PROJECT MANUAL

KITCHEN ADDITION FOR

JAFFARYA CENTER

4555 MILLERSPORT HIGHWAY
AMHERST, NY 14228

SA PROJECT NO. 07129.03

September 14, 2018

ARCHITECT
SILVESTRI ARCHITECTS, PC
1321 MILLERSPORT HIGHWAY, SUITE 101
AMHERST, NY 14221

CIVIL CONSULTANT
C&S ENGINEERING
141 ELM STREET
BUFFALO, NY 14202

STRUCTURAL CONSULTANT
PETRILLI ENGINEERING
429 KINSEY AVENUE
KENMORE, NY 14217

MECHANICAL/ELECTRICAL CONSULTANT
EBS ENGINEERING
4050 RIDGE LEAD ROAD, SUITE C
AMHERST, NY 14228

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General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

Jaffarya Islamic Center
10300 Transit Road, Amherst, NY 14221

THE OWNER:
(Name, legal status and address)

Jaffarya Islamic Center
10300 Transit Road, Amherst, NY 14221

THE ARCHITECT:
(Name, legal status and address)

Silvestri Architects, PC
1321 Millersport Highway, Suite 101, Amherst, NY 14221

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

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§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

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G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

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§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

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§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

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§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

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§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

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delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely

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upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

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§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

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§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

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ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- **.1** assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- **.2** assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

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§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- **.1** The change in the Work;
- **.2** The amount of the adjustment, if any, in the Contract Sum; and
- **.3** The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- **.1** Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- **.2** Unit prices stated in the Contract Documents or subsequently agreed upon;
- **.3** Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- **.4** As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

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.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

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§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

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§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

.1 defective Work not remedied;

.2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;

.3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

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.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a Separate Contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

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§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

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§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

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.1 employees on the Work and other persons who may be affected thereby;

.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and

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

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's 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 Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

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promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or

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expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

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§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during

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that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

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§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;

.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

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§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- **.1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- **.3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- **.1** Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** Accept assignment of subcontracts pursuant to Section 5.4; and
- **.3** Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- **.1** that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- **.2** that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- **.1** cease operations as directed by the Owner in the notice;

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.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

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§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

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§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

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§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

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PAGE 1

Jaffarya Islamic Center
10300 Transit Road, Amherst, NY 14221

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Jaffarya Islamic Center
10300 Transit Road, Amherst, NY 14221

...

Silvestri Architects, PC
1321 Millersport Highway, Suite 101, Amherst, NY 14221

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AIA® Document D401™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 15:39:45 on 05/21/2018 under Order No. 2584414542 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2017, General Conditions of the Contract for Construction , as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

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SUPPLEMENTARY GENERAL CONDITIONS

1. PROTECTION OF PERSONS AND PROPERTY

(Amend Article 10 of the General Conditions by the addition of the following):

All items of work required for the protection of public, workmen, site and construction operation as required by the General Conditions and/or laws or regulations shall be completed before the work is started on the project.

2. EXECUTION, CORRELATION, INTENT OF DOCUMENTS

Make no changes from Contract Documents without first receiving written permission from the Architect. Where detailed information is lacking, before proceeding with work, refer matter to Architect for information.

If work is required in manner to make it impossible to produce first class work, or should discrepancies appear among Contract Documents, request interpretation before proceeding with work. If Contractor fails to make such request, no excuse will thereafter be entertained for failure to carry out work in satisfactory manner. Should conflict occur in or between drawings and specifications, Contractor is deemed to have estimated on more expensive way of doing Work unless he shall have asked for and obtained written decision before submission of proposal as to which method or materials will be required.

Omissions from the drawings or specification, or the misdescription of details for work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work; but they shall be performed to complete the work as it is intended, without any gaps between the various subdivision of work or between the work of the Contractor and all subcontractors, as if fully and correctly set forth and described in the drawings and specifications.

3. SUBCONTRACTORS

(Amend Article 5.2-1 of the General Conditions by the addition of the following):

Within 10 days after awarding of the contracts, the prime Contractors shall submit a list of suppliers and/or Subcontractors he or she proposes to employ in the construction of the project for approval to the architect.

4. SUBSTANTIAL COMPLETION

(Amend Article 9.8 of the General Conditions by the addition of the following):

Substantial completion is defined as the point of time when the owner is able to use the facility in its entirety.

5. PROGRESS PAYMENTS

(Amend Article 9.6 of the General Conditions by the addition of the following):

Payments will be made on the basis of progress and will be made once a month. Application for Payment Form shall be submitted in triplicate on AIA Standard Form Document G702 by the thirtieth of each month for payment by the thirtieth of the following month.

Progress payments shall be made upon monthly requisitions from the contractor in the amount of ninety per cent, (90%), of the contract sum allocated to labor and materials and equipment stored on or off site for that monthly period.

6. CONTRACT

The Form of Agreement Between the Construction Manager and Sub Contractor, (Stipulated Sum), AIA Document A401, Standard Form of the American Institute of Architects, l987 edition, pages 1 through 4, shall be used as the contract and shall form a part of these bidding documents.

This document is kept on file in the architect's office and may be examined upon request by any of the bidders.

EMPIRE GEO SERVICES, INC.

CORPORATE/
BUFFALO OFFICE
5167 South Park Avenue
Hamburg, NY 14075
Phone: (716) 649-8110
Fax: (716) 649-8051

ALBANY OFFICE
PO Box 2199
'lston Spa, NY 12020

5 Knabner Road
Mechanicville, NY 12118
Phone: (518) 899-7491
(518) 899-7496

CORTLAND OFFICE
60 Miller Street
Cortland, NY 13045
Phone: (607) 758-7182
Fax: (607) 758-7188

ROCHESTER OFFICE
535 Summit Point Drive
Henrietta, NY 14467
Phone: (585) 359-2730
Fax: (585) 359-9668

Geotechnical Engineering Report
Proposed Jaffarya Center of Niagara Frontier
10300 Transit Road
Amherst, New York

Prepared For:

Jaffarya Center of Niagara Frontier

c/o Picone Construction Corporation
8680 Main Street
Williamsville, New York 14221

Prepared By:

Empire Geo-Services, Inc.
5167 South Park Avenue
Hamburg, New York 14075

9/10/07

Project No.: BE-07-199
September 2007

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1.00 INTRODUCTION

1.10 GENERAL

This report presents the results of a subsurface exploration program and geotechnical engineering evaluation completed by Empire Geo-Services, Inc. (Empire) for the proposed Jaffarya Center of Niagara Frontier planned at 10300 Transit Road in the Town of Amherst, New York. The approximate location of the project site is shown on Figure 1.

Jaffarya Center of Niagara Frontier (JCNF), at the request and recommendation of Picone Construction Corporation (PCC), retained Empire to complete the subsurface exploration program and provide geotechnical engineering recommendations for the project. SJB Services, Inc. (SJB), Empire's affiliated subsurface exploration company, completed the subsurface exploration program, which consisted of seven (7) test borings drilled at the project site.

On this basis, Empire prepared this report, which summarizes the subsurface conditions encountered by the test borings and presents geotechnical recommendations for design and construction of the foundations, slab-on-grade and asphalt pavement areas as well as the associated site preparation work. Our work was completed in general accordance with our August 23rd, 2007 proposal, and as authorized by PCC on behalf of JCNF.

1.20 PROJECT DESCRIPTION

The proposed project is expected to consist of the following, based on the information provided by PCC.

- The JCNF building will consist of a single story structure with approximately 11,417 square feet of building space;
- The building is planned to be supported on a shallow spread foundation system;
- The floor construction is planned as slab-on-grade;
- The building will not contain a basement;
- The proposed building will be designed for seismic loads per the Building Code of New York State; and

- Asphalt concrete pavement parking areas are planned on the west and east sides of the proposed building. An asphalt concrete access and entrance drive is planned along the north side of the site, from Transit Road. Traffic is expected to consist mainly of automobiles, with occasional delivery trucks.

Figure 2 shows the planned site development and the approximate test boring locations.

1.30 SITE DESCRIPTION

The project site is located on the west side of Transit Road (street address 10,300 Transit Road), between Dann Road and Smith Road in the Town of Amherst, New York. The site is predominately undeveloped and is generally open and covered with lawn to tall field grass. An existing shed structure is located in the east portion of the site and an existing residence adjoins the southeast corner of the site. The site topography drops slightly from east to west with ground surface elevations (El.) at the test boring locations ranging between El. 584.7 feet (boring B-7) and El. 581.5 feet (boring B-1) based on the benchmark datum described below.

2.00 SUBSURFACE EXPLORATION

The subsurface exploration program consisted of seven (7) test borings drilled by SJB on September 4th and 5th, 2007. The test borings are designated as B-1 through B-7 and their approximate locations are shown on Figure 2.

