SECTION 00850 – PREVAILING WAGE

The State of Rhode Island, Department of Labor, Division of Professional Regulation General Decision Modification is an integral part of the Bid Documents for prevailing wage rate requirements.

An available copy is on the following State of Rhode Island website:
www.purchasing.ri.gov

All contractors working on State of Rhode Island prevailing wage projects must adjust hourly rates for their employees every July 1, in accordance with Davis Bacon updated rates, which are indicated on the following website:
www.wdol.gov/dba.aspx

US Government prevailing wage tables can be found on the following website:
www.purchasing.ri.gov/bidinfo/geninfo/geninfo.aspx

Applicable Rhode Island Labor Laws can be found on the following website:
www.dlt.ri.gov/pw/

END OF SECTION 00850

SECTION 01000 – SUMMARY OF WORK

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Overview: Contractor to provide all labor, materials and equipment to remove the existing dock/leveler canopy and install a new dock leveler and vehicle restraint system at the CCRI Warwick campus, in accordance with the contract drawings and specifications listed in the Project Manual.

B. General Requirements:

1. Contractor shall perform the Work of the Contract under a stipulated sum Contract with the Owner in accordance with the Conditions of Contract.

2. Vendor is responsible for obtaining and paying for any required Local and State licenses, Permits and inspections.

3. Contractor to include all Bond costs in their Bid.

4. Before starting work, all Contractor workers and Subs are required to obtain and submit a current (within 2 months) BCI of State residing in along with RI BCI and State-approved picture ID. CCRI College Police reserves the right to deny Campus access to any worker based on information provided on the submitted BCI.

5. All onsite workers are to be OSHA 10 certified. Copies of this certification along with driver licenses are required on the first day of work.

6. The Contractor is responsible for providing their workers with all personal protection equipment. At a minimum, this includes hard hats, reflective vests, eye protection, harnesses and ear protection.

7. All completed work must be inspected and approved by the College and the Engineer.

8. There will be mandatory bi-weekly progress meetings onsite with four week look-ahead schedules to be furnished to the College and Engineer.

9. Contractor and/or its subcontractors are to be licensed as required by RI Department of Labor.

10. All contractors and subcontractors to sign in each employee at the CCRI Security Office located on the lower level at the start of each shift.

11. Deliveries to be coordinated with the college and to occur at convenient times for the college.

12. The Successful Bidder is to submit the names and resumes of the onsite

supervisors for review and acceptance to work on campus by the College team. The College reserves the right to reject any proposed onsite supervisors.

13. The College is not responsible for security of materials, tools, etc.

14. Contractors are not permitted to display a project sign anywhere on the campus grounds.

15. Contractor must come to terms with all vendors and subcontractors prior to submitting their bid.

16. All noisy demolition shall be performed between 10:30pm and 6:00am.

1.02 ALTERNATES

A. None at time of bid.

1.03 CONTRACTOR'S USE OF SITE AND PREMISES

A. Owner intends to fully occupy the facility during the period of construction.

B. Construction Operations: Limit work areas within the building as agreed with the College. Coordinate with Owner to insure delivery and completion per the schedule identified on the Bid Form. Include all costs of this coordination, including all premium time wages that may be required to meet these requirements, in the Base bid.

C. Provide access to and from site as required by law and by Owner:

1. Building Entrance and Emergency Exits During Construction: Keep all exits required by code to remain open during construction period; provide temporary exit signs if exit routes are temporarily altered.

2. Do not obstruct roadways, sidewalks, or other public ways without permission from the Owner.

D. Utility Outages and Shutdown:

1. Do not disrupt or shut down life safety system, including but not limited to fire alarm system, without 7 days' notice to Owner and authorities having jurisdiction.

2. Prevent accidental disruption of utility services to other facilities. Any and all shutdowns to occur during third shift.

3. Do not disrupt building control wiring or fire alarm wiring passing through the area of work.

E. Protect all existing surfaces from damages. Any damages to the existing surfaces requiring replacement and or repair will be at this vendor's expense.

F. At all times and at the completion of the Project, construction areas are to be kept in a clean, safe and acceptable condition on a daily basis.

G. Vendor is responsible for removing all project debris off site daily including all costs associated with waste containers and proper disposal of waste. The College will provide an exterior location for the temporary placement of a waste container.

H. Vendor is to have all equipment necessary to perform the installation and service including tools, staging, lift truck, etc. No CCRI equipment or tools will be available.

I. Any work that affects the fire suppression and fire alarm systems is to be done by the College contracted maintenance companies with all costs included in the base bid.

1.04 ITEMS PROVIDED BY OWNER INSTALLED BY CONTRACTOR

A. None

1.05 WORK BY OWNER

A. Items noted NIC (Not in Contract) will be supplied and installed by Owner before Substantial Completion. Some items include:

1. None

1.06 OWNER REQUIRED SUBCONTRACTORS

A. None

1.07 ITEMS TO BE SALVAGED

A. None

1.08 ALLOWANCES

A. Include an allowance of $15,000 for unknown concealed work.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

A. Submit monthly waivers of lien for all vendors and subs.

B. Submit certified payrolls to CCRI.

C. Submit monthly MBE Reports w/cancelled checks to CCRI with each invoice for payment.

END OF SECTION 01000

Office of Diversity, Equity and Opportunity (ODEO)
MBE Compliance Office
1 Capitol Hill, 3rd Floor
Providence, RI 02908

(401) 574-8670
www.mbe.ri.gov

Pursuant to RIGL 37-14.1 as well as the regulations promulgated thereto, the MBE Compliance Office requires that you complete the following table. Please note that these figures will be verified with the MBEs identified. If there are outstanding issues, such as retainage or a dispute, please indicate and attach supporting documentation for same. Also note that copies of invoice and cancelled checks for payment to all MBE subcontractors and suppliers are required.

Contractor/Vendor Name:
Project Name & Location:
Original Prime Contract Amount: $_____ Current Prime Contract Amount: $_____ % Complete: _____

MBE/WBE Subcontractor	Original Contract Amount	Change Orders	Revised Contract Value	% Completed To Date	Amount Paid To Date	Amount Due	Retainage %	Retainage Amount	Explanation

I declare, under penalty of perjury, that the information provided in this verification form and supporting documents is true and correct.

_____ Signature

_____ Date

_____ Printed Name

Notary Certificate:

Sworn before me this _____ day of _____, 20___.

_____ Notary Signature

_____ Commission Expires

SECTION 01005 – ADMINISTRATIVE PROVISIONS

PART 1 - GENERAL

1.00 GENERAL REFERENCE

A. The General Conditions, Supplementary General Conditions and Division 1 of these specifications are hereby included as part of this section.

1.01 REQUIREMENTS INCLUDED

A. Title of Work, and type of Contract.

B. Contractor Use of Premises.

C. Applications for Payment

D. Field Engineering.

E. Reference Standards.

F. Cutting and Patching

1. Requirements and limitations for cutting and patching of Work.

G. Supervision

H. Miscellaneous Administrative Items

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. All equipment, materials, installation, workmanship, inspection, and testing shall be in strict accordance with the Rhode Island Uniform Building Code.

B. The contractor must provide all material, labor, tools, plant supplies, equipment, transportation, superintendence, temporary construction of every nature and all other services and facilities necessary to complete the construction for the Owner, including all incidental work as required or described in the contract documents.

1.03 CONTRACT METHOD

A. Construction of the Work under single Lump Sum contract.

B. Items noted "NIC" (Not in Contract) and other items as indicated will be furnished and installed by Owner.

1.04 APPLICATIONS FOR PAYMENT

A. Submit three copies of each application under procedures of Section 01300 on AIA

G702 - Application and Certificate for Payment.

B. Content and Format: That specified for Schedule of Values in Section 01300.

C. The contractor must submit a payment schedule and Lump Sum breakdown with their Lump Sum Bid. The State will hold 5% of Lump Sum until Final Acceptance.

D. Contractor shall refer to Section 00700 - General Conditions, for additional requirements.

1.05 CONTRACTOR USE OF PREMISES

A. Limit use of premises for Work and for construction operations, to allow for work by other Contractors. The contractor shall develop a phasing plan that must be submitted and approved by owner prior to any work on site.

B. The contractor shall provide for the necessary protection of the work area from the general public and the working staff utilizing the parking lot during construction.

C. Limit access to site and work areas as directed by the Owner.

D. The contractor shall not use private property to store equipment or materials without written approval of the property owner.

