



PROJECT MANUAL
STR Project Number 25014

**RICH TOWNSHIP HIGH SCHOOL
D227 FAC & STEM CAMPUSES
PARKING LOT RESURFACING**

Prepared for:

**RICH TOWNSHIP HIGH SCHOOL
DISTRICT 227**
20550 S. Cicero Avenue
Matteson, IL 60443

Issue for Bid/Permit:
Jan. 19, 2026

PROJECT DIRECTORY

STR PROJECT NUMBER 25014

PROJECT: PARKING LOT RESURFACING

RICH SOUTH HIGH SCHOOL

Fine Arts and Communications Campus

5000 Sauk Trail

Richton Park, Illinois 60471

RICH CENTRAL HIGH SCHOOL

S.T.E.M. Campus

3600 West 203rd Street

Olympia Fields, Illinois 60461

OWNER: BOARD OF EDUCATION

RICH TOWNSHIP HIGH SCHOOL DISTRICT 227

20550 S. Cicero Avenue

Matteson, IL 60443

Tel: 708-679-3000

Mr. Dennis Forst, Assistant Superintendent of Business Operations

Tel: 708-679-5719

Mr. Elliot Echols, Director of Buildings and Grounds

Tel: 708-679-6120

CONSTRUCTION

MANAGER: PEPPER CONSTRUCTION COMPANY

411 Lake Zurich Rd.

Barrington, IL 60010

Mr. Brian Healy, Senior Project Manager

Tel: 847-381-2760

ARCHITECT: STR PARTNERS LLC

350 West Ontario Street, Suite 200

Chicago, Illinois 60654

Tel: 312-464-1444

Skylar Moran, Project Manager

Tel: 312-585-8372

CIVIL

ENGINEER: STR-SEG

350 W Ontario St

Chicago, IL 60065

Tel: 262-253-4700

Mr. Randy Marquardt, Principal Engineer

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Project No. 25014

The following listed documents comprise the project manual for the project listed above. Where numerical sequence of sections is interrupted, such interruptions are intentional.

The complete Project Manual for this project consists of all sections indicated dated 01/19/2026, which must not be separated for any reason. The Architect and Owner disclaim any responsibility for any assumptions made by a contractor or subcontractor who does not receive a complete Project Manual, including all sections listed in the Table of Contents.

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DIVISION 01
GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 PROJECT DESCRIPTION

- A. The Project consists of the following general activities as described in the Construction Documents and Project Manual for **D227 FAC & STEM Campuses Parking Lot Resurfacing**.
- B. The work of the Project shall include all labor, material, and equipment to provide complete installation of all work including all code required devices and functions that may not specifically be indicated in this Project Manual.
 - 1. The work includes (not to be taken as a complete description or extent of the work) as follows:
 - a. Selective demolition of paving materials
 - b. selective demolition and replacement of existing site features to remain
 - c. new paving material
 - d. new signage and markings
 - e. temporary materials for access to facilities
 - 2. Commencement of Work: Demolition and construction to begin as noted below:
 - a. as early as **Friday May 22, 2026**, except as noted
 - b. Work by Owner's separate contractor for electric vehicle charger installation to be phased
 - 3. The Work includes scheduling coordination with the Owner or Owner's contractor(s) for site access and usage.

1.2 CONTRACTORS USE OF PREMISES

- A. General: The Contractors shall limit their use of the premises to construction activities in areas indicated; allow for Owner occupancy and use by the public.
 - 1. The school may be active with concurrent construction work of separate projects. Contractor to work with Principals, Owner, Owner's Representative, etc. to coordinate construction schedules as needed.
 - 2. Confine operations to the immediate area of work indicated.
 - 3. Keep driveways and entrances serving the premises clear and available to the Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - 4. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - 5. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
 - 6. Do not dispose of any waste material on site, either by burial or by burning.

7. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and locations of storage sheds to the areas indicated. If additional storage is necessary obtain and pay for such storage off-site.

- B. Lock automotive type vehicles such as passenger cars and trucks and other types of mechanized and motorized construction equipment, when parked and unattended so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

1.3 PROTECTION

- A. Existing surrounding area and property shall be properly protected from damage by Contractor and left undamaged from all operations of each Contractor.

1.4 COORDINATION OF WORK

- A. The Construction Manager shall assume total responsibility for the proper coordination of all work for all trades.
- B. Any costs for provision of labor and material over and above the basic Construction Document requirements, which are made necessary by the lack of such total coordination of all trades, shall be borne by the Construction Manager, and no consideration for time extension or extra cost will be allowed.
- C. Any such work must be performed at the earliest time convenient to the progress of the Project.

1.5 OWNER'S WORK

- A. The Owner may be performing work in other areas of the site and/or in conjunction with this same project, utilizing its own custodial and maintenance employees and/or outside Contractor services.
- B. Other construction work may be performed at the same building by Contractors not necessarily those providing the work on this Project.
- C. It is understood that by submitting a Bid, the Bidders acknowledge the Owner's right to engage in such construction, and agree to cooperate with the Owner's other employees and/or Contractors as required, and to not allow such Owner's work to delay nor interfere with this Contractor's execution of his Contract Work.

1.6 OWNER OCCUPANCY

- A. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the site prior to Substantial Completion, provided that such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of their total Work.

1. A Certificate of Substantial Completion will be executed for each specific portion of the Work to be occupied prior to Owner occupancy.
2. Obtain a Certificate of Occupancy from local building officials prior to Owner occupancy.
3. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy the Owner will provide operations and maintenance of mechanical and electrical systems in occupied portions of the building.

1.7 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 1. Notify Owner not less than two days in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
- C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 1. Notify Owner not less than two days in advance of proposed disruptive operations.
 2. Obtain Owner's written permission before proceeding with disruptive operations.
- D. Controlled Substances: Use of tobacco products and other controlled substances on the property is not permitted.
- E. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
 1. Maintain a list of approved screened personnel with the Owner's representative.

1.8 TIME OF COMPLETION AND OCCUPANCY

- A. The date of Substantial Completion shall be no later than the end of the day on:
 1. **Friday July 17, 2026** for all work.
 2. Substantial Completion is the stage in the progress of the Work when the work or designated portion thereof is sufficiently complete in accordance with the contract documents so the Owner can occupy or utilize the work for its intended use.
- B. The date of Final Completion shall be no later than the end of the day on:
 1. **Friday July 31, 2026** for all work.

1.9 CODES AND PERMITS

- A. Construction work shall be performed in compliance with the requirements of the IBC 2024, all applicable local, state and federal law, regulations, and rules and the requirements of the Contract Documents.
- B. Work shall not commence until the Construction Manager(s) and all insurance and material payment has secured building construction permits and bond requirements are met.
- C. The Construction Manager(s) shall pay for all inspection fees.
- D. The Construction Manager(s) shall secure and pay for inspections per Section 01 45 33 including to secure and pay inspection professional(s). Upon completion of the inspection work, Construction Manager(s) shall submit to Architect fully executed forms per Section 01 45 33.

1.10 TAXES

- A. The Owner being a not-for-profit organization, it is believed that none of the following taxes accrue from the performance of this Contract: Retailer's Occupation Tax, Service Occupation Tax, Use Tax, or Service Use Tax (either Illinois, municipal or county) and Federal Retail Excise Tax. Costs for these taxes shall be excluded from the proposal at the time of bidding and from the Contract Sum; provided, however, should it be determined that any of said taxes do accrue from the performance of this Contract then said taxes so accruing shall be adjusted according to the liability as determined and in accordance with Article 12 of the General Conditions of the Contract.
- B. Contractor shall pay all Federal and State Unemployment Insurance and Old Age Benefits as required by law.

1.11 INSURANCE

- A. The Owner Shall purchase and maintain Builder's Risk insurance in accordance with the General Conditions.

1.12 ALLOWANCES

- A. Include the amounts of allowances in the Base Bid. The final Contract amount will be adjusted to reflect the actual cost.

1.13 CONTRACT AWARD

- A. The Project will be constructed under a single prime contract for all work specified herein.
- B. The Owner, however, reserves the right to reject any and all Bids and to waive any informality on bids received whenever such rejection or waiver is in his best interest.
- C. In awarding contract(s), the Owner will take into full consideration skill, facilities, capacity, experience, ability, responsibility, previous work, financial standing of bidder, amount of work

being carried on by bidder, quality of construction, equipment available, and the Contractor's ability to achieve a prompt and efficient completion work.

- D. As the date of Final Completion is extremely important to the Owner, a Contractor's record for completing projects on time will be considered heavily in the selection of a successful Bidder.

1.14 EFFECTIVE DATE FOR COMMENCEMENT OF GUARANTEES

- A. Unless otherwise agreed to in writing by the Owner, or otherwise extended in these Specifications, the date for the commencement of the guarantees for the Contractor's work and his subcontractor's work shall be the date of the Owner's Final Acceptance of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements governing handling and processing allowances.
 - 1. Selected materials and equipment, and in some cases, their installation are shown and specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation.
- B. Allowances for Products:
 - 1. Amount of each allowance includes:
 - a. Cost of Product to Contractor or subcontractor, less any applicable trade discounts.
 - b. Delivery of product to site
 - 2. Related Work Included in Contract Sum: In addition to the amount of each allowance, include in contract sum, the contractor's cost for the following:
 - a. Include in Contract price cost for allowances.
 - b. Handling at site including unloading and storage.
 - c. Protection from damage.
 - d. Labor for installation and finishing.
 - e. Other expenses required to complete installation.
- C. Allowances for Unforeseen Conditions (General Allowance)
 - 1. Amount of each allowance includes the following:
 - a. Cost of Product to Contractor or subcontractor, less any applicable trade discounts.
 - b. Delivery of product to site
 - c. Handling at site including unloading and storage.
 - d. Protection from damage.
 - e. Labor for installation and finishing
 - f. Other expenses required to complete installation
 - 2. Related Work Included in Contract Sum: In addition to the amount of each allowance, include in contract sum, the contractor's cost for the following:
 - a. Include in Contract price cost for allowances.
 - b. Cost for bonds.

c. Cost for Prime Contractor's general conditions and overhead.

D. Procedures for submitting and handling Change Orders are included in Section 01 26 00 Contract Modification Procedures.

1.2 SELECTION AND PURCHASE

A. At the earliest feasible date after Contract award, advise the Architect of the date when the final selection and purchase of each product or system described by an allowance must be completed in order to avoid delay in performance of the Work.

1. When requested by the Architect, obtain proposals for each allowance for use in making final selections; include recommendations that are relevant to performance of the Work.
2. Purchase products and systems as selected by the Owner and Architect from the designated supplier.

1.3 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to indicate actual quantities of materials delivered to the site for use in fulfillment of each allowance.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspect products covered by an allowance promptly upon delivery for damage or defects.

3.2 PREPARATION

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

1. Schedule of Allowances
Refer to Construction Manager's scope of work descriptions for information related to allowances to be included in each trade package.

3.3 SELECTION OF PRODUCTS UNDER ALLOWANCES

A. Architect's Duties:

1. Consult with Contractor in consideration of products and suppliers or installers.
2. Make selection in consultation with Owner. Obtain Owner's decision or approval.
3. Transmit Owner's written decision to Contractor.

4. Prepare Change Orders as required.

B. Contractor's Duties:

1. Assist Architect and Owner in determining qualified suppliers or installers.
2. Obtain proposal from suppliers and installers, when requested by Architect.
3. Make appropriate recommendations for consideration of Owner/Architect.
4. Notify Architect promptly of:
 - a. Any reasonable objections Contractor may have against any supplier or party under consideration for installation.
 - b. Any effect on construction schedule anticipated by selections under consideration.

3.4 CONTRACTOR RESPONSIBILITY FOR PURCHASE, DELIVERY, INSTALLATION AND ADJUSTMENT OF COST

- A. Should cost be more or less than specified amount of allowance, Contract price will be adjusted accordingly by Change Order.
- B. Submit claims for anticipated additional costs at site, or other expenses caused by selection under allowance, prior to execution of work.
- C. Submit documentation of actual costs at site, or other expenses caused by selection under allowance, within 60 days after completion of execution of work.
- D. Failure to submit claims within designated time will constitute waiver of claims for additional costs.
- E. At Contract closeout, review approved changes in Contract amount in final statement of accounting.
- F. Proper documentation and approval will be required to make equitable adjustment to allowances prior to project closeout. Any unused allowances will be deducted from the final contract amount.

END OF SECTION

**SECTION 01 23 00
ALTERNATES**

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for Alternates.
- B. Definition: An Alternate is an amount proposed by Bidders and stated on the Bid Form for certain construction activities defined in the bidding requirements that may be added to or deducted from Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents.
- C. Coordination: Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Alternate is complete and fully integrated into the project.
- D. Notifications: Immediately following the award of the Contract, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates.

1.2 SCHEDULE OF ALTERNATES

- A. Alternates are identified on the Form of Proposal (Bid Form) only.
- B. Drawing Sheet(s) referenced in the Form of Proposal relating to Alternate Bids contains requirements for materials and methods necessary to achieve the Work described under each Alternate.
 - 1. Include as part of each Alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for products selected under an allowance.
 - 2. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use facsimile of form provided in Project Manual.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. CONTRACTOR TO SUBMIT AN ITEMIZED SIDE-BY-SIDE DETAILED COMPARISON of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified. SUBSTITUTION REQUEST WILL NOT BE REVIEWED WITHOUT THIS COMPARISON.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.

- g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect

will return requests without action, except to record noncompliance with these requirements:

- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- b. Requested substitution provides sustainable design characteristics that specified product provided.
- c. Substitution request is fully documented and properly submitted.
- d. Requested substitution will not adversely affect Contractor's construction schedule.
- e. Requested substitution has received necessary approvals of authorities having jurisdiction.
- f. Requested substitution is compatible with other portions of the Work.
- g. Requested substitution has been coordinated with other portions of the Work.
- h. Requested substitution provides specified warranty.
- i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Not allowed, except as specifically provided for in the technical specifications (Divisions 02 through 49) where a Contractor-proposed improvement in materials or techniques is offered at no increase in Contract Sum.

PART 3 - EXECUTION (Not Used)

END OF SECTION

RICH TOWNSHIP HIGH SCHOOL D227 FAC & STEM CAMPUSES PARKING LOT RESURFACING

TO: Skylar Moran, AIA
STR Partners, LLC
350 W Ontario St. Ste. 200
Chicago, IL 60654

INSTALLER: _____ PHONE: _____
Name of Subcontractor

ADDRESS: _____

1. Specification Section: _____ Paragraph: _____

2. Reason for Substitution:

3. Proposed Substitute:

A. Name and Model No.: _____

B. Manufacturer: _____

Address: _____

Phone Number and Person to Contact: _____

C. Applicable reference standards: _____

D. Attachments:

1. Product Information:

- a. Applicable performance and test data.
- b. Color chart, if applicable.
- c. Samples, if requested by Architect.

2. Sample product warranty, if applicable.

3. Installation instructions.

4. Manufacturer's Reputation: Attach evidence of manufacturer qualifications and reputation for prompt delivery and efficiency in servicing products, as applicable.

5. Comparison: Attach an itemized comparison of the proposed substitution with product specified, including test performance data.
 6. Cost Data: Attach accurate cost data on proposed substitution in comparison with product specified.
 7. Changes in Work: Attach data relating to changes required in other work to permit use of proposed substitution and changes required in construction schedule.
 8. Schedule Impact: Attach a statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 9. Previous Installation: Attach list of not less than 5 similar projects on which proposed substitution was used. List name and address of project, date of installation, and name, address, and phone number of Architect.
 - a. List only projects local to the Project or to the Architect.
4. In making request for substitution, Contractor represents that:
- A. It has examined the Drawings and Specifications and has determined that, to the best of its knowledge, the proposed substitution is appropriate for the use intended in the Drawings and Specifications, and will perform as well as or better than the specified product.
 - B. It will provide the same warranties for substitution as for product specified.
 - C. It will coordinate installation of accepted substitution into Work, making such changes as may be required for Work to be complete in all respects.
 - D. It waives all claims for additional costs related to substitution which consequently become apparent.
 - E. Cost data is complete and includes all related costs under its Contract.

Name of Manufacturer, Signature of Manufacturer's Representative	DATE
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Name of Installer, Signature of Installer's Representative	DATE
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Name of Prime Contractor, Signature of Prime Contractor's Representative	DATE
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Name of Coordinating Contractor, Signature of Coordinating Contractor's Representative	DATE
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END OF SUBSTITUTION REQUEST FORM

SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Promptly implements Change Order procedures.
 - 1. Provide full written data required evaluating changes.
 - 2. Maintain detailed records of all work done on time-and-material/force account basis.
 - 3. Provide full documentation to Architect on request.
- B. Designate in writing member of Contractor's organization:
 - 1. Who is authorized to accept changes in Work.
 - 2. Who is responsible for informing others in Contractor's employ of authorization of changes in Work.
- C. Owner designates, in writing, a person authorized to execute Change Orders.
- D. Related Requirements:
 - 1. Section 00 70 00 "General Conditions of Contract."
 - 2. Section 01 29 00 "Payment Procedures."
 - 3. Section 01 60 00 "Product Requirements."