The test boring locations were initially established on a site plan provided to Empire by PCC. The test borings were then located in the field by representatives of SJB by using tape measurements referenced to Transit Road and the project site property lines. Optical survey level techniques were utilized to determine the existing ground elevations at the test boring locations. The ground surface elevations were referenced to the rim of a sanitary sewer manhole (benchmark), located near the southeast corner of the site, as shown on Figure 2. The benchmark has an established elevation datum of El. 585.06 feet, based on a site plan drawing (Drawing No.: C1), prepared by C&S Engineers, Inc.

The test borings were made with a Central Mine Equipment (CME) model 85 truck mounted drill rig, using hollow stem auger and split spoon sampling techniques. Split spoon samples and Standard Penetration Tests (SPTs) were taken continuously from the ground surface to a depth of 12 feet and in intervals of 5 feet or less beyond the zone of continuous sampling. The split spoon

sampling and SPTs were completed in general accordance with *ASTM D 1586 - "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils"*.

Test borings B-3 through B-6 were completed within the footprint of the proposed building. Test borings B-1, B-2 and B-7 were completed within or near the proposed parking/drive areas. Test boring B-4 was advanced to a depth of 41.9 feet, where sample spoon and auger refusal (apparent bedrock refusal) was met. Borings B-3, B-5 and B-6 were advanced to a depth of 25.0 feet and terminated. Test borings B-1, B-2 and B-7 were advanced to a depth of 10.0 feet and terminated.

42'
75'
30'
127'

A geologist prepared the test boring logs based on visual observations of the recovered soil samples and review of the driller's field notes. The soil samples were described based on a visual/manual estimation of the grain size distribution, along with characteristics such as color, relative density, consistency, moisture, etc. The test boring logs are presented in Appendix A, along with general information and a key of terms and symbols used to prepare the logs.

3.00 SUBSURFACE CONDITIONS

The general stratigraphy encountered in the test borings consisted of about 4 to 9-inches of topsoil at the ground surface followed by predominately sandy silty clay, silty fine sand and silty clay indigenous soils. Fill soils were not readily apparent within the test borings, although it is possible that in some cases the upper indigenous soils could have been previously reworked and disturbed by past agricultural activities on the site. Bedrock appears may have encountered in the deeper boring, B-4, at a depth of about 41.9 feet as indicated by the sample spoon and auger refusal encountered at this depth. Bedrock coring, however, was not performed to confirm the actual nature of the refusal material.

The indigenous soils consist of an upper layer of yellow-brown silty fine sand or yellow-brown sandy silty clay encountered at boring locations B-3, B-4, B-5 and B-6, which extends to a depth of about 2 to 4 feet at these locations. Beneath these upper indigenous soils and beneath the topsoil at borings B-1, B-2 and B-7, red-brown silty clay deposits, containing trace or no sand, were encountered, which were present through the remaining depth of the test borings, with the exception of boring B-4. At a depth of about 30 feet in boring B-4, the silty clay contains intermixed sand and gravel (defined as glacial till deposited soil) and grades to a very stiff to hard silty consistency.

The indigenous soils are classified as SM, CL-ML and CL group soils using the Unified Soil Classification System (USCS), ASTM D2488. Standard Penetration

Test (SPT) "N" values obtained in the indigenous soils ranged from 2 to greater than 50. The SPT "N" values indicate the upper granular silty sand soils are of a firm relative density, while the cohesive silty clay soils ranged from 6 to 32 indicating their consistency varies between "hard" and "soft". Generally the cohesive silty clay soils grade to a medium to soft consistency (i.e. indicated by SPT "N" values of less than 8) beginning at a depth of about 8 to 12 feet and extending to a depth of about 30 feet.

In all cases the driller did not note the presence of freestanding water in the borings at the completion of drilling and sampling. Although not observed during our investigation, it is possible that some localized perched or trapped groundwater could be present at various times and locations within the upper sandier soils, which overlie the less permeable silty clay soils. Perched groundwater conditions can be particularly more prevalent following heavy or extended periods of precipitation and during seasonally wet periods. It should be expected that both perched and permanent groundwater conditions could vary with location and with changes in soil conditions, precipitation and seasonal conditions.

4.00 GEOTECHNICAL CONSIDERATIONS AND RECOMMENDATIONS

4.10 GENERAL

The subsurface conditions encountered by the test borings are considered suitable for developing the proposed Jaffarya Center building using a spread foundation system and slab-on-grade floors, as currently proposed. The geotechnical issues, which must be addressed, include the proper preparation of the foundation bearing grades, along with the subgrades for the slab-on-grade and pavement construction.

4.20 SPREAD FOUNDATION DESIGN

Spread foundations for the proposed Jaffarya Center building should bear on suitable, undisturbed indigenous soil bearing grades or on Engineered Fill (i.e. compacted Structural Fill or suitable flowable backfill) following removal of any fill soils, should they be present at locations away from the boring locations, and any unsuitable indigenous soils below the proposed footing. Suitable indigenous soil bearing grades should consist of stiff to hard silty clay soils, which are free of organics, soft, loose, wet or otherwise deleterious conditions.

Suitable bearing grade depths/elevations encountered at the building area test boring locations are presented on the following table. In general foundations

should bear at or below these grades or on engineered fill, placed following excavation to these grades.

Recommended Suitable Subgrade Depth and Elevation for Spread Foundation or Engineered Fill		
Boring No.	Ground Surface Elevation (Feet)	Suitable Bearing Grade Depth/Elevation (Feet)
B-3	584.7	3.0 / 581.7
B-4	585.1	2.0 / 583.1
B-5	583.4	2.5 / 580.9
B-6	584.4	2.0 / 582.4

Subsurface conditions may vary away from the test boring locations and therefore could require adjustments in the suitable subgrade elevation based on actual conditions encountered at the time of construction. Accordingly, close inspection of the foundation bearing grades, by qualified geotechnical personnel, is recommended.

If it is necessary to place Structural Fill beneath the foundations, it should be placed beyond the foundation limits a horizontal distance equal to at least 0.5 times the thickness of the Structural Fill layer beneath the foundation. Excavations, therefore, will need to be planned and sized accordingly. Recommendations for Structural Fill material along with its placement and/or compaction are presented in Appendix B.

Flowable backfill material, if used, should be a non-swelling type material and should have a minimum 28-day compressive strength (f'c) of 250 pounds per square inch (psi). The flowable backfill should extend at least 12 inches horizontally beyond the foundation limits for its entire depth.

Spread foundations constructed on suitable indigenous soil bearing grades or on properly constructed engineered fill materials placed over the suitable bearing grades can be sized based on a maximum net allowable bearing pressure of 2,500 pounds per square foot (psf).

Continuous wall foundations should be at least 2.0 feet in width and column/individual foundations should be at least 3.0 feet in width. Exterior foundations should be embedded a minimum of 4.0 feet below finished exterior grades for frost protection. Interior foundations should be embedded a minimum of 2.5 feet below the finished floor elevation in order to develop adequate bearing

capacity. All foundations, however, must bear on suitable bearing grades in accordance with the recommendations above.

Due to the influence of the softer clay soils below a depth of about 8 to 12 feet with regard to settlement, foundations should not be designed to bear at grades lower than 6 feet below the current site grades, without further evaluation by Empire. Empire should also further evaluate the potential settlement of any column foundations greater than 7 feet in width.

It is estimated that spread foundations sized and properly constructed in accordance with the above recommendations will undergo total settlement of less than ¾-inch.

4.30 FLOOR SLABS

The floors for the proposed Jaffarya Center building can be constructed as slab-on-grade over the existing indigenous soil subgrades following removal of the topsoil and organic soil and proper subgrade preparation as outlined in Section 4.60.3 below. A minimum of 6-inches of Subbase Stone (Structural Fill), as described in Appendix B, is recommended beneath the floor slabs. In addition, a suitable stabilization/separation geotextile, such as Mirafi 500X, should be placed over the existing soil subgrades prior to placement of the Subbase Stone layer.

We note that the above subbase stone thickness is not designed for carrying construction vehicle loads. Therefore, it may be desirable for the Contractor to temporarily increase the Subbase Stone thickness within the building pad area to provide a suitable working surface to stage the construction, carry construction vehicle loads and protect the underlying subgrades. This will be particularly important if construction proceeds during seasonally wet periods. The additional subbase stone material could then be removed in preparation for the actual floor construction and re-used as foundation backfill, pavement subbase or as otherwise determined appropriate.

The floor slabs may be designed as slab-on-grade using a modulus of subgrade reaction of 150 pounds per cubic inch (pci) at the top of the subbase layer. It is recommended that the slab-on-grade be constructed such that it is not structurally connected to, or resting directly on, perimeter walls or column footings in order to limit differential settlement effects. A moisture barrier does not appear to be necessary where the floor slabs are constructed above the final site grades, unless otherwise recommended by the flooring manufacturer.

