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LIST OF TABLES/SCHEDULES

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SP.21	Proposed Site Plan
CD.01	Construction Details and Notes

SECTION 01000 - GENERAL REQUIREMENTS:

CONTENTS

1.1 Summary of Work: Definitions: The word, "provide" means furnish and install complete. The word "Contractor" means the proper trade referred by its reference.

The contractor is referred to the "Instructions to Bidders", "Bid Form", "Form of Bid Bond", "Form of Contract", "Performance and Payment of Bonds", "General Conditions", "Supplementary General Conditions", "Contract Drawings", and any "Amendments" to any foregoing, all of which are hereby made part of this contract.

1.2 Submittals: A progress schedule shall be submitted to the Architect by the Contractor prior to initiation of work and shall be adhered to at all times. Any deviation from the schedule shall be brought to the immediate attention of the Architect.

Before work is started, the Contractor shall submit to the Architect for approval a list of materials, with trade names, proposed to be furnished (4 copies) and shop drawings as requested by the Architect. Submittals shall be representative of materials to be used by the Contractor in completing his work.

1.3 Progress Payments: Prior to the start of work, the Contractor shall submit a complete payment breakdown to the Architect. Payments will be made by the Owner in accordance with Article 9 of the General Conditions. The Contractor shall submit applications for payment of vouchers on the forms

prescribed and approved by the Owner. These applications shall be submitted to the Architect for approval before final payment by the Owner.

1.4 Materials Handling:

1.4.1 Delivery: The Contractor shall be responsible for all materials being delivered in manufacturer's original unopened containers with manufacturer's labels intact and legible.

1.4.2 Storage: Storage space for materials and equipment is considered limited and the Contractor will schedule deliveries to minimize space required for storage.

The Contractor shall place and store materials and equipment in spaces agreed upon by the Owner, Architect, and Contractor. The contractor shall provide continuous protection against damage or loss.

1.4.3 Waste Materials: All waste materials shall be stored and removed from the site in a manner agreed upon by the Contractor, the Owner, and the Architect daily. In the event material and debris are left at the site and not removed in accordance with the specifications, the Owner may remove the offending materials at the Contractor's expense.

1.4.4 Use of Site: The Contractor's use of the premises is restricted to the areas involved in the work.

Telephone facilities of the Owner are not at the disposal of the construction personnel. The Owner is not responsible for any materials, tools, or equipment of the Contractor. All streets and all drive areas throughout and adjacent to the property must be kept free of obstructions.

1.4.5 Safety: All work shall be performed with the safety of the building occupants, students, and staff taken into consideration.

1.5 Special Conditions:

1.5.1 Reserved:

1.5.2 Reserved:

1.5.3 Reserved:

1.5.4 Supervision: All work specified herein shall be carried out under the direction of the Architect and with the approval of the coordinator of building services of the Owner with the least interference with the routine use of the building. All materials, equipment, etc., shall be stored where and as directed.

The coordinator of building services shall determine the compliance with the terms of this specification and any subsequent contract based upon same and his decision shall be final and conclusive as to the intent of the specifications and the sufficiency in quality and quantity of any work performed or material furnished in connection with the work covered by the specifications. The Architect shall assist and advise the coordinator as necessary.

1.5.5 Installation: The complete installation shall be in accordance with the latest rules and regulations of the Boards and Departments having jurisdiction.

Any item or requirement necessary for a complete installation but not specifically described in this specification shall conform to the governing rules and regulations.

The Contractor shall procure all the necessary and usual certificates for all work installed by him and deliver same to the Architect before final acceptance.

The Contractor is responsible for all rigging, scaffolding, and hoisting that is required in order to install the equipment as specified.

1.5.6 Existing Work: Existing work shall be cut, drilled, altered, removed or temporarily removed and replaced as necessary for the performance of the contract. However, unless otherwise provided by the specifications, no structural members shall be cut or altered without the authorization of the Architect. Work remaining in place which is damaged or defaced by reason of work as done under this contract, shall be restored equal to its condition at the time of the award of this contract.

1.5.7 Existing Equipment: Equipment temporarily removed as a result of work under this contract shall be protected, cleaned, and replaced equal to its condition at the time of the award of this contract.

1.6 Coordination: All work shall be coordinated with the Owner. Working hours shall be scheduled during the hours permitted by the authority having jurisdiction during the normal work days, Monday through Friday.

The Contractor shall not interfere with the operation of existing essential services during all normal operating hours and periods. All work requiring temporary interruption of essential services shall be done only with the specific approval of the Architect and Owner. The Contractor shall set up a schedule of work affecting existing services for approval by the Owner and the Architect.

Contractor shall give 24 hours notice to the Project Manager for those areas where access would be required the next working day.

Overtime of Owner employees resulting from and/or as requested by the Contractor(s) shall be chargeable to the Contractor.

1.7 As-Builts: The Contractor, upon completion of installation of work, shall provide the Owner with as-built drawings (3 copies) to be approved by the Architect. These drawings shall show the exact location and invert of all items installed and/or altered by the Contractor.

1.8 Time of Completion: The Contractor, prior to being awarded the contract, shall prepare and submit for the Architect and Owner's approval, a progress schedule for the work. The progress schedule shall be related to the entire project to the extent required by the contract documents. This schedule shall indicate the dates from the start of work to completion and shall be revised as required by the conditions of the work subject to the Architect’s approval. Any departure from the schedule shall be brought to the attention of the Architect.

The Contractor in preparing his schedule shall comply with the requirements of Table 1-1 which lists the total weeks for completion from the contract award date.

Any objections by a prospective bidder to this time schedule shall be indicated on the bid form with submittal of bid and notify Architect in writing ten (10) calendar days before the bid.

1.9 Liquidated Damages: The Contractor agrees that, from the compensation otherwise to be paid, the Owner will assess liquidated damages in the amount indicated on Table 1-1 for each calendar day

thereafter that the work included under his contract remains uncompleted after calendar occupancy day specified under Time of Completion which sum is agreed upon as the proper proportionate measure of liquidated damages which the Owner will sustain per diem, by failure of the Contractor to progress or complete his work under his contract at the time stipulated, and the sum is not to be construed as in any sense a penalty.

The above liquidated damages shall be interpreted as partial reimbursement to the Owner resulting from costs of legal fees and the cost of additional Architect services, and other expenses of the Owner because of non-compliance by original dates, but shall not be considered as including costs of legal fees and the cost of additional services in connection with claims, arbitration, litigation, default, or insolvency of the Contractor.

1.10 Reserved:

1.11 Substitutes: When a product or material is specified by name, as noted in these specifications, such specifications establishes the standard type and quality considered most satisfactory for the particular purpose in the building and the proposal therefore should be based thereon, so that all bid under the same conditions. Another product or material of the same type and to meet the requirements may be submitted for consideration as a substitute only under the following conditions:

1. If a bidder intends to offer substitution of the product specified, such intentions must be stated in the bid. Bidder must prove equivalence of substitution and furnish detailed specifications and catalog cuts or drawings. Failure to identify exceptions or deviations from equipment specified must be interpreted to indicate that the product offered complies with the specification in every respect.

2. Prior to a bid, if a bidder wants a substitute product approved, requests for substitution must be submitted in writing at least ten (10) days before the date set for the receipt of bids. Requests must be submitted with approved shop submittals. All bidders will, in turn, be notified if the proposed substitutes will be approved prior to the receipt of bids.

1.12 Guarantees:

1. Guarantees shall be furnished by all prime contractors for all labor and materials for a period of one (1) year from the date of completion and final acceptance of his work by the Owner, which shall include an agreement to repair and make good at his own expense any and all defects which may appear in his work or materials.

2. Where special guarantees covering installation, operation, or performance of any systems or appliances furnished under this contract for this work are herein required, the full responsibility for the fulfillment of such guarantees, in triplicate, from any and all sub-contractors and material suppliers, two (2) copies of which shall be filed with the Architect before final acceptance.

1.13 Communications: Should there be any problems with the contract in terms of working conditions, cooperation of the owner personnel, tenants, vandalism, job safety, stolen equipment and materials, unusual field conditions; the Contractor will immediately notify the Architect and the owners representative in writing for resolution by the Architect and the owner.

1.14 Protection:

1. Provide all required protective measures for removal work. Give particular attention to the protection requirements so as to prevent any damage to existing construction or to adjoining public and private property, including thoroughfares. The Contractor will be held responsible and shall restore at his own expense any such damage to the complete satisfaction of the Architect.

2. Protect adjoining public and private property, including thoroughfares, from damage due to disposal operations.

3. Protect from damage all utility lines to remain.

4. Take extreme care to protect the occupants of adjoining areas and prevent any harm to them through the required operations.

1.15 Indemnity:

1. Each prime contractor agrees to indemnify and save the Owner and Architect and their authorized representatives, harmless from and against any and all costs, loss, expenses, liability, damages, including cost of defending any action on account of any injury or damage to the buildings, improvements or property of any person, firm, corporation, or association and on account of any injury (including death) to any person or persons arising or resulting from the work provided for or performed under the specifications, or from any act, omission, or negligence of the contractor, sub-contractors, and his or their agents or employees. The foregoing provisions shall not be deemed to be released, waived or modified in any respect by reason of any surety or insurance provided by the contractor under this contract.

1.16 Removal and Disposal of Debris:

1. Each prime contractor is responsible for removal from the building and off site disposal of all rubble, trash, combustible materials and debris of all kinds created by and in the construction of this project. This includes all debris created by or connected with the operations of all contractors, sub-contractors and material suppliers engaged in the construction.

2. Each prime contractor shall pay all costs, fees, and permits attendant to the loading, unloading, cartage, dumping and disposal of all rubbish, and/or debris. No other contractor, sub-contractor, or material supply man shall be obliged to pay any costs attendant to this operation. The complete removal of all debris shall be performed with such frequency as to maintain the grounds around the building free from debris. Materials and debris removed will be loaded directly into waiting trucks or containerized vehicles so as not to litter the adjacent grounds.

3. In addition, the building and grounds will be maintained in a clean and orderly manner so as to conform with all local fire safety regulations and in accordance with the latest editions of the Safety Code of the National and State Board of Fire Underwriters.

4. Areas designated by Architect will be the only place the contractor will be allowed to load and off load usable materials and/or debris. He shall at no time block the fire exists of the

building. He will further repair any damage done to the sidewalks, pavements, and lawn areas upon completion of the project.

1.17 Ingress, Egress, and Circulation: Each prime contractor shall be responsible for performing his construction activities in such manner to maintain essential ingress and egress for visitors and occupants of Owner-occupied areas and to continuously maintain all required emergency exits from and circulation between existing facilities. Passageways for emergency exits shall be kept continuously free from debris, construction equipment, tools, stockpiles of materials, and other hazards to speedy evacuation. The contractor shall provide all necessary temporary work as prudence and good practice may dictate and in accordance with Public Law, to obtain and maintain all such ingress, egress, and circulation requirements. All temporary work shall be removed when no longer required.

1.18 Non-Interference with Owner's Operations: Each prime contractor shall acquaint himself with the general character of the Owner's operations prior to commencing work and shall so schedule his work to avoid interference therewith. The sequence of demolition and removal operations shall be in accordance with a schedule of contract operations approved by the Owner and Architect.

1.19 Security and Safety: The Contractor shall maintain adequate security at all times to protect the materials and work in place from damage, theft, malicious mischief and vandalism. The Contractor shall also observe and comply with all codes and regulations applicable to the safety of employees, tenants, and the general public. The Contractor, specifically, shall meet all requirements of OSHA as published in the Federal Register and procurable from the Government Printing Office, and the New Jersey Department of Labor Safety Regulations as related to the construction work.

1.20 Reserved:

1.21 Storage: Storage space for materials and equipment is considered limited and the Contractor will schedule deliveries to minimize space required for storage.

The Contractor shall place and store materials and equipment in spaces agreed upon by the Owner, Architect, and Contractor. The Contractor shall provide continuous protection against damage or loss.

1.22 Visit to Site: Each prime contractor shall examine the drawings and specifications, must visit the site and note all field conditions which may influence the work required by his contract. Each prime contractor must verify the data noted in the drawings and specifications. He shall report any discrepancies between the bid documents and field conditions to the Architect no later than ten (10) days before bids are due so that the Architect may issue clarification addenda if required. Failure to report any discrepancies within the time frame noted, will nullify any extra cost claim by the Contractor, if claim is based on discrepancies between specifications, drawings, and field conditions.

1.23 Architect's Inspections: Accommodate Architect's inspections by providing manpower, equipment, etc. as required by the inspector. Assist the inspector as requested.

1.24 Contract Location:

1. Paterson Public School 19 T #973-321-0190

31 James St.
Paterson, New Jersey 07502

1.25 Installation: The complete installation shall be in accordance with the latest rules and regulations of the Boards and Departments having jurisdiction.

Any item or requirement necessary for a complete installation but not specifically described in this specification shall conform to the governing rules and regulations.

Each prime contractor shall procure all the necessary and usual certificates for all work installed by him and deliver same to the Architect before final acceptance.