1.06 JOB SAFETY AND ACCIDENT PREVENTION

A. All construction work on this project must be performed in compliance with the Occupational Safety and Health Act of 1970 or with local or State occupational safety and health regulations enforced by an agency of the locality or State under a plan approved by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA).

1. All contractors and subcontractors shall comply with requirements of the Occupational Safety and Health Act of 1970 or revisions thereto, which are applicable during the term of this contract and hold the Owner and Architect and/or their agents harmless from any claim or loss that may result from violations of or claims under this act.

B. See the General Conditions for further requirements.

1.07 FIELD ENGINEERING

A. Provide field engineering services; establish grades, lines, and levels, by use of recognized engineering survey practices.

B. Contractor shall not deviate from established grades and lines, except by written approval of the Architect or obvious error exists in designated grades and lines.

C. Contractor shall establish bench marks as required to properly perform work of this

project.

D. Contractor shall layout partition lines and other significant reference lines or points which will enable mechanical, electrical and other trades to accurately locate boxes, openings, sleeves, conduits, hangers, inserts and other devices.

E. Prior to start of any work, the contractor shall confirm and verify the location, adequacy and elevations of all existing conditions that are being disturbed for a complete installation. Contractor shall pay all costs associated with any modifications required by his failure to follow this requirement.

F. All Construction layout, Survey and as-built drawings will be incidental to this contract.

1.08 REFERENCE STANDARDS

A. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes. All RIDOT Standards Specifications and Material testing requirements apply to this contract.

B. The date of the standard is that in effect as of date of Contract Documents when there are no bids, except when a specific date is specified. If governing codes reference standard date then code reference date shall be in effect.

C. Obtain copies of standards when required by Contract Documents. Maintain copy at jobsite during progress of the specific work.

1.09 CUTTING AND PATCHING

A. Submit written request in advance of cutting or alteration which affects:

1. Structural or security integrity of any element of Project.
2. Integrity of weather-exposed or moisture-resistant element.
3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.
5. Work of Owner or separate Contractor.

1.10 EXISTING UTILITIES AND STRUCTURES

A. Contractor shall be responsible for injury or damages to any utility piping, drains, sewers, electrical wiring and conduits, buildings and other structures that may be met within the prosecution of the work. Contractor shall be liable for any damages to items resulting from work of this Contract. To include injury or damages caused by Subcontractors, sub-subcontractors and material manufacturers.

B. Shore or sling in place and prevent any damage to above mentioned items. Maintain them in constant operation except as may be required to connect or disconnect from them.

C. All existing utilities are NOT indicated on the drawings. Contractor to use caution during construction.

1.11 SUPERINTENDENCE OF SUBCONTRACTORS

A. The contractor must supervise subcontractors in accordance with the provisions of General Conditions. A project superintendent shall be on site whenever any work is being performed. Contractor to submit resume of proposed project super for Design Team's approval.

1.12 COORDINATION

A. Prior to commencement of subcontract work, a designated representative of each subcontractor shall meet with project superintendent, Owner and Engineer at the site to discuss requirements and scope of Work.

B. The General Contractor and all subcontractors will be required to attend a preconstruction conference at a date and time set by the Owner.

1.13 BEHAVIOR OF PERSONNEL

A. If in the opinion of the Owner, any employee of the Contractor or his subcontractors is physically or mentally unfit for work or exhibits behavior incompatible with work site environment, said employee may be required to leave property and may be refused re-admittance.

1.14 SUBSTITUTIONS

A. In all cases where a proprietary designation is used in connection with materials or articles to be furnished under this contract and the phrase "or equal" is not used, the Contractor shall furnish the specified item, unless a written request for a substitute has been submitted by the Contractor and reviewed by the Architect to his satisfaction.

1.15 CODES, RULES AND REGULATIONS

A. All work is to be in accord with the latest requirements of:

1. Federal, State and Municipal Laws
2. Rhode Island Building and Fire Code
3. National Plumbing Code
4. National Electric Code
5. Any prevailing rules, regulations pertaining to adequate protection and/or guarding of any moving parts or otherwise hazardous locations.

B. Reference in Specifications or Drawings shall mean and intend the latest edition of such, as published at date of submission of bids.

C. Reference to technical society organizations or body is made per the following abbreviations:

AIA	American Institute of Architects
AISE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction ASA American Standards Association
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWSC	American Welding Society
CS	Commercial Standard of U.S. Dept. of Commerce
FS	Federal Specifications
NBFU	National Board of Fire Underwriters
NBS	National Bureau of Standards
NEC	National Electric Code
UBC	Uniform Building Code
UL	Underwriters' Laboratories, Inc.
AASHO	American Assoc. of State Highway Officials

D. Nothing in the Specification or Drawings is to be construed to allow work not in accord with the above requirements. When requirements shown or specified are less than those in the codes listed above, the Contractor is to furnish and/or install the larger size or higher standard without extra cost to the Owner.

1.16 DRAWINGS AND SPECIFICATIONS

A. All work drawn on Plans and not specified or all work specified and not drawn are part of Contract Work required to be done and are to be executed as fully as if described in both of these ways. Only work specifically noted in the following manner shall be considered as not being in the contract:

".....by Owner".
".....NIC (Not In Contract)".

B. If, after examination of Contract Drawings and Specifications, or after a visit to the premises, any discrepancies, omissions, ambiguities, or conflicts are found in or amount contract documents or there is doubt as to their meaning, Architect is to be notified at the earliest possible date. Where information sought is not clearly indicated or specified, the Architect will issue addendum to the Contractor clarifying conditions, which addendum will become part of the Contract Documents. Neither the Owner nor the Architect will be responsible for any oral instructions.

C. If there are two ways and/or instruction in drawings and/or specifications, it shall be assumed that the Contractor has based his base bid price on the most expensive way.

D. If duplication is shown on drawings and/or specifications of work by more than one trade, Architect shall determine which trade shall do work and rebate shall be due from the other trades to Owner.

E. Drawings DO NOT include any necessary components for construction safety.

F. In all work shown on Drawings, figured dimensions are to be followed in all cases,

though they may differ from scaled measurements. Before beginning the work, Contractor is to check through and verify all dimensions/elevations and call to the attention of the Architect any apparent or manifest discrepancy.

1. Contractor shall verify all dimensions with existing and actual field conditions, prior to start of any work.

G. All work and materials shown on drawings shall be interpreted by the Contractor as being new work and materials to be furnished and installed unless are specifically indicated as being existing to remain.

1.17 MANUFACTURER'S DIRECTIONS

A. It is intended that manufactured articles, materials, and equipment be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with manufacturer's printed directions unless specifically specified to the contrary.

B. If there is a conflict between the Contract Documents and manufacturer's directions, the Contractor shall notify the Architect in writing. Contractor shall not proceed with work until Architect has reviewed the conflicting data and provide the Contractor with a decision on which specification to follow.

1.18 GENERAL SPECIFICATION NOTE

A. The paragraph entitled "WORK INCLUDED" in each section of the technical section shall be considered general in nature and NOT all inclusive. The intent of the paragraph is to provide a general guide of what is included in the section.

B. The paragraph entitled "RELATED WORK" in each section of the technical section shall be considered general in nature and NOT all inclusive. The intent of the paragraph is to provide a general guide of what work is related to work included in this section.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.

B. After uncovering existing work, inspect conditions affecting performance of Work.

C. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Provide all required temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.

B. Provide protection from elements for areas which may be exposed by uncovering work.

3.03 CUTTING AND PATCHING

A. Execute cutting, fitting, and patching including excavation and fill to complete work.

B. Fit products together, to integrate with other work.

C. Remove and replace defective or non-conforming work.

D. Provide openings in the Work for penetration of mechanical and electrical work.

3.04 PERFORMANCE

A. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.

B. Cut rigid materials using saws or core drill. Existing interior window casings and trim scheduled to be removed shall be saw cut at location where removed materials meet existing materials scheduled to remain. Pneumatic tools not allowed without prior approval of the Architect.

C. Restore work with new Products in accordance with requirements of Contract Documents.

D. Fit work tight to adjacent surfaces and refinish all work back to its original condition. Refinish all surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

E. At penetrations of fire rated walls, partitions, ceiling, and all floor construction, completely seal voids with fire rated materials to full thickness of the penetrated element.

END OF SECTION 01005

SECTION 01006 – CONSTRUCTION PHASING AND SCHEDULING

PART 1 - GENERAL

1.00 GENERAL REFERENCE

A. The General Conditions, Supplementary General Conditions and Division 1 of these specifications are hereby included as part of this section.