4.40 SEISMIC DESIGN CONSIDERATIONS

The subsurface conditions encountered at the site consist generally of about 42 feet of hard to soft overburden soil overlying apparent bedrock. Accordingly, it is our opinion that the upper 100 feet of the proposed building site can be classified as Seismic Site Class "D" in accordance with Table 1615.1.1 of the Building Code of New York State.

The spectral accelerations in the project site area for Site Class "B" were obtained by Empire using a public domain computer program developed by the ICBO, in conjunction with the United States Geological Survey (USGS). These accelerations are based on NEHRP mapping, as published in the Building Code of NYS, dated 2002, and were obtained by using the Zip Code 14051 for the East Amherst, New York area.

The spectral response acceleration in the East Amherst, New York area (Zip Code 14051) for Site Class "B" are approximately 0.326g for the short period (0.2 second) response (S_s) and 0.072g for the 1 second period response (S_1). For design purposes, these spectral response accelerations were then adjusted for the Seismic Site Class "D" classifications as follows:

Adjusted Spectral Response Acceleration for Site Class "D":

- Short Period Response (S_{MS}) - 0.502g
- 1 Second Period Response (S_{M1}) - 0.173g

The corresponding five percent damped design spectral response accelerations (S_{DS} and S_{D1}) are as follows:

- S_{DS} - 0.335g
- S_{D1} - 0.115g

4.50 PAVEMENT DESIGN

Pavement design recommendations are provided for a Commercial Duty Asphalt Concrete Pavement, which will be subject to primarily automobile traffic, and occasional delivery trucks. The pavement section recommended is based on the assumption that the subgrades will be prepared as discussed in Section 4.60.3 below. A stabilization/separation geotextile is recommended beneath the subbase course of the pavement section.

Commercial Duty Asphalt Concrete Pavement:

- 1.5 inches - Top Course
- 2.5 inches - Binder Course
- 12 to 15 inches - Subbase Course*
- Geotextile

*It is recommended the subbase course thickness be increased to 15 inches in the entrance and driveway areas, which will be subject to more frequent and heavier loads. Also it may be necessary to increase the subbase thickness in some areas to improve subgrade conditions and to promote drainage to underdrains, etc, as discussed below.

Materials for the above pavement structure components should consist of the following:

A. Asphalt Concrete Top Course - NYSDOT Standard Specifications, Item No. 403.198902 M - Hot Mix Asphalt, Type 7 Top Course.

B. Asphalt Concrete Binder Course - NYSDOT Standard Specifications, Item No. 403.138902 M - Hot Mix Asphalt, Type 3 Binder Course.

C. Subbase Course – Should comply with NYSDOT Standard Specifications, Item No. 304.14 M - Type 4 Subbase, with the condition that if a gravel and sand product is used (vs. a crusher run stone), the gravel should be a crushed gravel material.

D. Geotextile - Woven polypropylene stabilization/separation geotextile (i.e., Mirafi 500X or approved suitable equivalent).

Accumulation of water on pavement subgrades should be minimized by grading the subgrade to a slope of at least 2 percent. Under-drains or adjacent drainage swales are recommended to drain pavement subgrades and the subbase layer to help limit the potential for frost action and improve pavement life.

4.60 SITE PREPARATION AND CONSTRUCTION

4.60.1 Construction Dewatering

Based on the conditions observed in the test borings, it appears that shallow excavations should not encounter general groundwater conditions. Some localized perched or trapped groundwater seepage, however, could be encountered at various locations, depths and time, depending on precipitation and seasonal conditions

Construction dewatering will be required for surface water control and for excavations, which could encounter some localized perched or trapped groundwater conditions.

Surface water should be diverted away from open excavations and prevented from accumulating on exposed subgrades. Exposed soil subgrades will be susceptible to strength degradation in the presence of excess moisture.

Dewatering should be implemented in conjunction with excavation work such that the work proceeds in the dry. Groundwater conditions should be maintained below the proposed excavation bottom. It is anticipated that diversion berms, proper site grading, cut-off trenches, and sump and pump methods of dewatering will be sufficient to control surface water and perched groundwater conditions. Surface water and groundwater dewatering plans should include implementation of measures to control erosion, sedimentation and the migration of soil fines.

4.60.2 Excavation and Foundation Construction

Excavation to the proposed bearing grades for foundation construction should be performed using a method, which reduces disturbance to the bearing grade soils, such as a backhoe equipped with a smooth blade bucket. Any existing fill or otherwise deleterious soil material, beneath proposed foundation bearing grades, should be removed. The indigenous soil bearing grades should be observed and evaluated by a representative of Empire, prior to placement of the foundation and/or any engineered fill materials. Placement and compaction of Structural Fill beneath foundations should also be observed and tested by a representative of Empire.

All soil bearing grades for foundation construction should be protected from precipitation and surface water. The indigenous soils will be sensitive to disturbance and strength degradation when in the presence of excess moisture. If construction of the foundations proceeds during seasonal wet periods and/or the foundations will not be constructed on the same day of the excavation, it may be desirable to place a 2 to 3-inch thick lean concrete mud mat in the excavation bottom to help protect the exposed subgrades and provide a suitable working surface for the foundation construction.

Water should not be allowed to accumulate on the soil bearing grades and the bearing grades should not be allowed to freeze, either prior to or after construction of foundations. If bearing grades are not protected and degrade, they must be undercut/removed accordingly.

Foundation excavations should be backfilled as soon as possible and prior to construction of the superstructure. It is recommended that foundation excavations, within slab on grade areas and adjacent pavement areas be backfilled with a Structural Fill or Suitable Fill, as recommended in Appendix B.

4.60.3 Subgrade Preparation for Slab-on-Grade and Pavement Construction

The site preparation work should be performed during dry periods to minimize potential degradation of the subgrade soils and undercuts which may be required to establish a stable base for construction. It should be understood that the existing subgrade soils are sensitive and can degrade and lose strength when they are wet and disturbed by construction equipment traffic.

Accordingly, efforts should be made to maintain the subgrades in a dry and stable condition at all times, and minimize construction traffic directly over these soils. These efforts should include installation of temporary drainage swales or berms to divert surface runoff away from the construction areas, sloping of the subgrade and "sealing" of the surface, at the end of each day or when rain is anticipated, with a smooth drum roller to promote runoff, and restricting construction equipment traffic from traveling directly over the subgrade surfaces, especially when they are wet.

Existing vegetation, tree stumps, topsoil, organic soils, and any other deleterious materials within the proposed slab-on-grade and pavement areas should be removed. Following stripping of the surface materials and any required excavation to the proposed subgrade; the exposed subgrades should be proof-rolled. The proof-rolling should be performed, prior to any fill placement, using a smooth drum roller weighing at least 7 tons. The roller should be operated in the static mode and complete at least two (2) passes over the exposed subgrades.

The subgrade proof-rolling should be done under the guidance of, and observed by, a representative of Empire. Accordingly, it may be necessary to waive the proof-rolling requirement if wet subgrades are present. This should be determined by Empire. Any undercuts, which may be required as the result of the proof-rolling, should be performed based on guidance and evaluation of the conditions by Empire. Any undercuts should be backfilled with a suitable material as recommended by Empire.

During construction, the contractor should take precautions to limit construction traffic over the subgrades for slab-on-grade and pavement construction. Any subgrades, which become damaged, rutted or unstable should be undercut and repaired as necessary prior to placement of the overlying fill courses.

Any subgrade fill placement, necessary to raise the site grades, may proceed following preparation and acceptance of the existing subgrades.

Suitable Granular Fill, as described in Appendix B, can be used to raise the site grades, beneath the Subbase Stone course for the slab-on-grade and pavement construction. Placement of subgrade fill (Suitable Granular Fill), to raise site grades, should be observed and tested by a representative of Empire. It is recommended that utility trenches located within slab on grade and pavement areas be backfilled with controlled Structural Fill.

4.60.4 Pavement Construction

Placement of the pavement subbase stone can proceed, following proper subgrade preparation, proof-rolling and subgrade filling as described in Section 4.60.3. Installation of adjacent geotextile panels should have minimum overlap of 12 to 18 inches. The subbase stone should be placed and compacted in accordance with the recommendations presented in Appendix B for Structural Fill. Construction of the asphaltic concrete courses (i.e., binder and top) should be performed in accordance with NYSDOT Standard Specification Section 400. In addition, placement of asphalt concrete courses should not be permitted on wet surfaces or when the subgrade surface is less than 40° F.

5.00 CONCLUDING REMARKS

This report was prepared to assist in planning the design and construction of the proposed Jaffarya Center of Niagara Frontier planned at 10300 Transit Road in the Town of Amherst, New York. The report has been prepared for the exclusive use of Jaffarya Center of Niagara Frontier, Picone Construction Corporation, and other members of the design team, for specific application to this site and this project only.

