost and expense.

4. The Subcontractor shall notify the Contractor of all requests for temporary construction opening. All temporary construction openings that require structural modifications shall be designed by a registered professional engineer provided by the Subcontractor who is licensed in the state in which the Project Site is situated and the Subcontractor shall submit all calculation to the Contractor for submission to the Architect. The Subcontractor shall pay for all costs incurred to install and close the temporary construction openings unless otherwise provided in this Agreement.
5. The Subcontractor shall provide a sand or litterbox under all pipe cutting or threading tools and protect the floor from all oil staining. The Subcontractor shall provide all necessary protection on all of the Subcontractor's tools that are operated anywhere inside the building or over exterior concrete areas at all times during the performance of the Subcontractor's Work.
6. The Subcontractor shall not apply permanent layout markings for the Subcontractor's Work. The Subcontractor shall pay all costs incurred to remove the Subcontractor's layout markings on all permanent components of the building.
7. The Subcontractor agrees to perform the Subcontractor's Work with the goal of achieving a zero item punchlist at the completion of the Subcontractor's Work. The Subcontractor shall immediately respond and correct all quality issues as they occur.

Q. CLOSEOUT DOCUMENTATION

1. The Subcontractor shall note all changes to the location of equipment, fixtures, support structures and all permanent installations on an as-built copy of the Contract Documents on a weekly basis. The as-built set of Contract Documents shall be kept in the Contractor's field office for use and review by the Owner, the Contractor and other third-party subcontractors.
2. The Subcontractor shall provide final as-built and operational documentation for all of the Subcontractor's Work, updated to reflect as-built deviations from locations identified in the Contract Documents. All final as-built documentation for the Subcontractor's Work shall be submitted to the Contractor in AutoCAD format or such other format as required by the Contract Documents.
3. The Subcontractor shall provide all warranties, trainings, operations, maintenance, and parts information for the Subcontractor's Work as required by the Contract Documents. The Subcontractor acknowledges that final payment of the Subcontract Amount is not due and payable until all close-out documentation (as-built documents, training, operations and maintenance information, warranties, spare parts and attic stock) have been delivered to the Contractor and approved by the Owner.
4. All warranties begin at the Date of Substantial Completion. This date is established by the Certificate of Substantial Completion issued by the Architect. The Subcontractor is responsible for all costs associated with correcting the work including but not limited to cleaning, selective demolition, patching, protection, and repairs.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER To be issued by Insurance Agent, Broker or Company	CONTACT NAME:	
	PHONE (A/C, No. Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	
INSURED Your Company Name and Address	INSURER A : Name of the Insurance Company	
	INSURER B :	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN. THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YY)	LIMITS
	GENERAL LIABILITY	X	X	XXXXX	XXXXX	XXXXX	EACH OCCURRENCE \$1,000,000
X	COMMERCIAL GENERAL LIABILITY						DAMAGES TO RENTED PREMISES(Ea occurrence) \$50,000
	CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR						MED EXP (Any one person) \$5,000
							PERSONAL & ADV INJURY \$1,000,000
							GENERAL AGGREGATE \$2,000,000
							PRODUCTS-COMP/OP AGG \$2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						
	POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC <input type="checkbox"/>						
	AUTOMOBILE LIABILITY	X	X	XXXXX	XXXXX	XXXXX	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000
X	ANY AUTO						BODILY INJURY(Per person) \$
	ALL OWNED AUTOS						BODILY INJURY(Per accident) \$
	HIRED AUTOS						PROPERTY DAMAGE (Per accident) \$
							\$
X	UMBRELLA LIAB	X					EACH OCCURRENCE \$2,000,000
	EXCESS LIAB		X	XXXXX	XXXXX	XXXXX	AGGREGATE \$2,000,000
	DED <input type="checkbox"/> RETENTION \$						\$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	N/A					WC STATUTORY LIMITS <input type="checkbox"/> OTH-ER <input type="checkbox"/>
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)						E.L. EACH ACCIDENT \$1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE \$1,000,000
							E.L. DISEASE - POLICY LIMIT \$1,000,000
	OTHER -						

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required) Project Name or number: XXXXX

Attach IL 70 35 or similar carrier form indicating cancellation notification to the certificate holder.

The Albert M. Higley Co., LLC and (Owner) are named additional insureds under the above captioned general liability policy including ongoing and completed operations on a primary and non-contributory basis when required by written contract for (Project Name).