1.01 REQUIREMENTS INCLUDED

A. Coordination.

B. Work Hours.

C. Work Sequence and Scheduling.

1.02 RELATED REQUIREMENTS

A. Section 01005 - Administrative Provisions: Cutting and patching.

B. Section 01300 - Submittals: Construction schedules.

C. Section 01500 - Construction Facilities and Temporary Controls: Temporary enclosures, protection of completed work, and cleaning.

1.03 COORDINATION

A. Coordinate work of the various sections of specifications and all drawings, to assure efficient and orderly sequence of installation of construction elements, and with provisions for accommodating items installed later.

B. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practicable; make runs parallel with lines of build- ing. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

E. Execute cutting and patching to integrate elements of Work, uncover ill-timed, defective, and non-conforming work, provide openings for penetrations of existing

surfaces, and provide samples for testing. Seal all penetrations through floors, walls, and ceilings.

F. COOPERATION

1. Construction operation of various contracts will be proceeding concurrently. Contractor and Subcontractors shall make every effort to cooperate with the other Contractors on the site and in such manner not to delay or interfere with carrying forward other Contractor's work.

2. Contractor and Subcontractors shall coordinate their work with adjacent work, and cooperate with other trades so as to facilitate general progress of work. Each trade shall afford other trades every reasonable opportunity for installation of their work and for storage of their materials.

1.04 WORKING HOURS

A. In no case shall Contractor or any Subcontractor perform any work on project, except during regular working hours without in each instance, notifying the Owner's Representative in order that they may be present to assist during work. This shall not be interpreted as a measure to prevent the Contractor from working "overtime" under any circumstances, but merely to insure that the Owner's Representative may have the opportunity to be on hand to assist the Contractor, as may be required, to interpret Contract Documents, Plans or Specifications and to insure that construction operations will not interfere with Owner's Operations.

1. Normal working hours for the purpose of this construction project shall be 7:00am to 3:00pm daily. Work performed outside of these hours must be approved by the Engineer and Owner prior to performing work. The Owner's operations will take precedence over the Contractor's operations. Any noisy work shall be completed between 10:30pm to 6am.

B. If found necessary to reach a proper stopping place in any portion of the work, or to complete work within the Contract time limit, the Contractor shall work his forces and forces of his Subcontractors overtime without addition to the Contract Price. The Contractor shall insure that installation of Work under any subcontract does not interfere with nor delay progress of the building work, nor with progress of any independent contracts running concurrently.

1.05 GENERAL WORK SEQUENCE and SCHEDULING REQUIREMENTS

A. Contractor shall schedule and construct work to accommodate Owner's continuous and uninterrupted use of the facility during the construction period.

B. The buildings will be occupied during all of the construction process. The construction schedule shall be developed around the understanding that the buildings are occupied and that they cannot be closed nor can the Owner's operations stop. The Contractor shall

perform the work of this contract in a manner that causes no disruption to the continuous occupation of the buildings and sites for their intended purposes.

1. Construction schedule shall be approved by the Owner.

2. Owner's use of the buildings and sites shall have priority in the scheduling of work. Under no circumstances can the operations of the College be disrupted.

3. Any noisy (demolition) work is to be done off-hours, on weekends and/or on third shift at vendor's expense.

END OF SECTION 01006

SECTION 01200 – PROJECT MEETINGS

PART 1 - GENERAL

1.00 GENERAL REFERENCE

A. The General Conditions, Supplementary General Conditions and Division 1 of these specifications are hereby included as part of this section.

1.01 REQUIREMENTS INCLUDED

A. Contractor participation in preconstruction conferences and progress meetings.

B. Contractor administration of pre-installation conferences.

1.02 RELATED REQUIREMENTS

A. Section 01006 - Construction Phasing: Coordination of Work, Scheduling and Phasing.

1.03 PRECONSTRUCTION CONFERENCES

A. Owner shall administer preconstruction conference for execution of Owner - Contractor Agreement and exchange of preliminary submittals.

B. Engineer shall administer site mobilization conference at Project site for clarification of Owner and Contractor responsibilities in use of site and for review of administrative procedures.

1.04 PROGRESS MEETINGS

A. Contractor will schedule and administer project meetings throughout progress of the Work at weekly intervals.

B. Contractor shall make physical arrangements for meetings. Contractor shall be responsible for recording meeting minutes and distribution to all concerned parties. Minutes shall be typed and distributed within two working days of the meeting.

C. Attendance: Contractor, job superintendent, major subcontractors and suppliers; Owner's Representative, Engineer and others as appropriate to agenda topics for each meeting.

1.05 PRE-INSTALLATION CONFERENCES

A. When required in individual specification Section, Contractor shall convene a pre- installation conference prior to commencing work of the Section.

B. Require attendance of entities directly affecting, or affected by, work of the Section.

C. Review conditions of installation, preparation and installation procedures, and coordination with related work.

END OF SECTION 01200

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.00 GENERAL REFERENCE

A. The General Conditions, Supplementary General Conditions and Division 1 of these specifications are hereby included as part of this section.

1.01 SECTION INCLUDES

A. Submittal procedures.

B. Construction schedules.

C. Proposed Products list.

D. Shop drawings.

E. Product data.

F. Manufacturers' instructions.

G. Manufacturers' certificates.

H. Schedule of Values.

I. Progress Reports

J. Construction Cost Estimate

1.02 GENERAL SUBMITTAL PROCEDURES

A. Schedule of Submittals

1. Within 30 days after receiving a notice to proceed the contractor must submit to the Engineer, in duplicate, a schedule listing all items that must be furnished for review and approval by the Owner.

B. Transmit each submittal with AIA Form G810 or Architect accepted form.

C. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.

D. Contractor Review:

1. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements of Contract Documents.

2. Coordinate submittals with requirements of Work and of Contract Documents.

3. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.

E. Schedule submittals to expedite the Project.

1. Transmit submittals in accordance with approved Progress Schedule and in such sequence to avoid delay in the Work or work of other contracts. Failure to do so will not justify an extension in contract time.

2. Coordinate submittals into logical groupings to facilitate interrelation of the several items.

F. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.

G. Provide space for Contractor and Engineer review stamps.

H. Revise and resubmit submittals as required, identify all changes made since previous submittal. Failure to do so will be reason to reject submittal.

I. Distribute copies of reviewed submittals to concerned parties.

1.03 CONSTRUCTION SCHEDULES

A. The contractor is responsible for the scheduling of construction and must prepare a scheduling and charting system described below. This schedule is to ensure adequate planning and execution of the work by the contractor and to assist the Owner in appraising the reasonableness of the schedule and evaluating work progress.

B. General Requirements of Schedule

1. Submit initial schedule in duplicate within 10 days after date of Owner-Contractor Agreement for Architect review.

2. Revise, update and resubmit 3 copies with monthly requisition.

C. Format

1. Horizontal bar chart with separate line for each section of Work, identifying first work day of each week.

2. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and under

Allowances.

3. Provide legend for symbols and abbreviations used.

4. Major milestones must be indicated on the schedule, such as the Notice to Proceed date, 50 percent completion, substantial completion for liquidated damages purposes, and project completion. In addition, the schedule must indicate when utility connections are to be made, permits to be obtained, and all other internal or external activities that affect the work flow (including all activities of the Owner that affect progress and contract-required dates to be completed).

D. Coordinate contents with Schedule of Values.

E. Participate in joint review and evaluation of schedule.

F. After review, revise as necessary as result of review, and resubmit 6 copies within 10 days.

G. See General Conditions for additional requirements.

1.04 PROPOSED PRODUCTS LIST

A. Within 10 days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number or each product.

1.05 SHOP DRAWINGS

A. Submittal of shop drawings and related data must conform to the requirements of the general contract clauses and as specified in this section. The contractor must make any corrections required by the Architect. If the contractor considered any correction indicated on the drawings to constitute a change to the contract drawings or specifications, notice must be given to the Engineer. The approval of the drawings must not be construed as a complete check but indicates only that the general method of construction and detailing is satisfactory. Approval of the shop drawings does not relieve the contractor of the responsibility for any error that may exist because the contractor is responsible for the dimensions and design of adequate connections and details and satisfactory construction of all work.

B. Present in a clear and thorough manner. Title each drawing with Project name and number; identify each element of drawings by reference to sheet number and detail, schedule, or room number of Contract Documents.

C. Identify field dimensions; show relation to adjacent or critical features or Work or products.

D. Minimum Sheet Size: Multiples of 8-1/2 x 11 inches.

E. Number and type of copies as follows:

1. Submit reproducible transparency.

2. Submit the number of opaque reproductions which Contractor requires, plus three copies which will be retained by Architect.