The recommendations were prepared based on Empire Geo-Services, Inc.'s understanding of the proposed project, as described herein, and through the application of generally accepted soils and foundation engineering practices. No warranties, expressed or implied are made by the conclusions, opinions, recommendations or services provided.

Empire Geo-Services, Inc. should be informed of any changes to the planned construction so that it may be determined if any changes to the recommendations presented in this report are necessary. Empire Geo-Services, Inc. should also

review final plans and specifications to verify that the recommendations were properly interpreted and implemented.

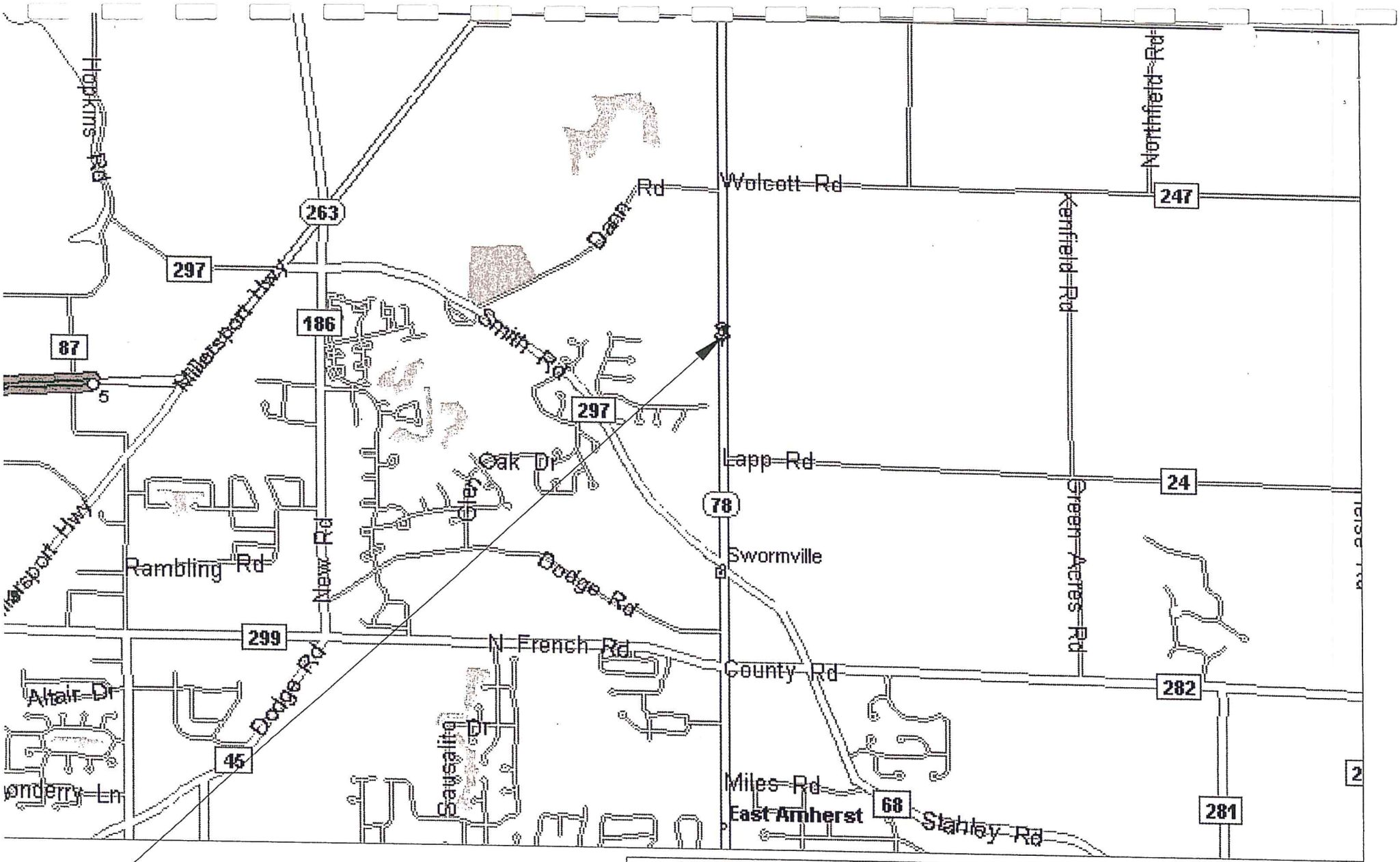
Important information regarding the use and interpretation of this report is presented in Appendix C.

Respectfully Submitted:

EMPIRE GEO-SERVICES, INC.

John J. Danzer, P.E.
Senior Geotechnical Engineer

FIGURES



NOTE:

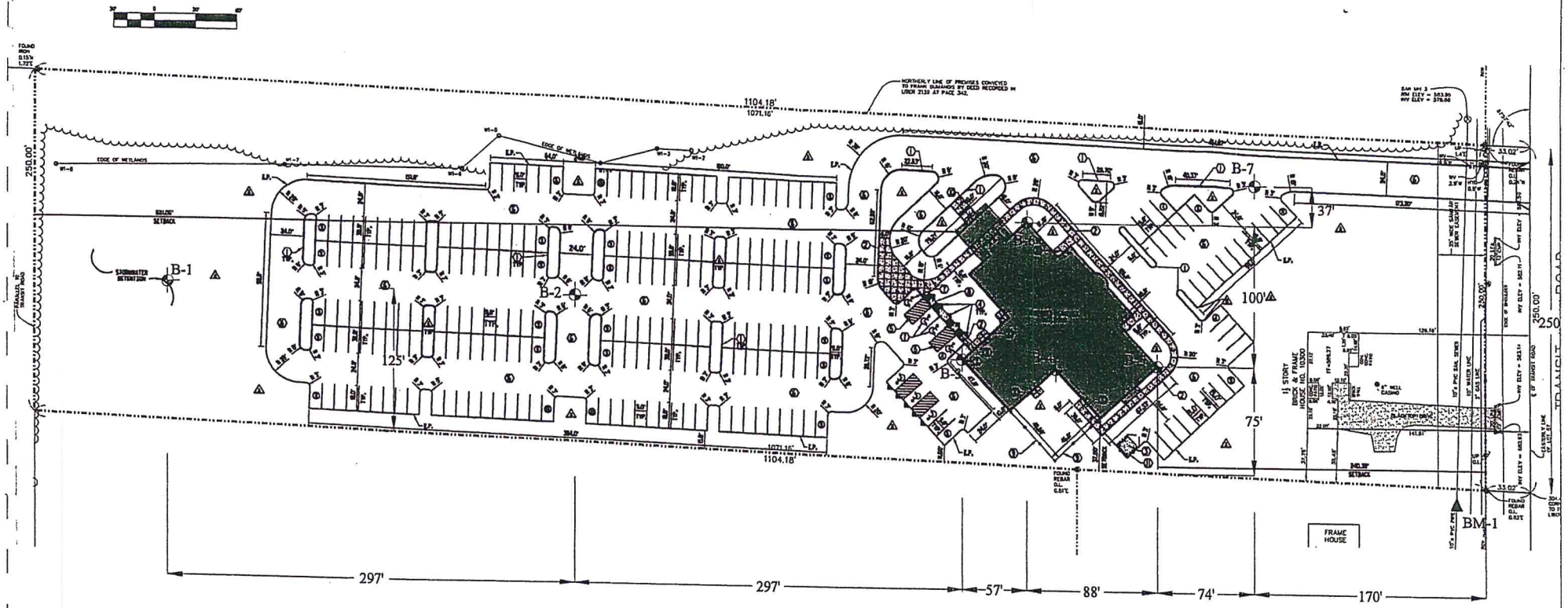
BASE MAP DEVELOPED FROM MICROSOFT STREETS AND TRIPS

EMPIREGEO SERVICES INC
a subsidiary of SJB Services, Inc.

PROPOSED JAFFARYA CENTER
OF NIAGARA FRONTIER
10300 TRANSIT ROAD
AMHERST, NEW YORK

SITE LOCATION PLAN

DR BY: MZS	SCALE: NTS	PROJ NO.: BE-07-199
CHKD BY: JJD	DATE: 09/10/07	FIGURE NO: 1



LEGEND:

B-1 ⊕ INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORINGS

BM-1 ▲ BENCHMARK: RIM OF EXISTING SANITARY SEWER MAHOLE LOCATED AT SOUTHEAST CORNER OF SITE. ELEVATION 585.06 FEET BASED ON SITE PLAN C1 PREPARED BY C&S ENGINEERS, INC.

N

EMPIREGEO SERVICES INC
a subsidiary of SJB Services, Inc.