Each prime contractor is responsible for all rigging, scaffolding, and hoisting that is required in order to install the equipment as specified.

1.26 Code Requirements: All work performed and materials furnished shall be done in strict accordance with current requirements of the Safety Code, the National Board of Fire Underwriters, the National Electrical Code, IBC Code 2015 New Jersey Edition, State of New Jersey Department of Education enhancements to the UCC, and state and local codes as may apply including all revisions and authorized standards to date.

1.27 Permits and Inspections: Each prime contractor shall obtain and pay for any necessary Municipal or State inspection and permit as required by the inspection authority, and make such tests as are called for by the regulations of such authorities. These tests shall be made in the presence of such authorities or their authorized representative.

1.28 Shop Drawings, Product Data, and Samples:

1. Work Included:

   a. Submit to Architect, all shop drawings, product data, and samples as required by these specification sections.

   b. Designate construction schedule dates for submission, and dates shop drawings reviewed, product data and samples will be needed for each product.

   c. Contractor must stamp all submittals with "approval stamp" before submitting to the Architect.

2. Shop Drawings:

   a. Original drawings prepared by Contractor, Sub-Contractor, supplier or distributor, which show some portion of the work, showing fabrication, layout, setting, or erection of details.

   b. Prepared by qualified details.

   c. Identify details by reference.

   d. Reproduction of submittals to be opaque diazo prints or blueprints.

3. Product Data:

a. Manufacturer's Standard Schematic Drawings:

1. Modify drawings to delete information which is not applicable to the project.

2. Supplement standard information to provide additional information applicable to project.

b. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.

1. Clearly mark each copy to identify pertinent materials, products or models.

2. Mark each item with the appropriate specification reference.

3. Show dimensions and clearances required.

4. Show performance characteristics and capacities.

5. Show wiring diagrams and controls.

6. Indicate any deviations for characteristics specified clearly.

4. Samples:

a. Where called for in specifications or required by Architect provide physical examples to illustrate materials, equipment or workmanship and to establish standards by which completed work is judged.

b. Provide office samples of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of products or material with integrally related parts and attachment devices.

2. Full range of color samples.

3. After review samples may be used in construction of the project.

c. Clearly identify each sample with appropriate specification reference and clearly indicate any deviation from specification.

5. Contractor's Responsibilities:

a. Review shop drawings, product data, and samples prior to submission, make certain that items conform to specifications and requirements of work, and so certify when submitting items for approval.

b. Verify:

1. Field measurements;

2. Field construction criteria;

3. Catalog numbers and similar data.

c. Coordinate each submittal with requirements of work and of contract documents.

d. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect's review of the submittals.

e. Contractor's responsibility for deviations in submittals from requirements of contract documents is not relieved by Architect's review of submittals, unless Architect deviations are identified by contract at time of submission.

f. Notify Architect, in writing, at the time of submissions or deviations in submittals from requirements of contract documents.

g. Begin no work which requires submittals until return of submittals with Architect's stamp and initials or signature indicating review.

h. After Architect's review distribute copies, as needed.

6. Submission Requirements:

a. Submittal schedule for shop drawings, product data, and samples shown:

1. Date of Contractor's submittals;

2. Date of Contractor's resubmittals;

3. Date of approval;

4. Date of release of work or purchase order.

b. Schedule submissions at least fifteen (15) days before dates reviewed submittals will be needed.

c. Submit number of copies of shop drawings and product data samples which Contractor requires for distribution and manuals, three (3) copies which will be retained by Architect and two (2) copies for owner.

d. Submit number of samples specified in each of these specification sections.

e. Accompany submittals with transmittal letter in duplicate, containing:

1. Date;

2. Project title and number, and contract number;

3. Contractor's name and address;

4. Number of each shop drawing, product data, and sample; and quantity of drawings submitted;

5. Notification of deviations from contract documents;

6. Other pertinent data.

f. Submittals shall include:

1. Data and revision dates;

2. Project title and number;

3. The names of:

a. Architect
b. Contractor
c. Subcontractor
d. Supplier
e. Manufacturer
f. Separate details, when pertinent.

4. Identification of product or material;

5. Relation to adjacent structure or materials;

6. Field dimensions, clearly identified as such;

7. Specification section numbers;

8. Applicable standards, such as ASTM number or Federal Specification;

9. Identification of deviation from contract documents;

10. Contractor's stamp, initialed or signed, certifying to review of submittal; verification of field measurements and compliance with contract documents.

7. Architect's Review:

a. Architect will review and stamp submitted shop drawings and other submissions in one (1) of the following ways:

1. "NO EXCEPTIONS TAKEN": Submission is in full compliance with all contract documents, or indicated deviations are acceptable.

2. "MAKE CORRECTIONS NOTED": Submission has minor corrections not significant enough to require resubmission; noted corrections must be made in the final installation.

3. "REJECTED": Submission does not meet contract requirements; resubmission of shop drawings, which meet contract requirements, is required.

4. "AMEND AND RESUBMIT": Resubmission is required due to the nature and/or number of corrections.

b. Work shall be executed in accordance with "No Exception Taken" or "Make Corrections Noted" drawings only.

c. Architect's approval is for conformity to design requirements and arrangement only. Contractor is responsible for quantity, dimension, accuracy of fit, and coordination with other trades. Approval is subject to all contract requirements and does not authorize any changes involving additional costs, unless stated in a separate letter or change order.

8. Resubmission Requirements:

a. Shop Drawings:

1. Revise initial drawings, as required, and resubmit, as specified to initial submittal;

2. Indicate on drawings any changes which have been made, other than those requested by Architect;

3. Submit new product data and samples, as required on initial submission.

9. Distribution of Submittals After Review:

a. Distribute copies of shop drawings and product data which carry Architect's stamp to:

1. Contractor's File;

2. Job Site File;

3. Record Document File;

4. Sub-Contractors;

5. Supplier;

6. Fabricator.

b. Distribute samples as directed; remove from site if so placed, or incorporated in finished work when permitted by Architect.

1.29 Schedule of Values:

1. Work Included:

a. Submit to Architect the Schedule of Values, within seven (7) days after award of contract.

b. Upon request of Architect, support values given with data that will substantiate their correctness.

c. List quantities of materials specified under unit price allowances.

d. Payment for materials stored on site will be limited to those materials listed in Schedule of Unit Material Values.

e. Use Schedule of Values only as basis for Contractor's Application for Payment.

2. Submittals:

a. Form and Content:

1. Submit typewritten Schedule of Values on AIA G702a.

2. Use Table of Contents of these specification as basis for format of listing costs of work for sections under divisions applicable to contract.

3. Identify each line item with section number and title, as listed in Table of Contents of these specifications.

3. Preparation:

a. Itemize separate line item cost for each of the following general cost items:

1. Insurance, performance, and payment bonds;

2. Field supervision and layout;

3. Temporary facilities and controls;

4. Mobilization;

5. Performance testing (not less tan 10% of value of equipment/system being tested);

6. Allowances.

b. Payment for field supervision, layout, temporary facilities, and controls will be made monthly as a percentage of project completion corresponding directly to the percent of total dollar value of the work owed (does not include retainage).

c. Itemize separate line item cost for work required by each section of these specifications.

d. Provide line item for each major component of work for which contractor will require partial payment or where so requested by the Architect.

4. Review and Submittal:

a. After review by Architect and Owner, revise and resubmit schedule, as required.

b. Schedule of Value(s) which are "front-loaded" will be rejected.

1.30 Project Coordination: Wherever the term, "General Construction Contractor" is used herein, it is intended to mean either the Contractor for the General Construction whenever separate prime contracts are involved, or the Sole Contractor if there are no other prime contractors engaged on the project.

Wherever separate contracts are awarded to separate Prime Contractors for the different branches of the work or where there is a single Prime Contractor, the Contractor for the General Construction (hereinafter referred to as the General Construction Contractor) has the responsibility for being the supervisor, manager, overseer, coordinator, and expediter of all the contractors and of the total construction process and all of its parts, in accordance with the contract. In executing the duties assumed by these responsibilities, the General Construction Contractor shall provide sufficient executive and supervisory staff in the field to accomplish efficient and expeditious handling of these matters. There shall be at least one (1) full-time Project Manager assigned by the General Construction Contractor, as well as the field staff referred to above; The Project Manager shall attend each Progress Meeting at the site.

Contractor shall afford the Owner and others reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work. Contractors shall coordinate their work with other trades, so that no portion of the work is delayed or not properly undertaken due to such lack or failure of cooperation.

Contractors shall lay out and install their work at such time or times and in such manner as to facilitate the general progress of the project.

1.31 Regulatory Requirements: All general construction, plumbing, heating, and electrical work is to be done in accordance with the New Jersey Uniform Construction Code. No work requiring inspections and approvals of construction code officials is to be covered or enclosed prior to inspection and approval by appropriate code enforcement officials.

Prior the start of any crane equipment operations, each contractor shall make all necessary applications and obtain all required permits from the Federal Aviation Administration (FAA). The sequence of operations, timing and methods of conducting the work shall be approved by the FAA to the extent that it relates to their jurisdiction.

1.32 Reserved

1.33 Reserved

1.34 Temporary Toilet Facilities: The Contractor shall provide and pay for suitable temporary toilets, at an approved location on the site, prior to the start of any field work. They shall comply with State and Local laws. The General Construction Contractor will be responsible for maintenance, removal and relocation as described hereinafter.

Toilets shall be of the portable, chemical type, mounted on skids, with screened enclosures with doors, each having a urinal and water closet.

Each unit shall be serviced at least twice a week, including removal of waste material, sterilizing, recharging tank, refilling tissue holders, and thorough cleaning and scrubbing of entire interior which shall be maintained in a neat and clean condition.

Relocate facilities inside building and connect to water and sewer as soon as work will allow.

When toilets are connected to water and sewer lines, take precautions to preventing freezing.

Remove units from the site at completion of work when directed.

1.35 Protection of Work and Property:

1. Safety Precautions and Programs: Each prime contractor shall be responsible, in cooperation with and under the leadership of the General Contractor, for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. He shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent, unless otherwise designated by the contractor in writing to the Contracting Officer.

2. Safety of Persons and Property: Each prime contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

   a. Every employee on the work and all other persons who may be affected thereby;

   b. All the work and all the materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the contractor or any of his subcontractors, or lower tier subcontractors; and

   c. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation or replacement in the course of construction.

The contractor shall give all notices in writing, and comply with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority bearing on the safety of persons or property of their protection for damage, injury or loss.

The contractor shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, including rails, night-lights, the posting of danger signs, and other warnings against hazards, promulgating safety regulations, notifying owners and users of adjacent utilities and other means of protection against accidental injury or damage to persons or property.

When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution for the work, the contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

No contractor shall load or permit any part of the work to be loaded so as to create a safety hazard.

The contractor shall promptly remedy all damage or loss to any property caused in whole or in part by the contractor, any of his subcontractors, subcontractors, or anyone directly or indirectly employed by any of them, or by anyone whose acts any of them may be liable and for which the contractor is responsible. The foregoing obligations of the contractor are in addition to his obligations as stated elsewhere herein.

1.36 Emergencies: In any emergency affecting the safety of persons or property, the contractor shall act with diligence, at his discretion, to prevent threatening injury, damage, or loss. In such case, he shall immediately notify the Owner and Architect of the action taken and shall forthwith prepare and submit a detailed and documented report to the Owner and Architect.

Wherever the contractor has taken no action, but has notified the Owner and the Architect or wherever the Owner and Architect has otherwise been made aware of any emergency threatening injury to persons, or

loss or damage to the work, or to adjacent property, the contractor shall act only as instructed or authorized by the Owner or Architect.

1.37 Final Clean Up: In addition to those responsibilities addressed in the General Conditions, the Contractor shall:

1. Remove all debris and rubbish resulting from or relating to his work. Rubbish shall not be thrown from building openings above the ground floor unless contained within chutes;

2. Remove putty stains from glass and mirrors; wash and polish inside and outside;

3. Remove marks, undesirable stains, fingerprints, other soil, dust or dirt from painted, decorated or stained woodwork, plaster or plasterboard, metal acoustic tile and equipment surfaces;

4. Remove spots, paint and soil from resilient, glazed and unglazed masonry and ceramic flooring and wall work;

5. Remove temporary floor protections, clean, wash or otherwise treat and/or polish, as directed, all finished floors;

6. Clean exterior and interior metal surfaces, including doors and window frames and hardware of oil stains, dust, dirt, paint and the like, polish where applicable and leave without fingerprints or blemishes; and

7. Restore all landscaping, roadway and walkways to preexisting condition. Damage to trees and plantings shall be repaired in the next planting season, and such shall be guaranteed for one year from date of repair and/or replanting.

1.38 Reserved

1.39 Application for Payment:

1. Work Included: Submit applications for payment to Architect, in accordance with schedule established by the General Conditions of the Contract for Construction and the Contract Between Owner and Contractor.

2. Related Work: Related work includes General Conditions for Construction, Supplementary General Conditions, Schedule of Values, and Contract Closeout.

3. Format and Data Required: Submit applications typed on AIA documents. Where “Architect” or “Engineer” is referred to, it shall also mean “Architect”.