1.2 CHANGE ORDER PROCEDURE

- A. Initiation of Contractor Changes:
 - 1. Requests for change may be initiated in writing.
 - 2. Subcontractors initiating a request for change shall direct their requests to their Contractor.
 - 3. Architect will review and direct Contractor's requests for change to the Owner or the Owner's Representative with recommendations.
 - 4. Requests for change affecting contract sum or contract completion shall be made prior to starting any changes to the contract or contract documents. Failure to make appropriate written requests will invalidate any claims for additional costs or time for said work.
- B. Owner Authorizes: The Owner or Owner's Representative, having considered the necessity for the request change and availability of funds will authorize Architect to prepare a request for proposal (RFP).
- C. Architect Prepares Request for Proposal:

1. The Architect, following consultation with the Contractor regarding sub-contracts, which will be affected by the proposed change, will prepare an RFP for each Contractor's response.
2. RFP, Supplemental Drawings and Specifications for each proposed change or transmitted to the Contractor.

D. Contractors Prepare Proposals:

1. Detailed Breakdown of Material Equipment and Labor:
 - a. Contractor or Subcontractor whose work is affected by a proposed change shall prepare a proposal for change.
 - b. Detailed breakdown shall be prepared in accordance with the Contract Documents.
 - 1) If a change affects work covered by agreed on prices, such prices will be used as the basis for adjustments to contract sum.
 - 2) In all other cases, adjustments to contract sum shall be based on the Contractor's direct cost, including costs of material, labor, equipment, bonds, and taxes, as applicable.
 - 3) Labor rates shall be itemized on the detailed breakdown indicating trade, base wage rates, total union fringe benefits, FICA, unemployment compensation insurance, and workmen's compensation insurance. Labor rates shall not include costs for inefficiencies of construction supervision or labor.
 - 4) All change order adjustments to the contract developed above shall include the amounts for overhead and profit, which do not exceed the average amounts indicated in the Schedule of Values, or an amount of 10%, whichever is less, and that no overhead and profit shall be deducted from the price for the changes deleting work in the contract. If a subcontractor performs the changed work, no more than 10% may be added to the subcontractor's costs for overhead and profit.

E. Contractor Review:

1. Review: The contractor shall review all proposals for:
 - a. Conformances with the RFP to ensure that all items and only those items of work affected by proposed change are included.
 - b. Assurance that these proposals are submitted in conformance with the Contract Documents.
2. Transmittal: Contractor shall forward to the Architect a complete sets of proposals with his recommendation regarding the proposals.
 - a. In making his recommendation, the Contractor shall certify that the price is appropriate and if it is not appropriate, he shall state the reasons for not certifying the price.

- b. Proposals, complete with all required information, shall be submitted to the Architect within three weeks of the date of the RFP in order to receive further consideration.

F. Architect Reviews:

1. The Architect reviews the Contractor's proposals for completeness and conformance with the RFP and Contract Documents. Those proposals, which are incomplete or have inadequate detailed breakdowns, will be returned to the Contractors for resubmissions.
2. Architect will review, and when appropriate, approve all price proposals, recommending that the Owner approve issuance of a change order.
3. When the Architect considers the costs or quantities to be inappropriate to the work requested, the Architect will notify the Contractor in writing of the concerns and the Contractor will provide the necessary back up materials to justify the submittal or modify the submittal.
4. Submittals not properly justified will not be forwarded to the Owner and written notice as to the reasons will be forwarded to the Contractor. After 30 days of said written notification and no further response by the Contractor, the request will be considered inappropriate and will receive no further consideration.

G. Architect Issuance of a Change Order:

1. The Architect, having received what he believes to be an appropriate and acceptable Contractor proposal for the proposed change, and having received the Owner's approval to issue a change order, will recommend the issuance of a Change Order.
2. The change order package prepared by the Architect for submittal to the Owner shall contain the following items:
 - a. Three originals of the Change Order for with the original signatures.
 - b. Originals of the Request for Proposal with the original signatures.
 - c. As applicable, one copy of drawings and specs.
 - d. On changes initiated by the Architect, a letter explaining the circumstances related to the need for the change.
 - e. On Owner requested change orders, a letter of request signed by the Owner's Representative.
 - f. Change Order Authorization Form for the Owner's Signature and permanent record in accordance with Public Act 85-1295.

H. Owner Approves (Disapproves) Change Order: For a change in Contract Sum and/or Contract Time.

- I. One copy of approved Change Order with original signatures will be returned to the Contractor, or notice and explanation as to why it has been rejected will be forwarded to the Contractor.

1.3 CORRELATION WITH CONTRACTOR'S SUBMITTALS

- A. Revise monthly Schedule of Values and Request for Payment forms to record each change as a separate item of Work and the record adjusted Contract Sum.

- B. Revise Construction Schedule monthly to reflect each change in Contract Time.
- C. Revise sub's schedules to show changes for other items of work affected by changes.
- D. Upon completion of work under Change Order enters pertinent changes in Project Record Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

**SECTION 01 29 00
PAYMENT PROCEDURES**

PART 1 - GENERAL

1.1 SUMMARY:

- A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.
 - 1. Coordinate the Schedule of Values and Applications for Payment with the Contractor's Construction Schedule, List of Subcontracts, and Submittal Schedule.
- B. The Contractor's Construction Schedule and Submittal Schedule are included in Section "Submittals".
- C. The Subcontractor shall submit its Applications for Payment to the Construction Manager for review.
- D. The Construction Manager shall review all Schedule of Values and Applications for Payment for all subcontractors before forwarding to the Architect for review, with any comments they may have in regard to such submittals.

1.2 SCHEDULE OF VALUES:

- A. The Construction Manager shall coordinate preparation of the Schedule of Values with all subcontractors.
 - 1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
 - a. Contractor's construction schedule.
 - b. Application for Payment form.
 - c. List of subcontractors.
 - d. Schedule of alternates.
 - e. List of products.
 - f. List of principal suppliers and fabricators.
 - g. Schedule of submittals.
 - 2. Submit the Schedule of Values to the Owner's Representative at the earliest feasible date, but in no case later than 7 days before the date scheduled for submittal of the initial Application for Payment.
- B. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.
 - 1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.

- b. Name of the Architect.
 - c. Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
- 2. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:
 - a. Generic name.
 - b. Related Specification Section.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that have affected value.
 - g. Dollar value.
 - h. Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent.
- 3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items.
- 4. Include a separate line item for scheduled allowance(s).
- 5. Round amounts off to the nearest whole dollar; the total shall equal the Contract Sum.
- 6. For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- 7. Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.
 - a. At the Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.
- 8. Schedule Updating: Update and resubmit the Schedule of Values when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT:

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Owner's Representative, Architect and paid for by the Owner.
 - 1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is typically the day following the fourth Monday of each month (corresponding to the date of regular Board of Education

meetings). The period of construction Work covered by each Application for Payment shall be the previous calendar month, prior to the date for submittal of pencil draw application for payment, and starting the day following the end of the preceding period.

1. Pencil draw applications for payment must be received by the Owner three (3) weeks before payment is due. Allow sufficient time for review by the Owner's Representative and by the Architect.
 2. Finalized applications for payment must be received by the Owner one (1) week before payment is due. Final Applications for Payment are to be fully executed originals, including all waivers and certified payroll. Allow sufficient time for delivery to Architect and processing of Final Applications for Payment for distribution to the Owner and Contractor.
- C. Payment Application Forms: Use AIA Document G 702 and Continuation Sheets G703 as the form for Application for Payment.
- D. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.
1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.
 2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
- E. Transmittal: Submit 3 executed copies of each Application for Payment to the Architect by means ensuring receipt within 24 hours; one copy shall be complete, including waivers of lien and similar attachments, when required.
1. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the Owner's Representative and the Architect.
- F. Waivers of Mechanics Lien: With each Application for Payment submit waivers of mechanics liens from subcontractors or sub- contractors and suppliers for the construction period covered by the previous application.
1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
 2. When an application shows completion of an item, submit final or full waivers.
 3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Delays: Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the application.
 - a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of Work covered by the application who could lawfully be entitled to a lien.

5. Waiver Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to Owner.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
1. List of subcontractors.
 2. List of principal suppliers and fabricators.
 3. Schedule of Values.
 4. Contractor's Construction Schedule (preliminary if not final).
 5. Schedule of principal products.
 6. Schedule of unit prices.
 7. Submittal Schedule (preliminary if not final).
 8. List of Contractor's staff assignments.
 9. List of Contractor's principal consultants.
 10. Copies of building permits.
 11. Copies of authorizations and licenses from governing authorities for performance of the Work.
 12. Initial progress report.
 13. Report of pre-construction meeting.
 14. Certificates of insurance and insurance policies.
 15. Performance and payment bonds (if required).
 16. Data needed to acquire Owner's insurance.
 17. Initial settlement surveys and damage report, if required.
- H. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Administrative actions and submittals that shall proceed or coincide with this application include:
1. Occupancy permits and similar approvals.
 2. Warranties (guarantees) and maintenance agreements.
 3. Maintenance instructions.
 4. Changeover information related to Owner's occupancy, use, operation and maintenance.
 5. Final cleaning.
 6. Application for reduction of retainage, and consent of surety.
 7. Advice on shifting insurance coverage's.
 8. Final progress photographs.
 9. List of incomplete Work, recognized as exceptions to the Certificate of Substantial Completion.
- J. Final Payment Application: Administrative actions and submittals, which must precede or coincide with submittal of the final payment Application for Payment, include the following:
1. Completion of Project closeout requirements.
 2. Completion of items specified for completion after Substantial Completion.

3. Assurance that unsettled claims will be settled.
4. Assurance that Work not complete and accepted will be completed without undue delay.
5. Transmittal of required Project construction records to Owner.
6. Proof that taxes, fees and similar obligations have been paid.
7. Removal of temporary facilities and services.
8. Removal of surplus materials, rubbish and similar elements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project Web site.
 - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 01 70 00 "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 2. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.

1.2 DEFINITIONS

- A. RFI: Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, on Project Web site, and by each temporary telephone. Keep list current at all times.

1.4 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, which depend on each other for proper installation, connection, and operation.
 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop

Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - c. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - d. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - e. Indicate required installation sequences.
 - f. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
 1. File Preparation Format: digital data file format to be industry standard “.DWG” format.
 2. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format, unless directed otherwise.
 3. Architect and consultants reserve the right to charge fees for digital data files provided to contractors for contractors’ convenience in developing shop drawings and documentation.
 - a. Architect and consultants make no representations as to the accuracy or completeness of digital data files.
 - b. Contractor shall execute a data licensing agreement in the form of AIA Document C106 or a CAD Waiver Agreement provided by Architect or consultants.

1.6 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect and Construction Manager.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716 or Software-generated form with substantially the same content as indicated above, acceptable to Architect.
1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action and Construction Manager's: Architect and Construction Manager will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect or Construction Manager after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures".

- a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly, unless directed otherwise. Use software log that is part of Project Web site.
- F. On receipt of Architect's and Construction Manager's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Construction Manager within seven days if Contractor disagrees with response.
 - 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT WEB SITE

- A. Use Construction Manager's Project Web site for purposes of hosting and managing project communication and documentation until Final Completion. Project Web site shall include the following functions:
 - 1. Project directory.
 - 2. Project correspondence.
 - 3. Meeting minutes.
 - 4. RFI forms and logs.
 - 5. Task and issue management.
 - 6. Photo documentation.
 - 7. Schedule and calendar management.
 - 8. Submittals forms and logs.
 - 9. Drawing and specification document hosting, viewing, and updating.
 - 10. Online document collaboration.
 - 11. Reminder and tracking functions.
 - 12. Archiving functions.
- B. Contractor, subcontractors, and other parties granted access by Construction Manager's to Project Web site shall execute a data licensing agreement in the form of AIA Document C106.

1.8 PROJECT MEETINGS

- A. General: Construction Manager will schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, Construction Manager, and Architect, within three days of the meeting.

- B. Preconstruction Conference: Construction Manager will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Preparation of record documents.
 - m. Use of the premises and existing building.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.
 - t. Construction waste management and recycling.
 - u. Parking availability.
 - v. Office, work, and storage areas.
 - w. Equipment deliveries and priorities.
 - x. First aid.
 - y. Security.
 - z. Progress cleaning.
 4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Construction Manager of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Construction Manager will schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

- a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of material samples, attic stock, and spare parts.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractor's punch list.
 - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - i. Submittal procedures.
 - j. Coordination of separate contracts.
 - k. Owner's partial occupancy requirements.
 - l. Installation of Owner's furniture, fixtures, and equipment.
 - m. Responsibility for removing temporary facilities and controls.
4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Construction Manager will conduct progress meetings at regular intervals.
- 1. Coordinate dates of meetings with preparation of payment requests.
 - 2. Attendees: In addition to representatives of Owner, Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.

- 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- F. Coordination Meetings: Construction Manager will conduct Project coordination meetings at regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
1. Attendees: In addition to representatives of Owner, Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.

- 10) Hazards and risks.
- 11) Progress cleaning.
- 12) Quality and work standards.
- 13) Change Orders.

- 3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 16
CONSTRUCTION PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 SUMMARY:

- A. Detailed Construction Schedule: Within 14 calendar days following Notice of Award the Construction Manager shall meet with the Owner and Architect to develop a detailed construction schedule by refining and expanding the pre-construction schedule criteria to conform to the specific plan of operations envisioned by the Contractors. The contractor will then prepare and distribute within the next 7 days the detailed construction schedule incorporating the work of all of the contractors and sub-contractors, as well as the time limitation for shop drawing preparation and approval, and the expected material purchasing and delivery durations.
- B. Each Sub-contractor shall cooperate with Construction Manager in furnishing information for preparation of construction schedule and participate in its creation.
- C. The contractor is to take special note of any activities, which involve disruption, or requiring access to existing facilities during the school year and obtain the owners approval prior to this disruption in advance.
- D. No work shall be done neither between 6:00 p.m. and 7:00 a.m. nor on Sundays or legal holidays without written permission of Owner. However, emergency work may be done without prior permission.

1.2 CONTENT OF SCHEDULE

- A. Construction Progress Schedule prepared by Construction Manager:
 - 1. Show complete sequence of construction by activity.
 - 2. Show dates for beginning and completion of each major element of construction and installation dates for major items of equipment. Elements shall include, but not limited to:
 - a. Shop drawing submissions from supplier/manufacturer, transmission to Architect, A/E review time, and return to supplier/manufacturer.
 - b. List major material and equipment orders, manufacturer, fabrication / lead time, anticipated delivery date, installation time, and checkout,
 - c. Material and performance testing and supervisory services activity.
 - d. Relocation of existing utilities, sewers, conduits, water mains, etc.
 - e. Major sub-contractor / trade contractor activities.
 - f. Site preparation and cleaning.
 - g. Building excavation and backfill.
 - h. Sub-structure and Slab on Grade.
 - i. Piping, duct work, and wiring installation.
 - j. Structural steel erection.
 - k. Concrete pour sequence.
 - l. Installation of exterior walls

- m. Installation of roof and weather tight integrity.
 - n. Precast concrete erection if applicable.
 - o. Electrical work activity.
 - p. Heating, ventilating, and air conditioning work activity.
 - q. Plumbing work activity.
 - r. Installation of site utilities and sewers. (storm and sanitary).
 - s. Start-up date for major MPE equipment.
 - t. Allowance for inclement weather.
 - u. Site grading, paving, concrete, and improvements.
 - v. Final cleanup.
 - w. Owner occupancy.
3. Update the schedule by showing the percentage of completion for each activity as of first day of each month.

1.3 SCHEDULE REVISIONS AND UPDATES

- A. Updates to the Construction Schedule: At the end of the first month and every two weeks thereafter, to completion, the Owner, the Contractors and major Subcontractors will meet at the job site to review and update the schedule. The Contractor shall have in attendance at these meetings personnel who are thoroughly familiar with the project and who have decision-making authority. They shall report the actual progress of the work to indicate status of each activity, determine the actual status of the project, and to mutually arrive at decisions or actions that may be required to maintain the projected schedule.
- B. Progress and revisions or change to the original detail construction schedule, if approved, will be made at this meeting. This information will provide the basis for generating an updated, current construction schedule, as well as the progress payment requests. Updated schedules shall be issued by the Construction Manager with the minutes of the meeting.
- C. Show changes occurring since previous revised submittal.
 - 1. Major changes in scope.
 - 2. Activities modified since previous submittal.
 - 3. Revised projections of progress and completion.
 - 4. Other identifiable changes.
- D. Provide a narrative report as needed to define:
 - 1. Problem areas, anticipated delay, and impact on schedule.
 - 2. Corrective action recommended and its effect.
 - 3. Effect of changes on schedules of other Contractors.

1.4 DELAYS AND RECOVERY

- A. Once a Contractor starts on any part of work which affects public convenience, health, or safety, he shall diligently and expeditiously prosecute such work until it is no longer in any respect a public inconvenience, health or safety hazard.