3. After review, reproduce and distribute in accordance with Article on Procedures above and for Record Documents described in Section 01700 - Contract Close-Out.

1.06 PRODUCT DATA

A. Submit the number of copies which the Contractor requires, plus three copies which will be retained by the Engineer.

B. Mark each copy of standard printed data to identify pertinent products, referenced to Specification Section and Article number. Show reference standards, performance characteristics, and capacities, wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.

C. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the Work. Delete information not applicable.

D. Supplement manufacturers' standard data to provide information unique to this Project.

1.07 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

B. Identify conflicts between manufacturers' instructions and Contract Documents. Perform no work until conflict has been satisfactorily resolved.

1.08 MANUFACTURER'S CERTIFICATES

A. When specified in individual specification Sections, submit manufacturers' certificate for review, in quantities specified for Product Data. The contractor must review all certificates before submissions are made to ensure compliance with the contract specification requirements and to ensure that the affidavit is properly executed prior to submission to the contracting officer. Certification must not be construed as relieving the contractor from furnishing satisfactory material if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.

1.09 SCHEDULE OF VALUES

A. Requirements included:

1. Contractor shall submit a schedule of values allocated to the various portions of the work, within twenty days after the award of contract.

B. Form and Content of Schedule of Values

1. Per General Conditions.

2. Schedule shall list the installed value of the component parts, by phase, of the work in sufficient detail to serve as a basis for computing values for progress payments during construction

3. For each major line item list sub-values of major products or operations under the item.

a. List all items that have a value of $5,000 or more break out labor and material cost.

b. For items on which progress payments will be requested for stored materials, break down the value into:

1. The cost of the materials, delivered and unloaded.
2. The total installed value.

4. The sum of all values listed in the schedule shall equal the total contract sum.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

A. Failure of Contractor to follow submittal requirements specified herein will serve as reason to reject the submittal, material, product or work in place.

B. Performing any work, ordering or furnishing materials/products prior to review will serve as justification to reject and refusal to make payment of same.

END OF SECTION 01300

SECTION 01400 – QUALITY CONTROL

PART 1 - GENERAL

1.00 GENERAL REFERENCE

A. The General Conditions, Supplementary General Conditions and Division 1 of these specifications are hereby included as part of this section.

B. The contractor is responsible for the overall quality of all its own work and the work performed by the subcontractors working under this contract. The quality of any part of the work installed must not be less than that required by the contract documents. If the Engineer or Owner determines that the quality of work does not conform to the applicable specifications and drawings, the contractor will be advised in writing of the areas of nonconformance and within 7 days the contractor must correct the deficiencies and advise the Engineer and Owner in writing of the corrective action taken.

1.01 SECTION INCLUDES

A. Quality assurance and control of installation.

B. References.

C. Field samples.

D. Inspection and testing laboratory services.

1.02 RELATED SECTIONS

A. Section 01300 - Submittals: Submission of Manufacturers' Instructions and Certificates.

B. Section 01600 - Material and Equipment: Requirements for material and product quality.

1.03 CONTRACTOR QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply fully with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher

standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.04 REFERENCES

A. Conform to reference standard by date of issue current on date of Contract Documents.

B. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 INSPECTION AND TESTING LABORATORY SERVICES

A. All inspection and testing services to be provided by Contractor and included in Base Bid costs.

B. Limits of Testing Laboratory Authority

1. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Laboratory may not approve or accept any portion of the Work.
3. Laboratory may not assume any duties of Contractor.
4. Laboratory has no authority to stop the Work.

C. Contractor Responsibilities

1. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities.
3. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of Products to be tested, to facilitate tests and inspections, storage and curing of test samples.

END OF SECTION 01400

SECTION 01500 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.00 GENERAL REFERENCE

A. The General Conditions, Supplementary General Conditions and Division 1 of these specifications are hereby included as part of this section.

B. The contractor must provide all temporary facilities and services required to complete the work and to comply with OSHA and other applicable regulations.

1.01 SCOPE OF WORK THIS SECTION

A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone service, water, fire protection and sanitary facilities.

B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, water control and snow and ice control, dust control and hazards control. Maintenance of required means of egress from existing structure.

C. Vendor is not allowed to put up a construction or project sign on campus.

1.02 RELATED SECTIONS

A. Section 01005 - Administrative Provisions.

B. Section 01006 - Construction Phasing and Scheduling: Phasing and sequencing construction.

C. Section 01700 - Contract Close-Out: Final cleaning.

1.03 TEMPORARY ELECTRICITY

A. Connect to existing power service. Power consumption shall not disrupt Owner's need for continuous service.

B. Provide temporary electric feeder from existing electrical service at location as directed.

C. Owner will pay cost of energy used.

D. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required.

E. Provide feeder switch at source distribution equipment.

F. Permanent convenience receptacles may be utilized during construction work in the building.

G. Provide all labor, materials and equipment required for installation of temporary electric lighting and power.

H. Temporary power for hoisting, welding or compressor equipment shall be provided and paid for by the Contractor.

I. Each subcontractor shall furnish all extension cords, sockets, lamps, motors, and accessories required for the execution of his work.

J. Lighting fixtures, lamps, feeders, and branch circuit wiring as indicated on contract plans shall not be used for temporary lighting.

1. Safety: The contractor must provide and maintain lights and signs to prevent damage or injury and must illuminate all hazardous areas. Safety lights must be kept burning from dusk to dawn.

K. At the end of the day's work, close all lights and power other than the minimum required for exterior security lights.

L. During construction the Contractor shall maintain the existing electrical system in operating condition in all areas. Contractor shall furnish and pay for all labor and materials required to maintain this system in a full operating condition.

1.04 TEMPORARY SANITARY FACILITIES

A. Vendor to provide port-a-johns.

1.05 BARRIERS AND BARRICADES

A. Provide and maintain barriers to prevent unauthorized entry to construction areas, to allow for the continued uninterrupted use of existing buildings and sites, to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public access and use of existing buildings.

C. Provide barriers to protect non-owned vehicular traffic, stored materials, site and structures from damage.

D. Provide guardrails, barricades, handrails, and covers for floor, roof, and wall openings.

E. Comply with OSHA with regard to standards and requirements for guardrails, openings and stairways.

1.06 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where specified in individual specification Sections.

B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.

C. Prohibit traffic from landscaped areas.

1.07 SECURITY

A. Provide security and facilities to protect Work from unauthorized entry, vandalism, or theft.

B. Contractor shall keep all unauthorized visitors off construction site by such legal/approved means as he selects.

1.08 STORAGE AREAS

A. Construction material storage, offices, shops, etc. shall be located as directed and assigned by the Owner. Contractor shall relocate any material storage areas, temporary trailers, etc., as required during work execution.

1.09 PROGRESS CLEANING AND JANITORIAL SERVICES

A. The contractor must furnish daily janitorial services for the project site and must perform any required maintenance of facilities and grounds deemed necessary by the Owner's Representative during the entire term of the contract. Services must be performed at such a time and in such a manner as to least interfere with the operations. Services must be performed to the satisfaction of the Owner's Representative. The contractor must provide daily trash collection and cleanup of the buildings and adjacent outside areas, and disposal of all discarded debris, aggregate samples and concrete test samples in a manner approved by the Owner's Representative. No separate payment may be made for these contractor- furnished services; all costs are incidental to the contract.

B. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

C. Maintain premises and properties free from accumulation of waste, debris and rubbish caused by operations.

D. Collect and deposit debris in such collation facilities.

E. Remove all debris from the job site on a regular basis. Do not allow trash and debris to accumulate or remain on the site for longer than 48 hours.

1.10 TEMPORARY FIRE PROTECTION

A. The Contractor shall provide and maintain in good operating condition suitable and adequate fire protection equipment and services and shall comply with all reasonable recommendations regarding fire protection made by the Owner's Representatives or by the local fire chief or fire marshal.

B. As a minimum temporary fire protection shall be IAW NFPA 241-1980, unless more stringent requirements are required by proceeding paragraphs.

1.11 HOISTING FACILITIES

A. Provide hoisting facilities as required for the vertical movement of all materials.

B. Comply with OSHA for all hoists, conveyers, and elevators and maintain the facilities in compliance with the law.

1.12 TEMPORARY CONTROLS

A. Dust Control

1. The contractor must keep all work areas within or outside the project boundaries free from the dust that would cause the standards of air pollution to be exceeded or that would cause a hazard or nuisance to others. Dust must be controlled as the work proceeds and whenever a dust nuisance or hazard occurs. No separate or direct payment is made for dust control, and its cost is considered incidental to and included in the contract price.