4. Preparation of Application:

   a. Application Form:

      1. Fill in required information, including Change Orders executed prior to the date of submittal of application;

      2. Fill in summary dollar values to agree with respective totals indicated on continuation sheets;

3. Execute certification with signature of a responsible officer of contract firm. Signature shall be notarized.

b. Continuation Sheets:

1. Fill in total list of all scheduled component items of work, with item number, and scheduled dollar value for each item;

2. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to nearest dollar or as specified in the Schedule of Values.

3. List each Change Order executed prior to date of submission at the end of the continuation sheets. Round off values to nearest dollar or as specified for Change Order executed prior to date of submission, at end of continuation sheets.

4. List by an original component item of work.

5. Submit revised progress schedule with each Application for Payment.

5. Substantiating Data: When Architect requires substantiating data, Contractor shall submit suitable information with a cover letter identifying the following:

a. Project;
b. Application number and date;
c. Detailed list of enclosures;
d. For stored products:

1. Item number and identification, as shown on application;
2. Description of specific material.

Submit one (1) copy of data and cover letter for each application.

6. Preparation of Final Application: Fill in application form as specified for progress payments. All documentation, as called for in the "General Conditions of the Contract for Construction" and Section 1.53 shall have been submitted and found acceptable by the Owner before Application for Final Payment is made.

7. Submittal Procedure: Submit five (5) copies of each Application for Payment to Architect at times stipulated in the agreement. When Architect finds the application properly completed and correct, he will transmit three (3) Certificates for Payment to Owner, and return one (1) copy to Contractor.

1.40 Project Meetings:

1. Work Included:

a. To enable orderly review during progress of the work and to provide for systematic discussion of problems, Construction Manager will conduct Project Meetings throughout the construction period; Architect will schedule and

administer pre-construction meeting, periodic progress meetings, and specially called meetings throughout the progress of work including:

1. Provide an agenda for meetings;

2. Give notice of each meeting at least four (4) days in advance of meeting date (except for meetings to discuss work critical to completion of project;

3. Make physical arrangements for meetings;

4. Preside at meetings;

5. Record minutes including significant proceedings and decisions;

6. Reproduce and distributes copies of minutes after each meeting for the following:

   a. Owner;
   b. Contractor;
   c. Participants at meeting (other than those employed by the contractor);
   d. Recipients shall copy and distribute more as deemed appropriate.

b. Representatives of contractors, sub-contractors, and suppliers attending meetings shall be qualified and shall have authority to act on behalf of the entity each represents.

2. Related Work: Related work includes Bid Advertisement and Project Record Documents.

3. Pre-Construction Meeting:

a. A pre-construction meeting will be scheduled within fifteen (15) days after date of Notice to Proceed, and before the commencement of operations.

b. Location will be on site in area provided by the Contractor.

c. Attendance by the following is required:

   1. Owner's representative;
   2. Architect and his professional consultants;
   3. Resident project representative (if applicable);
   4. Contractor's superintendent;
   5. Major sub-contractors;
   6. Major suppliers;
   7. Others, as appropriate.

d. Agenda will address the following areas as appropriate:

   1. Use of premises such as office, work and storage areas and owner's requirements;
   2. Construction facilities, controls, construction aids;
   3. Temporary utilities;
   4. Toilet facilities;

5. Safety procedures;
6. First aid procedures;
7. Security procedures;
8. Housekeeping procedures;
9. Emergency contacts with telephone numbers;
10. Review of proposed sub-contractors;
11. Designation of key personnel;
12. Communications;
13. Schedule of Values and Application for Payment;
14. Construction Progress Schedule;
15. Submittals;
16. Project Record Documents;
17. Processing Field and Change Orders.

4. Revisions to Minutes:

a. Unless published minutes are challenged, in writing, prior to the next regularly scheduled progress meeting, they will be accepted as properly stating activities and decisions of the meeting;

b. Persons challenging published minutes shall reproduce and redistribute copies of the challenge to all indicated recipients of the particular set of minutes;

c. Challenge to minutes shall be settled as the priority portion of the "old business" at the next regularly scheduled meeting.

5. Observations: Contractor, to the extent possible, shall have materials and work available for inspection by Architect at the time of the meeting.

1.41 Contract Closeout:

1. Work Included: Provide an orderly and efficient transfer of the completed work to the Owner.

2. Quality Assurance: Prior to requesting inspection by Architect, use adequate means to assure that work is completed, in accordance with specified requirements, and is ready for the requested inspection.

3. Procedures:

a. Substantial Completion:

1. Provide a Consent of Surety to reduction in retainage;

2. Within reasonable time after receipt of list, Architect will inspect to determine status of completion;

3. Should Architect determine work is not substantially complete:

a. Architect promptly will so notify contractor, in writing, giving the reasons;
b. Contractor shall remedy deficiencies and notify Architect when ready for reinspection;

c. Architect will reinspect work.

4. When Architect concurs that work is substantially complete:

a. Architect will prepare “Certificate of Substantial Completion” accompanied by Contractor’s list of items to be completed or corrected, as verified by the Architect;

b. Architect will submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate.

b. Final Completion:

1. Verify work is complete including, but not necessarily limited to, items mentioned in the General Conditions;

2. Certify the following:

a. Contract documents have been reviewed;
b. Work has been inspected for compliance with contract documents;
c. Work has been completed, in accordance with contract documents;
d. Equipment and system have been tested as required, and are operational;
e. Work is completed and ready for final inspection;
f. Work meets requirements of and has been inspected by all applicable governmental agencies;
g. Work has been installed, in accordance with the requirements of all manufacturers used on project, and that no warrantees or bonds have been voided.

3. Architect will make an inspection to verify status of completion;

4. Should Architect determine that work is incomplete or defective:

a. Architect shall promptly notify contractor, in writing, listing incomplete or defective work;
b. Contractor shall remedy deficiencies promptly and notify the Architect when ready for reinspection.

5. Architect determines that work is acceptable under the contract documents, he will request contractor to make closeout submittals.

c. Closeout submittals include, but are not necessarily limited to the following:

1. Project Record Documents, including record drawings, operation, and maintenance manuals.

2. Operation and maintenance data for items so listed in pertinent other sections of these specifications and for other items when so directed by the Architect.

3. Warrantees and bonds (including Maintenance Bond).

4. Evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to the following:

   a. Certificate of Inspection and acceptance from Fire Marshall;
   b. Certificate of Inspection and acceptance from Electrical Department or UL;
   c. Certificate of Occupancy.

5. Certificate of Insurance for products and completed operations.

6. Evidence of payment and release of liens from all sub-contractors and material men.

7. List of Sub-Contractors, service organizations, and principal vendors, including names, addresses and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

8. Consent of Surety to Final Payment.

9. General Release.

d. Final Adjustment of Accounts:

1. Submit a final statement of accounting to Architect, showing all adjustments to the contract sum;

2. If so required, Architect will prepare final Change Order showing adjustments to contract sum which were not made previously by Change Orders.

5. Instruction:

a. Complete instruction of Owner's personnel in proper operation and maintenance of systems, equipment, and similar items which were provided as part of the work;

b. Minimum of twenty-four (24) hours instruction shall be provided to Owner's personnel at such time, as requested by Owner.

1.42 Cleaning:

1. Work Included:

a. Provide necessary cleaning during construction to maintain premises and public properties free from accumulation of waste, debris, and rubbish caused by operations;

b. At completion of work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials; clean all sight-exposed surfaces, whether worked on or not and leave project clean and ready for occupancy;

c. If contractor fails to clean up at completion of work, owner may do so and charge the cost to the contractor.

2. Related Work: Related work includes Contract Closeout.

3. Requirements of Regulatory Agencies:

   a. Fire Protection:

      1. Store volatile, flammable materials, and waste in covered protective metal containers and remove from premises daily; storage and handling of such materials shall meet requirements of the Fire Code and Fire Marshall;

      2. Provide fire extinguishers, fire protective devices, fire fighting clothing, equipment and materials in quantities and location, as required by the Fire Marshall;

      3. Designate key person to be responsible for fire protection and fire fighting.

   b. Pollution Control:

      1. Conduct cleanup and disposal operations to comply with local ordinances and pollution laws:

         a. Burning or burying of rubbish and waste materials on project site is prohibited;

         b. Dispose of volatile fluid wastes; such as mineral spirits, oil or paint thinner; into storm and/or sanitary sewer systems, streams, and/or waterways is prohibited.

4. Quality Assurance:

   a. Use adequate number of skilled mechanics who are thoroughly trained and experienced in the necessary crafts and are completely familiar with the specified requirements and methods needed for proper performance of the work in this section;

   b. Use experience laborers or professional cleaners for the final cleaning.

5. Cleaning Materials:

   a. Use only cleaning materials recommended by manufacturer of surface to be cleaned;

   b. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

6. During Construction:

a. Contractor shall oversee cleaning of its work operations and shall ensure that building and grounds are maintained free from accumulations of waste materials and rubbish;

b. Contractor shall sprinkle his dusty debris with water before removal;

c. At one (1) week intervals maximum during progress of work, Contractor shall cleanup site and dispose of waste materials, rubbish, and debris;

d. Contractor to provide dump containers and locate on site for collection of waste materials, rubbish, and debris and provide removal service;

e. Contractor shall not allow its waste materials, rubbish, and debris to accumulate and become unsightly or hazardous condition;

f. Contractor shall vacuum or otherwise clean interior of building areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until building is ready for acceptance or occupancy;

g. Contractor shall lower his waste materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights;

h. Contractor shall schedule cleaning operations so dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces, or on equipment.

7. Final Cleaning: Prior to substantial completion and turnover of the project to the Owner, Contractor shall clean all areas of the building, whether worked on or not if affected by his operations.

1.43 Project Record Documents:

1. Work Included:

a. Contractor shall provide maintenance of documents, as follows:

1. Maintain at job site one (1) copy of the following:

a. Contract drawings;
b. Specifications;
c. Addenda;
d. Approved shop drawings;
e. Approved catalog cuts;
f. Change orders;
g. Other modifications to the contract;
h. Field test reports;
i. Work set of record drawings.

2. Store documents in temporary field office, apart from other documents used for construction;

3. Provide necessary files and racks for storage of documents;

4. Do not use record documents for construction purposes;

5. Make documents available at all times for inspection by Architect/ Engineer and Owner.

2. Related Work: Related work includes Operations and Maintenance Data.

3. Recording: Information shall be recorded by the Contractor to permit accurate record drawings:

a. Label each document file, “PROJECT RECORD”, in two inch (2”) high printed letters;

b. Keep record documents current;

c. Do not allow any work to be permanently sealed until required information has been recorded;

d. Contract drawings:

1. Legibly mark to record actual construction;
2. Elevations of various elements in relation to datum;
3. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements;
4. Location of internal utilities concealed in construction and referenced to visible and accessible features of structure, if significantly different than that shown on drawings;
5. Field changes of dimensions and details;
6. Changes made by Change Order or Field Order;
7. Details not on original contract drawings;
8. At completion of work, turn over all information to Architect.

e. Specifications and Addenda: Legibly mark up each section to record the following information:

1. Manufacturer;
2. Trade name;
3. Catalog number of each product and item of equipment actually installed;
4. Changes made by Change Order or Field Order;
5. Other matters not originally specified..

4. Sub-Contractors and Suppliers List: Provide a complete list of names, addresses, and telephone numbers of all contractors, sub-contractors, and suppliers employed on the project.

5. Submittals:

a. At completion of project, deliver record documents to Architect;

b. Accompany each submittal letter in duplicate, containing the following:

1. Date;
2. Project title and number;
3. Contractor’s name and address;

4. Title and number of each record document;
5. Certification in writing that each document, as submitted, is complete and accurate and reflects the actual condition at the building site;
6. Signature of Contractor or authorized representative.

1.44 Reserved

1.45 Contractor Assumption of Absolute Liability: The liability of the Contractor hereunder, for all injuries to persons or damages to persons or damages to property, is absolute and is not dependent upon any question or negligence on his or its part or on the part of his or its agents, servants, or employees, and neither the approval of the Architect or the methods of doing the work, nor the failure of the Architect to call attention to improper or inadequate methods or to require a change in methods nor the neglect of the Architect to direct the Contractor to take any particular precautions or to refrain from doing any particular thing, shall excuse the Contractor in case of any such injury to persons or damages to property.

1.46 Lien Interest: No materials or supplies, for the work shall be purchased by the Contractor or by any sub-contractor subject to any lien interest or under a conditional sale or other agreement by which an interest is retained by the seller. The contractor warrants that he has good title to all materials and supplies used by him in the work.

1.47 Use and/or Storage of "Hazardous Substances": The contractor is to notify the owner of any "Hazardous Substances" to be used/stored on site during construction at the Pre-Construction Meeting. This notification shall include a "Hazardous Substances Fact Sheet" as prepared by the Department of Health and Senior Services.