- B. If at any time during project the Contractor fails to maintain progress in accordance with the approved construction schedule it shall be considered cause for withholding of progress payments otherwise due under the Contract.
- C. Whenever it becomes apparent from progress evaluation and updated schedule data that milestone completion dates and/or contract completion dates will not be met, Contractor shall take some or all of the following actions:
 - 1. Increase construction manpower in such quantities and crafts as shall substantially eliminate the backlog of work.
 - 2. Increase number of working hours per shift, shifts per work day, work days per week, or amount of construction equipment, or combination of the foregoing sufficient to substantially eliminate the backlog work.
 - 3. Reschedule work items to achieve concurrency of accomplishment.
- D. Under no circumstances will the addition of equipment or construction forces, increasing the working hours or any other method, manner or procedures to return to the current Construction Progress Schedule be considered justification for additional compensation or treated as an acceleration.
- E. Contractors shall accept risk for delays caused by rate of progress of work to be performed under other Contracts. In the event Contractor is delayed in prosecution and completion of his work because of such conditions, he shall have no claim for damages or Contract adjustment.

1.5 SUBMITTAL REQUIREMENTS

- A. For initial submittal of construction schedule and subsequent revisions thereof, Construction Manager shall furnish six copies of schedule to Architect and one copy to each Contractor.
- B. Failure to prepare and submit construction schedules on a timely basis as previously noted shall be considered cause for withholding any of the progress payments otherwise due under Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. This section outlines in general the items that the Contractor must prepare or assemble for submittal during the progress of the work.
- B. Contractor's attention is directed to the individual specification section in these contract documents, which contain additional and special submittal requirements.

1.2 SHOP DRAWINGS

- A. Drawings:
 - 1. Present in a clear and thorough manner.
 - 2. Details shall be identified by reference to sheet and detail, schedule, or room numbers shown on drawings.
- B. Product Data:
 - 1. Clearly mark each copy to identify pertinent products or models.
 - 2. Performance characteristics and capacities (Test Results).
 - 3. Dimensions, weight, and clearances.
 - 4. Wiring or piping diagrams and controls.
 - 5. Location, direction, and magnitude of loads and vibrations to supporting structure.
 - 6. Product data for products requiring samples shall be submitted with sample.
- C. Manufacturer's Standard Schematic Drawings and Diagrams:
 - 1. Modify drawings and diagrams to delete information which is not applicable to work.
 - 2. Supplement standard information to provide information specifically applicable to work.

1.3 SAMPLES

- A. Samples shall accompany product data.
- B. Samples shall be of sufficient size and quantity to clearly illustrate:
 - 1. Functional characteristics of product, with integrally related parts and attachment devices.
 - 2. Full range of color, texture, and pattern.

1.4 CONTRACTOR RESPONSIBILITIES

- A. Review shop drawings and samples prior to submittal.

- B. Determine and Verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Catalog numbers and similar data.
 - 4. Conformance with specifications.
- C. Coordinate each submittal with requirements of work and of Contract Documents.
- D. Notify Architect in writing, at time of submittal, of deviations in submittals from requirements of Contract Documents.
- E. Begin no fabrication or work, which requires submittals until return of submittals with Architect approval.
- F. Designate in construction progress schedule dates for submittal and receipt of reviewed shop drawings and samples.

1.5 SUBMITTAL REQUIREMENTS

- A. Submit shop drawings and samples required by Contract Documents to Architect.
- B. Submit shop drawings and samples for products requiring color or finish selection in a timely manner to facilitate selection and coordination.
- C. Submit in accordance with construction progress schedule.
- D. Number of copies required:
 - 1. Shop Drawings to be submitted electronically in PDF file format to contacts provided at first progress meeting. All shop drawings will be returned to Contractor as PDF files with the exception of physical submittals for color/finish selections.
 - 2. In addition to PDF file format submittals, Contractor to submit two (2) hard copies of the following:
 - a. Any shop drawings intended to be viewed as full size drawing sheets (for example, structural steel, aluminum glazing details, HVAC ductwork or MEP/FP coordinated drawings, etc.).
 - b. Any shop drawing intended to be viewed as 8 ½"x 11 print containing more than 20-pages (for example, light fixture package, Test & Balance Report, etc.).
 - 3. In addition to PDF file format submittals, Contractor to submit a minimum of two (2) samples for physical submittals for color/finish selections. One sample will be retained by Architect for record, one sample will be returned to Construction Manager. If sub-contractors require physical submittals for record, provide additional samples as required.
- E. Submittals shall contain:
 - 1. Date of submittal and dates of previous submittals.

2. Project title and number.
3. Contract identification.
4. Names of:
 - a. Contractor.
 - b. Supplier.
 - c. Manufacturer.
5. Identification of product, with equipment identification numbers, motor numbers, and specification section number.
6. Field dimensions, clearly identified.
7. Relation to adjacent or critical features of work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
9. Identification of deviations from Contract Documents.
10. Identification of revisions of resubmittals.
11. An 8 in. by 3 in. blank space for Contractor and Architect stamps.
12. Contractor's stamp, signed, certifying contractor's review of submittal, verification of products, field measurement, field construction criteria, and coordination of information within submittal with requirements of work and of Contract Documents.

1.6 RESUBMITTAL REQUIREMENTS

- A. Make any corrections or changes in submittals required by Architect and resubmit unless specified.
- B. Shop Drawings and Product Data:
 1. Revise initial drawings or data and resubmit as specified for initial submittal.
 2. Indicate changes which have been made other than those requested by Architect.
- C. Samples: Submit new samples as required for initial submittal.
- D. The Contractor shall reimburse the Owner for all Architect fees for review of product data or shop drawings beyond the initial submittal review and one re-submittal.

1.7 DISTRIBUTION

- A. Distribute reproductions of shop drawings and copies of product data, which carry Architect's, stamp approval to:
 1. Job site file.
 2. Record documents file.
 3. Other affected Contractor.
 4. Subcontractors.
 5. Supplier or fabricator.
 6. Owner.
- B. Distribute samples which carry Architect's stamp of approval as directed by Architect.

1.8 ARCHITECT DUTIES

- A. Review submittals with reasonable promptness and in accordance with schedule.
- B. Affix stamp and signature, and indicate requirements for resubmittal or approval of submittal.
- C. Return submittals to Contractor for distribution or for resubmittal.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

**SECTION 01 33 01
ELECTRONIC FILES**

PART 1 - GENERAL

1.1 SUMMARY

- A. For all contractors who wish to obtain Electronic Files from the Architect and its consultants for use in Coordination, Shop Drawing and/or Record Drawing phases, the attached Electronic Files Release Agreement from STR Partners must be completed, signed, and returned to STR.
- B. Additional forms may be required from consultants and will be provided at time of request(s).

PART 2 - PARTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION



STR PARTNERS LLC
350 WEST ONTARIO STREET
SUITE 200
CHICAGO IL 60654
T 312.464.1444
F 312.464.0785
www.strpartners.com

ELECTRONIC FILES RELEASE AGREEMENT

For and in consideration of STR Partners LLC (STR) providing its Building Information Modeling and other Electronic Data (hereinafter "Electronic Files") to _____ (hereinafter "Recipient") for the project described as "_____", Recipient accepts the Electronic Files subject to the following terms and conditions:

The Electronic Files are provided for information purposes only in connection with the Recipient's performance of its responsibilities and obligations related to the completed Project (i.e. preparation of shop drawings for above-mentioned project, or the creation of the Recipient's model information for the coordination of systems for the above-mentioned project, and related collaboration); provided however, Recipient accepts and assumes all risk and responsibility with regard to any use of the Electronic Files, including but not limited to, readability, translation, compatibility, and alteration issues which may occur. Recipient understands and agrees that the hard copies of the final plans and specifications are the official Construction Documents, and STR does not represent that the Electronic Files are a complete and accurate representation of the hard copy Construction Documents.

The Electronic Files shall not be considered as having been created with full contemplation for how the Electronic Files may be used by the Recipient or by others besides STR. The Electronic Files have not been created by STR with the intent, either expressed or implied, for use by others and are provided only as a convenience with all risk, liability and responsibility assumed by Recipient.

Electronic Files are identified as computer generated information in an electronic format in the form of text, drafting, 2D graphics, 3D graphics, and Building Information Models (BIM).

In further consideration of such transfer, the Recipient hereby understands, acknowledges and agrees that such Electronic Files are solely for the Recipient's convenience and that STR makes no representations or warranties whatsoever about the accuracy of such Electronic Files. STR assumes no responsibility to maintain or keep current the Electronic Files for use by the Recipient.

The Electronic Files shall not be considered to be Contract Documents as defined by the General Conditions of the Contract for Construction, nor shall they be considered As-Built or record set of Drawings.

The use of Electronic Files shall be at the sole risk of the Recipient without liability, risk, or legal exposure to STR. As a condition of acceptance by the Recipient of Electronic Files, the Recipient agrees to release STR from any and all liabilities, claims, damages, losses, costs,

attorney's fees arising from the use of the Electronic Files and further agrees to defend, indemnify and hold harmless STR and all of its personnel and consultants from liabilities, causes of action, claims, damages, losses, and expenses, including attorney's fees resulting from and which are alleged to have resulted from any use or reuse of such Electronic Files by Recipient or any transferee of Recipient.

The Recipient agrees and understands further that all information on the Electronic Files are considered proprietary to STR, and are for the Recipient's use and benefit only for purposes of this Project. The Recipient agrees not to sell, lease, rent, or transfer to any other person or entity such drawings without STR's express prior written consent.

Use of the Electronic Files, in whole or in part, constitutes Recipient's agreement to the above statements.

Requested files:

Sheet _____

Sheet _____

Sheet _____

Sheet _____

Sheet _____

Sheet _____

Sheet _____

Sheet _____

Sheet _____

Sheet _____

IFC file _____ (check here)

Company Name: _____

Authorized Agent Name & Title: _____
(PRINT)

(SIGNATURE)

Date: _____

Company's Email Address or other On-line Access for electronic file delivery:

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDE

- A. Construction Manager:
 - 1. Coordinate work of crafts and subcontractors.
 - 2. Schedule elements of remodeling and renovation work to expedite completion.
 - 3. Schedule noisy or hazardous work to avoid problems with Owner's operations.
 - 4. In addition to demolition shown on drawings, cut, move or remove existing construction to provide access or to allow remodeling and new work to proceed. Include:
 - a. Repair/remove hazardous or unsanitary conditions.
 - b. Remove abandoned piping, conduit and wiring.
 - c. Remove all unsuitable or extraneous materials not marked for salvage, such as abandoned furnishings and equipment, and debris, such as rotted wood, rusted metals and deteriorated concrete.
 - 5. Clean surfaces: Remove surface finishes to install new work and finishes.
 - 6. Patch, repair and refinish existing items to remain, to the specified condition for each material, with a neat transition to adjacent new construction.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary of Work."
 - 2. Section 01 70 00 "Execution Requirements."

1.2 SEQUENCE AND SCHEDULES

- A. Schedule work in sequences and within times specified by Construction Manager.
- B. Submit separate detailed sub-schedule for alterations work, coordinated with Construction Manager Schedule. Show:
 - 1. Each stage of work; occupancy dates of areas.
 - 2. Date of Substantial Completion for each area of alteration work.
 - 3. Crafts and subcontractors employed in each stage.

1.3 ALTERATIONS, CUTTING AND PROTECTION

- A. Assign moving, removal, cutting and patching work to crafts qualified to perform the work in a manner to cause least damage to each type of work, and provide means of restoring surfaces to appearance of new work.
- B. Perform cutting/removal work to remove minimum necessary, and in a manner to avoid damage to adjacent work.

- C. Perform cutting and patching as specified in Section 01 70 00 "Execution Requirements."
- D. Protect existing finishes, equipment and adjacent work that is scheduled to remain, from damage.
- E. Protect existing and new work from weather and temperature extremes.
 - 1. Maintain the interior work above 60 degrees F.
 - 2. Provide weather protection, waterproofing, heat and humidity control to prevent any damage to remaining existing work and to new work.

PART 2 - PRODUCTS

2.1 SALVAGED MATERIALS

- A. Salvage sufficient quantities of cut or removed materials to replace damaged work of existing construction, when material is not readily obtainable on current market.
 - 1. Store salvaged items in a dry, secure place on site.
 - 2. Items not specified for use in any repair work remain property of Owner.
 - 3. Do not use salvaged or used material in new construction, except with a prior written authorization from Architect and Owner.

2.2 MATERIALS FOR PATCHING, EXTENDING AND MATCHING

- A. Ensure that work is complete.
 - 1. Provide same materials or types of construction as that is existing, to patch, extend or match existing work.
 - a. Contract Documents may not define products or standards of workmanship present in existing construction.
 - b. Determine products by inspection and testing.
 - c. Determine the workmanship by use of existing as sample of comparison.
 - 2. Presence of a product, finish or type of construction requires that patching, extending, or matching be performed to make Work complete and consistent to identical quality standards.

PART 3 - EXECUTION

3.1 REMOVE EXISTING CONSTRUCTION

- A. Remove and dispose of all existing construction indicated to be demolished.

3.2 PERFORMANCE:

- A. Patch and extend existing work using skilled craftsman capable of matching existing quality of workmanship. For patched or extended work, provide quality equal to that specified for new work.

3.3 ADJUSTMENTS

- A. Where partitions are removed, patch the floors walls and ceilings with finish materials to match existing as closely as possible.
 - 1. Where removal of partitions results in adjacent spaces becoming one, rework floors and ceiling to provide smooth planes without breaks, steps or bulkheads.
 - 2. Where extreme change of plane of two inches or more occurs, request instruction from Architect.

3.4 DAMAGED SURFACES

- A. Patch and replace all portions of existing finished surfaces found to be damaged, lifted, discolored or showing other imperfections, with matching material.
 - 1. Provide adequate support prior to patching the finish surfaces.
 - 2. Refinish patched portions of painted or coated surfaces in a manner to produce uniform color and texture over entire surface.
 - 3. When the existing surface cannot be matched, refinish entire surface to nearest intersections.

3.5 TRANSITION FROM EXISTING TO NEW WORK

- A. When new work abuts or finishes flush with existing work, make a smooth transition. Patched work shall match existing adjacent work in both texture and appearance as closely as possible.

3.6 CLEANING

- A. Perform construction cleaning as directed by Construction Manager.
 - 1. Clean Owner-occupied areas daily.
 - 2. Clean all the spillage, overspray, and heavy dust collections in Owner-occupied areas immediately.
- B. At completion of work of each craft, clean area and make surfaces ready for work of successive crafts.
- C. At completion of alterations work in each area, provide final cleaning in accord with Construction Manager instructions and return space to a condition suitable for use of Owner.

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section establishes quality control standards for the project.

1.2 REGULATORY REQUIREMENTS FOR TESTING AND INSPECTION

- A. Building Code Requirements: Comply with requirements for testing and inspections of applicable codes, including additional requirements for testing and inspection, as adopted and interpreted by local authorities having jurisdiction, including the Illinois State Board of Education.
- B. Requirements of Fire-Protection Authorities: Comply with testing and inspection requirements of the State Fire Marshall and local Fire Marshal having jurisdiction.

1.3 QUALITY CONTROL

- A. Contractor's Quality Control: The Contractor shall ensure that products, services, workmanship and site conditions comply with the requirements of the Contract Documents by coordinating, supervising, testing and inspecting the Work and by utilizing only suitably qualified personnel.
- B. Contractor Quality: The Contractor shall employ people and companies expert in and with documented experience and success in their craft or trade to perform the Work.
- C. Quality Requirements: Work shall be accomplished in accordance with quality requirements of the Contract Documents, including by reference, all applicable codes, laws, rules, regulations, standards, manufacturer's instructions and recommendations, and published trade standards. When no quality basis is prescribed, the quality shall be in accordance with the best-accepted practices of the construction industry for the trade and location of the Work for projects of this type.
- D. Quality of Products: Unless otherwise indicated, or specified, all products shall be new, free of defects and fit for the intended purpose.
- E. Quality of Installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, with proper alignment and relationship between the various adjacent elements.
- F. Protection of Existing and Completed Work: The Contractor shall take all measures necessary to preserve and protect the existing and completed Work free from damage, deterioration, soiling and staining and exposure to ultraviolet light, until acceptance of the Work by the Owner.

- G. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building codes requirements in preparing, fabricating, erecting, installing, applying, connecting and finishing the Work.
- H. Deviations from Standards and Code Compliance and Manufacturers Instructions and Recommendations: Document and explain all deviations from reference standards and building code requirements and manufacturer's product installation instructions and recommendations, including acknowledgement by the manufacturer that such deviations are acceptable and appropriate for the Project.
- I. Verification of Quality: Work shall be subject to verification of quality by the Owner, Architect and/or Architect's consultants in accordance with the provisions of the Conditions of the Contract.