PROPOSED JAFFARYA CENTER
OF NIAGARA FRONTIER
10300 TRANSIT ROAD
AMHERST, NEW YORK

SUBSURFACE EXPLORATION PLAN	DR BY: MZS	SCALE: AS SHOWN	PROJ NO.: BB-07-199
	CK BY: JJD	DATE: 09/10/07	FIGURE NO.: 2

APPENDIX A

SUBSURFACE EXPLORATION LOGS

DATE

STARTED _____

FINISHED _____

SHEET ____ OF ____

SJB SERVICES, INC.
SUBSURFACE LOG

PROJ. No. _____

HOLE No. _____

SURF. ELEV. _____

G.W. DEPTH _____

PROJECT _____ LOCATION _____

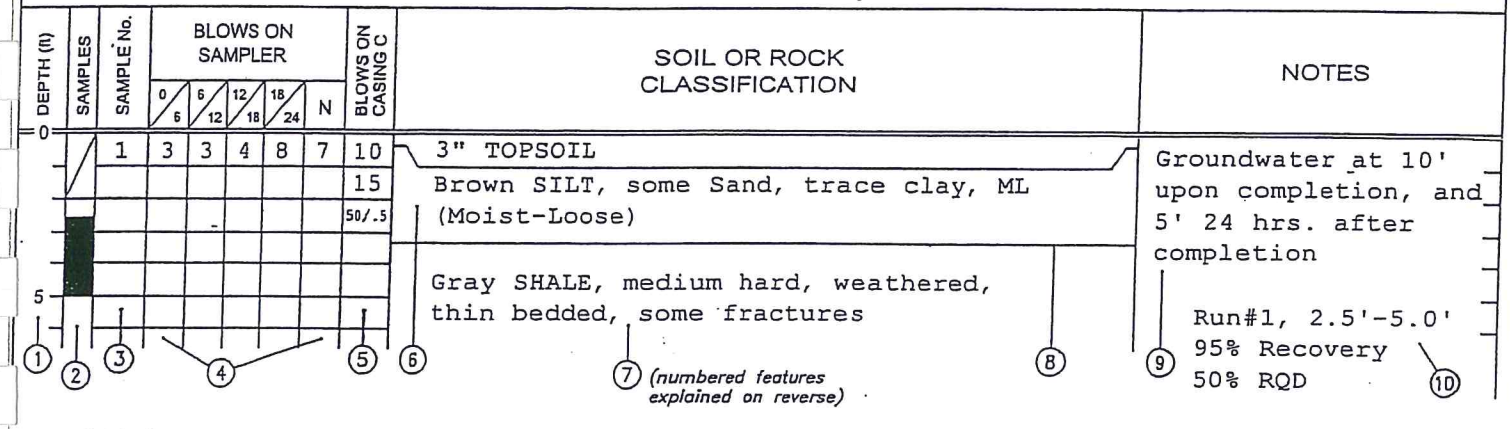


TABLE I

- Split Spoon Sample
- Shelby Tube Sample
- Geoprobe Macro-Core
- Auger or Test Pit Sample
- Rock Core

TABLE II

Identification of soil type is made on basis of an estimate of particle sizes, and in the case of fine grained soils also on basis of plasticity.

Soil Type	Soil Particle Size	
Boulder	>12"	Coarse Grained (Granular)
Cobble	3" - 12"	
Gravel - Coarse	3" - 3/4"	
- Fine	3/4" - #4	
Sand - Coarse	#4 - #10	
- Medium	#10 - #40	
- Fine	#40 - #200	
Silt - Non Plastic (Granular) Clay - Plastic (Cohesive)	<#200	Fine Grained

TABLE III

The following terms are used in classifying soils consisting of mixtures of two or more soil types. The estimate is based on weight of total sample.

Term	Percent of Total Sample
"and"	35 - 50
"some"	20 - 35
"little"	10 - 20
"trace"	less than 10

(When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.)

TABLE IV

The relative compactness or consistency is described in accordance with the following terms:

Granular Soils		Cohesive Soils	
Term	Blows per Foot, N	Term	Blows per Foot, N
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Firm	10 - 30	Medium	4 - 8
Compact	30 - 50	Stiff	8 - 15
Very Compact	>50	Very Stiff	15 - 30
		Hard	>30

(Large particles in the soils will often significantly influence the blows per foot recorded during the penetration test)

TABLE V

Varved	Horizontal uniform layers or seams of soil(s).
Layer	Soil deposit more than 6" thick.
Seam	Soil deposit less than 6" thick.
Parting	Soil deposit less than 1/8" thick.
Laminated	Irregular, horizontal and angled seams and partings of soil(s).

TABLE VI

Rock Classification Term		Meaning
Hardness	- Soft	Scratched by fingernail
	- Medium Hard	Scratched easily by penknife
	- Hard	Scratched with difficulty by penknife
	- Very Hard	Cannot be scratched by penknife
Weathering	- Very Weathered	Judged from the relative amounts of
	- Weathered	disintegration, iron staining, core

Rock Classification Term			
Bedding	- Laminated	(<1")	Natural breaks in Rock Layers
	- Thin Bedded	(1" - 4")	
	- Bedded	(4" - 12")	
	- Thick Bedded	(12" - 36")	
	- Massive	(>36")	

(Fracturing refers to natural breaks in the rock oriented at some

Detention Pond 10'

DATE
START 9/5/2007
FINISH 9/5/2007
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-1
SURF. ELEV 581.5'
G.W. DEPTH See Notes

PROJECT: JAFFARYA CENTER OF NIAGARA FRONTIER LOCATION: TRANSIT ROAD
PROJ. NO.: BE-07-199 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	4	5			5" TOPSOIL	
		6	10		11	Red- Brown Silty CLAY, tr. sand, tr. gravel	
	2	6	12			(moist, stiff, CL)	
		10	12		22	(v. stiff)	
5	3	12	17				
		16	17		33	(hard)	
	4	16	15				
		20	19		35		
	5	12	14				
10		16	18		30		
						Boring Complete at 10.0'	No Free Standing Water Reading Obtained at Boring Completion
15							
20							
25							
30							
35							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: R. BROWN

DRILL RIG TYPE : CME- 85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

Rock Parking Lot 10'

DATE
START 9/5/2007
FINISH 9/5/2007
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-2
SURF. ELEV 582.3'
G.W. DEPTH See Notes

PROJECT: JAFFARYA CENTER OF NIAGARA FRONTIER LOCATION: TRANSIT ROAD AMHERST, NEW YORK
PROJ. NO.: BE-07-199

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	3	4			5" TOPSOIL	
		6	6		10	Red- Brown Silty CLAY, tr. sand, tr. gravel	
	2	4	6			(moist, stiff, CL)	
		10	12		16	(v. stiff)	
5	3	18	15				
		14	20		29		
	4	11	13				
		15	12		28		
	5	14	15				
10		12	11		27		
						Boring Complete at 10.0'	No Free Standing Water Reading Obtained at Boring Completion
15							
20							
25							
30							
35							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: R. BROWN

DRILL RIG TYPE : CME- 85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

Building Corner 25'

DATE
START 9/5/2007
FINISH 9/5/2007
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-3
SURF. ELEV 584.7'
G.W. DEPTH See Notes

PROJECT: JAFFARYA CENTER OF NIAGARA FRONTIER LOCATION: TRANSIT ROAD
PROJ. NO.: BE-07-199 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	5	7			4" TOPSOIL	
		8	9		15	Yellow- Brown Silty Fine SAND, some Clay, tr. gravel	
	2	2	5			(dry, firm, SM)	
		8	4		13	Red- Brown Silty CLAY, tr. sand, tr. gravel	
5	3	5	7			(moist, stiff, CL)	
		11	12		18	(v. stiff)	
	4	10	12				
		14	19		26		No Recovery Sample #5
	5	5	7				
10		6	7		13		
	6	3	4			(medium)	
		4	4		8		
15							
	7	4	3				
		2	3		5		
20							
	8	1	2				
		2	2		4		
	9	2	3				
25		4	4		7		
						Boring Complete at 25.0'	No Free Standing Water Reading Obtained at Boring Completion
30							
35							

Crappy Soil?