Should the need for the use of a hazardous substance arise during construction, the contractor is to utilize the following procedure:

1. If the school is occupied, notice is to be given to the owner of the need for a hazardous substance a minimum of two (2) weeks prior to its arrival on site. A "Hazardous Material Fact Sheet" is to be submitted at that time for each substance to be used. Also, a notice indicating the type(s) of hazardous substance(s) to be used is to be posted within the school a minimum of two (2) days prior to its arrival on site.

2. If the school is not to be occupied within 24 hours of use, notice is to be given to the owner and a notice posted within the school (as per the description above) a minimum of two (2) days prior to the arrival of hazardous substances on site.

The above procedures are as per Act No. 246 of the State of New Jersey, PL 1997, c.364.

1.48 Lead Base Paint: All contractors shall be made aware that some of the walls and ceilings that are painted and are required to be disturbed may contain lead base paint. The contractor shall follow safe work practices with regard to removing any lead based paint from these areas. Please refer to Section 02831 for General Procedures required for any activities that would affect the lead based paint.

Pursuant to 40 CFR Part 745, all firms performing renovation, repair and painting projects in target housing must be certified with the EPA to conduct lead-based paint activities and/or renovations prior to disturbing any areas where lead-based paint has been identified, or where the painted surface(s) has not already been determined to be lead free by an EPA-certified lead inspector/risk assessor

END OF SECTION 01000

SECTION 01010 – SUMMARY OF WORK

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS/REQUIREMENTS INCLUDES:

A. Work of items listed below is comprised of **Contract No. 36 – Retaining Wall and Fence Repair at School No. 19.**

B. SUMMARY OF WORK

1. Demolish existing fences, retaining walls, concrete steps, paved area, concrete sidewalk, and curb.
2. Construct new retaining wall with fence, including sidewalk, curb, steps, and stormwater pipes and catch basins.

C. Contractor's Duties:

1. Except as specifically noted, provide and pay for:

a. Labor, materials, and equipment;

b. Tools, construction equipment, and machinery;

c. Water, heat, utilities, etc. required for construction;

d. Other facilities and services necessary for proper execution and completion of work.

2. Secure and pay for, as necessary, proper execution and completion of work, and as applicable, at time of receipt of bids:

a. Government Fees;
b. Licenses;
c. Inspections of all work;
d. Material Testing.

3. Give required notices to all governmental agencies and utilities;

4. Comply with codes, ordinances, regulations, rules, orders and other legal requirements of public authorities which bear on performance of work.

5. Promptly submit written notice to Engineer of observed variance of Contract Documents from legal requirements:

a. Appropriate modification to Contract Documents will adjust necessary changes;

b. Assume responsibility for work known to be contrary to such requirements when above notice has not been given.

6. Owner is exempt from sales tax:

a. Obtain sales tax exemption certificate from Owner;

b. Put exemption certificate number on invoices for material incorporated in work;

c. Upon completion of work, file with Owner notarized statement that all purchase made under exeption certificate were entitled to be exempt;

d. Pay legally assessed penalties for improper use of exemption certificate number.

7. INSPECTIONS:

a. All inspections are to be called for at least 24 hours prioir to the inspection date:

END SECTION 01010

SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Coordination Drawings.
2. Project meetings.

1.2 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Project closeout activities.
7. Project closeout activities.

1.3 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within five (5) days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than fifteen (15) days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Tentative construction schedule.
b. Phasing.
c. Critical work sequencing and long-lead items.
d. Designation of key personnel and their duties.
e. Procedures for processing field decisions and Change Orders.
f. Procedures for requests for interpretations (RFIs).
g. Procedures for testing and inspecting.
h. Procedures for processing Applications for Payment.
i. Distribution of the Contract Documents.
j. Preparation of Record Documents.
k. Use of the premises and existing building.
l. Work restrictions.
m. Owner's occupancy requirements.
n. Responsibility for temporary facilities and controls.
o. Construction waste management and recycling.
p. Parking availability.
q. Office, work, and storage areas.
r. Equipment deliveries and priorities.
s. First aid.
t. Security.
u. Progress cleaning.
v. Working hours.

3. Minutes: Architect will record and distribute meeting minutes.

C. Progress Meetings: Conduct progress meetings at bi-weekly intervals. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in

planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

        1) Review schedule for next period.

3. Minutes: Architect will record and distribute to Contractor the meeting minutes.

END OF SECTION 01310

SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Submittals Schedule.

1.03 SUBMITTALS

A. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

1. Submit an electronic copy of schedule, using software indicated, on CD-R, and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.

B. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect’s final release or approval.

1.04 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.

2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.01 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.

2. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.02 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.

C. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

2.03 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 5 days of date established for the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

PART 3 - EXECUTION

3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Engineer, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01320

SECTION 01322 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.

B. See Division 1 Section "Closeout Procedures" for submitting photographic negatives and/or digital media as Project Record Documents at Project closeout.

1.2 SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same label information as corresponding set of photographs.

B. Construction Photographs: Submit a complete set of digital image electronic files as a Project Record Document on CD-ROM. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped.

1.3 USAGE RIGHTS

A. The Owner and Architect are granted unlimited rights for reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in jpg format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1600 by 1200 pixels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

A. Photographer: Engage photographer to take construction photographs.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in filename for each image.
2. Field Office Images: Maintain one set of images on CD-ROM in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect.

C. Preconstruction Photographs: Before commencement of demolition, take digital photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.

1. Flag construction limits before taking construction photographs.
2. Take twenty (20) photographs to show existing conditions adjacent to property before starting the Work.
3. Take twenty (20) photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.

END OF SECTION 01322

SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for the following:
   1. Disposing of nonhazardous demolition and construction waste.

B. See Division 2 Section "Building Demolition" for disposition of waste resulting from demolition of buildings, structures, and site improvements[, and for disposition of hazardous waste].

1.2 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 SUBMITTALS

A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit three (3) copies of report. Include separate reports for demolition and construction waste. Include the following information:

   1. Material category.
   2. Generation point of waste.
   3. Total quantity of waste in tons.
   4. Quantity of waste salvaged, both estimated and actual in tons.
   5. Quantity of waste recycled, both estimated and actual in tons.
   6. Total quantity of waste recovered (salvaged plus recycled) in tons.
   7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

B. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

C. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.4 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification and waste reduction work plan.[Include separate sections in plan for demolition and construction waste.] Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement waste management plan as approved by Architect and Owner. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Division 1 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.3 RECYCLING DEMOLITION WASTE

A. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.

B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.

C. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
1. Clean and stack undamaged, whole masonry units on wood pallets.

D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

E. Metals: Separate metals by type.

1. Structural Steel: Stack members according to size, type of member, and length.
2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

3.4 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees at landfill facility.

3.5 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

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

END OF SECTION 01524

TABLE 1-1

LIQUIDATED DAMAGES

PATERSON PUBLIC SCHOOLS

Contract No.	Description	Start Date	Completion Dates	Liquidated Damages $/Calendar Day
36	Retaining Wall & Fence Repair at School #19	May 28, 2018	Final Completion/CO by: September 30, 2018	1,500

SECTION 02000 - SITE IMPROVEMENTS

CONTENTS

2.1 General:

1. The bidder is referred to the General Terms and Conditions, Supplementary Terms and Conditions, and General Requirements, which form a part of this contract.

2. Conform to applicable safety standards of OSHA and New Jersey Department of Labor, US Department of Labor, and applicable Federal, Commercial and Trade Associations Specifications.

3. Maintain the sites in debris free conditions at all times.

4. Protect public and personal property.

5. The Contractor shall inspect the site before submitting his bid. Failure of the Contractor to inspect the site shall not relieve him of his responsibility to do all of the work in accordance with the drawings and specifications. Any unacceptable conditions or departures from the drawings should be noted to the Engineer prior to submission of bid.

6. All site features including sidewalks, curbing, drainage structures, etc., which are accidentally destroyed, lost, or injured on account of or during the construction of the work under this contract, or which are removed, shall be restored by the Contractor at no additional cost to the Owner.

7. The Contractor shall prepare and submit to the Engineer for approval a progress schedule for the work. The progress schedule shall be related to the entire project and shall indicate sequence of work and time requirements for various phases of the work. The schedule shall indicate from start of work to completion and shall be revised as required by the conditions of the work subject to the Engineer's approval. Any departure from the schedule shall be brought to the immediate attention of the Engineer.

8. All work shall be performed in the best and most professional manner by workers skilled in their respective trades. Contractor will maintain adequate supervision of the work at all times.

9. The Contractor shall be responsible to field verify all measurements and locations.

10. Actual locations of all underground utilities shall be the responsibility of the Contractor. Excavation shall not begin until the Contractor can identify the location of all underground utilities and provide documentation to the Engineer.

2.2 Scope of Work: The work shall include, but not be limited to the following:

1. Remove existing, excavate, re-grade and repave areas shown on the drawings. The excavated material, debris, and existing base shall be removed and disposed of as part of the contract. Transition to existing structures and/or surfaces in an acceptable manner. The pavement shall be pitched to drainage structures and according to the drawings and as directed.

2 Construct new storm drainage.

3. Restore lawn areas disturbed with topsoil, mulch, and seed by hydroseed and mulch application.

4. Construct concrete and bituminous concrete pavement, sidewalks and slabs where shown on the drawings and as directed.

5. Install all soil conservation measures related to the select project work area.

6. Restore disturbed areas in a satisfactory manner.

7. Obtain and pay for all local and state permits required for the work under this project.

2.3 Paving:

2.3.1 General:

1. The Contractor shall properly prepare the excavated area and the existing disturbed area for repaving.

2. All weak, cracked areas in the existing disturbed pavement shall be repaired with proper patches. Patches shall be full depth asphalt concrete to ensure strength equal to or exceeding that of the surrounding pavement structure.

3. Pavement shall be an average of 6" thick dense graded aggregate and 3” thick I-2 base course.

4. The Contractor performing the work under this section of the specifications shall furnish all materials, tools, and equipment, and shall perform all labor and services as may be necessary to complete the partial removal of existing pavement and new paving as indicated on the drawings, and as herein specified.

5. Provide temporary barricades, sign work, or fencing as required to protect the public and construction personnel from hazardous areas and areas of work.

6. Placing of surfacing materials, grading, tapering, and rolling, as necessary to provide a smooth, well graded and uniform surface.

7. Clean up on a daily basis.

8. All paving shall provide complete drainage. Puddling or bird baths will not be acceptable.

9. Remove all barricades and leave site in a debris free condition, upon completion of work.

10. Provide one (1) year guarantee to replace damaged pavement, fill potholes, repave unevenly settled areas, etc.

11. Perform all work as shown on the drawings.

12. Contractor to coordinate with Owner to minimize the disturbance of the daily activities of the sites.

13. It will be the Contractor's responsibility to inform the Owner and Engineer seven (7) days in advance when construction will be performed.

2.3.2 Standards and Materials: Meet the requirements and recommendations of applicable portions of the standards listed.

1.	Associated General Contractors of America, Inc.	AGC
2.	American Society of Testing Materials	ASTM
3.	New Jersey Department of Transportation	NJSDOT
4.	American Concrete Institute	ACI
5.	Asphalt Paving Institute	API
6.	National Ready-Mixed Concrete Association	NRMCA
7.	American National Standards Institute	ANSI

2.3.3 Description:

1. Hot Mixed Bituminous Concrete Course: Hot mixed bituminous concrete course shall consist of the construction of the following surface courses on previously constructed base courses.

2. Bituminous Concrete Stabilized Base Course: All work performed shall conform to the New Jersey Department of Transportation standard specifications.

   The thickness shall be as indicated on the drawings.

   Tack coat shall be included. Tack coat shall be Emulsified Asphalt, Grade RS-1 conforming to AASHTO M 140.

   Surveying costs shall be included.

   Surface preparation and cleaning shall be included.

   The thickness for trench restoration shall be as indicated on the drawings.

2.3.4 Methods of Construction:

1. All equipment, tools, machinery, and other appliances used in handling materials and executing any part of the work shall be subject to the approval of the Engineer before the work is started and whenever found unsatisfactory they shall be changed and improved, or new equipment substituted, as required by the Engineer. All equipment, tools, machinery, and plant used must be maintained in a satisfactory working condition.

2. The mixture shall be transported from the mixing plant to the project in motor trucks equipped with tight, clean bodies which shall be lightly lubricated with a thin oil, soap or lime solution or dusted with hydrated lime, to prevent the mixture from sticking to the bodies. Each truckload of mixture delivered shall be covered with a canvas tarpaulin or other approved material of such size, and so fastened as to protect the mixture from the weather. When required, the trucks shall be suitably insulated to insure delivery of the mixture to the project within the temperature requirements and in a suitable condition for proper laying. Any truck causing excessive segregation of the mixture by its spring suspension or other contributing factors or that shows oil leaks of any magnitude or causes undue delays shall, upon direction of the Engineer, be removed from the work until such conditions are corrected.

3. Rollers shall be in good condition, capable of reversing without backlash.

4. Construction:

   a. Weather Limitations: Bituminous concrete mixtures shall not be placed when the atmospheric temperature is below 40°F except when approved by the Engineer, or when the weather is foggy, rainy, or otherwise unfavorable in the opinion of the Engineer.

   b. Conditioning of Existing Surfaces: The surface of the base course or existing pavement upon which the bituminous concrete pavement is to be placed shall be clean, dry, and free from frost when the paving operations are about to start and shall be maintained in that condition.