CERTIFICATE HOLDER

CANCELLATION

The Albert M. Higley Co., LLC
2926 Chester Avenue
Cleveland, Ohio 44114

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

MATERIAL PURCHASE ORDER AGREEMENT

THIS AGREEMENT made as of the 8 day of [December](#) in the year of [2021](#), by and between:

THE ALBERT M. HIGLEY CO., LLC
3636 Euclid Avenue
Cleveland, Ohio 44115
TEL 216-861-2050

hereinafter called the “BUYER”, and

[Davis Fetch Corporation](#)
[743 Ross Avenue](#)
[Pittsburgh, PA 15221](#)
[\(412\) 242-5410](#)

hereinafter called the “SELLER”

The Buyer and Seller in consideration of the terms, covenants and conditions herein contained agree as set forth below:

ARTICLE 1. SCOPE AND PRICE

- A. The Seller agrees to furnish all the goods, wares, materials and merchandise set forth in Paragraph B hereof, for use by the Buyer in the construction of the project identified as [AHN Alpha Labs](#) (the “PROJECT”) located at [100 South Jackson Avenue, Pittsburgh, PA 15202](#) (Project Address) for [Allegheny Health Network](#) (the “OWNER”), in strict and complete accordance with the Project plans and specifications prepared by [Hayes Design Group](#) (the “ARCHITECT”) and as further defined in Schedule “A” if attached hereto and incorporated herein by reference.
- B. A summary of the goods, wares, materials and/or merchandise to be furnished F.O.B. jobsite to the Buyer by the Seller are as follows and as further defined in Schedule “B” if attached hereto and incorporated herein by reference:

[Doors, Frames and Hardware](#)

In consideration whereof, the Buyer agrees to pay the Seller for the full and faithful performance of the Purchase Order as follows and as defined in Schedule “B” if attached hereto and incorporated herein by reference:

TOTAL PURCHASE ORDER AMOUNT: \$ [43,800.45](#)

ARTICLE II. CONTRACT FORMATION

Buyer shall not be bound by this Purchase Order until (1) a formal written acknowledgment is received by Buyer from Seller or (2) submittals are made, manufacturing is begun or shipment is made against this order, constituting an acceptance of this order as written; but no payments will be made until receipt by the Buyer of Seller's signed acknowledgment copy of this Purchase Order. This purchase order, and any documentation referred to herein, supersede all prior understandings, transactions and communications, whether oral or written with respect to the matter referred to herein, (including the terms and conditions of Seller's sales invoice), and form the complete contract between the Buyer and Seller. No modification, alteration or amendment of this order shall be binding upon the Buyer unless made in writing and signed by Buyer's authorized representative. The Seller, in addition to the obligations set forth in this Purchase Order, assumes toward the Buyer all the obligations and responsibilities that the Buyer assumes toward the Owner, as set forth in the Contract Documents for the Project hereinabove referred to, insofar as applicable, generally or specifically to the materials to be furnished by Seller under this Contract.

ARTICLE III. DELIVERY SCHEDULE

Seller acknowledges time is of the essence with regard to this Purchase Order. Seller acknowledges receipt of and shall make all deliveries in accordance with Contractor's Project Schedule or in anticipation thereof. The Seller agrees to furnish and deliver all goods, wares, materials and merchandise in accordance with the Project Schedule if attached hereto and incorporated herein by reference as **Schedule "D"**. Buyer reserves the right to change and/or modify any portion of the Project Schedule due to factors inherent in the Work to be performed for the Project. Seller shall use its best skill and judgment to cause this Purchase Order to be performed in a prompt and expeditious manner and in strict accordance with the Project Schedule and any amendments thereto.

Within seven (7) calendar days following Seller's receipt of this Agreement, Seller shall submit to Buyer a schedule identifying in ample detail, delivery of all goods, wares, materials and merchandise to be incorporated into the Project, including all planned purchase delivery dates, submittals, samples and other scheduling information as requested by Buyer. Seller shall provide Buyer with adequate notice of any special requirements for any specialty manufactured, fabricated or long lead-time items. Further, Seller agrees to notify Buyer immediately of any matters or events which may delay delivery of goods or performance hereunder.

If the Seller shall fail to make delivery as aforesaid and such failure shall result in the Buyer incurring any damages, including but not limited to liquidated or consequential damages, the Seller shall pay the Buyer the amount which the Buyer has been damaged. Such payment by the Seller shall not release the Seller from its obligation to otherwise fully perform this Purchase Order.

The Seller further agrees to indemnify, hold harmless, reimburse and defend Contractor from all direct or indirect loss, costs or expense, including attorney's fees and disbursements, which arise out of or relate to any and all claims, demands and causes of action from the Owner, Architect, the Owner's separate Contractors, or the Contractor's separate Subcontractors which allege their respective activities were subject to delay, acceleration, disruption, interference or hindrance caused in whole or part by the actions or inactions of the Seller in failing to supply the goods, wares, materials and/or merchandise in accordance with the Project Schedule.