1.4 INSPECTIONS AND TESTS

- A. The Contractor shall cause all tests and inspections required by authorities having jurisdiction to be made for Work under this Contract, including those by the Regional Office of Education, Building Department, Local Public Works Department, Fire-Protection District, Health Department or similar agencies.
- B. The Contractor shall cause all tests and inspections required by the serving utilities to be made for Work under the Contract.
- C. The Contractor shall cause all specified or Architect-requested tests and inspections to be conducted by materials or systems manufacturers. Additionally, all tests and inspections required by materials or systems manufacturers as conditions of warranty or certification of Work shall be made.

PART 2 - PARTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

DIN	Deutsches Institut fur Normung e.V. www.din.de	49 30 2601-0
IAPMO	International Association of Plumbing and Mechanical Officials www.iapmo.org	(909) 472-4100
ICC	International Code Council www.iccsafe.org	(888) 422-7233
ICC-ES	ICC Evaluation Service, Inc. www.icc-es.org	(800) 423-6587 (562) 699-0543

- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CPSC	Consumer Product Safety Commission www.cpsc.gov	(800) 638-2772 (301) 504-7923
EPA	Environmental Protection Agency www.epa.gov	(202) 272-0167
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
USPS	Postal Service www.usps.com	(202) 268-2000

- D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from U.S. Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.gpoaccess.gov/cfr/index.html	(866) 512-1800 (202) 512-1800
FS	Federal Specification Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil/ Available from Defense Standardization Program www.dsp.dla.mil Available from General Services Administration www.gsa.gov Available from National Institute of Building Sciences www.wbdg.org/ccb	(215) 697-2664 (202) 619-8925 (202) 289-7800
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section incorporates the provisions of the Illinois State Board of Education's Health / Life-Safety Handbook, Chapter 1: Building Permit / Certificate of Occupancy Process. The scope requires on-site inspections for the purpose of the completion of Inspection Statements and Confirmation of Called Inspection Records by a licensed Architect or Engineer, or inspector prequalified by the Illinois State Board of Education.
- B. The Owner will contract with an Inspector to fulfill the ISBE's required Called Inspections and to ensure that inspectors are certified in the requested areas of inspection. ISBE Inspector to complete and sign all code required forms; the Design Team does NOT complete nor sign any forms.
- C. It is the Trade Contractor's responsibility to coordinate with the Construction Manager and Owner's Inspection agency to ensure inspections occur in sequence with the construction progress.

1.2 REFERENCES

- A. Illinois State Board of Education, Notice of Adopted Amendments, Title 23: Education and Cultural Resources, Subtitle A: Education; Subchapter d: Construction and Building Maintenance; Part 180, Health/Life Safety Code for Public Schools
- B. Illinois State Board of Education's Health / Life-Safety Handbook. - Latest Edition
- C. 2018 Illinois Accessibility Code (71 Ill. Adm. Code 400)
- D. 2015 OSFM (Office of the State Fire Marshal) rules titled Illinois Elevator Safety Rules (41 Ill. Admin. Code 1000)
- E. 2015 Illinois Plumbing Code (77 Ill. Admin. Code 890) Effective April 24, 2014
- F. 2013 OSFM Boiler and Pressure Vessel Safety Rules (41 Ill. Admin. Code 120) Effective August 1, 2013
- G. ICC/NSSA Standard for the Design and Construction of Storm Shelters (ICC 500-2014), published jointly by the International Code Council and the National Storm Shelter Association
- H. 2024 International Building Code (IBC) and 2024 International Existing Building Code (IEBC)
 - 1. ICC/NSSA Standard for the Design and Construction of Storm Shelters (ICC 500-2014), published jointly by the International Code Council and the National Storm Shelter Association shall apply instead of the provisions contained in Section 423
 - 2. 2018 Illinois Accessibility Code (71 Ill. Adm. Code 400) shall apply instead of the accessibility provisions set forth in Chapter 11

3. Illinois Plumbing Code (77 Ill. Admin. Code 890) and Section 405.3.1 of the 2015 International Plumbing Code shall apply instead of the plumbing provisions set forth in Section 101.3.2 of Chapter 1 and incorporated in Chapter 35
 4. 2015 Illinois State Fire Marshal's rules titled Illinois Elevator Safety Rules (41 Ill. Admin. Code 1000) shall apply instead of the elevator provisions in the IBC
 5. 2014 Illinois OSFM Compliance Standards for Sprinkler Systems (41 Ill. Admin. Code 109.110) shall apply in conjunction with sprinkler requirements set forth in Section 22-23 of the School Code, the IBC, and the IFC.
- I. 2023 National Electric Code (NEC) (NFPA70), as referenced by 2024 IBC
 - J. 2024 International Energy Conservation Code (IECC)
 - K. 2024 International Fire Code (IFC), excluding Chapter 4
 1. Joint Rules of the Office of the State Fire Marshal and the Illinois State Board of Education: School Emergency and Crisis Response Plans (29 Ill. Admin. Code 1500) shall apply instead of Chapter 4
 - L. 2024 International Mechanical Code (IMC), excluding Chapter 20
 1. Illinois State Fire Marshal's rules titled Boiler and Pressure Vessel Safety Rules (41 Ill. Admin. Code 120) shall apply instead of those provisions set forth in Chapter 20 of the International Mechanical Code
 - M. 2024 International Fuel Gas Code (IFGC)

1.3 QUALITY ASSURANCE

- A. Qualifications:
 1. The Owner shall engage an independent (third-party) architect or professional engineer (PE) licensed to practice in the State of Illinois, or a qualified inspector, certified by the Illinois State Board of Education

1.4 PROJECT CONDITIONS

- A. Coordinate site visits for investigations at the stage of construction appropriate to and consistent with the requirements set forth in the Inspection Statements (Form 36-36) and Confirmation of Called Inspection Records (Form 36-37).

1.5 COORDINATION

- A. Coordinate and schedule site visits with the Construction Manager.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine the Contract Documents to become familiar with Project requirements and sequence of construction.
 - 1. Contract Documents are defined in the General and Supplementary Conditions of Contract.
- B. Be familiar with the requirements set forth in the Inspection Statements (Form 36-36) and Confirmation of Called Inspection Records (Form 36-37).
- C. Discuss construction schedule with Construction Manager. Coordinate inspection visits with the Construction Manager so that visits coincide with ISBE requirements.

3.2 INSPECTIONS

- A. Visit the site and review construction as called for on Inspection Statements (Form 36-36) and Confirmation of Called Inspection Records (Form 36-37).
- B. Report deficiencies discovered before and during performance of inspections. Submit report to the Architect and Construction Manager. Keep a log documenting these construction deficiencies.
- C. Sign-off on forms only when construction has been completed to the satisfaction of the inspector and/or when construction has been performed in accordance with the Contract Documents.
- D. Maintain an up-to-date progress original of the Inspection Statements (Form 36-36) and Confirmation of Called Inspection Records (Form 36-37).
- E. Upon completion of the inspection work, Construction Manager shall submit forms to Architect.

PART 4 - FORMS

4.1 Refer to the ISBE forms 36-36 and 36-37 attached.

Project # _____

INSPECTION STATEMENTS

Illinois Elevator Safety Inspection Statement
Current OSFM Illinois Elevator Safety Rules (41 Ill. Adm. Code 1000) as of January 1, 2025

Based upon my survey of the project at or within the _____ (facility name), I find and hereby certify that the project has been inspected as required by the current OSFM Illinois Elevator Safety Rules, 41 Ill. Adm. Code 1000, as of January 1, 2025.

☐ NOT APPLICABLE _____ (initial)

Design Professional Name Firm

Design Professional Signature Date

(Seal)

IBPVS Inspection Statement
Current OSFM Boiler and Pressure Vessel Safety Rules (41 Ill. Admin. Code 2120) as of January 1, 2025

Based upon my survey of the project at or within the _____ (facility name), I find and hereby certify that the project has been inspected as required by the current OSFM Boiler and Pressure Vessel Safety Rules (41 Ill. Adm. Code 2120), as of January 1, 2025

☐ NOT APPLICABLE _____ (initial)

Design Professional Name Firm

Design Professional Signature Date

(Seal)

IPC Inspection Statement
Current Illinois Plumbing Code (77 Ill. Admin. Code 890) as of January 1, 2025

Based upon my survey of the project at or within the _____ (facility name), I find and hereby certify that the project has been inspected as required by the current Illinois Plumbing Code (77 Admin. Code 890) as of January 1, 2025.

☐ NOT APPLICABLE _____ (initial)

Design Professional Name Firm

Design Professional Signature Date

(Seal)

(1/25) Form 36-36 (for use in confirming inspections have been conducted for other Illinois Agency codes)

Project # _____

CONFIRMATION OF CALLED INSPECTION RECORDS

2024 International Building Code Called Inspection Records ☐ NOT APPLICABLE (initial)

	Called Inspection Type	Approval to Proceed Date	A/E or Qualified Inspector Signature	ISBE ID Number or A/E License Number
1.	Footing			
2.	Foundation			
3.	Concrete Slab / Under-floor			
4.	Lowest Floor Elevation			
5.	Framing			
6.	Lathe and Gypsum Board			
7.	Fire Resistant Penetrations			
8.	Energy Efficiency			
9.	Special Inspection			
10.	Final IBC			

2024 International Electrical Code (Appendix K) Called Inspection Records ☐ NOT APPLICABLE (initial)

	Called Inspection Type	Approval to Proceed Date	A/E or Qualified Inspector Signature	ISBE ID Number or A/E License Number
1.	Prefabricated Assembly Evaluation Report			
2.	Underground			
3.	Rough-in			
4.	Final IEC			

2024 International Energy Conservation Code Called Inspection Records ☐ NOT APPLICABLE (initial)

	Called Inspection Type	Approval to Proceed Date	A/E or Qualified Inspector Signature	ISBE ID Number or A/E License Number
1.	Foundation (thermal envelope)			
2.	Framing (thermal envelope)			
3.	Insulation (thermal envelope)			
4.	Rough-in "Okay to Cover" (mechanical, service water heating, electrical, lighting)			
5.	Final (mechanical, service water heating, electrical, lighting)			
6.	Final IECC			

2024 International Fire Code Called Inspection Records ☐ NOT APPLICABLE (initial)

	Called Inspection Type	Approval to Proceed Date	A/E or Qualified Inspector Signature	ISBE ID Number or A/E License Number
1.	Final IFC			

2024 International Mechanical and Fuel Gas Code Called Inspection Records ☐ NOT APPLICABLE (initial)

	Called Inspection Type	Approval to Proceed Date	A/E or Qualified Inspector Signature	ISBE ID Number or A/E License Number
1.	Prefabricated Assembly Evaluation Report			
2.	Underground Piping			
3.	Rough-in			
4.	Final IMC & IFGC			

(12/24) Form 36-37 (Prescribed by Regional Superintendent for local board use)

180.220

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for products selected under an allowance.
 - 2. Section 01 63 50 "Substitution Procedures" for requests for substitutions.
 - 3. Section 01 42 00 "References" for applicable industry standards for products specified.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor through Construction Manager of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Section 01 33 00 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 33 00 "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.
 2. Store materials in a manner that will not endanger Project structure.

3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements set forth by the project schedule.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
4. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience.
 - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01635 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
 - 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 - 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION

**SECTION 01 70 00
EXECUTION REQUIREMENTS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for limits on use of Project site.
 - 2. Section 01 33 00 "Submittal Procedures" available from Construction Manager for submitting surveys.
 - 3. Section 07 84 13 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- C. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.

2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 4. Dates: Indicate when cutting and patching will be performed.
 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- E. Certified Surveys: Submit two copies signed by land surveyor.
- F. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.4 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

- C. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 01 31 00 "Project Management and Coordination."
- E. Surface and Substrate Preparation: Comply with manufacturer's written recommendations for preparation of substrates to receive subsequent work.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.

5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect or Construction Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect and Construction Manager before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

- E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.

2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
 - J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.

- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 - 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 50 00 "Construction Facilities and Temporary Controls."

- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

**SECTION 01 77 00
CLOSEOUT PROCEDURES**

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
 - 1. Substantial Completion procedures.
 - 2. Final Acceptance Procedures.
 - 3. Operating and Maintenance Instructions.
 - 4. Final cleaning.
- B. Related Requirements:
 - 1. Section 01 78 23 "Operation and Maintenance Data."
 - 2. Section 01 78 39 "Project Record Documents."
 - 3. Section 01 79 00 "Demonstration and Training."

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting review for certification of Substantial Completion, each Prime Contractor shall complete the following. List exceptions in the request.
 - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
 - 4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
 - 5. Deliver tools, spare parts, extra stock, and similar items.
 - 6. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
 - 7. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
 - 8. Notify Owner's Representative and Architect and General Construction Contractor that project is ready for review.

- B. Review Procedures: On receipt of a request for review, the Architect and Owner's Representative will either proceed with review or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following review, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. The Architect will repeat review when requested and assured that the Work has been substantially completed.
 - a. The Contractor shall reimburse the Owner for all Architect fees for additional services necessitated by the Architect being required to make Substantial Completion reviews beyond the initial review and one re-review.
 2. Results of the completed review will form the basis of requirements for final acceptance.

1.3 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final review for certification of final acceptance and final payment, Contractor shall complete the following. List exceptions in the request.
1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations were required.
 2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
 3. Submit a certified copy of the Architect's final review list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
 4. Submit final meter readings for; utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the Work.
 5. Submit consent of surety to final payment.
 6. Submit a final liquidated damages settlement statement.
 7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Re-review Procedure: The Architect will re-review the Work upon receipt of notice that the Work, including review list items from earlier reviews, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.
1. Upon completion of re-review, the Architect will prepare a certificate of final acceptance, or advise the contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, re-review will be repeated.
 - a. The Contractor shall reimburse the Owner for all Architects' fees for additional services necessitated by the Architect being required to make final acceptance reviews beyond one final review and one additional re-review.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
1. Maintenance manuals.
 2. Record documents.
 3. Spare parts and materials.
 4. Tools.
 5. Lubricants.
 6. Fuels.
 7. Identification systems.
 8. Control sequences.
 9. Hazards.
 10. Cleaning.
 11. Warranties and bonds.
 12. Maintenance agreements and similar continuing commitments.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
1. Complete the following cleaning operations before requesting review for Certification of Substantial Completion.
 - a. Remove labels that are not permanent labels.
 - b. Clean transparent materials, including mirrors and glasses in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
 - d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - e. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

- C. Pest Control: Engages an experienced exterminator to make a final review, and rid the Project of rodents, insects and other pests.
- D. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.
- E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
 - 1. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Coordinate with Construction Manager for additional requirements or procedures.

1.2 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section to Construction Manager.
 - 1. Construction Manager will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file: Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Construction Manager/Owner.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.

- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Construction Manager will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Construction Manager will return copy with comments.
 - 1. Correct or revise each manual to comply with Construction Manager's comments. Submit copies of each corrected manual within 15 days of receipt of Construction Manager's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
 - 1. List of documents.
 - 2. List of systems.
 - 3. List of equipment.
 - 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."
- F. Coordinate with Construction Manager for additional requirements or procedures.

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.

2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Construction Manager.
 7. Name and contact information for Architect.
 8. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 9. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Coordinate with Construction Manager for additional requirements or procedures.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
1. Type of emergency.

2. Emergency instructions.
 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.
- E. Coordinate with Construction Manager for additional requirements or procedures.

2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.
- F. Coordinate with Construction Manager for additional requirements or procedures.

2.5 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.

- 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.
- G. Coordinate with Construction Manager for additional requirements or procedures.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.

4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.
- I. Coordinate with Construction Manager for additional requirements or procedures.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Section 01 78 39 "Project Record Documents."
- G. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 01 70 00 "Execution Requirements" for final property survey.
 - 2. Section 01 77 00 "Closeout Procedures" for general closeout procedures.
 - 3. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

- A. Record Product Data: Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- B. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- C. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect and Construction Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings or as required by Owner. Coordinate with Architect/Owner.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 4. Refer instances of uncertainty to Architect through Construction Manager for resolution.
 5. Architect will furnish Contractor digital data files of the Contract Drawings for use in recording information.

- a. See Section 01 33 01 "CADD Drawings" for requirements related to use of Architect's digital data files.
 - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Format: Annotated PDF electronic file with comment function enabled.
 - 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 - 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 - 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Include changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as annotated PDF electronic file.

1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's and Construction Manager's reference during normal working hours.

END OF SECTION

SECTION 01 79 00
DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.

1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator and instructor.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name and address of videographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Name of Construction Manager.
 - f. Date of video recording.

2. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
3. At completion of training, submit complete training manual(s) for Owner's use in PDF electronic file format on compact disc.

1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Preinstruction Conference: Conduct conference at Project site to comply with requirements of Construction Manager. Review methods and procedures related to demonstration and training including, but not limited to, the following:
 1. Inspect and discuss locations and other facilities required for instruction.
 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 3. Review required content of instruction.
 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
 - 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 - 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.

- e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
- a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
- a. Diagnostic instructions.
 - b. Test and inspection procedures.
7. Maintenance: Include the following:
- a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
8. Repairs: Include the following:
- a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."

- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
 - 3. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral performance-based test.
- F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Video: Provide minimum 640 x 480 video resolution converted to .mp4 format file type or format file type acceptable to Owner, on electronic media.
 - 1. Electronic Media: Read-only format compact disc acceptable to Owner, with commercial-grade graphic label.
 - 2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.

3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
 4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:
 - a. Name of Contractor/Installer.
 - b. Business address.
 - c. Business phone number.
 - d. Point of contact.
 - e. E-mail address.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
1. Film training session(s) in segments not to exceed 15 minutes.
 - a. Produce segments to present a single significant piece of equipment per segment.
 - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
 - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
1. Furnish additional portable lighting as required.
- E. Narration: Describe scenes on video recording by audio narration by microphone while or dubbing audio narration off-site after video recording is recorded. Include description of items being viewed.
- F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- G. Pre-produced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION

DIVISION 02
EXISTING CONDITIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section covers the demolition and removal of existing pavements and other construction to the extent shown in the Contract Drawings.

1.2 REGULATORY REQUIREMENTS

- A. Comply with local, state and federal codes, rules and regulations applicable to demolition work but not limited to erosion control, air pollution, noise pollution, and waste disposal.
- B. Contractor shall pay for and acquire all permits that may be required for demolition work.

1.3 UTILITY LOCATION AND PROTECTION

- A. Contractor, prior to any excavation or demolition, shall notify:
 - 1. A designated locating service;
 - 2. All utilities, governmental agencies, entities, known to, or which can reasonably be assumed to have items within limits of project; to locate and mark location of such items.
- B. **Public Utilities:** Contractor shall be responsible for locating and protecting all public utilities during the duration of the construction process. Any damage to these utilities resulting from the Work of this Contract shall be the responsibility of the Contractor.
- C. **Private Utilities:** Contractor shall be responsible for locating and protecting all known private utilities during the duration of the construction process. Any damage to these utilities resulting from Work of this Contract shall be the responsibility of Contractor.
 - 1. Coordinate with Owner to locate existing irrigation lines and take reasonable measures to protect those lines, connections and equipment during the course of construction.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Reference Contract Drawings for site demolition notes identifying components to be removed and replaced.
- B. Prevent movement or settlement of adjacent structures scheduled to remain and protect, as necessary, all structures which are not to be demolished.
- C. Cooperate and work with local utility companies to provide disconnection or abandonment of designated utility services.

- D. Provide layout and staking necessary to perform all Work, including replacement of curbing and pavements in existing locations, where indicated for adjustment in the Contract Drawings.

3.2 DEMOLITION AND REMOVAL

- A. Except where specified in other sections, all materials and equipment removed, and not reused or salvaged shall become property of Contractor.
- B. Demolish and remove from site designated structures, pavements, walks and appurtenances in accordance with removal procedure and schedule.
- C. Cease operations and notify Architect immediately if adjacent structures or landscape features are affected by the Work.
- D. Remove and properly dispose of all materials encountered in a timely manner.
- E. Do not burn or bury materials on site.
- F. Demolish and remove all pavements in areas designated on the Construction Drawings.
- G. Neatly saw cut pavement edges at right angle to surface to complete depth of pavement prior to shattering, breaking or mechanical removal.
- H. Keep work sprinkled to minimize dust. Coordinate with Owner for water usage.
- I. Compact areas affected by demolition and removals to maintain proper density.
- J. Perform removals without damage to adjacent pavements or structures.

3.3 SOIL REMOVAL

- A. Stockpile topsoil to be re-used on site; remove remainder from Project site.
- B. Stockpile subsoil to be re-used on site; remove remainder from Project site.
- C. Stockpiles: Use areas designated on site; pile depth not to exceed 8-feet; protect from erosion.

3.4 ROUGH GRADING

- A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.
- B. Do not remove topsoil when wet.
- C. Refer to Section 31 23 16 - "Excavation and Fill" for filling and compaction procedures.

END OF SECTION

DIVISION 31
EARTHWORK

SECTION 31 23 16
EXCAVATION AND FILL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Pulverization-in-place of existing pavements.
- B. Excavation for paving and stabilization of unstable sub-base, as required.
- C. Materials and placement requirements for new aggregate base course, or fine grading of existing aggregate base course, under specified pavements.
- D. Removal, storage and placing of subsoil and topsoil fill materials.

1.2 RELATED REQUIREMENTS

- A. Refer to Division 01 for Allowance and Unit Pricing procedures for additional work performed under a unit price payment method.
- B. Section 02 41 00 - Site Demolition: Pavement removals.
- C. Trenching, backfilling, and compacting shall be done in accordance with the local jurisdictional requirements.

1.3 REFERENCES

- A. Work under this Section shall be in accordance with applicable provisions of the State of Illinois Department of Transportation (IDOT), "Standard Specifications for Road and Bridge Construction", current edition, except as herein modified. Wherever the term "Standard Specifications" is used, it shall refer to that IDOT Specification.
 - 1. **Exception:** This contract is a lump sum contract and the items, methods of measurements and basis of payment shall not apply.
- B. ASTM International Standards, latest editions unless otherwise stated:
 - 1. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - 2. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

1.4 SUBMITTALS

- A. Prior to delivering aggregate base materials, submit the following information:
 - 1. Certified gradation reports.
 - 2. Name and location of supplier.

- B. Provide to Architect, a copy of aggregate shipping/load tickets for materials installed during the course of the project, indicating: Project name, address, job number, date and time of delivery.

1.5 QUALITY ASSURANCE

- A. Prior to the start of construction, Contractor shall attend a pre-construction meeting with the Owner, Construction Manager and Architect.
- B. Proof rolling: Shall be performed with a truck similar in size and gross weight as that used in paving operations.
 - 1. Expectation is that the truck will be loaded and weigh approximately 70,000-lbs.
 - 2. Proof rolls with other equipment, such as roller, tractors, graders, etc. will not be considered sufficient.
- C. Tolerances:
 - 1. Top Surface of Subgrade: Plus, or minus 1/10-foot from required elevation.
 - 2. Scheduled Compacted Thickness: Within 1/4 inch.
 - 3. Aggregate Flatness: Maximum variation of 1/2 inch measured with 10 foot straight edge.
 - 4. Variation from True Elevation: Within 0.03 feet of approved grades.

PART 2 - PRODUCTS

2.1 AGGREGATE MATERIALS

- A. Dense Graded Aggregate Base (DGAB) for base stabilization:
 - 1. Coarse Aggregate for Base Course Construction: Conform to Standard Specifications.
 - a. Porous Granular Embankment (PGE) – Crushed limestone, recycled concrete or approved equivalent.
 - 2. Fine Aggregate Base for Course Construction: Conform to Standard Specifications.
 - a. CA-6 – Crushed limestone or approved equivalent.
- B. Open Graded Aggregate (OGA):
 - 1. Open Graded Aggregate for drainage: Conform to Standard Specifications.
 - a. CA-7 – Crushed limestone or recycled concrete.
 - b. CA-16 – Crushed limestone or recycled concrete.

2.2 FILL MATERIALS

- A. Subsoil Fill: Materials excavated on-site, or similar.
 - 1. Graded.
 - 2. Free of lumps larger than three inches, rocks larger than two inches, and debris.

- B. Topsoil: Sufficient topsoil to complete seeding of turf.
 - 1. Shall be weed-free, natural, fertile and friable soil possessing the characteristics of representative productive soil in the vicinity.
 - 2. Obtain from naturally well-drained areas.
 - 3. Shall not be excessively acid or alkaline or contain toxic substances which may be harmful to plant growth.
 - 4. Shall be without admixtures of stones, stumps, roots, debris or other objects one inch or more in diameter which might be a hindrance to planting preparation.
 - 5. Topsoil present on-site, if meeting all requirements above, may be utilized.

2.3 DRAINAGE MATERIALS

- A. Sub-surface drainage piping: SDR 35 PSM gasket or solvent-weld pipe with a minimum PS 46, complying with ASTM D3034, by:
 - 1. Advanced Drainage Systems, Inc.; ads-pipe.com.
 - 2. Charlotte Pipe and Foundry Company; charlottepipe.com.
 - 3. JM Eagle; jmeagle.com.
 - 4. Or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. Compact cohesive subgrade in accordance with Standard Specifications.
- B. All compaction shall extend 12 inches beyond proposed edge of pavement unless otherwise indicated. Includes asphalt, concrete flatwork, and concrete curb and gutter.

3.2 PREPARATION

- A. Locate, identify, and protect from damage above- and below-grade utilities to remain.
- B. Stake and flag locations of known utilities.

3.3 PULVERIZATION IN PLACE (EXISTING PAVEMENTS)

- A. Pulverize the existing asphaltic pavement full depth, and to a minimum of 97-percent passing a 2-inch screen.
- B. In addition, pulverize the existing crushed aggregate base course to a depth of four to 4 to 6-inches and mix with the asphaltic material.
- C. Prior to paving, the pulverized material shall be graded smooth to the lines, elevations, and slopes as shown on Contract Drawings and as marked in the field.

- D. The re-laid, pulverized material shall be compacted in the following sequence:
 - 1. First, with a pads-foot roller;
 - 2. Second, with a vibratory steel roller;
 - 3. Water shall be added prior to and during compaction, as required.
- E. Compaction requirements:
 - 1. Each layer shall be compacted to 95-percent in accordance with ASTM D1557.
 - 2. For a compacted lift thickness of pulverized material up to 6-inches, compaction equipment shall be in accordance with Standard Specifications.
 - 3. For a compacted lift thickness of pulverized material between 6 and 8-inches, compaction shall be performed using 12-ton vibratory pads-foot roller and 8-ton vibratory steel roller.
 - 4. For thicknesses greater than 8-inches, remove material and re-install in multiple, compacted layers as described herein.
- F. Excess material:
 - 1. Remove and dispose of any excess pulverized material that cannot be balanced on site.

3.4 EXCAVATION AND PREPARATION (EXISTING PAVEMENTS)

- A. Following removal of existing pavements, where the underlying aggregate base or sub-base is exposed, Contractor shall be responsible for:
 - 1. Proof rolling to establish stability; proof-roll operations shall be witnessed by the Construction Manager or other Representative of the Owner.
 - 2. Undercutting of areas of instability, as confirmed by the Architect or Construction Manager, down to sub-base that is firm and unyielding.
 - a. Obtain approval for additional work from the Construction Manager or other Representative of the Owner prior to proceeding.

3.5 STABILIZATION

- A. Verify that sub-base is firm and unyielding prior to placement of any aggregates.
- B. **Note:** Bituminous concrete may be utilized for stabilization, in lieu of aggregate, where acceptable to the Owner and Architect.
- C. Placing of Dense Graded Aggregate Base (DGAB):
 - 1. Bring base course to indicated depths and profiles. Place in layers not exceeding eight inches in depth.
 - 2. Properly compact areas adjacent to areas not accessible to rollers with mechanical or hand tamping devices.
 - 3. Add water as necessary during compaction to bring aggregate to optimum moisture content. When an excess of moisture exists, rework stabilizing base course materials until

optimum moisture content is obtained.

4. Fine-grade and compact to 95-percent in accordance with ASTM D1557. Add water as necessary during compaction to bring aggregate to optimum moisture content.

3.6 INSTALLATION OF SUBSURFACE DRAINAGE PIPING

- A. Place open-graded aggregate (OGA) in bottom of trench, to required depths and profiles. Place in layers not exceeding 8-inches in depth and compact until no further visible consolidation occurs.
 1. Utilize mechanical or hand tamping devices.
- B. Install piping to slope gradients required for proper drainage, with maximum variation from true slope of 1/8-inch in 10-feet.
- C. Place piping over completed open-graded aggregate bedding material, centered in trench.
- D. Protect piping and excavation trench from damage or displacement until backfilling operation is completed.
- E. Install open-graded aggregate at sides and over top of drainage piping and compact.

3.7 INSTALLATION OF AGGREGATE BASE

- A. Preparation:
 1. Identify required lines, levels, contours, and datum.
 2. Correct irregularities in subgrade gradients and elevation by scarifying, reshaping, and re-compacting.
 3. Do not place aggregate on soft, muddy, or frozen surfaces.
- B. Place aggregate, to indicated depths and profiles, in layers not exceeding eight inches in depth. Roller compact to specified density.
 1. Compact to 95-percent in accordance with ASTM D1557 or IDOT requirements.
 2. Properly compact areas adjacent to curbs, catch basins, manholes, and other areas not accessible to rollers with mechanical or hand tamping devices.
- C. Level and contour surfaces to elevations and gradients indicated or required.
 1. Fine grade to accommodate placement of pavement at proposed finish elevations and slopes.
- D. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.
- E. Add water as necessary during compaction to bring aggregate to optimum moisture content.
 1. When an excess of moisture exists, rework stabilizing base course materials until optimum moisture content is obtained.

3.8 PLACING OF FILL MATERIALS

- A. In areas where vehicles or equipment have compacted soil, scarify surface to depth of three inches.
- B. Provide subsoil fill and compact to comply with specified finish grade elevations.
- C. Provide and lightly compact topsoil; allow for settling of approximately 20-percent when spreading.
- D. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.
- E. Remove and replace, or re-compact fills softened by frost, flooding, or weather.

3.9 CLEAN-UP

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- B. Remove equipment from site as soon as practical after completion of Work. Sweep and clean up surrounding areas affected by Work to restore them to pre-construction condition.

END OF SECTION

DIVISION 32
EXTERIOR IMPROVEMENTS

SECTION 32 01 30
LANDSCAPE RESTORATION AND REHABILITATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Requirements for removal and replacement, with like materials, of lawns, plantings or pavements, where damaged by the Contractor during the performance of the Work.
 - 1. Repair of lawn areas shall be made by re-seeding.

1.2 RELATED REQUIREMENTS

- A. Section 31 23 16 - Excavation and Fill; Aggregate base for pavements.
- B. Section 32 12 16 - Bituminous Concrete Paving; Replacement of damaged pavement.
- C. Section 32 13 13 - Portland Cement Concrete Paving; Replacement of damaged pavement.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Cost of all repairs under this Section shall be the sole responsibility of the Contractor.
 - 1. Pre-existing site conditions such as cracked pavement, rutted lawns or damaged plantings should be documented and brought to the attention of the Owner prior to the start of the Work, or will be considered damaged by the Contractor.
 - 2. Unless otherwise noted before construction begins, failures in underground sprinkler systems or other utilities will be considered damaged by the Contractor.
- B. If the Contractor fails to make repairs to the Owner's satisfaction:
 - 1. Owner reserves the right to make such repairs to grounds, pavements or utilities as required to restore them to pre-construction condition.
 - 2. Cost of such repairs, plus fifteen percent (15%) for administration, will be deducted from sums due to the Contractor; or if insufficient, Contractor agrees to reimburse the Owner for any shortfall.

1.4 WARRANTY

- A. Contractor shall be responsible for maintenance (watering, fertilizing, etc.) of repaired lawn areas and plantings until they are well established.
- B. The Contractor shall warrant new lawn areas and/or plantings as follows:
 - 1. If the project is completed prior to June 30th, for a period of 90 days from the date of project completion.
 - 2. If the project is completed on July 1st or later, until new growth is evident the following spring.

- C. Contractor shall correct unsatisfactory landscaping materials or workmanship and shall repair such defects promptly upon notice, at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Topsoil: Shall be stripped from existing repair area on the site or imported fertile, friable, natural topsoil of loamy character that is characteristic of the locality.
 - 1. Shall be capable of growing healthy horticultural crops of grasses.
 - 2. Shall be free of toxic substances and shall have a pH value of not less than 5.0 nor more than 7.5.
- B. Fertilizer: Shall be commercial grade (5 10 5), delivered to site in unopened containers that clearly display the manufacturer's label, indicating the analysis of the contents.
- C. Planting replacement: Shall be plants of the same size and species as existing.
 - 1. Planting stock shall be well branched and formed, sound, vigorous, and free from disease, sunscald, windburn, abrasion, harmful insects or insect eggs with healthy, normal, and unbroken root systems.
 - 2. Plants shall have been grown under climatic conditions similar to those in the locality of the project and shall conform to the requirements and recommendations of ANSI Z60.1.
 - a. Balled and burlapped (B&B) plant ball sizes and ratios will conform to ANSI Z60.1, consisting of firm, natural balls of soil wrapped firmly with burlap or strong cloth and tied.
 - b. Bare root (BR) plants shall have the root system substantially intact, but with the earth carefully removed; roots shall be covered with a thick coating of mud by "puddling" after the plants are dug.
 - c. Container grown plants shall have sufficient root growth to hold the earth intact when removed from containers, but shall not be root bound.
- D. Trees, deciduous and evergreen shall be single-trunked with a single leader and shall display no weak crotches.
 - 1. Deciduous trees and shrubs shall be of uniform habit of growth, with straight boles or stems and free from objectionable disfigurements.
 - 2. Evergreen trees and shrubs shall have well-developed, symmetrical tops with typical spread of branches for each particular species or variety.
- E. Ground cover and vine plants shall be well established in removable containers, integral containers, or formed homogeneous soil sections.
- F. Lawn repairs: Provide grass mixture comparable to existing turf delivered to site in unopened containers that clearly display the manufacturer's label, indicating the analysis of the contents.