B. Hazards Control

1. Store volatile wastes in covered metal containers and remove from premises daily.
2. Prevent accumulation of wastes which create hazardous conditions.
3. Provide adequate ventilation during use of volatile or noxious substances.

C. Cleaning and Disposal

1. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
2. Do not burn or bury rubbish and waste materials on project site.
3. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drain.
4. Do not dispose of wastes into streams or waterways.
5. Maintain cleaning until project, or portion thereof, is occupied by Owner.

D. Parking

1. All contractor employees and subs shall park in the Public Parking Lot.

PART 2 PRODUCTS (Not Used)

END OF SECTION 01500

SECTION 03 30 01 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.03 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
   1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, manufacturer, and testing agency.

B. Welding certificates.

C. Material Certificates: For each of the following, signed by manufacturers:
   1. Cementitious materials.
   2. Admixtures.
   3. Form materials and form-release agents.
   4. Steel reinforcement and accessories.
   5. Fiber reinforcement.
   6. Waterstops.

7. Curing compounds.
8. Floor and slab treatments.
9. Bonding agents.
10. Adhesives.
11. Vapor retarders.
12. Semirigid joint filler.
13. Joint-filler strips.
14. Repair materials.

D. Material Test Reports: From a qualified testing agency indicating compliance with requirements.

E. Field quality-control reports.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
   2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301, "Specifications for Structural Concrete."
   2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.01 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
   1. Plywood, metal, or other approved panel materials.
   2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
      a. High-density overlay, Class 1 or better.
      b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
      c. Structural 1, B-B or better; mill oiled and edge sealed.
      d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

C. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
   3. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
   4. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.

2.02 STEEL REINFORCEMENT

A. Epoxy-Coated Reinforcing Bars: Deformed bars, ASTM A 775/A 775M, epoxy coated, with less than 2 percent damaged coating in each 12-inch (300-mm) bar length.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, steel wire into flat sheets.

2.03 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
   1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.04 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
   1. Portland Cement: ASTM C 150, Type I, Type II, 5000 psi high early.

B. Normal-Weight Aggregates: ASTM C 33, coarse aggregate or better, graded. Provide aggregates from a single source.

C. Water: ASTM C 94/C 94M and potable.

2.05 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
   1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
   2. Retarding Admixture: ASTM C 494/C 494M, Type B.
   3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
   5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.06 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class B. Include manufacturer's recommended adhesive or pressure-sensitive tape.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Fortifiber Building Systems Group; Moistop Ultra 6.
      b. Raven Industries Inc.; Griffolyn.
      c. Stego Industries, LLC; Stego Wrap, 10 mil Class A.

B. Sheet Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick.

C. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

D. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a 3/8-inch (9.5-mm) sieve, 10 to 30 percent passing a No. 100 (0.15-mm) sieve, and at least 5 percent passing No. 200 (0.075-mm) sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

2.07 FLOOR AND SLAB TREATMENTS

A. Slip-Resistive Emery Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive, crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Anti-Hydro International, Inc.; Emery.
      b. Dayton Superior Corporation; Emery Tuff Non-Slip.
      c. Lambert Corporation; EMAG-20.
      d. L&M Construction Chemicals, Inc.; Grip It.
      e. Metalcrete Industries; Metco Anti-Skid Aggregate.

B. Emery Dry-Shake Floor Hardener: Factory-packaged, dry combination of Portland cement, graded emery aggregate, and plasticizing admixture; with emery aggregate consisting of no less than 60 percent of total aggregate content.

2.08 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Axim Italcementi Group, Inc.; CATEXOL CimFilm.
      b. BASF Construction Chemicals - Building Systems; Confilm.
      c. ChemMasters; SprayFilm.
      d. Conspec by Dayton Superior; Aquafilm.
      e. Dayton Superior Corporation; Sure Film (J-74).
      f. Edoco by Dayton Superior; BurkeFilm.
      g. Euclid Chemical Company (The), an RPM company; Eucobar.
      h. Kaufman Products, Inc.; Vapor-Aid.
      i. Lambert Corporation; LAMBCO Skin.
      j. L&M Construction Chemicals, Inc.; E-CON.
      k. Meadows, W. R., Inc.; EVAPRE.
      l. Metalcrete Industries; Waterhold.
      m. Nox-Crete Products Group; MONOFILM.
      n. Sika Corporation; SikaFilm.
      o. SpecChem, LLC; Spec Film.
      p. Symons by Dayton Superior; Finishing Aid.
      q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
      r. Unitex; PRO-FILM.
      s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
      b. BASF Construction Chemicals - Building Systems; Kure 200.
      c. ChemMasters; Safe-Cure Clear.
      d. Conspec by Dayton Superior; W.B. Resin Cure.

F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. BASF Construction Chemicals - Building Systems; Kure 1315.
      b. ChemMasters; Polyseal WB.
      c. Conspec by Dayton Superior; Sealcure 1315 WB.
      d. Edoco by Dayton Superior; Cureseal 1315 WB.
      e. Euclid Chemical Company (The), an RPM company; Super Diamond Clear VOX; LusterSeal WB 300.

2.09 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

B. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

2.10 REPAIR MATERIALS – NOT USED

2.11 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
   1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:
   1. Fly Ash: 25 percent.

C. Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
   2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.12 PROPORTIONING AND DESIGN OF MIXES

A. The design of the exact proportions for the mix, including amounts of admixtures and water to meet all specification requirements shall be the responsibility of the concrete supplier.

B. Submit written reports to Engineer of each proposed mix for each class of concrete at least 30 days prior to start of work. Do not begin concrete production until proposed mix designs have been reviewed by Engineer.

C. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:
   1. 4000-psi, 28-day compressive strength, maximum size of aggregate as specified below, minimum cement content 611 pounds per cubic yard.
      a. Foundations and Walls: 1-1/2" maximum aggregate size.
      b. Slabs: ¾" maximum aggregate size.

2.13. ADMIXTURES

A. Use mid-range or high-range water-reducing admixture (Superplasticizer) in concrete as required for placement and workability.
   1. Use mid-range water-reducing admixture in pumped concrete, concrete for slabs, and concrete with water/cement ration of 0.50 or less.

B. Use nonchloride accelerating admixture in concrete slabs placed at ambient temperatures below 50°F (10°C).

C. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content of 4.5 to 6.5 percent. Interior slabs shall have a maximum air content of 3 percent.

D. Use corrosion inhibitor admixture in the elevated slab concrete. Add admixture at the manfacturer's recommended rate of 3 gal./yd.

E. Use admixtures for water reduction and set control in strict compliance with manufacturer's directions.

F. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:

1. Subjected to freezing and thawing, W/C 0.45.
2. All other concrete, W/C 0.50.

G. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
1. Ramps, slabs, and sloping surfaces: Not more than 3 inches.
2. Reinforced foundation systems: Not less than 1 inch and not more than 3 inches.
3. Concrete containing plant-added mid-range water reducing admixture: 4-inch to 6-inch slump at time of arrival at the site.
4. Concrete containing high-range, water-reducing admixture (Superplasticizer): Not more than 8 inches after addition of high-range, water-reducing to site-verified 2-inch to 3-inch slump concrete. Concrete containing plant added high-range, water-reducing admixture shall arrive at the site with a 5-inch to 8-inch slump.
5. Other concrete: Not more than 4 inches.

2.14 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.15 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M and furnish batch ticket information.

PART 3 - EXECUTION

3.01 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Construct forms tight enough to prevent loss of concrete mortar.

D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

E. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

F. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely

braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

3.02 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
   2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
   3. Install dovetail anchor slots in concrete structures as indicated.

3.03 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
   1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

3.04 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.05 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by the Engineer.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

3.06 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.07 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.08 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
   1. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
      a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
      b. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
   2. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch (3.2 mm).

E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
   1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.

3.09 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
   1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

   2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
      a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
      b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
      c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

   3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
      a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

   4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.10 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.

B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

3.11 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.12 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part Portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
   1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
   2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
   3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Engineer.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
   1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
   2. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.