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: R. BROWN DRILL RIG TYPE : CME- 85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

Building Corner * to Bedrock

DATE
START 9/4/2007
FINISH 9/4/2007
SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-4
SURF. ELEV 585.1'
G.W. DEPTH See Notes

PROJECT: JAFFARYA CENTER OF NIAGARA FRONTIER LOCATION: TRANSIT ROAD AMHERST, NEW YORK
PROJ. NO.: BE-07-199

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	6	7			4" TOPSOIL	
		13	13		20	Yellow- Brown Silty CLAY, tr. sand, tr. gravel	
	2	12	16			(dry, v. stiff, CL- ML)	
		20	16		36	(moist, hard)	
5	3	6	11			Red- Brown Silty CLAY, tr. sand, tr. gravel	
		12	14		23	(moist, v. stiff, CL)	
	4	14	20				
		24	18		44	(hard)	
	5	12	3				
10		4	4		7	(medium)	
	6	3	4				
		3	3		7		
15							
	7	2	2				
		2	2		4		
20							
	8	2	1				
		1	2		2		
25							
	9	2	2				
		3	2		5		
30							
	10	4	5			Red- Brown Silty CLAY, some f-c Sand, some fine	
		18	24		23	Gravel (Till) (moist, v. stiff, CL- ML)	
35							
	11	19	23			(hard)	
		45	50		68		
J							

CRAPPY Soil ?

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: R. BROWN

DRILL RIG TYPE: CME- 85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 9/4/2007
FINISH 9/4/2007
SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-4
SURF. ELEV 585.1'
G.W. DEPTH See Notes

PROJECT: JAFFARYA CENTER OF NIAGARA FRONTIER LOCATION: TRANSIT ROAD AMHERST, NEW YORK
PROJ. NO.: BE-07-199

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	12	14	30				
		45	50/0.4		REF	Sample Spoon and Auger Refusal at 41.9'	No Free Standing Water Reading Obtained at Boring Completion
45							REF= Sample Spoon Refusal
50							
55							
60							
65							
70							
75							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: R. BROWN

DRILL RIG TYPE: CME- 85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

BLDG CORNER 25'

DATE
START 9/5/2007
FINISH 9/5/2007
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-5
SURF. ELEV 583.4'
G.W. DEPTH See Notes

PROJECT: JAFFARYA CENTER OF NIAGARA FRONTIER LOCATION: TRANSIT ROAD AMHERST, NEW YORK
PROJ. NO.: BE-07-199

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	4	6			7" TOPSOIL	
		4	7		10	Yellow- Brown Silty CLAY, tr. sand, tr. gravel	
	2	6	7			(dry, stiff, CL- ML)	
		12	14		19	Red- Brown Silty CLAY, tr. sand, tr. gravel	
5	3	7	8			(moist, v. stiff, CL)	
		12	12		20		
	4	10	15				
		15	17		30		
	5	3	9				
10		8	11		17		
	6	7	8				
		8	9		16		
15							
	7	2	2				
		2	2		4		
						GRAPPY Soil	
20							
	8	2	1				
		2	3		3		
	9	2	3				
25		3	3		6		
						Boring Complete at 25.0'	No Free Standing Water Reading Obtained at Boring Completion
30							
35							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: R. BROWN

DRILL RIG TYPE : CME- 85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

BLDG CORNER 25'

DATE
START 9/5/2007
FINISH 9/5/2007
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-6
SURF. ELEV 584.4'
G.W. DEPTH See Notes

PROJECT: JAFFARYA CENTER OF NIAGARA FRONTIER LOCATION: TRANSIT ROAD AMHERST, NEW YORK
PROJ. NO.: BE-07-199

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	4	6			9" TOPSOIL	
		9	12		15	Yellow- Brown Silty CLAY, some fine Sand (dry, stiff, CL- ML)	
	2	12	9				
		8	12		17		
5	3	3	7			Red- Brown Silty CLAY, tr. sand, tr. gravel	
		9	14		16	(moist, v. stiff, CL)	
	4	6	13				
		14	15		27		No Recovery Sample #5
	5	5	7				
10		6	6		13	(stiff)	
	6	3	4				
		4	4		8	(medium)	
15							
	7	1	2				
		3	2		5		
20							
	8	1	2				
		2	2		4		
	9	2	2				
25		3	2		5		
						Boring Complete at 25.0'	No Free Standing Water Reading Obtained at Boring Completion
30							
35							

CRAPPY Soil

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: R. BROWN

DRILL RIG TYPE : CME- 85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

FRONT Drive 10'

DATE
START 9/5/2007
FINISH 9/5/2007
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-7
SURF. ELEV 584.7'
G.W. DEPTH See Notes

PROJECT: JAFFARYA CENTER OF NIAGARA FRONTIER LOCATION: TRANSIT ROAD
PROJ. NO.: BE-07-199 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	5	5			8" TOPSOIL	
		6	7		11	Red- Brown Silty CLAY, tr. sand, tr. gravel	
	2	8	10			(moist, stiff, CL)	
		11	12		21	(v. stiff)	
5	3	9	12				
		16	16		28		
	4	13	16				
		15	16		31		
	5	10	9				
10		10	10		19		
						Boring Complete at 10.0'	No Free Standing Water Reading Obtained at Boring Completion
15							
20							
25							
30							
35							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: R. BROWN

DRILL RIG TYPE : CME- 85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

APPENDIX B

FILL MATERIAL AND EARTHWORK RECOMMENDATIONS

APPENDIX B

FILL MATERIAL AND EARTHWORK RECOMMENDATIONS

I. Material Recommendations

A. Structural Fill

Structural Fill should consist of a crusher run stone, free of clay, organics and friable or deleterious particles. As a minimum, the crusher stone should meet the requirements of New York State Department of Transportation, Standard Specifications, Item 304.12 M – Type 2 Subbase, with the following gradation requirements.

Sieve Size Distribution	Percent Finer by Weight
2 inch	100
¼ inch	25-60
No. 40	5-40
No. 200	0-10

B. Subbase Stone

The subbase stone course placed as the aggregate course beneath the slab-on-grade and pavement construction should conform to the same material requirements as Structural Fill, as stated above.

C. Suitable Granular Fill

Suitable soil material, classified as GW, GP, GM, SW, SP and SM soils using the Unified Soil Classification System (ASTM D-2487) and having no more than 85-percent by weight material passing the No. 4 sieve, no more than 20-percent by weight material passing the No. 200 sieve and which is generally free of particles greater than 4 inches, will be acceptable as Suitable Granular Fill. It should also be free of topsoil, asphalt, concrete rubble, wood, debris, clay and other deleterious materials.

Suitable Granular Fill can be used as foundation backfill and as subgrade fill to raise site grades beneath slab-on-grade and pavement construction. Material meeting the requirements of New York State Department of Transportation, Standard Specifications, Item 203.07M – Select Granular Fill, or Item 203.20 Select Granular Subgrade is acceptable for use as Suitable Granular Fill.

II. Placement and Compaction Requirements

All controlled fill placed beneath foundations, slab-on-grade and pavement construction and beneath utilities should be compacted to a minimum of 95 percent of the maximum dry density as measured by the modified Proctor test (ASTM D1557). Fill placed in non-loaded grass areas can be compacted to a minimum of 90 percent of the maximum dry density (ASTM D1557).

Placement of fill should not exceed a maximum loose lift thickness of 6 to 9 inches with the exception of subbase courses beneath slab-on-grade and pavement construction, which can be placed in a single lift not exceeding 15 inches. The loose lift thickness should be reduced in conjunction with the compaction equipment used so that the required density is attained.

Fill should have a moisture content within two percent of the optimum moisture content prior to compaction. Subgrades should be properly drained and protected from moisture and frost. Placement of fill on frozen subgrades is not acceptable. It is recommended that all fill placement and compaction be monitored and tested by a representative of Empire Geo-Services, Inc.

III. Quality Assurance Testing

The following minimum laboratory and field quality assurance testing frequencies are recommended to confirm fill material quality and post placement and compaction conditions. These minimum frequencies are based on generally uniform material properties and placement conditions. Should material properties vary or conditions at the time of placement vary (i.e. moisture content, placement and compaction, procedures or equipment, etc.) then additional testing is recommended. Additional testing, which may be necessary, should be determined by qualified geotechnical personnel, based on evaluation of the actual fill material and construction conditions.

A. Laboratory Testing of Material Properties

- Moisture content (ASTM D-2216) - 1 test per 2,500 cubic yards or no less than 2 tests per each material type.
- Grain Size Analysis (ASTM D-422) - 1 test per 2,500 cubic yards or no less than 2 tests per each material type.
- Liquid and Plastic Limits (ASTM D-4318) 1 test per 2,500 cubic yards or no less than 2 tests per each material type. Liquid and Plastic Limit testing is necessary only if appropriate, based on material composition (i.e. clayey or silty soils).

- Modified Proctor Moisture Density Relationship (ASTM D-1557) 1 test per 4,000 cubic yards or no less than 1 test per each material type. A maximum/minimum density relationship (ASTM D-4253 and ASTM D-4254) may be an appropriate substitute for ASTM D-1557 depending on material gradation.

B. Field In-Place Moisture/Density Testing (ASTM D-3017 and ASTM D-2922)

- Backfilling along trenches and foundation walls - 1 test per 50 lineal feet per lift.
- Backfilling Isolated Excavations (i.e. column foundations, manholes, etc.) 1 test per lift.
- Filling in open areas for slab-on-grade and pavement construction - 1 test per 2,500 square feet per lift.