G. Mulch:

1. Lawn seed bed mulch: Shall be stalks from oats, wheat, rye, barley, or rice that are free from noxious weeds, mold or other objectionable material. Straw shall be in an air dry condition and suitable for placing with blower equipment.
2. Planting bed mulch: Shall be stripped from the site free from deleterious materials and shall be stored as to prevent inclusion of foreign material. Supplement as needed to match type and size of existing mulch material.

PART 3 - EXECUTION

3.1 SITE RESTORATION

- A. Upon completion of project, restore grounds to their pre-construction condition including, but not limited to, property, utilities and landscaping.

3.2 PAVEMENT REPLACEMENT

- A. Demolition and base installation:
1. Remove damaged areas by saw cutting at edge of sound pavement.
 2. Add or remove existing aggregate as required to accommodate replacement pavements at existing elevations; Section 31 23 16.
- B. Asphalt pavement: Install new asphalt paving to match the thickness of the existing, surrounding pavement; Section 32 12 16.
- C. Concrete pavement: Install new Portland Cement Concrete Paving to match the thickness, color and finish of the existing, surrounding pavement; Section 32 13 13.

3.3 PLANTING REPLACEMENT

- A. Remove damaged trees, shrubs or ground cover. Remove foreign material, such as weeds, roots, stones, subsoil, frozen clods, and similar foreign materials, larger than two (2) inches in any dimension from topsoil.
- B. Dig plant pits by any approved method to provide vertical sides and flat bottoms. If dug with an auger, scarify glazed sides of the pit. The minimum allowable dimensions of plant pits shall be:
1. Depth: Regardless of width, six inches deeper for shrubs and nine inches deeper for trees than the depth of ball or root spread.
 2. Width: For ball or root spread up to two feet, pit diameters shall be twice the ball or root spread; for ball or root spread from two-to-four feet, pit diameters shall be two feet greater; for ball or root spread over four feet, pit diameters shall be 1-1/2 times the ball or root spread.
- C. Remove container-grown plants in such a way to prevent damage to plants or root system. For balled and burlapped plants, carefully remove excess burlap and tying materials and fold back. Where plastic wrap or treated burlap is used in lieu of burlap, completely remove these

materials before backfilling.

D. Setting:

1. Set plants plumb and hold in position until sufficient soil has been firmly placed around the roots or ball.
2. Set plants even with the depth at which they were grown in the nursery, collecting field, or container, in relation to surrounding grade.
3. Set ground cover plants after the mulch is in place; avoid contaminating the mulch with the planting soil.

E. Add slow release packet, tablet or pellet fertilizer as each plant is installed as per manufacturer's recommendation for method of installation and quantity.

F. Backfilling and watering:

1. For balled and burlapped and container-grown plants, backfill with planting soil mixture as specified to approximately half the depth of the ball and then tamp and water.
2. For bare root stock, plant with the roots arranged in a natural position. Remove damaged roots with a clean cut; paint cuts larger than 1/2 inch in diameter with tree-wound dressing. Carefully work Planting Soil Mixture in among the roots.
3. Tamp and water remainder of backfill Planting Soil Mixture; then form earth saucers or water basins around isolated plants with topsoil.

G. Wrap the trunks of deciduous trees immediately after planting. Stake and guy-wire trees taller than ten (10) feet in three opposing directions.

3.4 LAWN REPLACEMENT

- A. Strip existing turf and topsoil from the area requiring repair. Remove foreign material, such as weeds, roots, stones, subsoil, frozen clods, and similar foreign materials, larger than two (2) inches in any dimension from topsoil.
- B. Harrow and till to a depth of four (4) inches; incorporate fertilizer into the soil at a rate of 25 pounds per 1000 square feet. Establish grades by dragging or similar operations. Do not carry out lawn areas earthwork when the soil is wet so that the tilth of the soil will be destroyed.
- C. Seed at a rate of four (4) pounds per 1,000 square feet. Lightly rake seed into bed immediately after seeding. Roll seeded area immediately with a garden roller.
- D. The completed lawn area shall be thoroughly irrigated to a depth of four (4) inches and shall be covered with mulch.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Geogrid reinforcement of base/subbase course and/or subgrade improvement in the construction of paved or unpaved roadways, parking areas and similar installations, including:
 - 1. Furnishing geogrids as specified herein and shown on Contract Drawings.
 - 2. Storing, cutting, and placing geogrids in accordance with these specifications and in reasonable close conformity with the lines, grades, and dimensions shown on Contract Drawings or as recommended by manufacturer.
- B. Design details for geogrid reinforcement, such as geogrid type, fill thickness, pavement cross-section and associated details, shall be shown on Contract Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 31 23 16 - Excavation and Fill; Evaluation of subgrade conditions.
- B. Section 32 11 23 - Aggregate Base; Placement of subsequent materials.
- C. Performance Requirements:
 - 1. The reinforcement benefit attributed to the geogrid shall be as derived from the Giroud-Han Method.
 - 2. Appropriate partial safety factors shall be applied to results obtained using geogrids having properties or characteristics outside the range of vigorous model validation.

1.3 REFERENCES

- A. American Society of Civil Engineers (ASCE):
 - 1. Giroud, J.P., and Han, J.J. (2004). "Design method for geogrid-reinforced unpaved roads. Part 1 - Development of Design Method." Journal of Geotechnical and Geoenvironmental Engineering, 130 (8), 787-797.

1.4 DEFINITIONS

- A. Geogrid – A polymeric grid formed by a regular network of integrally connected, multidirectional tensile elements of appropriate orientation, size and shape with triangular apertures of appropriate size and shape to allow interlocking with surrounding soil, rock, or earth to function primarily as reinforcement.
- B. Unpaved Application – Placement of a geogrid immediately over a soft subgrade soil in order to improve the bearing capacity and mitigate deformation of the subgrade soil. The goal of this application may be to reduce undercut requirements, improve construction efficiency, reduce the

amount of aggregate subbase/base material required, provide a stiff working platform for subsequent pavement construction, or combination of the above.

1.5 SYSTEM DESCRIPTION

- A. Performance Requirements for Unpaved Applications: The reinforcement benefit attributed to the geogrid shall be as derived from the Giroud-Han Method. Appropriate partial safety factors shall be applied to results obtained using geogrids having properties or characteristics outside the range of vigorous model validation (ASCE, Giroud and Han, 2004).

1.6 SUBMITTALS

- A. Submit geogrid product data sheet, manufacturer's installation instructions and general recommendations.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Storage and Protection.
 - 1. Prevent excess mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to the geogrid materials.
 - 2. Rolled materials may be laid flat or stood on end.
 - 3. Geogrid materials should not be left directly exposed to sunlight for a period longer than the period recommended by the manufacturer.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCTS

- A. Structural Geogrid BX1100 by Tensar Earth Technologies, Inc.; tensarcorp.com.
- B. TerraGrid RX1100, by Hanes Geo Components; hanesgeo.com.
- C. See Division 01, for substitution requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Check geogrid upon delivery to verify that the proper material has been received.
- B. Product shall be inspected by Contractor, before installing, to be free of flaws or damage occurring during manufacturing, shipping, or handling.

3.2 PREPARATION

- A. The subgrade soil shall be prepared as indicated on Contract Drawings, or as directed by Consultant.

3.3 INSTALLATION

- A. Geogrid shall be laid at proper elevation and alignment as shown on Contract Drawings.
- B. Geogrid shall be installed in accordance with the installation guidelines provided by manufacturer or as directed by Consultant.
- C. Geogrid may be temporarily secured in place with ties, staples, pins, sand bags or backfill as required by fill properties, fill placement procedures or weather conditions or as recommended by manufacturer.

3.4 GRANULAR FILL PLACEMENT OVER GEOGRID

- A. Granular fill material shall be placed in lifts and compacted as specified in Section 32 11 23 - "Aggregate Base Course" and shall be placed, spread, and compacted in such a manner that minimizes the development of wrinkles in the geogrid and/or movement of the geogrid.
- B. A minimum loose fill thickness of 6-inches is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid. When underlying substrate is trafficable with minimal rutting, rubber-tired equipment may pass over the geogrid reinforcement at slow speeds (less than 5-mph). Sudden braking and sharp turning movements shall be avoided.

3.5 INSPECTION

- A. Owner or Owner's representative may randomly inspect the geogrid before, during and after (using test pits) installation.
- B. Any damaged or defective geogrid (i.e. frayed coating, separated junctions, separated layers, tears, etc.) will be repaired/replaced in accordance with Article 3.06.

3.6 REPAIR

- A. Any roll of geogrid damaged before, during and after installation shall be replaced by Contractor at no additional cost to Owner.
- B. Proper replacement shall consist of replacing the affected area, adding 3-feet of geogrid beyond the limits of the affected area.

3.7 PROTECTION

- A. Follow the manufacturer's recommendations regarding protection from exposure to sunlight.

END OF SECTION

SECTION 32 11 23
AGGREGATE BASE COURSE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Materials and placement requirements for aggregate base course under specified pavements.

1.2 RELATED REQUIREMENTS

- A. Section 31 23 16 - Excavation and Fill; Preparation of site and sub-grade stabilization.
- B. Section 32 12 16 - Bituminous Concrete Paving; Lower layer and surface course asphalt.
- C. Section 32 13 13 - Portland Cement Concrete Paving; Curbs and gutters, finished flat slabs.

1.3 REFERENCE STANDARDS

- A. Work under this Section shall be in accordance with applicable provisions of the State of Illinois Department of Transportation (IDOT), "Standard Specifications for Road and Bridge Construction", current edition, except as herein modified. Wherever the term "Standard Specifications" is used, it shall refer to that IDOT Specification.
 - 1. Exception: This contract is a lump sum contract and the items; methods of measurements and basis of payment shall not apply.
- B. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO T96 - Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine; 2002.
- C. ASTM International Standards, latest editions unless otherwise stated:
 - 1. ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort;
 - 2. ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method;
 - 3. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

1.4 QUALITY CONTROL

- A. Tolerances:
 - 1. Flatness: Maximum variation of 1/2-inch measured with 10-foot straight edge.
 - 2. Scheduled Compacted Thickness: Within 1/4-inch.
 - 3. Variation from True Elevation: Within 0.03-feet of approved grades.

1.5 SUBMITTALS

- A. Prior to delivering aggregate base materials, submit the following information:
 - 1. Certified gradation reports.
 - 2. Name and location of supplier.
- B. Provide, for the Consultant's review, a copy of aggregate shipping/load tickets for materials installed during the course of the project, indicating: Project name, address, job number, date and time of delivery.

PART 2 - PRODUCTS

2.1 AGGREGATE MATERIALS

- A. Dense Graded Aggregate Base (DGAB):
 - 1. Coarse Aggregate for Base Course Construction: Conform to Standard Specifications.
 - a. CA-2 – Crushed Limestone or recycled concrete.
 - 2. Fine Aggregate Base for Course Construction: Conform to Standard Specifications.
 - a. CA-6 – Crushed limestone or recycled concrete.
- B. Aggregate shall have a percent of wear of not more than 50, as determined by AASHTO T96.
- C. A minimum of 58-percent, by count, of the number of aggregate particles retained on the No. 4 sieve shall have at least 1 fractured face.
- D. Crushed stone aggregate shall not include reprocessed bitumen or any other foreign material mixed with native aggregate.

PART 3 - EXECUTION

3.1 GENERAL

- A. Compaction requirements shall be in accordance with IDOT requirements.
- B. Aggregate base shall extend 12-inches beyond edges of pavement unless otherwise indicated.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Correct irregularities in subgrade gradients and elevation by scarifying, reshaping, and re-compacting.
- C. Do not place aggregate on soft, muddy, or frozen surfaces.

3.3 INSTALLATION OF AGGREGATE BASE

- A. Place aggregate, to indicated depths and profiles, in layers not exceeding 8-inches in depth. Roller compact to specified density.
 - 1. Compact to 95-percent in accordance with ASTM D1557 or IDOT requirements.
 - 2. Properly compact areas adjacent to curbs, catch basins, manholes, and other areas not accessible to rollers with mechanical or hand tamping devices.
- B. Level and contour surfaces to elevations and gradients indicated.
 - 1. Fine grade to accommodate placement of pavement at proposed finish elevations and slopes.
- C. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.
- D. Add water as necessary during compaction to bring aggregate to optimum moisture content.
 - 1. When an excess of moisture exists, rework stabilizing base course materials until optimum moisture content is obtained.

3.4 FIELD QUALITY CONTROL

- A. See Division 01, for general requirements for field inspection and testing.
- B. Perform compaction density testing on compacted aggregate base course in accordance with ASTM D1556.
- C. Results will be evaluated in relation to compaction curve determined by testing un-compacted material in accordance with ASTM D698 ("Standard Proctor").
- D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.5 CLEAN-UP

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- B. Remove equipment from the site as soon as practical after completion of Work. Sweep and clean up surrounding areas affected by contracted Work to restore them to pre-construction condition.

END OF SECTION

SECTION 32 12 16
BITUMINOUS CONCRETE PAVING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Furnishing labor, materials, equipment, apparatus, tools, transportation, protection, and services necessary for, and reasonably incidental to, the proper execution and completion of all bituminous concrete paving Work as indicated on the Contract Drawings and hereinafter specified.

1.2 RELATED REQUIREMENTS

- A. Section 32 11 23 - Aggregate Base Course: Base aggregate.

1.3 REFERENCE STANDARDS

- A. Work under this Section shall be in accordance with applicable provisions of the State of Illinois Department of Transportation (IDOT), "Standard Specifications for Road and Bridge Construction", current edition, except as herein modified. Wherever the term "Standard Specifications" is used, it shall refer to that IDOT Specification.
 - 1. Exception: This contract is a lump sum contract and the items; methods of measurements and basis of payment shall not apply.
- B. ASTM International Standards, latest editions unless otherwise stated:
 - 1. ASTM D929 - Standard Practice for Sampling Bituminous Paving Mixtures.

1.4 SUBMITTALS

- A. Submit a job mix formula to the Consultant at least 10-days prior to installation:
 - 1. Furnish mix designs and supporting test data for surface and lower level courses indicated on Contract Drawings and in these specifications.
 - a. Note: Refer to "Clarifications" concerning mix adjustments, in product specifications, below.
 - b. Provide, to Consultant, a letter stating the asphalt mix to be furnished is currently approved for use by IDOT; letters from other source(s) will not be considered acceptable.
- B. Provide, to Consultant, a copy of shipping/load tickets for materials installed during the course of Project, indicating: Project name, address, job number, date and time of delivery.

1.5 QUALITY ASSURANCE

- A. Prior to start of construction, attend a preconstruction meeting with Owner and Consultant.

- B. Testing: Owner retains the right to engage a testing laboratory to verify that Work meets specification; See Division 01.
 - 1. Selection of testing company and payment for testing will be by Owner.
 - 2. In the event that specifications are not met, Contractor shall be responsible for costs of repair as well as the costs of the testing laboratory.
- C. Field Sampling and Testing:
 - 1. Field samples shall be taken in accordance with the requirements of ASTM D979 for each job mix delivered.
 - a. Materials may be sampled at the greater rate of either 1 sample for each 500-tons, or 1 sample per day, for each type of material placed on a project.
 - 2. The sample shall be of such size to provide material for tests specified and a split sample to perform verification/referee tests for gradation and binder content, if required.
 - 3. Tolerances:
 - a. Surface Flatness: When tested with a 10-foot straight edge in any direction, the maximum deviation of the surface shall not exceed 1/4-inch.
 - b. Variation from True Elevation: Shall be within 0.03-feet of approved grades.
 - c. Variation from compacted thickness: Pavement shall be a minimum thickness of that specified.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Transportation: Comply with the Standard Specifications, using approved vehicles.
- B. Deliver bituminous materials to the project site at 250-350 degrees F.
- C. Material shall be spread and compacted each day, before cooling below 175 degrees F.

1.7 ENVIRONMENTAL CONDITIONS

- A. Paving work shall not take place in foggy or rainy conditions.
- B. Lower Layer(s) shall only be placed when the temperature in the shade is at least 40 degrees F. and rising.
- C. Upper Layer shall only be placed when the temperature in the shade is at least 45 degrees F. and rising.

1.8 WARRANTY

- A. Provide a Contractor's warranty covering a period of 2-years after completion and final acceptance of Work.