No allowance for extension of time or delay in delivery dates for any cause whatsoever shall be claimed by the Seller unless the Seller shall have made written request upon the Buyer for such extension three (3) business days after the cause for such extension occurred and unless the Buyer and the Seller have agreed in writing upon the allowance of the time extension to be made.

No allowance of a time extension shall be made to the Seller in any event for the delay by the Seller in preparing any shop drawings, samples, submittals or in securing approval of the Architect or Owner thereto when such shop drawings, samples and submittals are not properly or timely prepared for approval of the

Architect or Owner or when the Seller by the exercise of reasonable diligence or good business judgment could have anticipated and avoided the delay.

ARTICLE IV. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

The Seller shall prepare and submit to the Buyer all shop drawings, material samples, manufacturer's literature, manuals and warranties which may be required by the Contract Documents in accordance with the Project Schedule if attached hereto as **Schedule "D"**.

Notwithstanding the dimensions given on the Plans, Specifications and other Contract Documents, it shall be the obligation and responsibility of the Seller to take such measurements as will insure the proper matching and fitting of any and all goods, wares, materials or merchandise covered by this Purchase Order. Seller further agrees that any product, equipment, system or manufacturer listed in the Purchase Order as acceptable shall meet and be in full compliance with the requirements and criteria, including those established by the product, equipment, system, and/or manufacturer used as the basis for the specification(s) governing this Purchase Order. Further, the Buyer shall have the right to reject any proposed deviations from specified criteria or characteristics, or deviation from the criteria and characteristics of the product, system or manufacturer used as the basis of the Purchase Order. Only specified items will be allowed for use on the Project. If however, an alternate or substitution is allowed during construction, it will only be allowed under the following circumstance: where the specified product, material or method (1) cannot be provided within Contract Time, but not as a result of Seller's failure to pursue the work promptly or coordinate various activities; (2) cannot be provided in a manner which is compatible with other material for the work, or cannot be properly coordinated therewith; (3) has not received required approval by a governing authority, and requested substitution can be so approved; or (4) where substantial advantage is offered to the Owner. All approved substitutions shall be set forth in a writing signed by Buyer and Seller. Any modifications necessary as a result of the use of an approved substitute shall be paid for by the Seller proposing the substitution. If the substitution is not approved in writing, the Seller shall use the product, material, article, piece of equipment, system or manufacturer specified in the Contract Documents.

ARTICLE V. TITLE AND DELIVERY

All materials furnished under this contract shall be delivered F.O.B. to jobsite by truck. Seller shall bear the full risk of loss of any goods purchased pursuant hereto until goods are delivered to and received and accepted by Buyer. Further, all materials furnished under this contract are to be suitably packaged or otherwise prepared for shipment by Seller to protect the same during transportation. No charge shall be made for packaging, boxing, freight, insurance, storage or drayage unless specifically authorized by the Buyer in writing. Seller shall be liable for damage to materials described herein caused by improper boxing, freight, packing or transportation. When usual terms of tariffs do not include insurance, shipments must be forwarded properly insured to their full sale prices thereunder.

ARTICLE VI. INSPECTION AND APPROVAL

All goods, wares, material and merchandise delivered to and received by Buyer shall be subject to the Buyer's inspection and approval, despite prior payment therefor. Goods, wares, materials or merchandise other than those specified shall not be substituted without Buyer's written authorization. Upon discovery by the Buyer that the material furnished contain any defect, patent or latent, or that the materials fail to conform to the foregoing warranty, Buyer shall have the right to (1) reject delivery of the material, or, if they have been accepted, to return them to Seller, receive any freight, storage, handling or other expenses incurred by the Buyer and be relieved of any payment for the purchase price thereof; or if payment has been made, to recover the purchase price so paid plus all freight, storage, handling or other expense incurred by Buyer; (2) to recover all expenses incurred in reworking the material in an attempt to make it usable; (3) cancel the balance of the order and/or (4) Seller shall fully indemnify Buyer for all loss, cost or expense (including attorney's fees and costs) incurred by Buyer which are caused in whole or in part by any allegation of product defect, patent or latent. Materials so returned shall not be replaced without Buyer's written replacement order. Buyer's rights as set

forth in this paragraph shall not be construed to limit or effect any other rights which Buyer may have under this Agreement or under the terms of Seller's warranty herein.