APPENDIX C

INFORMATION REGARDING THIS GEOTECHNICAL ENGINEERING REPORT

GEOTECHNICAL REPORT LIMITATIONS

Empire Geo-Services, Inc. (Empire) has endeavored to meet the generally accepted standard of care for the services completed, and in doing so is obliged to advise the geotechnical report user of our report limitations. Empire believes that providing information about the report preparation and limitations is essential to help the user reduce geotechnical-related delays, cost over-runs, and other problems that can develop during the design and construction process. Empire would be pleased to answer any questions regarding the following limitations and use of our report to assist the user in assessing risks and planning for site development and construction.

PROJECT SPECIFIC FACTORS: The conclusions and recommendations provided in our geotechnical report were prepared based on project specific factors described in the report, such as size, loading, and intended use of structures; general configuration of structures, roadways, and parking lots; existing and proposed site grading; and any other pertinent project information. Changes to the project details may alter the factors considered in development of the report conclusions and recommendations. *Accordingly, Empire cannot accept responsibility for problems which may develop if we are not consulted regarding any changes to the project specific factors that were assumed during the report preparation.*

SUBSURFACE CONDITIONS: The site exploration investigated subsurface conditions only at discrete test locations. Empire has used judgement to infer subsurface conditions between the discrete test locations, and on this basis the conclusions and recommendations in our geotechnical report were developed. It should be understood that the overall subsurface conditions inferred by Empire may vary from those revealed during construction, and these variations may impact on the assumptions made in developing the report conclusions and recommendations. *For this reason, Empire should be retained during construction to confirm that conditions are as expected, and to refine our conclusions and recommendations in the event that conditions are encountered that were not disclosed during the site exploration program.*

USE OF GEOTECHNICAL REPORT: Unless indicated otherwise, our geotechnical report has been prepared for the use of our client for specific application to the site and project conditions described in the report. *Without consulting with Empire, our geotechnical report should not be applied by any party to other sites or for any uses other than those originally intended.*

CHANGES IN SITE CONDITIONS: Surface and subsurface conditions are subject to change at a project site subsequent to preparation of the geotechnical report. Changes may include, but are not limited to, floods, earthquakes, groundwater fluctuations, and construction activities at the site and/or adjoining properties. *Empire should be informed of any such changes to determine if additional investigative and/or evaluation work is warranted.*

MISINTERPRETATION OF REPORT: The conclusions and recommendations contained in our geotechnical report are subject to misinterpretation. *To limit this possibility, Empire should review project plans and specifications relative to geotechnical issues to confirm that the recommendations contained in our report have been properly interpreted and applied.*

Subsurface exploration logs and other report data are also subject to misinterpretation by others if they are separated from the geotechnical report. This often occurs when copies of logs are given to contractors during the bid preparation process. *To minimize the potential for misinterpretation, the subsurface logs should not be separated from our geotechnical report and the use of excerpted or incomplete portions of the report should be avoided.*

OTHER LIMITATIONS: Geotechnical engineering is less exact than other design disciplines, as it is based partly on judgement and opinion. For this reason, our geotechnical report may include clauses that identify the limits of Empire's responsibility, or that may describe other limitations specific to a project. These clauses are intended to help all parties recognize their responsibilities and to assist them in assessing risks and decision making. Empire would be pleased to discuss these clauses and to answer any questions that may arise.

SECTION 01010 - SUMMARY OF WORK

1.0 GENERAL

This project consists of a kitchen addition to the existing mosque.

1.1 CONTRACTS

A. This is a Construction project with combined contracts as follows:
   1. General Construction Divisions
   2. Sitework
   3. Plumbing
   4. HVAC
   5. Electrical
   6. Fire Protection
   7. The Construction Manager will be responsible for the construction of the entire project.
   8. The Construction Manager as prime Contractor is responsible for coordination between himself and all his Subcontractors.
   9. All Contractors, prime or sub are directed to cooperate and coordinate their work with each other, and the lack of such will not be an acceptable excuse for delays.
   10. Any conflicts between the Construction Manager and/or subcontractors which will cause delay in construction, must be brought to the attention of the Architect, in writing, within twenty-four (24) hours.

B. All contracts shall include the General Conditions, and Supplementary Conditions, and General Requirements.

C. Extent of Operation - The Contractors shall provide all items, articles, materials, operation or methods listed, indicated, mentioned, or scheduled on the drawings and/or in the specifications, including all labor, materials, equipment and incidentals, necessary and required for their completion and installation in the project.

1.2 EXAMINATION OF SITE, DOCUMENTS, ETC.

Each bidder shall visit the site of the proposed work and fully acquaint himself with the conditions as they exist so that he may fully understand the facilities, difficulties, and restrictions attending the execution of the work under the Contract. Bidders shall also thoroughly examine and be familiar with the drawings and the specifications. The failure or omission of any Bidder to receive or examine any form, instrument, or document, or to visit the site or acquaint himself with conditions there existing shall in no way relieve the Bidder from any obligation with respect to his Bid.

1.3 PERMITS

The prime Contractors are responsible for obtaining and paying for all necessary permits as required by laws and ordinances, for work required to construct the project.

1.4 REFERENCES

References to known standard specifications shall mean and intend latest edition of such specifications adopted and published at date of invitation to submit proposals.

Reference to technical society, or organization or bodies is made in the specifications in accordance with the following abbreviations:

AIA	American Institute of Architects
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ASTM	American Society for Testing Materials
AWSC	American Welding Society Code
FS	Federal Specification
NBFU	National Board of Fire Underwriters
NBS	National Bureau of Standards
UL	Underwriters' Laboratories, Inc.
ASA	American Standard Association
SJI	Steel Joist Institute
AASHO	American Association of State Highway Official
CSI	Construction Specifications Institute
NYS	New York State Public Works Specification 1-2-62

1.5 CONSTRUCTION ASSOCIATION, CODES AND SPECIFICATIONS (option to substitute or add to references)

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturer's Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National standard Institute
APA	American Plywood Association
ASHRAE	American Society of Heating, Refrigeration and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWI	American Woodwork Institute
AWPI	American Wood Preservers Institute
AWS	American Welding Society
BIA	Brick Institute of America

CRCI	Concrete Reinforcing Steel Institute
CS	Commercial Standards
FGMA	Flat Glass Marketing Association
FM	Factory Mutual System
IEEE	Institute of Electrical and Electronic Engineers
NBS	National Bureau of Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NYSDOT	New York State Department of Transportation
NYSDPW	New York State Department of Public Works
PCI	Precast Concrete Institute
PEI	Porcelain Enamel Institute
SAMA	Scientific Apparatus Makers Association
SDI	Steel Deck Institute
SMACNA	Sheet Metal and Air-Conditioning Contractor's National Association
SSPC	Structural Steel Painting Council
UL	Underwriter's Laboratories

1.6 ITEMS PROVIDED BY CONTRACTORS AND CONSTRUCTION MANAGER

The General Contractor shall provide and maintain all temporary facilities, such a s water, electrical services, telephone and toilets. The General Contractor is also to provide a temporary field office.

A. Toilet facilities shall be provided by the Construction Manager.

B. Temporary field office shall be provided and maintained by the Construction Manager.

C. Temporary water service shall be provided by plumbing subcontractor.

D. Temporary Electrical Service shall be provided by the electrical Subcontractor.

E. Temporary heat shall be provided by the HVAC subcontractors.

1.7 STORAGE AND PARKING AREAS

A. The Construction Manager shall provide and maintain a temporary area at the site suitable for vehicular parking and for the stockpiling and storage of equipment and materials. These facilities shall be for the use of personnel for all trades of the project.

B. The Construction Manager shall keep such area free of debris, obstructions, standing water and provide necessary barricades.

1.8 GUARANTEES

A. Whenever within one year of beneficial occupancy any of the prime Contractors is notified in writing by either the Architect or the Owner, that any item of equipment, material and/or workmanship has proved defective or is not in any way meeting the specification requirements, he shall immediately replace, repair or otherwise correct the defect or deficiency without cost to the Owner.

B. The Contractor's liability for defects in materials and labor shall not be limited to less than the legal limit of liability in accordance with the laws of the State of New York.

C. The Contractor shall submit all guarantees, warranties, bonds and operating manuals to the Architect prior to receipt of final payment, for all work, materials and equipment provided under their contract.

1.9 AVAILABILITY OF MATERIALS

A. The Contractor shall review the availability of the materials specified and/or shown on drawings and must notify the Architect of any materials that will cause any delays in the construction of the project.

B. The delivery times, plus a list of alternate materials proposed, including additions or deductions in cost must be submitted in writing to the Architect for his review within two weeks after the award of the contract.