PART 2 - PRODUCTS

2.1 HOT MIX ASPHALT (HMA)

- A. Bituminous Concrete Paving, Class I: Conform to Standard Specifications, Section 406, as follows:
 - 1. Surface Course (termed Upper Layer on this project): N50, 9.5-mm.
 - 2. Lower Level, or Binder Course (termed Lower Layer on this project): N50, 19.0-mm.
 - 3. Stabilization Work (at Contractor's option): N50, 25.0-mm.
 - 4. Wedge/Leveling Course: N50, 9.5-mm.
- B. Asphalt cement for the specified mixes shall conform with Articles 1030 and 1031 of the Standard Specifications, in regard to the use of recycled materials.
- C. Recycled Materials: Contractor may elect to use recycled materials consisting of reclaimed asphaltic pavement (RAP), or recycled asphalt singles (RAS), or a blend of both.
 - 1. The use of these materials shall conform to Articles 1030 and 1031 of the Standard Specifications.

2.2 TACK COAT

- A. Bond/tack coat to be used where HMA will be in contact with previously-constructed asphalt, or Portland cement concrete pavement.
- B. Shall be bituminous material complying with types SS-1, SS-1h, CSS-1, CSS-1h, HFE 60, HFE 90, RC-70, SS-1hP, CSS-1hP.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Perform removals of existing materials and prepare aggregate base, including subbase stabilization, as required.
- B. Pavements to be overlaid must be dry and free of dust, dirt, debris, all loose materials and vegetation.
- C. A tack coat of emulsified asphalt shall be applied to all paved surfaces on which any course of HMA is to be placed at a rate of 0.05-gallons per square yard of surface.
 - 1. Tack coat shall be uniformly applied to cover the existing pavement with a thin film of residual asphalt free from streaks and bare spots.
 - 2. Equipment shall not operate on tacked surfaces until the tack has broken and cured.
- D. When a successive lift of HMA is to be placed, the existing surface shall receive a tack coat if that surface has become dirty or is over 48-hours old.

3.2 PLACING BITUMINOUS CONCRETE

- A. Place HMA on prepared surfaces.
 - 1. Place Lower Layer within 24-hours of applying tack coat.
 - 2. Place each layer to required grade, cross-section and compacted thickness.
- B. Equipment:
 - 1. Equipment furnished by Contractor shall be well maintained and in sound mechanical condition capable of performing Work.
 - 2. Paver: Self-contained, power-propelled unit with adjustable activated screed or strike off assembly, heated and capable of spreading and finishing courses of HMA to the specified typical section and thickness indicated.
 - 3. Rollers: A minimum of 2 rollers shall be on site prior to paving start-up and continuously during the paving operation.
- C. Finish asphalt elevations at fixed match points shall generally be as follows:
 - 1. Concrete curb pans that “reject” water: Flush.
 - 2. Concrete curb pans that “catch” water: 1/4-inch higher.
 - 3. Concrete flatwork (dumpster pads, service/garage door concrete: Flush.
 - 4. Concrete collars at catch basins: 1/4-inch higher.
 - 5. Storm water / sanitary rims: 1/4-inch higher.
 - 6. Utility boxes/covers (water and gas valve boxes, monument covers, etc.): 1/4-inch higher.
- D. Joints:
 - 1. Construction joints shall be straight, clean and vertical, and shall have the same texture, density, and smoothness as the surrounding pavement.
 - 2. Joints for Lower Layer and Upper Layer pavements shall be aligned (“stacked” joints).
- E. Placement of Upper Layer shall be performed no sooner than the following morning after installation of Lower Layer.

3.3 COMPACTION / ROLLING

- A. Compaction requirements shall be in accordance with Article 406 of the Standard Specifications.
- B. Compact HMA, as quickly as possible after placement, to specified density.
 - 1. Start compaction as soon as pavement will bear compaction equipment without undue displacement and proceed until specified density is achieved and Upper Layer is absent of roller marks.
 - 2. In areas inaccessible to rollers, compact pavement by use mechanical or hand tampers.
- C. Type of rollers used, and their relative position in Contractor’s sequence shall be at Contractor’s

option, providing that specified densities are obtained, subject to the following:

1. Vibratory rollers shall not be operated in the vibratory mode when the internal temperature of the HMA is below 175 degrees F.
- D. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks. Finished pavement surface shall be of uniform texture, smooth, true to grade, and free of defects to the satisfaction of Owner.

3.4 FIELD QUALITY CONTROL

- A. Verify that pavement surface is installed to specified lines, levels and contours, as shown in Contract Drawings.
- B. For general requirements related to testing, quality assurance and defect assessment, refer to Division 01.
- C. Owner reserves the right to secure core samples of completed pavement to verify minimum thickness and compaction requirements. Contractor shall be responsible for patching cores.

3.5 PROTECTION AND CLEAN-UP

- A. Immediately after placement, protect pavement from mechanical injury until surface temperature is less than 140 degrees F.
- B. Do not allow vehicular traffic on newly constructed pavement until surface course has cooled to ambient atmospheric temperatures.
- C. Remove equipment from the site as soon as Work is completed and approved. Excess fill and excavated earth and debris shall be removed from Project site.
- D. Sweep and clean up surrounding areas affected by contracted Work to restore them to pre-construction condition.

END OF SECTION

SECTION 32 12 36.16
PAVEMENT CRACKFILLING AND SEALCOATING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Furnishing of labor, materials, equipment, apparatus, tools, transportation, protection and services necessary for, and reasonably incidental to, proper filling of all joints/cracks and application of sealcoating over existing asphalt pavements.

1.2 RELATED REQUIREMENTS

- A. Section 32 12 16 - Bituminous Concrete Paving.
- B. Section 32 17 23.13 - Painted Pavement Markings and Signage.

1.3 REFERENCES

- A. ASTM International Standards, latest editions unless otherwise stated:
 - 1. ASTM D36/D36M - Standard Test Method for Softening Point of Bitumen (Ring-and Ball Apparatus).
 - 2. ASTM D140/D140M - Standard Practice for Sampling Bituminous Materials.
 - 3. ASTM D3381/D3381M - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
 - 4. ASTM D3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal.
 - 5. ASTM D5078/D5078M - Standard Specification for Crack Filler, Hot Applied, for Asphalt Concrete and Portland Cement Concrete Pavements.
 - 6. ASTM D5329 - Standard Test Methods for Sealants and Fillers, Hot-Applied, for Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements.
 - 7. ASTM D5727/D5727M - Standard Specification for Emulsified Refined Coal Tar (Mineral Colloid Type).
 - 8. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

1.4 DEFINITIONS

- A. Crack Sealing: Placement of materials into/over pavement cracks to substantially reduce infiltration of water. The crack receives no special preparation other than cleaning.
- B. Crack Filling: Placement of materials into pavement cracks to substantially reduce infiltration of water and to reinforce the adjacent pavement. The crack receives routing of crack edges and cleaning as preparation prior to crackfill application.

- C. Potholes or Failed Pavement: Cracks in excess of 1-inch in width; “alligatored” or “spider web” failure areas that require removal and replacement prior to sealcoating.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's printed Product Data Sheet and/or supplier's mix design.

1.6 QUALITY ASSURANCE

- A. Do not use crack repair product that has been over-heated, suffered prolonged heating or which ravel or can be pulled out by hand after placement.
- B. Do not mix different manufacturer's brands or different types of crack repair material.
- C. Do not depress joint/crack repair product temperature at the wand tip below manufacturer's recommended application temperature when loading product into product tank.
- D. Visually inspect areas for adhesion failure, damage to crack repair product, missed cracks, foreign objects in the product, or other problems that indicate Work is not acceptable. Replace defective Work.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Apply materials during dry weather and when rain is not anticipated within 8-hours after application is completed.
- B. Apply coating when pavement temperature is at least 50-degrees F. and the air temperature is 50-degrees F. and rising.

1.8 WARRANTY

- A. Prior to final payment, submit 2-year written, dual warranty by materials manufacturer/supplier and Contractor.
 - 1. Warranty shall include statements that warrant performance of the coating against flaking, chipping, loss of adhesion or other abnormal wear.
 - 2. In the event of abnormal wear within the warranty period, affected areas shall be recoated, with specified material, at no cost to Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Joint/Crack Filler Materials: Use hot-applied rubberized asphalt, unless specified otherwise:
 - 1. Rubberized Asphalt: ASTM D6690.
 - 2. Low Modulus Rubberized asphalt: ASTM D5078 or ASTM D6690 except as follows
 - a. Softening point: 85 degrees C minimum per ASTM D36.

- b. Resilience: 30-percent recovery minimum at 25 degrees C. plus or minus 1 degrees C. per ASTM D5329.
 - 1) Filling: Asphalt Cement: ASTM D3381.
- 3. Sand.
- B. Pavement Sealer:
 - 1. Coal tar-based pavement sealers will NOT be acceptable.
 - 2. Shall be capable of application and complete coverage, by squeegee, brush, or spray, to the bituminous surface at a spreading rate of 2.0 gallons per 10 square yards in a 2-coat application.
 - 3. Polymer Modified (PM) Sealer, mineral fillers, water, and other additives containing not more than 50-percent solids: ASTM D5727 (coal tar) or D140 (PM).
 - a. Clean, washed, air dried, hard and irregular Silica Sand #60/45 shall be added to the sealer at the ratio of 2 to 4 pounds per gallon.
 - b. Clean water, not supplied from lakes or wells, within a temperature range of 50-80 percent F. A 20 to 40 percent cut is recommended.
 - c. A polymeric latex additive, at a rate of approximately 2 to 4 percent by volume, shall be added to the sealer to keep the sealer, water, and sand suspended evenly.

2.2 EQUIPMENT

- A. Heating Equipment: Indirect heating using double boiler or circulating hot oil heat transfer for heating the product. Unit must have means of constant agitation.
- B. Hot Compressed Air Lance: Provide clean, oil-free compressed air at a volume of 100 cubic feet per minute at a pressure of 120-pounds per square-inch at the lance tip.
- C. Coating: Use equipment that keeps the mixture homogeneous at all times and is capable of applying required coating weights evenly over entire width of application mechanism in order to provide a uniformly coated surface.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect existing pavement surfaces for conditions and defects that will adversely affect quality of work, and which cannot be put into an acceptable condition through normal preparatory work as specified.
- B. Do not place coating over unsound oil spots softened by fuel or oil. If this condition exists, notify Consultant.
- C. Commencing installation constitutes Contractor's acceptance of surface as suitable for installation.

- D. Existing pavement surfaces and joints/cracks shall be evaluated for required crack treatment method in accordance with the following:

Crack Characteristics	Crack Treatment Method	
	Crack Sealing	Crack Filling
Width (in.)	0.2 to 0.75	0.2 to 1.0
Edge Deterioration	Minimal to none ≤ 25% of crack length	Moderate to none ≤ 50% of crack length
Annual Horizontal Movement (in.)	≥ 0.1	< 0.1
Type of Crack	Transverse Thermal Transverse Reflective Longitudinal Reflective Longitudinal Cold-Joint	Longitudinal Reflective Longitudinal Cold-Joint Longitudinal Edge Distantly Spaced Block

3.2 JOINT/CRACK FILLER PREPARATION

- A. Repairing Asphaltic Concrete Pavement: Repair areas shown on Contract Drawings.
- B. Routing of cracks:
1. Visible cracks shall be routed to create a groove of 5/8-inch wide by 1/2-inch deep along entire length of crack.
 2. As a final preparation step, the crack or joint shall be blown out with compressed air and cleaned with pressurized water (2000-2500 psi).
- C. Pavement Cleaning:
1. Thoroughly sweep and clean the pavement surface of dirt, debris and vegetation using truck-mounted power sweepers or air blowers.
 2. Apply soil sterilant, as required, in areas of extensive vegetation growth.
 3. Areas of oil spotting/buildup:
 - a. Shall be “burned” to create a rough, stone exposed surface.
- D. Crack Filling:
1. All cracks to be filled.
 2. Where crack depth exceeds 1-inch, sand shall be inserted into crack.
 3. Immediately before the installation of the joint/crack filler materials, remove loose materials/vegetation by blowing with oil-free compressed air and/or to leave joint/crack completely free of foreign matter, loosened particles and water.

3.3 JOINT/CRACK FILLER APPLICATION

- A. Provide heated crack filler material directly into cracks and joints.
 - 1. Use of pour pots will not be allowed.
- B. Overfill crack/joint and strike off to leave a bead of material approximately 2-inches wide and flush with existing pavement surface.

3.4 SEALCOATING PREPARATION

- A. Thoroughly sweep and clean the pavement surface of dirt, debris and vegetation using truck-mounted power sweepers or air blowers.
- B. Apply soil sterilant, as required, in areas of extensive vegetation growth.
- C. Areas of oil spotting/buildup:
 - 1. Shall be “burned” to create a rough, stone exposed surface.
 - 2. Where buildup is excessive, as determined by Owner and Consultant, cut out area and repave flush with existing pavement.

3.5 SEALCOATING APPLICATION

- A. First application to be applied using a rubber squeegee and second application to be applied by spray method: ASTM D3910.
- B. Coat the pavement edges first by pouring a continuous ribbon of the sealant mixture 6-12 inches away from the curbing and spread carefully with a brush applicator around the car stops.
- C. Apply 0.13 gallons of polymer modified sealer per sq. yd. for first application and 0.07 gallons of polymer modified sealer per sq. yd. for second application.
- D. First application shall be complete and free of pin-holes and voids. Second application shall present a uniform texture.
- E. Allow first application to cure sufficiently.
- F. Allow second application to cure a minimum of 24-hours under good drying conditions before allowing traffic.
 - 1. After coating has cured, paint/stripe area in accordance with Section 32 17 23.13 - “Painted Pavement Markings and Signage”.

3.6 FIELD QUALITY CONTROL

- A. For general requirements related to testing, quality assurance and defect assessment, refer to Division 01.
- B. Owner reserves the right to secure samples of pavement sealer to verify compliance with specified requirements.

3.7 CLEANING AND PROTECTION

- A. Barricade completed areas from traffic until new materials have cured sufficiently.
- B. Upon completion of Project, unused materials shall be removed from Project site and pavement shall be left in a clean condition.
- C. Clean and remove coating from curbs, walks, fences, and other items as required.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Products and installation procedures for concrete curbs and flatwork.
- B. Products and procedures for general joint sealing.

1.2 RELATED REQUIREMENTS

- A. Section 31 23 16 - Excavation and Fill.
- B. Section 32 01 30 - Site and Landscape Restoration.

1.3 REFERENCES

- A. American Concrete Institute (ACI):
 - 1. ACI 301 - Specifications for Structural Concrete; 2010.
 - 2. ACI 304R - Guide for Measuring, Misting, Transporting and Placing Concrete; 2000.
- B. ASTM International Standards, latest editions unless otherwise stated:
 - 1. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement;
 - 2. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field;
 - 3. ASTM C33/C33M - Standard Specification for Concrete Aggregates;
 - 4. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens;
 - 5. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete;
 - 6. ASTM C150/C150M - Standard Specification for Portland Cement;
 - 7. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete;
 - 8. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete;
 - 9. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete;
 - 10. ASTM C920 - Standard Specification for Elastomeric Joint Sealants;
 - 11. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink);
 - 12. ASTM D3575 - Standard Test Methods for Flexible Cellular Materials Made from Olefin Polymers.

1.4 SUBMITTALS

- A. If Contractor wishes to make improvements in materials or techniques, they shall make written request for approval stating in full the nature of the proposed changes, and stating that the changes, if approved, will be accomplished at no increase in cost to Owner.
- B. Submit concrete job mix formulas to Consultant at least 10-days prior to installation.
- C. Provide layout for panel sizes and joint patterns prior to concrete installation.
- D. Provide concrete testing results for slump and cylinder/compression tests, as specified herein.
- E. Provide, to Consultant, a copy of shipping/load tickets for materials installed during the course of Project, indicating: Project name, address, job number, date and time of delivery.

1.5 QUALITY ASSURANCE

- A. Concrete testing: Contractor to engage, and pay for, the services of an independent testing laboratory to perform cylinder testing as described in *PART 3*, below.
- B. Tolerances:
 - 1. Maximum variation of surface flatness: 1/2-inch in 10-feet, except where more stringent to comply with ADA Guidelines.
 - 2. Maximum variation from true position: 1/4-inch.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Concrete shall be ready-mixed and delivered to the site in transit mixers complying with ASTM C94.
- B. Concrete shall be delivered to the site and completely discharged within 1-hour after the addition of the cement to the aggregates, or before 250-drum revolutions, whichever is first.
 - 1. When ambient air temperature is above 90-degrees F, mixing and delivery time shall be reduced to 45-minutes.
 - 2. Temperature of the mixed concrete shall not be less than 50-degrees F and not more than 80-degrees F. at the time of placement.

1.7 ENVIRONMENTAL CONDITIONS

- A. Concrete operations shall not begin until the ambient temperature is 35-degrees F and rising and shall be discontinued when the ambient temperature is descending and is 40-degrees F or below.
- B. Do not place concrete on a frozen subbase. Any concrete damaged by freezing shall be removed and replaced at no cost to Owner.