ARTICLE VII. PAYMENT

On or before the 20th day of each month, Seller shall submit to Buyer, an Application for Payment through the online portal showing the proportionate value of goods, wares, materials and/or merchandise furnished during the month. To the extent not previously furnished, each Application for Payment shall be accompanied by original, executed partial waivers of liens for all materials provided by materialmen and suppliers with respect to the Project, to the extent Buyer has made payment to Seller for such item(s). Upon submission, when the Application for Payment has been Approved, it will automatically be considered the final submission for that period. Within seven (7) days of receipt of payments for the same from Owner, Buyer shall make a progress payment to Seller equal to the amount actually received from Owner less any amounts withheld pursuant to this Purchase Order. It is expressly agreed by and between Buyer and Seller that the receipt by Buyer of payment from the Owner which includes Seller's requested amount is an express condition precedent to Buyer's obligation to pay Seller. Partial releases and waivers of lien shall be required from the Seller and its major suppliers and creditors for said progress payment prior to any future payments, and final release and waivers of lien at the time of final payment of this Purchase Order. The balance of payment due will be made within thirty (30) days after final acceptance of the work by the Architect, Owner and Buyer, receipt of operation manuals, maintenance manuals and warranties from the Seller, and payment thereof by the Owner.

ARTICLE VIII. MODIFICATIONS

The Buyer at any time during the progress of the work may order, in writing, additions or deductions in the amount of goods, wares, materials, and/or merchandise to be sold by the Seller. If such changes affect delivery or amounts to be paid by Buyer, an equitable adjustment in writing shall be made in the prices or delivery schedule, or both. All such work shall be performed pursuant to the conditions of this Purchase Order.

ARTICLE IX. BREACH

In the event the Seller breaches any of the terms and conditions of this Purchase Order and if the breach is not corrected immediately after written request by the Buyer, the Buyer reserves the right and has the option, without prejudice, to furnish or obtain elsewhere substitute goods, wares, materials, merchandise and/or other services to remedy the breach all at the cost and expense to the Seller.

ARTICLE X. INSOLVENCY

Buyer shall have the unrestricted right without liability to cancel this Purchase Order, except for deliveries previously made or for goods covered by the order then completed and subsequently delivered in accordance with the terms of the order, in the event of the happening of any of the following or any comparable events: (i) Seller ceases to conduct its operation in the normal course of business (including inability to meet its obligations as they mature), (ii) Seller's insolvency or (commission on an act of Bankruptcy); (iii) commencement of proceedings by, for , or against Seller under any law relating to bankruptcy or the relief debtors; (iv) the appointment or application for a receiver or trustee for Seller, or (v) an assignment for the benefit of creditors is made by Seller, Buyer may terminate the order without liability except for deliveries previously made or for goods covered by the order then completed and subsequently delivered in accordance with the terms of the Purchase Order.

ARTICLE XI. WARRANTIES

The Seller expressly warrants and guarantees the merchantability, fitness and fitness for particular use of all materials furnished pursuant to this Purchase Order and expressly warrants and guarantees compliance with the specifications or samples of all goods, wares, materials, and/or merchandise furnished pursuant to this Purchase Order and shall make good at its own expense not only for any defect that may occur or develop prior to Buyer's release from responsibility to the Owner therefor, but also any defect that might occur after completion of the work. Seller agrees to indemnify and save harmless the Buyer, its customers and all third party users of

the final product with respect to all losses, costs, expenses (including attorney fees) and damages, including, but not limited to, consequential damages and special damages, incurred or as a consequence of any breach of this warranty by Seller. Further Seller agrees to transfer and assign to Buyer prior to receiving final payment any and all warranties which it may receive from any person, firm or corporation selling or otherwise providing any of the goods, wares, material and merchandise being provided under this Purchase Order.

ARTICLE XII. ENTRY ON PREMISES

If in the performance of this Purchase Order the Seller or any of its agents, employees or subcontractors is required to enter upon any premises other than premises owned or occupied by any such person, then the Seller agrees (a) to comply with all laws, rules, regulations, orders and ordinances applicable to all Work done hereunder, (b) to protect such premises from all mechanic's and materialmen's liens, (c) to take all reasonable precautions prescribed by any person in charge of any part of such premises with respect to the protection of such premises and all property and persons thereon or in the vicinity thereof, (d) to prevent any fire hazard and comply with all safety rules, (e) to maintain proper worker's compensation insurance covering all employees engaged in the performance of Work hereunder and public liability insurance for worker's compensation insurance covering all employees engaged in the performance of Work hereunder and public liability insurance for bodily injury and property damage with a combined single limit of not less than \$1,000,000 and naming the Buyer an Additional Insured on a primary and non-contributory basis, (f) to require each of its agents, employees and subcontractors entering upon such premises to agree to comply with all the foregoing and (g) to indemnify, defend and save harmless the Buyer, its officers, employees, agents and customers and any other person having rights in said premises or being on or about said premises from all fines, penalties, costs, losses, expenses, damages, claims, suits, liabilities including special or consequential damages and attorney's fees, resulting from injury, including death, to persons or property arising from or in any manner growing out of the performance of the Work provided for in this Purchase Order whether or not such fines, penalties, costs, losses, expenses, damages, claims, suits or liabilities are based in whole or in part upon the Buyer's alleged negligence or participation in the wrong.