      When the bituminous concrete is to be placed on newly constructed macadam base or on a new or existing gravel course, the surface shall be cleaned of all loose aggregate and binder and given a prime coat of asphaltic oil, tar, or emulsified asphalt as specified in Art. 3.10.2 of the New Jersey State Department of Transportation Standard at the rate of 0.10 gallon to 0.25 gallon per square yard as directed by the Engineer. Application of the prime coat shall be made not less than twelve (12) hours prior to the placing of the bituminous concrete and shall not be made when the macadam or gravel course is wet or frozen. Application methods and equipment shall meet with the approval of the Engineer.

      Contact surfaces of curbing, gutters, manholes, and other structures shall be painted with a thin uniform coating of asphaltic oil, Grade RC-2 or RC-3 conforming to the requirements specified in the New Jersey State Department of Transportation Standard just prior to placing of the bituminous concrete mixture against them.

   c. Preparation of Bituminous Materials: The bituminous material shall be heated to a temperature between 250°F and 325°F in tanks conforming to the requirements of the New Jersey State Highway Department Standard.

   d. Preparation of Mineral Aggregates: The mineral aggregates for the mixture shall be dried and heated at the mixing plant before being placed in the mixer.

   e. Transportation and Delivery of Mixtures: The mixtures shall be transported from the mixing plant to the point of use is vehicles conforming to the requirements hereinbefore specified. No loads shall be sent out so late in the day as to prevent completion of the spreading and compaction of the mixture during daylight unless artificial light satisfactory to the Engineer is provided.

   f. Spreading and Finishing: The mixture shall be laid only upon a base or existing surface which is dry and when the weather conditions are suitable, as hereinbefore specified under Weather Limitations. Upon arrival at the point of use, the mixture shall be spread and struck off so as to obtain, after compaction, the grade required on site or adjustments thereof made or ordered by the Engineer to obtain the prescribed thickness of bituminous concrete.

      The mixture may be spread and raked by hand. On such areas the mixture shall be dumped on steel dump boards and spread and raked to give the thickness of material required.

The Contractor shall provide suitable means for keeping all small tools clean and free from accumulation of bituminous material. He shall provide and have ready for use at all times enough tarpaulins or other suitable covers, as may be directed or approved by the Engineer, for use in any emergency such as rain, chilling wind, or unavoidable delay, for the purpose of covering or protecting any material that may have been dumped and not spread.

No bituminous concrete material shall be placed against the edge of a course or layer that has been rolled and has cooled, unless such edge is vertical or has been cut back to a vertical face and in either case has received a brush coat of bituminous material conforming to the requirements given above and approved by the Engineer.

g. Compaction: After the spreading and strike-off and while still hot, the course shall be compacted thoroughly and uniformly by rolling.

Each roller shall be operated by a competent experienced roller operator and must be kept as nearly as practicable in continuous operation while the work is underway.

Rolling shall begin at the sides and progress gradually to the center. If the width of the surface course permits, it shall be subjected to a diagonal rolling in two directions, the second diagonal rolling crossing the lines of the first. Rolling shall be continued until all roller marks are eliminated and the finished surface meets the requirements hereinafter specified under Surface Requirements. The speed of the roller shall not exceed three miles per hour and at all times shall be slow enough to avoid displacement of the hot mixture. Any displacement occurring as a result of the reversing of the direction of the roller, or from any other cause, shall be corrected at once by the use of rakes and of fresh mixture when required. To prevent adhesion of the mixture to the roller, the wheels shall be kept properly moistened with water by means of saturated mats or by other means approved by the Engineer, but excess water will not be permitted. Care shall be exercised in rolling not to disturb the line and grade of the edges of the bituminous concrete.

Along forms, curbs, headers, and walls and at other places not accessible to the roller, the mixture shall be thoroughly compacted with hot hand or mechanical tampers, and smoothing irons.

The surface of the pavement after compaction shall be smooth and true to the established grade within the tolerances hereinafter specified. Any pavement that becomes loose and broken or mixed with dirt, or is in any way defective shall be removed and replaced with fresh hot mixture, which shall be immediately compacted to conform to the surrounding area. Any area showing any excess of bituminous material shall be removed and replaced.

h. Joints: Placing of a placement course shall be as nearly continuous as possible and the roller shall pass over an unprotected end or side of a freshly laid mixture only when the laying of the course is to be discontinued long enough to permit the mixture to be chilled. In all cases, including the formation of joints as hereinafter specified, provision shall be made for proper bond with the new surface for the full depth of the course. Joints shall be formed by cutting back on the previous run so as to expose a vertical face, the full depth of the course. When the laying of the course is resumed, the exposed edge of the point shall be painted with a thin coat

of asphalt cement. The fresh mixture shall be raked against the joint, thoroughly stamped with hot tampers, and rolled.

i. Thickness: As specified on the drawings.

j. Installation Tolerances:

1. Maximum allowable variance of in-place compacted thickness from design thickness -- base course: Plus 1/2 inch, minus zero inches.

2. Maximum allowable variance of in-place compacted thickness from design thickness -- surface course: Plus 1/4 inch, minus zero inches.

3. Maximum allowable variance of surface smoothness - base course: Plus or minus 1/4 inch.

   a. Use 10-foot straightedge moved systematically over entire paved area to determine compliance with surface smoothness tolerance indicated.

4. Maximum allowable variance of surface smoothness - surface course: Plus or minus 1/8 inch.

   a. Use 10-foot straightedge moved systematically over entire paved area to determine compliance with surface smoothness tolerance indicated.

5. Maximum allowable variance of surface smoothness - crowned surfaces: Plus or minus 1/4 inch.

   a. Place crowned template at right angle to crown and move template systematically along entire length of crown to determine compliance with surface smoothness tolerance indicated.

6. In-place density: Pavement shall be compacted to at least 96 percent of density obtained by laboratory compaction.

2.4 Striping:

1. This work shall consist of applying white, yellow and/or blue traffic paint as indicated on the drawing and specified herein.

2. Paint shall conform to the NJDOT standard specification and the “Manual on Uniform Traffic Control Devices”.

3. All dirt, oil, grease, and other foreign material shall be removed from the areas upon which the traffic paint is to be placed.

4. The paint shall be applied on thoroughly dry surfaces when the surface temperature is above 40°F and applied at the rate of 300 to 330 linear feet per gallon of 4" wide stripes with a film thickness of 0.015".

5. Payment shall include all labor, materials, equipment, etc., necessary for the proper and complete work of this item.

END OF SECTION 02000

SECTION 02050 - DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Required demolition as indicated on the drawings.

1.02 SUBMITTALS

A. Proposed Demolition Activities:
   1. Submit proposed schedule of demolition activities. Indicate:
      a. Starting and ending dates for each activity as appropriate.
      b. Interruption and restoration of utility services.
   2. Submit proposed methods of operations.
   3. Submit proposed dust control measures.
   4. Submit proposed noise control measures.

B. Photographs: Before starting work, file with the architect photographs documenting existing conditions that later could be mistaken for damage caused by demolition operations.

C. Submit certificate stating that the required engineering survey has been performed.

D. Project Record Documents:
   1. Identify location of capped utilities.
   2. Indicate unanticipated structural, electrical, or mechanical conditions.

1.03 QUALITY ASSURANCE (NOT USED)

1.04 PROJECT CONDITIONS

A. Occupancy:
   1. Demolition will occur while school is not in session.

B. Existing Conditions:
   1. After the project is begun, the contractor is responsible for the condition of structures in which demolition occurs. The owner does not warrant that the condition of structures will not have changed since the time of inspection for bidding purposes.
   2. The owner reserves the right to remove and salvage portions of the structure prior to the start of demolition.

C. Unforeseen Conditions: Should unforeseen conditions be encountered that affect design or function of project, investigate fully and submit an accurate, detailed, written report to the engineer. While awaiting the architect's response, reschedule operations if necessary to avoid delay of overall project.

1.05 SEQUENCING AND SCHEDULING

A. Arrange schedule so as not to interfere with the owner's operations.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that utilities to be disturbed during construction have been disconnected and sealed.

B. Survey existing conditions and correlate with drawings and specifications to determine extent of demolition required.

C. Insofar as is practicable, arrange operations to reveal unknown or concealed structural conditions for examination and verification before removal or demolition.

D. Perform continuing surveys as the work progresses to detect hazards resulting from demolition or construction activities.

3.02 PREPARATION

A. Traffic: Do not obstruct walks or public ways without the written permission of governing authorities and of the owner. Where routes are permitted to be closed, provide alternate routes if required.

B. Protection:
   1. Provide for the protection of persons passing around or through the area of demolition.
   2. Perform demolition so as to prevent damage to adjacent improvements and facilities to remain.
   3. Provide protective measures to ensure free and safe passage of persons to and from occupied areas.
   4. Erect temporary protection such as walks, fences, railings, canopies, etc., where required by authorities having jurisdiction.
   5. Protect other new or existing work from damage during demolition operations.
   6. Protect existing site appurtenances, landscaping and specimen trees to remain.

C. Damages: Without cost to the owner and without delay, repair any damages caused to facilities to remain.

3.03 UTILITY SERVICES

A. Arrange with utility companies and shut off any utilities any utilities to be disturbed during construction.

B. Disconnect and cap indicated utilities before starting demolition operations.

C. Identify location of capped utilities on project record documents.

D. No interruption of utilities will be permitted.
   1. Provide temporary utilities when existing utilities are interrupted.

3.04 EXPLOSIVES

A. Do not use explosives.

3.05 POLLUTION CONTROLS

A. Control as much as practicable the spread of dust and dirt.

B. Observe environmental protection regulations.

C. Do not allow water usage which results in freezing or flooding.

D. Do not allow adjacent improvements to remain to become soiled by demolition operations.

3.06 DEMOLITION - GENERAL

A. Remove: Unless items are otherwise indicated to be reinstalled or salvaged, remove and scrap.

B. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare for service; reinstall in the same location (or in the location indicated).

C. Remove and Install New: Remove and dispose of items indicated and install new items in the same location (or in the location indicated).

D. Remove and Salvage: Items indicated to be salvaged will remain the owner's property. Carefully remove and clean items indicated to be salvaged; pack or crate to protect against damage; identify contents of containers; deliver to the locations indicated.

E. Remove and Scrap: Remove and dispose of items indicated.
   1. All demolished or removed items and materials shall be considered scrap except for those indicated to remain, those indicated to be reinstalled, and those indicated to be salvaged.
   2. Items of value to the contractor:
      a. The contractor may provide for temporary storage on site, if approved by the engineer.
      b. Remove all items from site when requested by the architect or the owner.
      c. On-site sale of removed items is prohibited.

F. Existing to Remain: Construction or items indicated to remain shall be protected against damage during demolition operations. Where practicable, and with the engineer's permission, the contractor may elect to remove items to a suitable storage location during demolition and then properly clean and reinstall the items.

G. Perform work in a systematic manner.

H. Demolish and remove existing construction only to the extent required by new construction and as indicated in the contract documents.

I. Perform selective demolition using methods which are least likely to damage work to remain and which will provide proper surfaces for patching.

J. Remove debris daily.

K. Use any methods permitted by governing regulations and the requirements of the contract documents.

3.07 DEMOLITION ON OR BELOW GRADE

A. Where portions of concrete slabs-on-grade are to be removed, first outline the portion with a concrete saw to a depth of at least 1 inch.

B. Remove concrete slabs-on-grade.

C. Completely remove below-grade construction, including foundations and footings.

3.08 FILLING BELOW-GRADE AREAS AND VOIDS

A. Completely fill below-grade areas and voids resulting from demolition of structures.

B. Use only clean, non-frozen, and approved soil material stone, gravel, or sand that is free from deleterious materials.

C. Do not place fill on saturated or frozen grade, frost, or deleterious material.

D. Place fill materials in 6 inch loose lifts and compact at optimum moisture content to original density of adjacent ground.

E. Grade completed surface to drain and to meet adjacent contours.

3.09 DISPOSAL OF DEMOLISHED MATERIALS

A. Promptly dispose of materials resulting from demolition operations. Do not allow materials to accumulate on site.

B. Transport materials resulting from demolition operations and legally dispose of off-site.

C. Do not burn removed materials on project site.

D. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

3.10 CLEANING

A. Remove tools and equipment. Dispose of scrap.

B. Leave exterior areas free of debris.

END OF SECTION 02050

SECTION 02300 - SITE WORK

PART 1 - GENERAL

1.1 Earthwork:

A. Scope of Work:

1. The General Contractor shall be responsible for the excavation required to install foundations and shall include any site work needed to allow equipment access to the site and preparation of the site for equipment.

2. Excavation and backfill required to install utilities.

3. Preparation of subgrade for walks, stairs, footings, and pavements as per drawings.

4. Excavation and backfill required to install new catch basins, manholes, storm pipe.

5. Backfilling and site restoration to return the area to conditions as they were at the beginning of the job.

6. Excavation shall be done in a manner to minimize the disruption of the services and access to the various parts of the site.