1.8 WARRANTY

- A. Provide a Contractor's warranty for materials and workmanship covering a period of 2-years after completion and final acceptance of Work.
 - 1. Warrant Work against defects due to faulty materials or workmanship and shall agree to repair or replace defective work without cost to Owner.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS AND MIXES

- A. Coarse aggregate shall meet requirements for deleterious substances (severe weathering regions) as specified with the following exception:
 - 1. Chert that has a specific gravity of less than 2.40 shall not exceed 2-percent of the weight of the coarse aggregate.
- B. Fly ash may be substituted at a 1:1 ratio, not to exceed 20-percent of total cementitious material.
- C. **Concrete Walks:** Shall be minimum 4,000-psi at 28-days, minimum cement content 6 bags per cubic yard, nominal maximum size aggregate 3/4-inch, maximum slump 4-inches, air entrained 5-1/2 to 7-percent; maximum water-to-cement ratio 0.44.
 - 1. Portland Cement: ASTM C150, Type 1A.
 - 2. Air Entrainment Additive: ASTM C260.
 - 3. Water: Potable, clean and not detrimental to concrete.
 - 4. Aggregate: ASTM C33.
 - 5. Fiber Additives: 1.5-lbs per cubic yard of poly fiber.
- D. **Concrete Curbs:** Shall be minimum 3,000-psi at 7-days and minimum 4,000-psi at 28-days, maximum cement content 7-1/2 bags per cubic yard, nominal maximum size aggregate 1-1/2-inch, maximum slump 3-inches, air entrained 5-1/2 to 7-percent; maximum water to cement ratio 0.43.
 - 1. Portland Cement: ASTM C150, Type 1 or Type 3.
 - 2. Air Entrainment Additive: ASTM C260.
 - 3. Water: Potable, clean and not detrimental to concrete.
 - 4. Aggregate: ASTM C33.
 - 5. Fiber Additives: 1.5 lbs per cubic yard of poly fiber.

Clarification: At Contractor's discretion, fiber additive may be omitted for curb and gutter; however, where curb is integral with walk, fiber additives are required.
- E. **Concrete pavements subject to vehicular traffic:** Shall be minimum 3,200 psi at 7-days and minimum 4,500-psi at twenty-eight (28) days, maximum cement content 7-1/2 bags per cubic

yard, nominal maximum size aggregate 1-1/2-inch, maximum slump three (3) inches, air entrained 5-1/2 to 7 percent; maximum water to cement ratio 0.43.

1. Portland Cement: ASTM C150, Type 1 or Type 3.
2. Air Entrainment Additive: ASTM C260.
3. Water: Potable, clean and not detrimental to concrete.
4. Aggregate: ASTM C33.
5. Fiber Additives: 1.5 lbs per cubic yard of poly fiber.

2.2 FORM MATERIALS

- A. Form materials shall conform to requirements of ACI 301.
- B. Expansion joint filler: W.R. Meadows "Deck-O-Foam", Quikcrete "Concrete Expansion Joint", Williams Products "Everlastic EJ-2000 or approved equal."
 1. Flexible, lightweight, non-staining, polyethylene, closed-cell compressible foam compatible with cold-applied sealants, caulks and hot-pour joint sealants for use where slab abuts walls, columns, or other vertical surfaces.
 2. 1/2-inch thickness, height to match slab thickness, with pre-scored removable strip to provide a uniform sealing reservoir.
 3. Complying with ASTM D3575: 1.7-pounds per cubic foot minimum density, 37-psi minimum tensile strength and 0.5-percent maximum water absorption by volume.
- C. Form Release Agent: Commercial formulation form coating compound that will not adversely affect concrete surfaces. Maximum VOC of 350 mg/l.
 1. Nox-Crete PCE, by Nox-Crete; nox-crete.com.
 2. Farm Fresh, by Unitex Chemicals/Dayton Superior Corp.; daytonsuperior.com.
 3. DUOGARD II, by W.R. Meadows; wrmeadows.com.
 4. See Division 01, for substitution requirements.

2.3 REINFORCEMENT

- A. Deformed steel bar: ASTM A615, Grade 60, #3, #4 or #6, epoxy coated.
- B. Dowel bars: ASTM A615, Grade 60, #4 or #6, smooth steel bars, epoxy coated.
- C. Chairs, Bolsters, Bar Supports, Spacers: Designed specifically for application, sized and shaped for support of reinforcement during installation and placement of concrete.
 1. Aztec EZ-Chair, by Dayton Superior Corp.; daytonsuperior.com.
 2. See Division 01, for substitution requirements.
- D. Tie Wire: Minimum 16-gauge annealed type.

2.4 ACCESSORIES

- A. Liquid-type, membrane-forming curing compound complying with ASTM C309 Type 1 and 1D, Class B. Moisture loss not more than 0.55-kg/sq. meter when applied at 200-sq.ft./gal.
 - 1. Clear on pedestrian pavements.
 - 2. White pigmented on pavements subject to vehicular traffic.
 - 3. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cure and Hard, by Symons Corp.; symons.com.
 - b. Kure-N-Seal, by BASF Building Materials; basf.com.
 - c. Dayton J-20 Day-Chem Cure & Seal, by Dayton Superior Corp.; daytonsuperior.com.
 - d. Tri-Kote 26, by TK Products div of Sierra Corp.; tkproducts.com.
 - e. CS-309-25 OTC, by W.R. Meadows; wrmeadows.com.
 - 4. See Division 01, for substitution requirements.
- B. Joint sealant for flat pavement: Single-component, self-levelling, moisture-curing polyurethane sealant conforming to ASTM C920, Type S, Grade P, Class 25.
 - 1. MasterSeal SL 1, by BASF Corp. Building Systems; buildingsystems.basf.com.
 - 2. Chem-Calk 955-SL, by Bostik, Inc.; bostik-us.com.
 - 3. Eucolastic 1SL, by Euclid Chemical Company; euclidchemical.com.
 - 4. Vulkem 45, by Tremco Commercial Sealants and Waterproofing; tremcosealants.com.
 - 5. Pecora NR-201, by Pecora Corporation; pecora.com.
 - 6. Sikaflex 1c SL, by Sika Corporation US; usa.sika.com.
 - 7. See Division 01, for substitution requirements.
- C. Epoxy adhesive:
 - 1. Resi-Bond (J-58), by Dayton Superior Corp.; daytonsuperior.com.
 - 2. SurePoxy 110, by Kaufman Products, Inc.; kaufmanproducts.net.
 - 3. Sikadur 32 Hi-Mod LPL, by Sika Corp.; usa.sika.com.
 - 4. Epogrip, by Sonneborn/BASF; basf.com.
 - 5. Rezi-Weld 1000, by W.R. Meadows; wrmeadows.com.
 - 6. See Division 01, for substitution requirements.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate and be responsible for removal and reinstallation of items not specifically designated to be removed, but that may be necessary for proper installation of Work.

- B. Protect adjacent surfaces, walls and landscaping from contact with concrete materials.
- C. Prior to placement of concrete:
 - 1. Place, support and secure reinforcement against displacement; do not place on concrete bricks.
 - 2. Clean reinforcement of foreign particles or coatings.
 - 3. Moisten base to minimize absorption of water from fresh concrete.

3.2 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Place joint filler vertical, in straight lines, at all walls, penetrations, supports, etc.; secure to formwork to prevent shifting during concrete placement.

3.3 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Deposit and consolidate concrete in a continuous operation until panel or section is completed.
- C. Do not transport concrete across reinforcement bars or mesh.
- D. Concrete shall not be segregated during placement nor shall it be contaminated with earth or other foreign matter.
- E. Concrete shall be thoroughly consolidated against the faces of forms, structures or adjacent concrete surfaces and around reinforcement.
- F. Place concrete continuously such that no cold joints occur; all joints shall occur at a planned joint line.
- G. Ensure concrete is thoroughly compacted and screeded to proper elevations and grades.

3.4 JOINTS

- A. Align curb, gutter, and sidewalk joints whenever possible.
- B. Match existing joints patterns for both expansion and scored joints.
- C. Provide scored (hand tooled) construction joints every 10-lineal feet along concrete curb/gutter.
- D. Provide construction/control joints where shown on Contract Drawings:
 - 1. Joints in sidewalks and other locations indicated shall be hand tooled.
 - 2. Saw cut joints shall be 1/8-inch or 1/4-inch, as shown on the Contract Drawings, 2-inch minimum depth. Soft-cut joints within 1 to 4-hours following surface-set of concrete.

- E. Joint sealing: At joints adjacent to or between pavement sections and at routed cracks.
 - 1. Repairs should be timed such that routed-out cracks are not exposed for more than 24-hours before sealing.
 - 2. Cracks larger than 1/16-inch in width shall be routed, as described above.
 - 3. Remove top strip from joint filler before sealing.
 - 4. Apply sealant to prepared joints, placed from the bottom up and in one smooth run from the beginning to the end of the joint.
 - a. Use caulking gun for small joints;
 - b. At wider joints, use bulk material and can with pour spout.
 - 5. Where required to completely fill joint cavity, perform tooling immediately after dispensing.

3.5 SAMPLING AND TESTING OF CONCRETE

- A. Sample concrete: ASTM C172.
- B. Compression test specimen: ASTM C31; one set of 5 standard cylinders for each test.
 - 1. One test set per 100-cubic yards, no less than 1 set per day, per site.
 - 2. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.
 - 3. Perform 1 slump test for each set of test cylinders taken.
- C. Compression strength test: ASTM C39; test as follows:
 - 1. One cylinder at 4-days;
 - 2. One cylinder at 7-days;
 - 3. One cylinder at 14-days;
 - 4. One cylinder at 28-days, and;
 - 5. One, if additional testing is required.

3.6 FINISHING

- A. Finish concrete with a steel trowel to provide a dense, smooth and watertight surface.
 - 1. Finish concrete walks to match existing.
 - 2. Provide a medium-texture broom finish, perpendicular to traffic route, on slabs.
- B. Formed concrete exposed to view shall have a rubbed finish, unless otherwise matching existing, adjacent surfaces.
 - 1. Rub with rubbing stone to remove all projections and round corners.
 - 2. Wet surface and brush evenly with cement grout mixture.

3.7 CURING AND PROTECTION

- A. Apply curing compound to exposed concrete surfaces as soon as final finishing operations are complete (or within 2-hours after water sheen has disappeared). Apply uniformly in accordance with manufacturer's recommendations.
- B. Immediately after finishing, take measures to protect concrete from premature drying, excessive hot or cold temperatures, and mechanical injury.
 - 1. Protect from frost and rapid drying for at least 7-days after placing.
- C. Do not permit vehicular traffic over pavement until satisfactory results have been achieved from comprehensive strength tests.

END OF SECTION

PAINTED PAVEMENT MARKINGS AND SIGNAGE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Products and application requirements for painted pavement markings, to replicate existing layout and color.
- B. Products and installation requirements for related parking signage.

1.2 RELATED REQUIREMENTS

- A. Section 32 12 16 - Bituminous Concrete Pavement.
- B. Section 32 13 13 - Portland Cement Concrete Paving; Concrete footing mix.

1.3 REFERENCES

- A. Comply with Federal Highway Administration (FHWA), Manual on Uniform Traffic Control Devices (MUTCD) manual (<http://mutcd.fhwa.dot.gov>) for details not shown.
- B. ASTM International Standards, latest editions unless otherwise stated:
 - 1. ASTM A499 - Standard Specification for Steel Bars and Shapes, Carbon Rolled from "T" Rails;
 - 2. ASTM A787/A787M - Standard Specification for Electric-Resistance-Welded Metallic-Coated Carbon Steel Mechanical Tubing;
 - 3. ASTM A1075 - Standard Specification for Flanged Steel U-Channel Posts;
 - 4. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength;
 - 5. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus;
 - 6. ASTM D1735 - Standard Practice for Testing Water Resistance of Coatings Using Water Fog Apparatus.
 - 7. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs;
 - 8. ASTM F594 - Standard Specification for Stainless Steel Nuts.

1.4 SUBMITTALS

- A. Provide a site plan documenting existing pavement markings, including relevant survey control points; obtain Owner's review and approval before applying.

1.5 QUALITY ASSURANCE

- A. Apply in accordance with manufacturer's instructions, using an experienced technician that is thoroughly familiar with equipment, materials and marking layouts.

1.6 ENVIRONMENTAL CONDITIONS

- A. Do not apply products in conditions outside the manufacturer's absolute limits.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of the specification is products by Sherwin Williams Company; sherwin-williams.com.
 - 1. Products by other manufacturers, subject to compliance with the specification requirements, will be considered by Consultant for approval as equal.

2.2 ACCEPTABLE PRODUCTS

- A. Provide paint specifically formulated for use as pavement marking in vehicular traffic areas in the colors selected by Owner from standard manufacturer's colors.
- B. Materials shall meet or exceed Federal Specifications TTP-115 (acetone base) or TT-P-1952F (water based).

2.3 PARKING BUMPERS

- A. Partial replacement of deteriorated or damaged: Replace to match type and dimension of existing.
- B. Securement pins:
 - 1. #4 (or greater) deformed steel bar.
 - 2. 18-inches in length, minimum.

2.4 EXTERIOR ADA PARKING SIGNS

- A. Provide exterior ADA Parking signs where indicated on Contract Drawings.
- B. Sign Posts: Basis of design is U-Channel, by Tapco Companies; tapconet.com. Products by other manufacturers, subject to compliance with the specification requirements, will be considered by Consultant for approval as equal:
 - 1. Galvanized Steel; 10-foot length, 2-lbs/ft., conforming to ASTM A499 and A1075.
 - 2. Mounting holes top to bottom.
 - 3. Sign to be mounted such that there is no extra post above sign.
- C. Mounting Hardware: Provide stainless steel bolts and nuts, Type 304, conforming to ASTM F593 and ASTM F594.
 - 1. 5/16" x 2-3/4" stainless steel hex bolt.
 - 2. 5/16" stainless steel washer.
 - 3. 5/16" nylon washer.
 - 4. 5/16" stainless steel locking nut with nylon insert.

- D. Sign Type: Accessible Parking: Shall meet Local DOT requirements.
- E. Mixes: Concrete for Foundations: Refer to Section 32 13 13 - "Portland Cement Concrete Paving".
- F. Provide quantity of ADA signs in locations as shown on Contract Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to start of construction, gather information necessary to re-stripe paving areas in a manner that duplicates the existing layout and colors unless otherwise noted by Owner or Consultant.
 - 1. Includes painting of curbs if existing.

3.2 PREPARATION

- A. Striping:
 - 1. Allow new pavement surfaces to cure for a period of not less than 14-days before application of markings.
 - 2. Clean surfaces thoroughly prior to paint application.
 - a. Remove dust, dirt and other granular surface deposits by power brooming, sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.
 - 3. Establish survey control points to determine locations and dimensions of markings.
- B. Signage:
 - 1. Examine areas for conditions detrimental to completion of the delivery and installation Work. Report findings to Consultant immediately. Do not proceed with Work until unsatisfactory conditions have been corrected or until advised in writing by Owner.
 - 2. Starting Work constitutes acceptance of conditions under which Work is to be performed. After such acceptance Contractor shall, at their own expense, be responsible for correcting unsatisfactory and defective Work resulting from such unsatisfactory conditions.

3.3 INSTALLATION

- A. Paint application:
 - 1. Begin pavement marking as soon as practicable after surface has been cleaned and dried.
 - 2. Where restriping existing lines (no sealcoating), a single coat application of specified paint will suffice.
 - 3. Over new asphalt pavement (or sealcoating), or where markings do not exist, apply 2-coat application of specified paint.
- B. In general terms:
 - 1. Parking lot and drive lane lines shall be 4-inches wide.

2. Color: As indicated in Contract Documents and approved by Owner prior to placement.
 3. Crosswalks shall be restriped to meet “international” specifications.
 4. Color: White.
 5. Adhere to ADA zones and markings. Handicap designations shall have a Blue background with White logo, unless otherwise dictated by Local Ordinance.
 6. Comply with FHWA MUTCD manual for details not shown.
- C. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.
1. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.
- D. Apply paint using mechanical equipment to produce uniform, straight edges and in accordance with manufacturer’s recommendations.
- E. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.
- F. Apply paint at the manufacturer’s recommended rate to produce a minimum wet-film thickness of 15-mils for both acetone- and latex-based paints.
- G. Signage:
1. Perform cutting and fitting necessary for installation and completion of Work while accommodating Work of other trades. Immediately repair damage to existing surfaces or finishes caused by Work at no cost to Owner.
 2. Verification of Conditions: Verify installation conditions previously established under other sections are acceptable for product installation in accordance with manufacturer's instructions.
 3. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.
 4. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.
 5. Install exterior signage as indicated on Contract Drawings or as directed by Owner.
 6. Install Accessible Parking signs as indicated on Contract Drawings. Locations and heights to meet ADA.

3.4 CLEANING AND PROTECTION

- A. Paint Markings:
1. Protect completed markings from traffic until the paint has thoroughly dried in accordance with manufacturer’s recommendations.

B. Signage:

1. After installation, clean soiled sign surfaces according to manufacturer's instructions. Protect units from damage until acceptance by Owner.
2. Provide cleanup and removal of debris resulting from the installation Work.

END OF SECTION

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