3.13 FIELD QUALITY CONTROL

A. Testing and Inspecting: General Contractor will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:
   1. Steel reinforcement placement.
   2. Verification of use of required design mixture.
   3. Concrete placement, including conveying and depositing.
   4. Curing procedures and maintenance of curing temperature.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
   1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
      a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
   2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
   3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
   5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   6. Compression Test Specimens: ASTM C 31/C 31M.
      a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
      b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
   7. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
      a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
      b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
   8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
   9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
   10. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive

strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods.
12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 03 30 01

SECTION 05 12 01 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:
   1. Structural steel.
   2. Grout.

B. Related Sections:
   1. Division 01 Section "Quality Requirements" for independent testing agency procedures and administrative requirements.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication of structural-steel components.
   1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
   2. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
   3. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
   4. For structural-steel connections indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint.

1.04 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.

B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.06 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.01 STRUCTURAL-STEEL MATERIALS

A. Metal Surfaces, General: For fabrication of work that will be exposed to view, use only materials that are smooth and free of surface blemishes including pitting, rust and scale seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding or by welding and grinding, prior to cleaning, treating and applying surface finishes.

B. Structural Steel Shapes, Plates and Bars: ASTM A 36.

C. Welding Electrodes: Comply with AWS requirements.

2.02 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts, ASTM A 563, Grade DH, (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers with plain finish.
1. Direct-Tension Indicators: ASTM F 959, Type 490 (ASTM F 959M, Type 10.9), compressible-washer type with plain finish.

B. Unheaded Anchor Rods: ASTM A 449.

1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
4. Finish: Plain.

C. Headed Anchor Rods: ASTM A 449, straight.
1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
4. Finish: Plain.

D. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.

E. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

2.03 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.04 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.

B. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 1, "Solvent Cleaning, SSPC-SP 2, "Hand Tool Cleaning, SSPC-SP 3, "Power Tool Clean ing."

C. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.
1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.05 SHOP CONNECTIONS

A. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.06 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
2. Surfaces to be field welded.
3. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-Off Blast Cleaning."
4. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

2.07 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize angles at loading dock.

PART 3 – EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

3.03 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

C. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

D. Splice members only where indicated.

E. Do not use thermal cutting during erection unless approved by Engineer. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

F. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.04 FIELD CONNECTIONS

A. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
   1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
   2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
   3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.05 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.

B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

C. Touchup Painting: Cleaning and touchup painting are specified in Division 09 painting Sections.

END OF SECTION 05 12 01

SECTION 11 13 19 - HYDRAULIC LEVELERS & VEHICLE RESTRAINT SYSTEM

PART 1- GENERAL

1.01 SUMMARY

A. Related Documents: Provisions established within General and Supplementary Conditions of the Contract, Division 1 - General Requirements and Drawings are collectively applicable to this Section.

1.02 SYSTEM DESCRIPTION

A. Design Requirements: Provide fixed-in-place adjustable loading and unloading platform for difference in height and gap between truck bed and building loading dock.

B. Provide vehicle restraint system.

C. Provide loading dock equipment, which has been manufactured, fabricated, and installed to withstand loads specified and to maintain performance criteria stated by manufacturer without defects or failure.

D. Comply with ANSI MH14.1-1987.

1.03 SUBMITTALS

A. General: Submit in accordance with Section 01 33 00.

B. Product Data: Submit product data for dock equipment, including dock leveler and vehicle restraint system.

C. Shop Drawings: Submit drawings indicating fabrication and erection of dock equipment including plans, elevations and large scale details.
1. Show anchorage, [pit sizes,] critical installation clearances, connections, and accessory items.
2. Provide location template drawings for items supported or anchored to permanent construction.
3. Provide rough-in drawings for electrical service in advance of concrete work.

D. Closeout Submittals: Submit following in accordance with Section 01 78 00.
1. Maintenance data.
2. Warranty: Specified warranty.

1.04 QUALITY ASSURANCE

A. Single Source Responsibility: Each component of dock equipment is required to be from same manufacturer.

B. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this Section with minimum ten years documented experience.

C. Regulatory Requirements: In compliance with ANSI MH14.1-1987 and the safety and labeling requirements of ANSI MH30.1-2007.

D. Certifications: Submit manufacturer's certification that products furnished for Project meet or exceed specified requirements.

1.05 WARRANTY

A. Special Warranty:
1. Manufacturer's standard prorated ten-year warranty for structural components upon approval of written application.
Parts include Lip, lip hinge, and shaft: deck plate and beams: rear frame and rear hinges
2. Manufacturer's standard 1-year base parts & labor warranty plus additional 4-year parts only warranty for hydraulic power unit and cylinders.

PART 2 – PRODUCTS

2.01 HYDRAULIC DOCK LEVELERS & VEHICLE RESTAINTS

A. 7' X 8' Air Powered Dock Levelers, 30,000 lbs. capacity, 16" lip and weather seals. Voltage 110V single phase, airDefense® stump-out & freefall protection system with 60,000 lbs. structural dock level support legs, lug style lip hinge & Lambda Beam Structure, clean pit kit, high volume, low pressure lifting system, low maintenance design, exclusive GRAVITY LIP™, automatic lip extension, lifetime lip hinge warranty, exclusive safeTFrame® Design (front & rear frame), NEMA 4X non-metallic push-button control panel, 120V single phase operation standard, full operating range toe guards, below-dock endloading capability, 16" lip standard, integral maintenance strut & lip support latch, heavy-duty B410-14F dock bumpers.

2.02 VEHICLE RESTRAINT SYSTEM

A. 32,000 lbs. restraining force, non-impact design & operation, horizontal hooking range 0-10" from face of 4" bumper. Low profile – stores lt 9-1/2" off grade. Vertical hooking range of 11 – 27-1/2". Performance logic controller (Star4 Only). NEMA rated & UL listed interlock-capable control panel with solid state controls (Star2 NEMA 4X, (Star4 NEMA 12). Standard back plate 30.5". Caution sign package. Linear actuator drive system (Star4 only). 120V single phase operation (excludes Star1). 24V DC LED interior & exterior communication lights. Include linear actuator drive system, push button control panel with programmable logic controller (PLC), Interior/exterior 24V LED light communication system, sensor bar, audible alarm, and exterior caution sign.

2.03 FABRICATION

A. Dock Equipment:
1. Welded base frame construction.
2. Unit supplied completely assembled, ready for use.

2.04 FINISHES

A. Dock Equipment Finish:

1. Preparation: Clean surfaces free from slag and splatter, loose mill scale, oil, grease, or rust.
2. Dock Leveler: Factory apply manufacturer's standard DTM (Direct to Metal) Water based Paint with built in rust inhibitors.
3. Color: Baked enamel green paint finish.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine conditions and proceed with Work in accordance with Section 01 40 00.

3.02 PREPARATION

A. Coordinate forming of pit to receive dock leveler.
   1. Manufacturer of Leveler to provide pit curbing and anchors, rough-in sizes and templates to appropriate trade for installation into pit.
   2. Ensure curb angles are square, level and flush with pit surfaces.
   3. Ensure that curb angles are in proper place and pit is of adequate size to receive leveler.
   4. Ensure that power accessories have been installed and made ready for installation.

3.03 INSTALLATION

A. Dock Leveler: Install in accordance with Section 01 60 00.
   1. Install in prepared pit in accordance with manufacturer's instructions
   2. Adjust dock leveler height by manufacturer's recommendations as required to provide flush alignment with leveler and dock floor. Weld leveler frame securely to embedded curb steel.

B. Vehicle Restraint System to be installed in accordance with manufacturer's instructions.

3.04 ADJUSTING AND CLEANING

A. Adjust installed unit for smooth, safe, efficient and balanced operation.

B. Remove temporary labels and coverings and protection of adjacent work areas.

C. Repair or replace damaged products.

D. Remove construction debris from site and dispose.

3.05 INSTRUCTION OF OWNER'S PERSONNEL

A. Instruct Owner's personnel in operation and maintenance of installed units. Provide bound copy of manufacturer's operation and maintenance manual at time of instruction.

END OF SECTION 11 13 19

SECTION 31 10 10 - MAINTENANCE OF SITE

PART 1 - GENERAL

1.01 GENERAL

A. This item shall consist of site maintenance during the demolition and construction phases of the work. Included but not limited to are sweeping adjacent to the project at least once a week and covering stockpiled material as ordered by the A/E.

PART 2 - PRODUCTS - (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 METHODS, EQUIPMENT AND MATERIALS

A. The methods, equipment and materials used for maintenance of the site shall be acceptable to the A/E prior to performing any of the necessary work.

END OF SECTION 31 10 10

SECTION 31 12 00 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of contract, including general and supplemental conditions and Division 1 specifications, apply to this work.