7. Excavated material that is not to be used for backfilling or is unsuitable for backfill shall be removed from the site. It is the responsibility of the contractor to properly remove, haul, and dispose of same.

8. Asphalt pavement and deleterious fill shall be removed off site and properly disposed of.

9. Contractor shall secure all of his equipment at the end of each work day.

10. Installation of storm sewer structures and piping.

11. Site staging area set up including construction fence and temporary stone base.

12. Site restoration.

B. Quality Assurance:

1. Safety Codes and Standards: Perform earthwork and site grading work in compliance with the applicable requirements of governing authorities having jurisdiction.

   Provide and maintain barricades, signs, lights, etc., required for the protection of personnel, tenants, the public, materials, etc. Barricades where applicable shall conform with all the local codes and regulations and shall be removed upon completion of the contract.

   The Contractor shall be solely responsible for stability of excavation and shall provide all sheathing, lagging, bracing, etc., required to retain the excavations and to prevent slides sloughs.

C. Job Conditions:

1. Testing and Inspection Service: Employ, at Contractor's expense, testing laboratory to perform soil testing and inspection service for quality control testing during earthwork operations.

D. Submittals: The contractor shall notify the Architect of the source of fill material to be used. The equipment to be used, date and time that earthwork operations will start, and the name of the person who will be in charge of the operations in the field.

E. Test Reports – Excavating: Submit following reports directly to Architect from the testing services, with copy the Contractor:

1. Test reports on borrow material.

2. Verification of each footing subgrade.

3. Field density test reports.

4. One optimum moisture - maximum density curve for each type of soil encountered.

5. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.

F. Existing Utilities: Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.

Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities.

Care shall be taken not to move, without the consent of the proper parties, any water or gas pipes, valve boxes, culverts, telegraph, telephone or electric piles, or wires, conduits or other structures or appurtenances, and where interfered with by the work they shall be supported securely in place until the work is complete, and shall be so treated as to render their condition safe and permanent as before. If so directed by the Architect, the location of any existing structures or work shall be changed to meet the requirements of the conditions encountered and leave all in good working order, at no extra cost to the owner.

If any water or gas mains, valve boxes, telephone conduits, drains and other existing structures are broken, injured or caused to leak by reason of the construction of the sewer or any part thereof, the Contractor shall give immediate notice to the proper parties having such structures in charge, and such parties shall cause such leaks, breaks, or injury to be repaired. If any house connections to the water mains shall become broken or damaged during the construction, they shall be immediately repaired by such parties. The expense of such work shall be paid by the Contractor.

G. Use of Explosives: The use of explosives is not permitted.

H. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.

Operate warning lights as recommended by authorities having jurisdiction.

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

I. Products:

1. Soil Materials – Definitions:

a. Satisfactory soil materials are defined as those complying with the American Association of State Highway and Transportation Officials (AASHTO) soil classification groups A-1, A-2-4, A-2-5 and A-3.

b. Unsatisfactory soil materials are defined as those complying with AASHTO for soil classification groups A-2-6, A-2-7, A-4, A-5, A-6 and A-7, also, peat and other highly organic soils and soil materials of any classification that have a moisture content at the time of compaction beyond the range of 1% below and 3% above the optimum moisture content of the soil material, as determined by moisture-density relations test.

c. Subbase Material: Naturally or artificially graded mixture of natural of crushed gravel, crushed stone, crushed slag, natural or crushed sand as specified on drawings or herein in layers of specified thickness.

d. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100% passing a 1-1/2" sieve and not more than 5% passing a No. 4 sieve.

e. Backfill and Fill Materials: Satisfactory soil materials free of clay, rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.

2. Borrow material shall be from a virgin source or meet the most stringent requirements of the New Jersey Residential, Non-Residential, and Impact and Groundwater Standards.

J. Execution:

1. Excavation: Work includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered. Remove all deleterious material and materials unacceptable to the Architect.

All existing rooty organic topsoil, uncompacted fill material, and peat must be removed from within the building and extending five feet beyond the building lines.

All layers of virgin soil directly beneath the peat or fill which are obviously loose or soft, whether due to the presence of roots, frost disturbance, or other causes, must either be removed or recompacted in place depending upon root content, layer thickness, or other pertinent factors, as directed by the Architect.

Excavated material, free from deleterious matter, may be used to grade areas around the buildings but shall not be reused for fill beneath floor slabs. All excess or unsuitable excavated material shall be disposed of by the Contractor in an approved off-site disposal area provided by the contractor. Should additional fill be required to meet final grade elevations, the contractor shall deliver to the site appropriate fill as part of his contract with no additional cost to the owner.

Earth excavation includes excavation of pavements and other obstructions visible on ground

surface; underground structures, utilities and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation. Any abandoned utility lines encountered during any and all excavation shall be removed in its entirety.

Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be at Contractor's expense.

Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Clean concrete fill may be used to bring elevations to proper position, when acceptable to Architect.

Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Architect.

a. Additional Excavation: When excavation has reached required subgrade elevations notify Architect who will make an inspection of conditions.

   If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Architect.

   Removal of unsuitable material and its replacement as directed will be part of base contract. No extra will be paid for any additional excavation.

b. Stability of Excavations: Slope sides of excavations to comply with OSHA, local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.

   Maintain sides and slopes of excavations in safe condition until completion of backfilling.

c. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers and cross-braces, in good serviceable condition.

   Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction.

   Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.

d. Dewatering: Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area. Dewatering shall be included in the project bid price. Separate payment will not be made for dewatering.

   Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

   Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to collecting

or run-off areas. Do not use trench excavations as temporary drainage ditches.

e. Material Storage: Stockpile satisfactory excavated materials w ere directed, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.

Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.

Dispose of excess soil material and waste materials as herein specified.

f. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10', and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.

In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms required lines and grades to leave solid base to receive other work. Excavation for footing and foundations shall be to virgin soil. Any existing foundations or other concrete work discovered during excavation shall be completely removed.

g. Excavation for Pavements: Cut surface under pavements to comply with cross-sections, elevations and grades as shown.

h. Excavation for Trenches: Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room. Provide 6" to 9" clearance on both sides of pipe or conduit.

Excavate trenches to depth indicated or required. Carry depth of trenches for piping to establish indicated flow lines and invert elevations. Beyond building perimeter, keep bottoms of trenches sufficiently below finish grade to avoid freeze-ups.

Where rock is encountered, carry excavation 6" below required elevation and backfill with a 6" layer of crushed stone or gravel prior to installation of pipe.

For pipes or conduit 5" or less in nominal size and for flat-bottomed multiple-duct conduit units, do not excavate beyond indicated depths. Hand excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.

For pipes or conduit 6" or larger in nominal size, and electrical work indicted to receive subbase, excavate to subbase depth indicated, or, if not otherwise indicated, to 6" below bottom of work to be supported.

Except as otherwise indicated, excavate for exterior water-bearing piping (water drainage) so top of piping is not less than 3' below finished grade.

Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.

Backfill trenches with concrete where trench excavations pass within 18" of column or wall footings and which are carried below bottom of such footings, or which pass under wall footings. Place concrete to level of bottom of adjacent footing.

Do not backfill trenches until tests and inspections have been made and backfilling

authorized by Architect. Use care in backfilling to avoid damage or displacement of pipe systems.

For piping or conduit less than 2'-6" below surface of roadways, provide 4" thick concrete base slab support. After installation and testing of piping or conduit, provide minimum 4" thick encasement (sides and top) of concrete prior to backfilling or placement of roadway subbase.

i. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35°F.

2. Compaction:

a. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification.

b. Percentage of Maximum Density Requirements: Compact soil to not less than the allowing percentages of maximum dry density for soils which exhibit a well-defined moisture density relationship (cohesive soils) determined in accordance with ASTM D 1557; and not less than the following percentages of relative density, determined in accordance with ASTM D 2049, for soils which will not exhibit a well-defined moisture-density relationship (cohesionless soils).

c. Structures: Slabs and Steps, Pavements: Compact top 12" of sub-grade and each layer of backfill or fill material at 90% maximum density for cohesive material or 95% relative density for cohesionless material.

d. Lawn or Unpaved Areas: Compact top 6" of subgrade and each layer of backfill or fill material at 85% maximum density for cohesive soils and 90% relatively density for cohesionless soils.

e. Walkways: Compact top 6" of subgrade and each layer of backfill or fill material at 90% maximum density for cohesive material or 95% relatively density for cohesionless material.

f. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material. Apply water in manner to prevent free water appearing on surface during or subsequent to compaction operations.

Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value.

3. Backfill and Fill:

a. General: All areas to receive fill shall be leveled. The surface shall be free from ruts, hummocks, or other uneven features which would tend to prevent uniform compaction by the equipment utilized. If placed, the stone drainage blanket shall consist of 3/4" size crushed stone and be uniformly spread over the bottom of the excavation. The average thickness of the drainage blanket shall be 15". Sump pits shall be set as required to

control the water level in the blanket. Pumps shall be used to maintain the water level a minimum of 12” below the surface of the fill. Material for controlled fill in building areas and extending five feet beyond the building limits shall preferably consist of clean sand and/or gravel, free of vegetable matter or other deleterious substances. The sand and/or gravel shall be well graded and shall contain no more than 70% by weight of material finer than the No. 30 sieve and no more than 15% by weight or material finer than the No. 200 sieve. Boulders and cobbles having a maximum diameter exceeding six inches shall be excluded from the fill material. Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below:

In excavations, use satisfactory excavated or borrow material.

Under grassed areas, use satisfactory excavated or borrow material.

Under walks and pavements, use subbase material.

Under steps, use subbase material.

Under building slabs, use drainage fill material.

Under piping and conduit, use subbase material where subbase is indicated under piping or conduit; shape to fit bottom 90° of cylinder.

Underground electrical conduit, encase -the conduit in 1' of white sand.

Backfill excavations as promptly as work permits, but not until completion of the following:

Acceptance of construction below finish grade including, where applicable, damp proofing, waterproofing and perimeter insulation.

Inspection, testing, approval, and recording locations of underground utilities.

Removal of concrete formwork.

Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.

Removal of trash and debris.

b. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.

   When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.

c. Placement and Compaction: Place backfill and fill materials in layers not more than 8” in loose depth for material compacted by heavy compaction equipment, and not more than 4” in loose depth for material compacted by hand-operated tampers.

Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density floor each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

The surface of the fill shall be kept at a slight slope to facilitate drainage of any ground or surface water which enters the excavation. Sump pits and pumps shall be used, if required, to maintain the fill in a reasonably dry condition.

After each layer has been placed and spread evenly, it shall be thoroughly compacted to an average value of 95% of the maximum Modified Proctor density of the soil being utilized within the building areas and extending five feet beyond the building limits in all directions. No individual test values shall be acceptable if they are below 90%. If required, the maximum density of the material shall be determined by a Soils Engineer in accordance with the American Society for Testing and Materials (ASTM) D 1557, latest edition. Cost for testing will be borne by the contractor at no additional cost to the owner.

A smooth-wheeled vibratory compactor should provide the most suitable means of compaction of essentially noncohesive granular soils. Small, portable rammer or vibratory plate compactors should be utilized within five feet of existing walls.

Sufficient passes of approved compactor shall be made in order to obtain the specified densities. A minimum of three passes of the compactor shall be required over all portions of each lift. A "pass" shall be defined as one passage of the contact portion of the compactor over the entire surface of the layer.

Place backfill and fill materials evenly adjacent to structures, piping or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately same elevation in each lift.

4. Grading:

   a. General: Uniformly grade areas within limits of grading under his section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.

   b. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding.

      Finish surfaces free from irregular surface changes, and as follows:

   c. Lawn or Unpaved Areas: Finish areas to receive topsoil to within no more than 0.10’ above or below required subgrade elevations.

   d. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10' above or below required subgrade elevation.

   e. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 1/2" above or below required subgrade elevation.

   f. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

5. Pavement Sub-Base Course:

   a. General: Subbase course consists of placing subbase material, in layers of specified thickness, over subgrade surface to support a pavement base course.

   b. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course.

   c. Shoulders: Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each subbase course layer. Compact and roll at least a 12" width of shoulder simultaneously with compacting and rolling of each layer of subbase course.

   d. Placing: Place subbase course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placement operations.

      When a compacted subbase course is shown to be 6" thick or less, place material in a single layer. When shown to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

6. Field Quality Control:

   a. Quality Control Testing During Construction: Allow testing service of inspect and approve subgrades and fill layers before further construction work is performed.

      Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ASTM D 2167 (rubber balloon method), as applicable.

   b. Footing Subgrade: For each strata of soil on which footings will be placed, conduct at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to Architect.

   c. Paved Areas and Building Slab Subgrade: Make at least one field density test of subgrade for every 2000 sq. ft. of paved area or building slab, but in no case less than 3 tests. In each compacted fill layer, make one field density test for every 2000 sq. ft. of overlaying building slab or paved area, but in no case less than 3 tests.

   d. Foundation Wall Backfill: Take at least 2 field density tests, at locations and elevations as directed.

      If in the opinion of Architect, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense.