Where Seller performs services on Buyer's premises, Seller agrees to furnish to Buyer satisfactory evidence of compliance with all laws and regulations, including specifically all taxes on payroll or contributions on account of social security, unemployment insurance and Federal or State worker's compensation. Seller further agrees to indemnify and save harmless Buyer against any claim, suit or demand, and all costs, damages or expenses incident thereto arising out of its failure to pay or secure such compensation, taxes or contributions or arising out of the performance of the work or in connection therewith or pertaining thereto.

ARTICLE XIII. GOVERNMENT CONTRACTS

It is understood and agreed that if any of the commodities or services ordered herein are wholly or partially to be used for any government contract or subcontract, this Purchase Order will be subject to renegotiations pursuant to the applicable laws, rules and regulations, whether hereto or hereafter enacted or adopted and all applicable provisions of the applicable United States Procurement Regulations or other governmental or municipal regulations in effect at the date hereof, and all such applicable requirements thereof are hereby incorporated herein by reference.

ARTICLE XIV. INDEMNIFICATION

The Seller shall indemnify the Buyer against and save it harmless from any and all claims, suits, or liabilities for infringement or violation of any patent or patent right, copyright, trademark or tradename arising in connection with this Purchase Order and anything done thereunder.

The Seller shall indemnify the Buyer against and save it harmless from any and all claims, suits or liability for injuries to property, injuries to persons, including death, and from any other claims, suits or liabilities, on account of any act or omission of the Seller, or any of its officers, agents, employees or servants.

The Seller shall indemnify the Buyer against and save it harmless from any and all expenses, costs, fines, penalties, assessments or other financial liability or any expense arising out of or in connection with any act or omission of the Seller which either solely or partially is or is claimed to be by any governmental agency a violation of any safety law, safety standard, safety code or safety regulation.

The Seller shall pay for all materials furnished and labor performed under this Purchase Order, and shall satisfy the Buyer thereupon when demand is made, and shall indemnify the Buyer and the Owner against and save them, the Premises for the Project and any account or fund established by Owner for payment of the Work, harmless from any and all claims, suits, liens, or attested accounts filed or asserted by Seller and any other third party performing any Work related to this Purchase Order. As between Seller and Buyer, Seller waives its immunities under Ohio Revised Code Chapter 4123 for purposes of enforcing the indemnity obligations herein.

ARTICLE XV. GOVERNMENT COMPLIANCE

Seller agrees that in the performance of this Purchase Order it will be performed in strict conformity with all federal, states, county and municipal statutes, ordinances or regulations, and all lawful regulations of any public authority applicable to the Work to be performed or the goods, wares, materials, equipment, systems and merchandise to be furnished under this Purchase Order, including, but not limited to, the Walsh-Healy act (U.S.C.A. Title 41, of 1938 (U.S.C.A. Title 29 Sections 201-209), as amended. Seller further agrees to pay all taxes applicable, for which the Seller is responsible, and obtain and pay for all permits, license fees, tests, and inspections necessary to its performance of this Purchase Order. Seller agrees upon request, to furnish Buyer a certificate of compliance with any or all such laws in such form as Buyer may require.

Further, where Seller performed services on Buyer's premises, Seller agrees to furnish to Buyer satisfactory evidence of compliance with all laws and regulations, including specifically all taxes on payroll or contributions on account of social security, unemployment insurance, and Federal or State workers' compensation. Seller further agrees to indemnify and save harmless Buyer against any claims, suit or demand, and all cost damages or expense incident thereto arising out of its failure to pay or secure such compensation, taxes, or contribution or arising out of the performance of the Work in connection therewith or pertaining thereto.

ARTICLE XVI. NONASSIGNMENT

The terms and conditions contained herein have been issued in reliance upon the Seller's reputation and good standing. Therefore, under no circumstances may Seller make any assignment in whole or in part of this Purchase Order or its rights hereunder, or any delegation of its obligations hereunder, without the prior written consent of Buyer and any attempted assignment or delegation without such consent shall be null and void.