1.02 DESCRIPTION

A. Summary: It is the intent to include under this Contract the selective demolition and removal of existing site structures and accessories of every description within the project limit line (see special notes and limit of construction as noted on the site demolition plans) which at present exists and extends above and below the ground level, including, pavements, floor slabs, foundations and rubble, and where required, to fill the voids with clean, compacted gravel borrow in preparation for new construction. Do not use any rubble to fill voids.

B. Work To Be Performed: Furnish all labor, materials, equipment and services necessary to complete the work indicated, and without limiting the generality thereof includes:

1. Building structures, steel guards, platforms, steps, wood and metal framing, ramps, building walls, foundations, paving materials of all description and all related items necessary to perform and complete such work.
2. Demolition and removal of site improvements.
3. Disconnecting, capping or sealing, and abandoning site utilities in place.
4. Disconnecting, capping or sealing, and removing site utilities.
5. Protection of work, existing construction and equipment to remain in use.
6. Gathering of rubbish and items materials removed under this Section and its removal from the project site.

C. It is not the intent herein to describe all items and work required to be removed under this Section. The Contractor shall assure himself that all of the work to be removed, not otherwise specified herein or described under other Sections, but shown on the Drawings, shall be removed under this Section at no additional cost to the Owner.

D. The Contractor shall also examine other Sections of these specifications and familiarize himself with their provisions regarding the removal of existing items and work. He shall understand that all items and work not specifically mentioned to be removed by the requirements of other Sections of these specifications shall be removed as part of the work under this Section.

1.03 SCHEDULING

A. Before beginning the removal of work and demolition, the Contractor shall consult jointly with the Owner and Engineer to determine the schedule of work, exact places, times and days during which the removal and demolition work may or may not be carried on, and to determine

further reasonable requirements, particularly in regards to noise prevention, dust prevention, weather protection, safety precautions and school schedule.

1.04 EXAMINATION OF PREMISES

A. The Contractor will be held to have examined the premises before submitting proposals for the work and to have satisfied himself as to existing conditions under which he will be obliged to operate or that will in any way affect the work under this Contract, also the character and amounts of materials and debris to be removed. No allowance will be made in this connection for error or negligence of the Contractor.

1.05 USE OF PREMISES

A. All apparatus, storage and the operation of workmen in connection with activities under this Section shall be confined to limits of the Contract as shown on the Drawings and shall not encumber the premises at any time. Storage will not be permitted on the property without the approval of the Owner, and in no case will storage be permitted outside the property without obtaining the necessary permits from the appropriate authorities.

B. All trucks carrying loose, dry material such as debris, plaster, broken concrete masonry, etc., shall be covered by tarpaulins to prevent blowing away or spillage. All spillage of whatever nature shall be promptly taken up and removed.

1.06 ACCESS AND EGRESS

A. The most diligent attention shall be paid to maintaining adequate passage to and from all exits at all times. Before any work is done which will significantly alter access or egress patterns, consult the Owner and Engineer and obtain their approval. Under no circumstances block or interfere with the free flow of people at legally required exits, or in no way alter the required conditions of such exits.

1.07 PROTECTION

A. The Contractor shall take all precautions and use whatever protective devices, shoring, guard rails and the like as may be required to assure that the remaining and adjacent portions of the existing work which is to remain is substantially supported and/or not loaded beyond safe limits.

B. Use tools and methods that will not transfer heavy shocks, vibrations and other disturbances to existing buildings.

C. Do not allow demolition debris to accumulate, and when outside sprinkle it with water to hold down dust when handling and loading.

1.08 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be

removed from the site with further disposition at the Contractor's option. All materials are to be disposed legally.

1.09 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.

B. Schedule of demolition activities indicating the following:

1. Detailed sequence of demolition and removal work, with starting and ending dates for each activity.

C. Inventory of items to be removed and salvaged.

1.10 PROJECT CONDITIONS

A. Protection of Adjacent Structures:

1. The work of demolishing the buildings and structures shall be carried on in a manner that will insure the safety of adjacent property and persons occupying such property against any damages or injuries which might occur from falling debris or other cause, and so as not to interfere with the use of adjacent buildings, roadways and structures or the free and safe passage to and from the same.
2. Take every precaution to guard against any movement or settlement of adjacent buildings, sidewalks, utilities or streets, and provide and place at the sole expense of the Contractor, bracing or shoring necessary or proper in connection therewith, and be solely and entirely responsible for the complete safety and support of such buildings, and be solely liable for any such movement or settlement and any damage or injury caused thereby or resulting therefrom. If at any time the safety of any adjacent building or structure shall appear to the Engineer, Owner or to the Contractor, to be endangered, then cease operations and at the sole expense of the Contractor, however great the same may be, take all proper means to support such building or structure and do not resume operations until permission has been secured in writing from the Engineer.
3. The Contractor shall take adequate precautions to protect all walks, roads, streets, curbs, pavements, lawns, trees and planting, on or off the premises, and shall repair and replace or otherwise make good, as directed by the Engineer, any such or other damage so caused at no cost to the Owner.

C. Perimeter fencing for the project to be in place prior to any demolition work.

1.11 SCHEDULING

A. Arrange demolition schedule so as not to interfere with Owner's on-site operations.

B. Any noisy demolition work to occur on third shift.

C. Contractor shall notify Dig-Safe at 811 prior to any work to verify location of all utility lines, pipes, wires and conduits.

PART 2 - MATERIALS

2.01 DISPOSAL OF WORK REMOVED

A. All non-salvageable refuse and debris which accumulates as a result of work under this Section shall be removed. No refuse or debris of any nature shall be allowed to accumulate to the detriment of the work. **Remove refuse and debris from site daily.**

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of demolition required.

C. Inventory and record the condition of the items to be removed and reinstalled and items to be removed and salvaged.

D. Perform surveys as the Work progresses to detect hazards resulting from demolition activities.

3.02 UTILITY SERVICES

A. Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.

B. Contractor shall be solely responsible for disconnecting and sealing indicated utilities serving structures to be demolished before start of demolition work.

C. Utility Requirements: Locate, identify, disconnect, and seal or cap off utility services serving structures to be demolished.

1. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.03 PREPARATION

A. Before starting the removal of work, the Contractor shall arrange for the disconnection of active utility services in the areas to be worked in. All work on existing utility services shall be accomplished by the respective trades or utility company having jurisdiction.

B. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

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

C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area.

1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.

D. Adequate protection of persons and property shall be provided at all times. All work shall be executed in such a way as to avoid hazard to person and property, interference with the use of adjacent buildings, and interruption of free passage to and from such buildings. All demolition work shall conform to the requirements of the Rhode Island Department of Public Safety.

3.04 CONDUCT OF WORK

A. Where new work joins or abuts existing work, cutting shall be carefully and accurately done true to lines indicated. Where concrete work is required to be cut, cutting shall be done by abrasive wheel, saws or coring. No jackhammers will be allowed at these areas unless otherwise approved by the Engineer.

B. All materials indicated on the Drawings to be removed shall be taken down in a manner so as not to damage the existing materials to remain.

C. The work shall be conducted with prime consideration given to the requirements specified herein, and to this end the Contractor shall maintain close coordination and cooperation with the Engineer.

D. The Contractor will have full access to the premises and the property up to the project limit lines. The Contractor shall take reasonable care to minimize disturbances to the adjacent property and abutting property owner.

E. Coordinate and cooperate with work of other trades involved in the disconnecting and/or maintenance of existing active mechanical or electrical lines.

F. Existing toilet facilities shall not be used for discharging waste, debris or any other type of material required to be disposed of.

3.05 POLLUTION CONTROLS

A. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Water supply will be provided for pollution control at no cost to the Owner. Comply with governing environmental protection regulations.

B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

C. Clean adjacent buildings, streets, trees, plantings and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before start of demolition.

3.06 DEMOLITION

A. Building Demolition: Demolish buildings as indicated on plans and remove from the site. Use methods required to complete Work within limitations of governing permits and regulations, and as follows:

1. Break up and remove concrete slabs on grade.
2. Dispose of demolished items and material promptly. On-site storage or sale of removed items is prohibited.

B. Below-Grade Construction: Demolish and remove all foundation walls and other below-grade construction.

C. Filling Below-Grade Areas: Completely fill below-grade areas and voids resulting from demolition of buildings and pavements with soil materials according to requirements specified in Division 2 Section "Earthwork."