7. Maintenance:

   a. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

      Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

b. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

c. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

8. Disposal of Excess and Waste Materials:

a. Removal from Owner's Property: Remove waste materials, including unacceptable excavated material, trash and debris, and dispose of it off Owner's property.

END OF SECTION 02300

SECTION 02500 - CONCRETE SITE WORK

PART 1 - GENERAL

1.01 General: All concrete work (material & construction procedure) shall be in accordance with ACI Standard 318-83 (R-86). Contractor shall perform all concrete work above and below grade as indicated on the drawings and as required.

Concrete shall be capable of developing minimum compressive strength of 4,000 psi at 28 days.

Add air entraining agency maximum 6% by volume to exposed concrete mix (ASTM C 260).

This work shall include any items for the construction of the retaining wall, sidewalk, and concrete curb.

1.02 Quality Assurance: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:

1. ACI 301 "Specifications for Structural Concrete for Buildings'.

2. ACI 318 "Building Code Requirements for Reinforced Concrete".

3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".

Materials and installed work may require testing and retesting, as directed by Architect, at any time during progress of work. Allow free access to materials stockpiles and facilities. Tests, including retesting of rejected materials and installed work, shall be done at Contractor's expense.

1.03 Form Materials:

1. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct form work for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. . Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection.

   Use overlaid plywood complying with U.S. Product Standard "A-C or High Density Overlaid Concrete Form", Class 1.

2. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

3. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

1.04 Concrete Materials:

Portland Cement: ANSI/ASTM C 150, Type I. Use one brand of cement throughout project.

Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.

For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.

Water: Drinkable.

1.05 Related Materials:

Waterstops: Provide flat, dumbbell type or center bulb type waterstops at construction joints and other joints as shown. Size to suit joints.

Rubber Waterstops: Corps of Engineers CRD-C 513.

Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

Waterproof paper.
Polyethylene film.
Polyethylene-coated burlap.

1.06 Proportioning and Design of Mixes: Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.

Submit written reports to Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.

Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:

4,000 psi 28-day compressive strength; W/C ratio, 0.44 maximum (non- air-entrained), 0.35 maximum (air-entrained).

Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

Ramps, slabs, and sloping surfaces: Not more than 3".

Reinforced foundation systems: Not less than 1-1/2” & not more than 3".

Other concrete: Not more than 4".

1.07 Concrete Mixes:

Job-Site Mixing: Mix materials for concrete in appropriate drum type batch machine mixer. For mixers of one cu. yd., or smaller capacity, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released. For mixers of capacity larger than one cu. yd., increase minimum 1-1/2. minutes of mixing time by 15 seconds for each additional cu. yd., or fraction thereof.

Ready-Mix Concrete: Comply with requirements of ANSI/ASTM C 94, and as herein specified.

During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ANSI/ASTM C 94 may be required.

When air temperature is between 85° F (30°C) and 90°F (32°C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90°F (32°C), reduce mixing and delivery time to 60 minutes.

Concrete Coloring Systems: Concrete coloring systems shall be Chromix admixtures; L.M. Scofield Company for main areas as shown on the drawings and Lithotex Colorstone; L.M. Scofield Company for accent areas as shown on the drawings. Admixtures shall conform to ASTM C 494, AASHTO M 194 and CRD C 87, and ASTM C 979 as coloring agents.

1.08 Forms: Design, erect, support, brace and maintain form work to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct form work so concrete members and structures are of correct size, shape, alignment, elevation and position.

Design form work to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.

Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, regrets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.

Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, regrets, recesses, and the like, to prevent swelling and for easy removal.

Provide temporary openings where interior area of form work is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.

Unless otherwise indicated, provide ties so portion remaining within concrete after removal is at least 1-1/2” inside concrete.

Provisions for Other Trades: Provide openings in concrete form work to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.

Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

1.9 Joints:

Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Architect.

Provide keyways at least 1-1/2" deep in construction joints in walls, slabs and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.

Place construction joints perpendicular to the main reinforcement. Continue reinforcement across construction joints.

Provide waterstops in construction joints as indicated. Install waterstops to form continuous diaphragm in each joint. Make provisions to support and protect exposed waterstops during progress of work. Fabricate field joints in waterstops in accordance with manufacturer's printed instructions.

Construct isolation joints in slabs-on-ground at points of contact between slabs on ground and vertical surfaces, such as column pedestals, foundation walls, grade beams and elsewhere as indicated.

Form contraction joints by inserting pre-molded hardboard or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. After concrete has cured, remove inserts and clean groove of loose debris.

Contraction joints may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.

1.10 Preparation of Form Surfaces: Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.

Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form coating material to accumulate in forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel form work is not acceptable.

1.11 Concrete Placement: Before placing concrete, inspect and complete form work installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.

Coordinate the installation of joint materials and moisture barriers with placement of forms and reinforcing steel.

Comply with ACI 304 and as herein specified.

Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation..

Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.

Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

Bring slab surfaces to correct level with straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning flashing operations.

Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.

When air temperature has fallen to or is expected to fall below 40°F (4°C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50°F (10°C), and not more than 80°F (27°C) at point of placement.

Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.

When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

Wet forms thoroughly before placing concrete.

Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

1.12 Finish of Formed Surfaces: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise imparted by form indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in' height -rubbed down or chipped off.

At tops of walls, horizontal offsets surfaces occurring 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.

1.13 Monolithic Slab Finishes: Reserved

1.14 Concrete Curing & Protection: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.

Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

Curing Methods: Perform curing of concrete by. moist curing, by moisture-retaining cover curing, by curing compound, and by combinations thereof, as herein specified.

Provide moisture curing by following methods:

1. Keep concrete surface continuously wet by covering with water.

2. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.

Provide moisture-cover curing as follows:

1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3” and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

Cure unformed surfaces, such as slabs and other flat surfaces by application of appropriate curing compound.

1.15 Removal of Forms: Form work not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50° F. (10°C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

1.16 Reuse of Forms: Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new form work.

When forms are extended for successive concrete placement, thoroughly clean surfaces, remove f-ins and laitance, and tighten forms to close joints. Align and secure joint- to avoid offsets. Do not use "patched' forms for exposed concrete surfaces, except as acceptable to Architect.

1.17 Miscellaneous Concrete Items: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

Grout base plates and foundations as indicated, using specified non-shrink grout. Use nonmetallic grout for exposed conditions, unless otherwise indicated.

1.18 Concrete Surface Repairs:

Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms.

Cut out honeycomb, rock pockets, voids over ¼" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, stains, air bubbles, honeycomb, rock pockets; f-ins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out from tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.

Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified.

Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.

Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01' wide or -which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.

Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.

Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.

Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least ¾" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in the same manner as adjacent concrete.

Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part Portland cement to 2 ½ parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.

Repair methods not specified above may be used, subject to acceptance of Architect.

1.19 Quality Control Testing During Construction: Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect.

Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.

1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.

2· Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure for normal weight concrete; one for each set of compressive strength test specimens.

3. Concrete Temperature: Test hourly when air temperature is 40°F (4°C) and below, and when 80°F (27°C), and above; and each time a set of compression test specimens made.

4. Compression Test Specimen: ASTM C 31; one set of 6 standard cylinders for each compressive strength test for each day's pour, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.

END OF SECTION 02500

SECTION 02722 - STORM DRAINAGE

PART 1 - GENERAL

1.1 GENERAL

A. Furnish and install the storm drainage system as shown on the drawings.

B. The Contractor shall furnish and install new manholes, storm pipe, and fittings shown on the drawings.

C. Existing pipe and storm water structures to remain in place shall be cleaned and all debris removed shall be disposed of off site. The piping to remain in place shall be saw cut and prepared for connection with the new drainage structures and piping.

D. Storm water structures and piping located within the proposed building footprint shall be removed.

E. Contractor shall be responsible for extending the existing roof drain and area drain piping to new storm water collection system. Match existing pipe size or install 6" diameter minimum, whichever is greater.

1.2 STORM DRAINS

A. Scope

1. The Contractor shall furnish, lay and joint storm drainage pipe and structures as shown on the drawings.

2. The work shall include all labor, tools, materials, and equipment including bedding and joint materials.

B. Type of Pipe:

1. N-12 Pipe double wall HDPE as manufactured by ADS or equivalent

a. HDPE pipe shall have a smooth interior and annular exterior corrugations and in accordance with ASTM F2648.

2. Schedule 40 PVC.

a. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.

b. Cellular-Core PVC Pipe: ASTM F 891, Schedule 40.

c. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.

d. Adhesive Primer: ASTM F 656.

1. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Adhesive primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

e. Solvent Cement: ASTM D 2564.

1. PVC solvent cement shall have a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Pipe Requirements:

1. The pipe shall be accurate and of uniform dimensions. All pipe shall be straight and true to form without bulges, dents, cracks, tears, or defects which will affect strength and shall have no bulges or dents on interior surfaces which will result in a noticeable variation in diameter from that obtained on adjacent unaffected portions of the surface.

2. Only domestic materials shall be offered, provided as follows, notwithstanding any inconsistent provision of law and unless the owner shall determine it to be in consistent with public interest or the cost to be unreasonable. Only pipe manufactured in the United States shall be used on this project.

3. The contractor shall supply pipe in standard lengths.

4. Each length of pipe shall be furnished with the manufacturer's designation indicating class, size, and batch of pipe.

5. The Contractor shall supply standard manufactured fittings and adapters for all bends.

D. Pipe Installation:

1. All pipes shall be carefully examined for dents, cracks, and other defects, and no pipe known to be defective shall be laid. If any pipe is found to be broken or defective after being laid, it shall be removed and replaced with a sound pipe without any further payment.

2. Joint surfaces shall be protected from damage and shall be carefully examined before jointing. No damaged joints shall be used in the work.

3. Pipe shall be thoroughly cleaned and ample precautions shall be taken to prevent entrance of dirt and debris into the pipe after laying. Exposed ends of the sewer shall be provided with temporary plugs or covers.

4. All pipe shall be carefully laid. to true alignment and grade. The trench bottom (6" below invert of pipe) shall be carefully graded to the proper elevation and the maximum practical solid bearing area shall be provided throughout its entire length, prior to swinging the pipe into place.

5. Care shall be taken not to excavate below grade (6” below invert). Material excavated below grade shall be replaced by material that meets with the approval of the Engineer.

6. All trenches shall be dewatered prior to laying pipe.

7. Immediately after the pipe is brought to final position, it shall be thoroughly secured and properly bedded, and ample support shall be provided to prevent settlement or disturbance.

8. Pipe shall be protected during construction against possible floatation in case the trench becomes flooded prior to placing the backfill.

D. Jointing

1. Pipe shall be carefully jointed in conformity with the best practice and the detailed instructions of the manufacturer.

2. All pipe ends shall be thoroughly cleaned prior to and during the jointing operation.

3. Actual details of required jointing practice will depend upon the particular type adopted, but shall, in all cases, involve approved practice and shall be such as to produce the required results.

4. At the manholes and inlet connections, use flexible water stops, resilient connectors, or other flexible connections to the structures.

1.3 DRAINAGE INLETS

A. Scope: The work includes furnishing all materials, labor, tools, and equipment necessary or incidental to complete construction of catch basin drainage inlets for sewers, including excavation and backfilling.

B. Materials and Workmanship: Excavation and backfill for inlets shall include the removal and replacing of all materials necessary for the proper construction of the inlets. Excavation and backfill shall conform to the specifications.

C. Construction:

1. Catch basin inlets shall be of the type as called for on the drawings.

2. Catch basin inlets shall conform with the typical catch basin inlet detail as shown on the drawings and shall consists of a six (6”) inch crushed stone foundation, a cast-in-place concrete base, solid concrete block construction walls, and frame and grate.

3. The area shall be excavated and the inlet structure constructed. After the catch basin inlet is completed and before backfilling, the exterior and interior of the inlet shall be plastered with a 1” coat of cement mortar. The inlet shall not be backfilled until the masonry has satisfactorily set.

1.4 MANHOLES AND STORM OUTLET STRUCTURES

A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.

2. Diameter: As indicated.

3. Ballast: Increase thickness of precast concrete sections or add concrete to base section as required to prevent flotation.

4. Base Section: 8-inch minimum thickness for floor slab and 6-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.

5. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.

6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated, and top of cone of size that matches grade rings.

7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.

8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.

9. Steps: wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than 36”.

10. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, to match diameter of manhole frame and cover, and height as required to adjust manhole frame and cover to indicated elevation and slope.

B. Manhole Frames and Covers:

1. Description: Ferrous; 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange and 26-inch diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "STORM SEWER."

2. Material: iron unless otherwise indicated.

1.5 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.

2. Defects requiring correction include the following:

a. Alignment: Less than full diameter of inside of pipe is visible between structures.

b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.

c. Damage: Crushed, broken, cracked, or otherwise damaged piping.

d. Infiltration: Water leakage into piping.

e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.

4. Re-inspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.

2. Test completed piping systems according to requirements of authorities having jurisdiction.

3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.

4. Submit separate report for each test.

5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

a. Exception: Piping with soil tight joints unless required by authorities having jurisdiction.

b. Option: Test plastic piping according to ASTM F 1417.