ARTICLE XVII. OSHA

The Seller shall be responsible for adhering to the requirements of OSHA's Hazard Communications Standard 1926.59 and all other applicable federal, state, city and local requirements in the jurisdiction where the Project is located concerning the same. The Seller specifically agrees to submit to the Buyer all Safety Data Sheets prior to delivery of any hazardous substances to the project site, and to insure the proper labeling of all such hazardous substances.

ARTICLE XVIII. NON-DISCRIMINATION IN EMPLOYMENT

Seller agrees that the representations and provisions required by Section 202 of the Executive Order No. 11246, as amended, as to equal employment opportunity and non-discrimination in employment are hereby incorporated in and made part of this Purchase Order.

ARTICLE XIX. AFFIRMATIVE ACTION IN EMPLOYMENT

The Affirmative Action clauses and regulation of Section 503 of the Rehabilitation Act of 1973 and Section 402 of the Vietnam Era Readjustment Act of 1974 are incorporated by reference and made a part of this Purchase Order.

ARTICLE XX. ALTERNATIVE DISPUTE RESOLUTION

The Buyer and Seller agree to negotiate in good faith and in an attempt to resolve any dispute for a period of at least sixty (60) business days following the receipt of written notice from either party to the other which shall set forth in specifics, the nature and description of the disputes, the actions or inactions of the other party which caused the dispute and the relief or remedy requested by the notifying party.

- a. Should Buyer and Seller be unable to resolve said disputes through good faith negotiation, Buyer and Seller agree to attempt in good faith to resolve said dispute through mediation through an organization acceptable to the Buyer as a condition precedent to arbitration and/or litigation as herein provided. All mediation proceedings shall be conducted in the location designated by the Buyer.
- b. Should Buyer and Seller be unable to resolve said disputes through mediation, any and all disputes, at the sole discretion of Buyer, shall be decided by arbitration in accordance with the construction industry arbitration rules of the American Arbitration Association then pertaining. The organization and any arbitrators appointed shall have no power or authority to decide or award punitive damages. The award rendered shall be final and judgment may be entered in any court having jurisdiction thereof. All arbitration proceedings or hearings shall be conducted in a location designated by the Buyer utilizing state law of project location. Buyer may join any other party in the arbitration proceedings that Buyer determines is necessary to a complete adjudication of any disputes arising under the terms of this Purchase Order and/or disputes arising under the terms of any other agreement or contract entered into between Buyer and any other party performing work on the Project.
- c. All disputes not resolved by arbitration will be resolved by litigation in any court having jurisdiction thereof, utilizing state law of the project location, after compliance with the negotiation and mediation terms set forth in this ARTICLE.

ARTICLE XXI. GOVERNING LAW

It is the express agreement of the parties hereto that the rights and duties of the parties hereto shall be determined by the laws of, and this Agreement shall be construed and considered as a contract made and to be performed in the State where the project is located.

ARTICLE XXII. INSURANCE

The Seller shall maintain general liability insurance including products and completed operations liability for a period of not less than (5) years after date of purchase order.

ARTICLE XXIII. SCHEDULES (if required)

- Schedule A - The Contract Documents
- Schedule B - Scope of Work
- Schedule C - General Conditions and Procedures
- Schedule D - Project Schedule

ARTICLE XXIV. ADDITIONAL PROVISIONS

IN WITNESS WHEREOF, the parties to these presents have hereunder set their hands as of the day and year first above written.

In the Presence of:

THE ALBERT M. HIGLEY CO., LLC

By: _____

Title: _____

Date: _____

In the Presence of:

SELLER: DAVIS FETCH CORPORATION

By: _____

Title: _____

Date: _____

Failure to return this signed Agreement within ten (10) business days of receipt of same by the Seller constitutes full acceptance of the price, terms and conditions stated herein and Buyer may justifiably rely upon said acceptance.

VI. Vendor Selection

Responsible Contracting – Construction Contracts

I. PURPOSE:

The purpose of this section is to ensure that all work on public construction contracts is performed by responsible, qualified firms that maintain the capacity, expertise, personnel, and other qualifications and resources necessary to successfully perform public contracts in a timely, reliable, and cost-effective manner. The intent of this policy is to make information available to those responsible for purchasing decisions about the relative responsibility of those looking to do business with Canton Township. and shall be adhered to by all operating departments within Canton.