D. Damages: Promptly repair damages to adjacent facilities, grounds and landscaping caused by demolition operations.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Disposal of the material shall be done in such a manner that there shall be no accumulation of any demolition material which may, in the opinion of the Owner, any local, State or Federal Official, the Fire Department, or any other public agency having jurisdiction, constitute a hazard. When necessary, a disposal site accepting hazardous materials will be utilized.

B. Burning: Do not burn demolished materials. Burning of any kind is not allowed on the site.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

D. Completely remove all protection when the work is completed or when ordered in writing by the Engineer.

3.08 CLEAN UP

A. Remove from the project site all materials and debris resulting from the work of demolition. Storage of such materials on the project site will not be permitted. The project site shall be safe, clean and holes filled and compacted with clean fill upon completion of the demolition and site clearance work.

B. Repair any sidewalk, curb, or pavement surface which has been damaged or destroyed during the demolition operations. Said repairs to sidewalk or pavement surfaces shall be accomplished by applying bituminous concrete or regular concrete, as applicable in a manner satisfactory to the Engineer and Owner.

END OF SECTION 31 12 00

SECTION 31 20 00 - EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 01 – Specifications Section, apply to this Section.

B. Rhode Island Department of Transportation – *Standard Specifications for Road and Bridge Construction*, Latest Edition with latest addenda.

1.02 SPECIAL CONDITIONS

A. The Contractor shall notify "Dig-Safe" in Rhode Island at 811, prior to any excavation.

1.03 SUMMARY

A. This Section includes the following:

1. Preparing and grading subgrade for footings and slabs-on-grade.
2. Grading and compaction requirements.

1.04 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 01 Specification Sections.

B. Samples of the following:

1. A 25 lb. sample of each proposed fill and backfill soil material from on-site or borrow sources for use for grain size analysis, with sample source clearly identified. Submittal shall be a minimum of two weeks prior to anticipated use.

C. Test Reports: In addition to test reports required under field quality control, submit the following:

1. Laboratory analysis of each soil material proposed for fill and backfill from on-site and borrow sources.
2. One optimum moisture-maximum density curve for each soil material.
3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.

D. Site Characterization of All Off-Site Borrow Sources:

The following information shall be submitted to the Owner for review at least two weeks prior to use of an off-site borrow source. No soil materials shall be brought to the site without approval by the Owner. Off-site borrow materials must be free of chemical contamination and must be characterized in accordance with this section. Materials brought on-site by the

Contractor and characterized to be contaminated will not be accepted and shall be legally disposed off off-site by the Contractor at no cost to the Owner. Any on-site materials or work adversely impacted by the presence of the contaminated borrow materials shall be replaced or repaired at no cost to the Owner.

1.05 QUALITY ASSURANCE

A. Codes and Standards: Perform earthwork complying with requirements of all authorities having jurisdiction.

B. Comply with applicable requirements of NFPA 495--Explosive Materials Code.

C. Testing and Inspection Service: Engage soil testing and inspection service, to perform testing of soil materials proposed for use in work and to provide field testing facilities for quality control testing during excavation and fill operations.

1. Cooperate with testing and inspection service as it obtains samples of existing soil materials and furnish testing service with necessary samples of haul-in fill materials.

D. Preconstruction Conference: Conduct conference at Project site to comply with requirements of Division 01 – Section "Project Meetings".

1. Before commencing site construction, meet with representatives of the governing authorities, Owner, Architect, consultants, Geotechnical Engineer, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

E. Materials placed and compacted which do not conform to project specifications for the application shall be removed and replaced with suitable material as directed by the A/E at no additional cost to the Owner.

1.06 PROJECT CONDITIONS

A. Existing Utilities: Locate existing underground utilities in areas of work. Where utilities are to remain in place, provide adequate means of protecting during excavation operations.

1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility Owner immediately for directions. Cooperate with Owner and with public and private utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfactory of utility Owner.
2. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, except when permitted in writing by Architect/Engineer and then only after acceptable temporary utility services have been provided.
   a. Provide minimum of 72-hour notice of proposed interruption to Architect/Engineer. Do not interrupt existing utility until receipt of written notice to proceed.
3. Demolish and completely remove from site existing underground utilities indicated to be

removed. Coordinate with local utility companies for shut-off of services if lines are active.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.

B. Gravel Borrow: This material shall conform to RIDOT materials M.01.02 (Column Ib of Table 1).

C. Common Borrow: This material shall conform to RIDOT material specification M.01.01.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

3.02 EXCAVATION

A. Unclassified Excavation: Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of materials and obstructions encountered.

B. Classified Excavation: Excavation is classified and includes excavation to required subgrade elevations. Excavation will be classified as earth excavation or rock excavation as follows:

1. Earth excavation includes excavation of pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; together with soil and other materials encountered that are not classified as rock or unauthorized excavation.

3.03 STABILITY OF EXCAVATIONS

A. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.

3.04 EXCAVATION FOR STRUCTURES

A. Excavate material to facilitate construction of embankments, roads, parking areas, pavements, structures, and other site improvements to the lines and grades indicated, and deeper as required. Where unsuitable materials such as uncontrolled fill, trash, peat, wood, tree stumps,

logs, construction/building debris, topsoil, or other materials that may compress, decay, or collapse or are otherwise considered not to be acceptable foundation bearing soils are encountered inside building footprints, excavation and replacement with compacted Engineered Fill or other acceptable, approved materials will be required.

B. Protect soil subgrades from disturbance caused by construction activities, water, and freezing.

C. Exercise care to preserve the material below and beyond the limits of excavation. Where excavation is carried below required grade, backfill to subgrade as specified.

D. Remove unstable bottom material. Remove large stones, debris, and unsuitable soils from the excavation bottoms.

3.05 APPROVAL OF SUBGRADE

A. Notify Architect/Engineer when excavations have reached required subgrade.

B. When Architect/Engineer determines that unforeseen unsatisfactory soil is present, continue excavation and replace with systematically placed and compacted backfill or fill material as directed.

1. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.

C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Architect/Engineer at no cost to the Owner.

D. Compacted Fill Surfaces: Compacted Engineered Fill, or other fill materials, which become disturbed, contaminated with clay or otherwise unacceptable to the Owner's Representative shall be removed and replaced with acceptable Engineered Fill at no additional cost to the Owner.

3.06 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the Architect/Engineer, at no cost to the Owner.

1. Fill unauthorized excavations under other construction as directed by the Architect/Engineer, at no cost to the Owner.

B. Where indicated widths of utility trenches are exceeded, provide stronger pipe, or special installation procedures, as required by the A/E, at no cost to the Owner.

3.07 STORAGE OF SOIL MATERIALS

A. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and

shape stockpiles to drain surface water. Provide erosion control measures around perimeter of stockpiles. Cover to prevent wind-blown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
2. Establish soil and material stockpiles on site only at locations acceptable to the Owner.

3.08 COMPACTION

A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.

C. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density according to ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, compact the top 12 inches below subgrade and each layer of backfill or fill material at 95 percent maximum dry density.
2. Under walkways, compact the top 6 inches below subgrade and each layer of backfill or fill material at 95 percent maximum dry density.
3. Under lawn or unpaved areas, compact the top 6 inches below subgrade and each layer of backfill or fill material at 90 percent maximum dry density.

D. Material in conformance to paragraph 2.1 herein which are placed and compacted to less than the specified density shall be:

1. Re-compacted as required to achieve specified density.
2. Removed and replaced with properly placed and acceptably compacted material.

E. Compaction by puddling is prohibited.

3.09 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between existing adjacent grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.

3.20 FIELD QUALITY CONTROL

A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.

1. Perform field in-place density tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2937 (drive cylinder method), as applicable.
   a. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.
   b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the A/E.
2. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2,000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.

B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, re-compact and retest until required density is obtained.

3.21 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.

   1. Scarify or remove and replace material to depth directed by the A/E; reshape and recompact at optimum moisture content to the required density.

C. Settling: Where settling occurs within 1 year after project completion, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.

   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. All unsuitable material, and suitable material not required for the proper completion of the contract, shall become the property of the Contractor, and shall be removed and properly disposed of off-site at no additional cost to the Owner.

B. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, debris, and pavement, and legally dispose of it off the Owner's property, at no cost to the Owner.

C. Disposal: Transport surplus satisfactory soil to designated storage areas on the Owner's property. Stockpile or spread soil as directed by Architect.

1. Remove waste material, including unsatisfactory soil, pavement, trash, and debris, and legally dispose of it off the Owner's property, at no cost to the Owner. Contractor to obtain and pay for all necessary permits or licenses for off-site disposal.

END OF SECTION 31 20 00