C. Leaks and loss in test pressure constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

1.6 IDENTIFICATION

A. Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.

1. Use detectable warning tape over ferrous piping.

2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

END OF SECTION 02722

SECTION 02870 - DEWATERING

PART 1- GENERAL:

1.01 General:

The contractor shall furnish sufficient pumping or other dewatering equipment and shall provide, at his own expense, satisfactory drainage whenever needed to the trench and other excavation during the progress of the work and at its completion for final inspection. No structures or pipe sewers shall be laid in water, and water shall not be allowed to flow over or raise upon any concrete, masonry, or pipe sewers until the work has been inspected and the mortar or concrete has properly set.

Where a continuous flow of water into the trenches causes a soft condition and where pumping cannot dry and prevent the flow of water in the trench, the contractor shall furnish, install, and maintain an efficient well point system.

Materials and workmanship used for the wellpoint system shall be in keeping with approved standard practice. The wellpoint system shall function so as to enable pipe, concrete foundations, and appurtenances to be installed without interference from running or standing water at the bottom of the excavation. The architect shall make the final decision as to the acceptability of the wellpoint system or any part thereof.

Where necessary, pea gravel or graded sand shall be used in conjunction with the wellpoints as they are installed to insure continuous pumping in dewatering fine material.

The wellpoint system shall be operated after the structures have been installed, as long as necessary, in order to construct manholes, install pipe and/or properly install the footings and foundations.

1.02 Disposal of Water:

All water pumped or bailed from the trench or other excavation shall be conveyed in a proper manner to a suitable point of discharge by the contractor at his own expense.

END OF SECTION 02870

SECTION 09963 - ELASTOMERIC COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes surface preparation and application of elastomeric coatings to exterior surfaces.

1.3 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

B. Stucco: A portland cement-based plaster used on exterior surfaces.

1.4 PERFORMANCE REQUIREMENTS

A. Provide elastomeric coatings that comply with performance requirements specified in MPI 113.

B. Provide elastomeric coating systems with the following properties as determined by test methods indicated:

1. Elongation: Not less than 100 percent with a tensile strength of 200 psi and not less than 88 percent recovery after 1 hour and 90 percent recovery after 24 hours when tested according to ASTM D 2370 using parameters established by MPI 113.
2. Accelerated Weathering: No cracking, peeling, blistering, chalking, or visual deterioration after 1000 hours when tested according to procedures in ASTM G 155.
3. Low-Temperature Flexibility: No crack formation when tested according to ASTM D 1737.
4. Moisture-Vapor Transmission: Not less than 2.0 perms according to ASTM D 1653.
5. Wind-Driven Rain Resistance: No water penetration according to procedures in FS TT-C-555.
6. Minimum Solids Content by Volume: Not less than 45 percent.

1.5 SUBMITTALS

A. Product Data: For each elastomeric coating system specified. Include crack fillers, block fillers, and primers.

1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference the specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
2. Manufacturer's Information: Technical information including label analysis and instructions for handling, storing, and applying each coating material.
3. Certification by elastomeric coating manufacturer that products supplied comply with local VOC regulations.

B. Samples for Initial Selection: For each type of finish-coat material indicated.

1. Owner to select color, color to match existing.

C. Qualification Data: For Applicator.

D. Material Certificates: For each elastomeric coating material, signed by manufacturers.

E. Product Test Reports: Based on evaluation of comprehensive tests by a qualified testing agency for each elastomeric coating material indicating compliance of elastomeric coatings with requirements based on comprehensive testing within the last five years of current product formulations.

1.6 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying elastomeric coating systems similar in material and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Source Limitations: Obtain crack fillers, primers and other undercoat materials from same manufacturer as finish coats.

C. Benchmark Samples (Mockups): Provide full-coat benchmark finish samples for each type of coating on each substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample submittals.

1. Architect will select one concrete, masonry and/or stucco exterior wall surface to represent surfaces and conditions for application of elastomeric coatings.

a. Wall Surfaces: Prepare samples on at least 5 sq. ft. of wall surface.

2. Apply benchmark samples according to requirements for the completed Work. Provide required sheen, color, and texture on each surface.
3. Approved benchmark samples will be used to evaluate coating systems.
4. Obtain Architect's approval of benchmark samples before starting application of coatings.
5. Final approval of colors will be from benchmark samples.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:

1. Product name or title of material.

2. Manufacturer's stock number and date of manufacture.
3. Contents by volume, for pigment and vehicle constituents.
4. Thinning instructions (if permitted).
5. Application instructions.
6. Color name and number.
7. Handling instructions and precautions.
8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.

1. Protect elastomeric coating materials from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.8 PROJECT CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 50 and 90 deg F, unless otherwise permitted by manufacturer's written instructions.

B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before starting or continuing coating operation.

1.9 WARRANTY

A. Elastomeric Coating Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace elastomeric coatings that fail within specified warranty period. Failures include, but are not limited to, water penetration through the coating.

B. Warranty Period for Elastomeric Coatings: Five year(s) from date of Substantial Completion.

1.10 EXTRA MATERIALS

A. Furnish extra elastomeric coating materials from same production run as materials applied and in quantities described below. Package materials in unopened, factory-sealed containers for storage and identify with labels describing contents. Deliver extra materials to Owner.

1. Quantity: Furnish Owner with 2 gal. of each color and finish of elastomeric coating materials applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

B. Manufacturers Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles (Basis of Design):

1. Stuc-O-Flex International, Inc. (Stuc-O-Flex).

2.2 ELASTOMERIC COATING MATERIALS, GENERAL

A. Material Compatibility: Provide crack fillers, block fillers, primers, elastomeric finish-coat materials, and related materials that are compatible with one another and substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality elastomeric coating materials that are factory formulated, comply with requirements in FS TT-C-555, and are recommended by manufacturer for the application indicated. Material containers not displaying manufacturer's product identification are not acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance of proposed substitutions.

C. Colors and Textures: See the Coating Schedule at the end of Part 3 for color selections.

D. Colors and Textures: As selected by Architect from manufacturer’s full range.

2.3 CRACK FILLERS

A. Crack Fillers: Factory-formulated acrylic emulsion crack fillers compatible with substrate and finish-coat materials indicated.

2.4 PRIMERS

A. Concrete and Masonry Primer: Factory-formulated, alkali-resistant, acrylic-latex primer (Basis of Design).

1. Stuc-O-Flex: Prime Seal: Applied as per manufacturers recommendations.

B. Stucco Primer: Factory-formulated stucco primer (Basis of Design).

1. Stuc-O-Flex: Prime Seal: Applied as per manufacturers recommendations.

2.5 ELASTOMERIC FINISH-COAT MATERIALS

A. Smooth Elastomeric Finish: Smooth, factory-formulated, 100 percent acrylic elastomeric coating (Basis of Design).

1. Stuc-O-Flex: Elastomeric Acrylic Finish: Applied at a minimum thickness of 1/8” with no voids.

B. Textured Elastomeric Finish: Textured, factory-formulated, 100 percent acrylic elastomeric coating (Basis of Design).

1. Stuc-O-Flex: Elastomeric Acrylic Finish: Applied at a minimum thickness of 1/8” with no voids.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for coating application. Comply with procedures specified in PDCA P4.

1. Proceed with coating application only after unsatisfactory conditions have been corrected and surfaces are thoroughly dry.
2. Start of coating application will be construed as Applicator's acceptance of surface conditions.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify Architect about anticipated problems when using coatings specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, light fixtures, and similar items already installed that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.

1. After completing coating operations, reinstall items removed, using workers skilled in trades involved.

B. Cleaning: Before applying coatings or other surface treatments, clean substrates of substances that could impair bond of coating systems. Remove oil and grease before cleaning.

1. Schedule cleaning and coating application so dust and other contaminants from cleaning process will not fall on wet, newly coated surfaces.

C. Surface Preparation: Clean and prepare surfaces to be coated according to manufacturer's written instructions for particular substrate conditions and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.
2. Cementitious Surfaces: Prepare brick, concrete, concrete unit masonry, stucco, and similar surfaces to receive elastomeric coatings. Remove efflorescence, chalk, dust, dirt,

release agents, grease, oils, and similar impediments to good adhesion by water blasting followed by a clear water rinse.

a. Remove mildew and neutralize surfaces according to manufacturer's written instructions before patching materials are applied.
b. Roughen as required to remove glaze. Use abrasive blast-cleaning methods if recommended by coating manufacturer.
c. If hardeners or sealers have been used to improve concrete curing, use mechanical methods for surface preparation.
d. Determine alkalinity and moisture content of surfaces to be coated by performing appropriate tests. If surfaces are sufficiently alkaline to cause finish paint to blister and burn, correct this condition before application. Do not apply coatings over surfaces where moisture content exceeds that permitted in manufacturer's written instructions.

3. Crack Repair: Fill cracks according to manufacturer's written instructions before coating surfaces.
4. Deep Hairline Cracks: Remove dust and dirt from around cracks. Remove mildew by sterilizing before filling. Apply manufacturer's recommended primer to cracks before patching. If shrinkage occurs after applying crack filler, apply additional filler material to cracks before initial application of elastomeric coatings.

a. Cracks up to 1/16 Inch: Clean surface around cracks. Apply crack filler primer penetrating cracks as deeply as possible, overflowing crack 2 inches on each side. When crack filler primer is dry, apply manufacturer's recommended sealant, forced well into cracks using a brush, putty knife, or trowel. Smooth edges of primed area around cracks. Allow for sealant shrinkage when applying.
b. Cracks up to 3/8 Inch: Open cracks to 1/4 to 3/8 inch wide and 1/8 inch deep. Clean cracks and surrounding area removing dust, dirt, and other impurities. Apply crack filler primer recommended by manufacturer with a brush to obtain uniform coverage and spread approximately 2 inches on each side of cracks. Fill cracks with manufacturer's recommended crack filler applied with a putty knife or trowel, and allow for shrinkage. If excessive shrinkage occurs, reapply crack filler.

D. Material Preparation: Mix and prepare materials according to coating manufacturer's written instructions.

1. Maintain containers used in mixing and applying elastomeric coatings in a clean condition, free of foreign materials and residue.
2. Stir materials before application to produce a mixture of uniform density. Stir as required during application. If surface film forms, do not stir film into material. If necessary, remove film and strain coating material before using.
3. If manufacturer permits thinning, use only thinners recommended by manufacturer, and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match color of finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply elastomeric coatings according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Colors, surface treatments, and finishes are indicated in coating schedule.
2. Do not paint over conditions detrimental to formation of a durable coating film, such as dirt, rust, scale, grease, moisture, and scuffed surfaces.
3. Provide finish coats compatible with primers used.

B. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

C. Scheduling Coating: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Number of coats and film thickness required are same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
2. If undercoats or other conditions show through final coat, apply additional coats until coating film is of uniform finish, color, and appearance. Ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
3. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until coating has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat does not cause undercoat to lift or lose adhesion.

D. Application Procedures: Apply elastomeric coatings by brush, roller, or spray according to manufacturer's written instructions.

1. Rollers: Use professional-quality quick-release rollers of carpet, velvet back, or high-pile sheep's wool covers with a 1- to 1-1/4-inch nap as recommended by manufacturer for material and texture required.
2. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

E. Minimum Coating Thickness: Apply each material no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness as recommended by manufacturer.

1. Wherever spray application is used, apply each coat to provide equivalent hiding of brush-applied coats. Do not double back with spray equipment, building up film thickness of two coats in one pass.

F. Prime Coats: If recommended by manufacturer, apply a primer to material being coated before applying finish coats.

G. Roller Application: Keep cover wet at all times; do not dry roll. Work in sections. Lay on required amount of material, working material into grooves and rough areas; then level material, working it into surface.

H. Spray Application: Use spray equipment for application only when permitted by manufacturer's written instructions and authorities having jurisdiction.

I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or recoat work not complying with specified requirements.

3.4 CLEANING

A. Cleanup: At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

1. After completing coating work, clean glass and spattered surfaces. Remove spattered coatings by washing, scraping, or other methods, being careful not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION

A. Protect work of other trades from damage whether being coated or not. Correct damage by cleaning, repairing, replacing, and recoating as approved by Architect. Leave in an undamaged condition.

B. Provide "Wet Paint" signs to protect newly coated finishes. Remove temporary protective wrappings provided by others to protect their work after completing coating operations.

1. After construction activities of other trades are complete, touch up and restore damaged or defaced coated surfaces. Comply with procedures specified in PDCA P1.

3.6 COATING SCHEDULE

A. Concrete: Provide the following elastomeric coating systems over exterior concrete surfaces:

1. Textured Elastomeric Finish: One finish coat(s) over a primer .

a. Primer: Concrete and masonry primer.
b. Finish Coats: Textured elastomeric finish.

B. Stucco (Portland Cement Plaster): Provide the following elastomeric coating systems over exterior stucco surfaces:

1. Smooth Elastomeric Finish: One finish coat(s) over a primer .

a. Primer: Stucco primer.
b. Finish Coats: Smooth elastomeric finish.

END OF SECTION 09963