II. DEFINITIONS:

1. Bid: means any application submitted by a bidder in response to an Invitation for Bid, Request for Proposal or Request for Qualifications, or other procurement process.
2. Bidder: means any person or entity that applies for any contract whether or not the application process is through an Invitation for Bid, Request for Proposal, Request for Qualifications, or other procurement process.
3. Construction Project: A project to construct, remodel or reconstruct any public works, public buildings, public structures, roadways, bridges, sidewalks or parks.
4. Contractor: any person, firm, corporation, partnership, association or any combination thereof, which enters into a contract with Canton to perform services on the leased or licensed premises.
5. Professional Services: Services rendered by members of a recognized profession or specialty which involve analysis, exercise of discretion, and independent judgment in their performance, and an advanced specialized type of knowledge, expertise, or training customarily acquired either by a prolonged course of study or equivalent experience. Examples include appraisal, architectural and engineering services, and legal services.
6. Responsible Bidder: A person or entity who has submitted a bid, which conforms in all respects to the requirements set forth in the ITB/RFP or other solicitation for bids.
7. Subcontractor: any person not an employee who enters into a contract with a contractor to assist the contractor in performing a contract, , to perform or assist in performing services on the leased or licensed premises. The term subcontractor does not include vendors or suppliers to Township purchasing contractors.

III. APPLICATION:

1. All contractors and subcontractors that perform a project valued at over \$75,000 on any public construction project shall be evaluated based on the requirements in this policy.

2. All firms engaged in contracts covered by this policy shall be qualified, responsible contractors or subcontractors that have sufficient capabilities in all respects to successfully perform contracts for which they are engaged, including the necessary experience, equipment, technical skills and qualifications and organizational, financial and personnel resources. Firms bidding on public contracts shall also be required to have a satisfactory past performance record and a satisfactory record of law compliance, integrity, and business ethics as described in this policy.

IV. ADMINISTRATION:

1. The Finance Department must monitor compliance with this policy including investigation of alleged violations.

V. BID EVALUATION CRITERIA

1. If a bidder demonstrates any of the following based on the review of the documentation provided (or interview, if applicable), they will be deemed as non-responsible:
 - a. A pattern of negligence pertaining to safety
 - b. The absence of proper licensure from the State of other certifying bodies
 - c. A gross lack of qualifications or expertise by personnel at the bidding company
 - d. Evidence of illegal or discriminatory hiring or payroll practices
 - i. The Township reserves the right to review bidders payroll records for employees working on the awarded contract if concerns arise related to illegal payroll practices.
 - e. A pattern of nonperformance on past contracts
2. Once the Township deems a contractor a responsible bidder, the Township must consider the contractors bid. The Township must consider, at minimum, each of the evaluation criteria listed in this Section in determining the best bid. The Township may require contractors or subcontractors to provide additional information by inclusion in bid documents. Additionally, the list set forth below in no way limits any additional criteria that the Township may deem relevant for purposes of making a determination of the bid that provides the best value to the Township.
3. Bid documents must require any contractor or subcontractor bidding on the project to submit written responses and other information and documentation regarding the listed criteria and any other criteria specified by the Township through the bid documents. The Township may request additional information or explanation from any contractor or subcontractor regarding any particular criteria. The bid documents must provide that the Township retains the right in its discretion to reject any and all bids. All required contractor financial and privileged information must be kept from public disclosure unless otherwise required by law.

Submitted bids must break out labor costs from material and equipment costs.

4. For each separate bid package, the Township in its discretion will weigh the information provided by the contractor or subcontractor regarding the evaluating criteria, as a whole, to determine the bid which provides the best value to the Township. Except as otherwise

required by law, no single criterion will necessarily be determinative in assessing which bid is the best value. The Township must weigh each of the criteria based on a distribution of percentage points on a 100-point scale. Additionally, a space shall be provided on the bid evaluation form for the prospective bidder to include additional information about themselves and/or their bid – this section would be optional for the prospective bidder to complete. The criteria to be considered in bid evaluation on construction projects by the Township shall be weighed categorically as follows, and shall include:

Total Maximum points must equal 100

- a. Price (35 points)
 1. Lowest Bidder 35 points
 2. Bids within 5% of lowest bid 30 points
 3. Bids within 10% of lowest bid 25 points
 4. Bids within 20% of lowest bid 20 points
 5. Bids within 40% of lowest bid 10 points
- b. Qualifications, Experience and Accountability (15 points)
 1. Qualifications of management and supervisory personnel to be assigned by the bidder, including the qualifications of subcontractors.
 2. References from individuals or entities the bidder has worked for within the last five years (5) years including specific municipal projects, information regarding records of performance and job site cooperation.
 3. Evidence of any quality assurance program used by the bidder and the results of any such program on the bidder's previous projects.
 4. Assurance that all construction work for this project must proceed economically, efficiently, continuously and without interruption.
 5. A list of previous projects completed within the past five (5) years of comparable size and complexity, including dates, clients, approximate dollar value, and size. Documentation from these previous projects including but not limited to all extra costs relating to the bidder's timeliness, performance, technique standards, trade standards, quality of work, extension requests, contractual fines and penalties imposed, liens filed, history of claims for extra work and any contract defaults with an explanation of the reason for the default and how the default was resolved.
 6. Provide a copy of the companies most recent financial statements.
- c. Workplace Safety (10points)
 1. The ratio of masters or journeypersons to apprentices proposed to be used on the construction project job site, if apprentices are to be used on the project.

2. Documentation of an on-going Michigan OSHA-approved, safety-training program for employees to be used on the proposed job site.
 3. Evidence of the bidder's worker's compensation Experience Modification Rating ("EMR"). Preference will be given to contractors and subcontractors who exhibit an EMR of 1.0 or less based on a three-year average.
 4. All craft labor that will be employed by the firm for the project has completed at least the OSHA 10-hour training course for safety established by the U.S. Department of Labor, Occupational Safety & Health Administration. (new added 10 hour option)
 5. All craft labor that will be employed by the firm for the project has completed at least the OSHA 30-hour training course for safety established by the U.S. Department of Labor, Occupational Safety & Health Administration.
 6. Documentation of master or journeyperson certification or status for masters and journeypersons to be used on the project, and the source of such certification or status.
- d. Workforce Development (15 points)
1. Documentation as to pay rates of employees and whether the bidder provides health insurance, pension or other retirement benefits, or other benefits to its employees. (yes) (no)
 2. Documentation that the bidder participates in a Registered Apprenticeship Program that is registered with the United States Department of Labor Office of Apprenticeship or by a State Apprenticeship Agency recognized by the Office of Apprenticeship. (yes) (no)
- e. Social Equity and Sustainability (10 points)
1. A statement from the bidder as to what percentage of its workforce can be drawn significantly from area residents because a goal of the Township is to utilize, in its construction activities, local residents as much as is economically feasible while retaining the high quality of construction required for its construction activities, consistent with applicable law. The Township will consider in evaluating which bids best serve its interests, the extent to which responsible and qualified bidders are able to achieve this goal.
 2. Assurance that the bidder is an equal opportunity employer and does not discriminate on the basis of race, sex, pregnancy, age, religion, national origin, marital status, sexual orientation, gender identity or expression, height, weight, or disability.

3. Evidence of Equal Employment Opportunity Programs, such as policies or specific programs, for minorities, women, veterans, returning citizens, and small businesses
 4. Evidence that the bidder is a business operated in Canton Township.
 5. If applicable, state certification evidence to support If the business is owned by at least 51% by women, minorities, veterans or people with disabilities
- f. Work Plan (15 points Max)
1. The proposed work plan to complete the project including such information as the schedule, staging, materials and equipment to be used, methods and techniques for completing the work that will be employed, plans to maintain operations at Township facilities or access to city infrastructure during construction if desired by the Township, or other criteria as determined by the Township in the bid documents.
5. Final step of determination may result in an interview process, of all or subset of responsible bidders, that will be scored independently from the above evaluation criteria. This provides the opportunity to explore significant variations of the proposals received. Interviews will be based on a set of predetermined questions, depending on the project scope.
 6. Final award recommendation will be presented to the Township Board with the initial evaluation scores, interview scores, and reasons for vendor selection. The Township Board shall have the right to reject any or all bids and waive irregularities in bidding and to accept bids which do not conform in every respect to the bidding requirements. If all bids are rejected, or if no bids are received, the Township may obtain new bids or negotiate in open market for a contract at a reasonable price, to purchase in the open market, or to have the work performed by Township employees.
 7. No contract shall be entered into without evidence of appropriate insurance and bonds in compliance with Public Act 213 of 1963 as approved by the Township's Corporation Counsel.

VI.SUBCONTRACTOR COMPLIANCE:

Subcontractors shall be required to meet the same standards as general contractors. A contractor must notify the Township immediately if using a subcontractor for a construction project over \$50,000, in which was not disclosed in the proposal. At that time, the contractor must provide all relevant information that would have been required during the bidding process. Should the subcontractor not meet the standards established during the bidding process, the contractor may be deemed in material breach of the contract.

VII. ENFORCEMENT:

Agreements between Canton Township and awardees of construction contracts above \$75,000 are subject to Canton's Responsible Contractor Policy. Remedies for violations are prescribed by the Ordinance, state law and federal law.

VIII. PUBLIC INPUT:

Suspected violations of this policy shall be reported to the purchasing division of the Finance Department. Contact information can be located on the Township's website.