C. All materials must be provided as specified unless approved equal by the Architect.

1.10 PROTECTION OF MATERIALS

The prime Contractor shall bear the sole responsibility for the care and protection of his respective materials and work installed in the building, and materials stored on the site for which payment has been made, and for the restoration of damaged or stolen materials, at no additional cost to the Owner.

1.11 LISTS AND SCHEDULES

The prime Contractors shall furnish a list of his subcontractors and a schedule of construction, in accordance with the General and Supplementary General Conditions of these bidding documents, if required by the Construction Manager and/or Architect.

1.12 REQUIRED INSURANCE

A. Before commencing the work, each prime contractor shall furnish to the Owner a certificate or

certificates of insurance in form satisfactory to the Owner, showing that he has complied with the general conditions. Owner shall be named as an additional insured on all policies by which carrier agrees to provide owner with at least thirty (30) days notice of any cancellation or change in policy.

B. The kinds and amounts of insurance are as follows:

1. Workmen's Compensation Insurance: a policy covering the obligations of the Contractor in accordance with the provisions of Chapter 41 as amended of the Workmen's Compensation Law, covering all operations under the contract, whether performed by him or by his subcontractors.

2. Liability and Property Damage Insurance limits of not less than:

$1,000,000.00 Each Person
$2,000,000.00 Each Accident
$2,000,000.00 Aggregate

for all damages arising during the policy period, shall be furnished in the following types:

a. Contractor's Liability Insurance: issued to and covering the liability for damage imposed by law upon each subcontractor with respect to all work performed by said subcontractor under the contract.
b. Contractor Protective Liability Insurance: issued to and covering the liability for damages imposed by law upon the Contractor with respect to all work under the contract performed for the Contractor by subcontractors.
c. Protective Liability Insurance: issued to and covering the liability for damages imposed by law upon the Owner.
d. Completed Operations Liability Insurance: issued to and covering the liability for damages imposed by law upon the Contractor between the date of final cessation of work and the date of final acceptance thereof.
e. Automobile Liability Insurance: covering all vehicles owned and hired in the amount of $500,000.00/$1,000,000.00 bodily injury and $1,000,000.00 property damage.
f. All Risk-Builders Risk Insurance provided in the amount equal to the total amount of the Bid.

1.13 NON-ASSIGNABILITY OF CONTRACT

Each Contractor is hereby prohibited from assigning, transferring, conveying, subletting or otherwise disposing of this contract, or of his right, title or interest therein, or his power to execute such contract

to any other person, company, or corporation, without previous consent in writing of the Owner. If the Contractor shall, without previous written consent herein provided for, assign, transfer, convey, sublet, or otherwise dispose of same, or his right, title, or interest therein, or his power to execute such contract to any other person, company or other corporation, the Owner shall revoke and annul said contract, and the Owner shall thereupon be relieved and discharged from any and all liability and obligations, growing out of this contract to the contractor and the person, company or other corporation to whom he shall assign, transfer, convey, sublet or otherwise dispose of same, and the Contractor and his assignees, transferees or sublessees, shall forfeit and lose all money theretofore earned under said contract, except so much as may be required to pay his employees; provided that nothing herein contained shall be construed to hinder, prevent, or affect an assignment by the Contractor for the benefit of his creditors made pursuant to the statutes of the State of New York.

1.14 LAYOUT OF THE WORK

The prime Contractor shall verify all lines, levels and dimensions as shown on the drawings and he shall report any errors or inconsistencies to the Architect before commencing work.

1.15 INQUIRIES

The Owner will not be responsible for any explanations or interpretations of the Construction Documents. All inquiries are to be directed to the office of Silvestri Architects.

1.16 COMPLIANCE WITH FEDERAL, STATE AND MUNICIPAL ORDINANCES

A. Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included therein, and if through omission or otherwise any such provision is not inserted, or it is not correctly inserted, it shall be physically amended to make such insertion.

B. These construction documents, and the joint and several phases of construction hereby contemplated are to be governed, at all time, by applicable provisions of the Federal law(s), including, but not limited to those statutes referred to elsewhere in this contract and the latest amendments thereto.

1.17 RESPONSIBILITY FOR DAMAGE

A. The Contractor shall be responsible for all damages to life and property due to his operations. He shall be responsible for all parts of his work, both temporary and permanent, until the work under this contract is accepted by the Owner.

B. He shall protect, indemnify, save harmless and defend the Owner from suits, actions, damages and costs of every name and description, resulting from the work under this contract, and the Owner may retain sufficient monies from the amount due or to become due the Contractor as may be necessary to satisfy any claim or damages filed against the Owner.

C. He shall be responsible for damages to work of other Contractors which are the result of his operations. Should the Contractor believe that the work shown by the drawings or specification is not calculated when executed to procure safe and substantial results, or if any discrepancy appears, it is his duty to immediately notify the Architect in writing, stop on same and await the written instructions of the Architect?

1.18 DEFECTIVE WORK AND MATERIALS

A. Any material or work found on inspection to be defective or not in strict conformance with requirements of drawings and specifications, or defaced or injured through the acts of fire or elements or any other cause shall be removed immediately from the premises and satisfactory materials or work or both, substituted therefore without delay.

B. If the Contractor does not remove such work or materials condemned by the Architect within the time limit fixed by written notice, the Owner may cause the same to be done and may store all materials at the expense of the Contractor. If the Contractor does not pay the expense of such removal within ten (10) days written notice, sell such materials at auction, or at a private sale and shall account for the net proceeds thereof, after deducting all costs and expenses that should have been borne by the Contractor.

C. No previous inspection or certificates of payment shall be held as an acceptance of defective work or materials, or to relieve the Contractor from the obligations to furnish sound materials and perform satisfactory work in accordance with contract requirements.

1.19 SHOP DRAWINGS

A. The prime Contractors shall provide the Architect with three (3) prints and one (1) Sepia Reproducible of all necessary shop drawings and information as may be required for the execution of the work. The manufacture or fabrication of any material or the performance of any work prior to approval of shop drawings will be entirely at the risk of the Contractor.

B. The Contractor shall submit to the Architect with such promptness as to cause no delay in his work or in that of any other Contractors employed on this work, copies of all shop or setting drawings required for the proper execution of the work herein specified.

C. Each shipment of drawings must be accompanied by a letter of transmittal, giving name of Contractor, list of drawings included, with each drawing marked with the name and location

of project and each series of drawings numbered consecutively.

D. All shop drawings and samples be thoroughly checked by the Contractor for compliance with the Contract Documents before submitting them to the Architect for approval and all shop drawings shall bear the Contractor's stamp of approval certifying that they have so been checked. Any shop drawings submitted without this stamp of approval and certification, and shop drawings which, in the Architect's opinion, are incomplete contain numerous errors or have not been checked or only checked superficially will be returned unchecked by the Architect for resubmission by the Contractor. In checking shop drawings, the Contractor shall verify all dimensions and field conditions and shall check and coordinate the shop drawings of any section or trade with the requirements of all other sections or trades whose work is related thereto, as required for proper and complete installation of the work.

E. Shop drawings shall be submitted in the order and time required for construction. Shop drawings submitted ahead of time required for construction will be held by the Architect for checking in the order as above set forth.

F. Under no condition will any claim for delay in the completion of contracts due to shop drawings being held by the Architect for the necessary and proper time for checking be recognized.

G. If it is found necessary to make changes in shop drawings, two prints will be returned to the Contractor, who, after making correction indicated, shall furnish, without charge, four additional copies. The Contractor shall continue to furnish drawings as above mentioned until all drawings are satisfactory to the Architect, who, however, will not be responsible for their accuracy.

H. If, during the checking and return of checked prints, the Contractor makes any additional changes or corrections on the original shop drawings, he shall call attention to each marking on the prints by a letter written to the Architect.

I. It is understood that the approval (NO EXCEPTION TAKEN) of any shop drawings by the Architect in no way relieves the Contractor from assuming the responsibility for the accuracy of same, nor does it relieve the Contractor from any of the required conditions as set forth in these specifications or accompanying drawings.

J. Shop Drawings without the approved stamp of the Architect will not be permitted on the premises. Actual fabrication of the work will not proceed until these shop drawings have received the approved stamp of the Architect.

K. Shop Drawings shall consist of, but not be limited to, fabrication, erection and setting drawings, schedule drawings, manufacturer's scale drawings, wiring and control diagrams, cuts or entire catalogs, pamphlets, descriptive literature and performance and test data. Prior

to submission of shop drawings on mechanical and electrical work, the Contractor shall submit lists of such equipment as required, for approval. Where practical, drawings shall be submitted in the form of a reproducible print, along with one set of white prints.

L. Reproductions of Contract Documents for use as shop drawings for materials specified and/or shown, WILL NOT be permitted.

1.20 RECORD DRAWINGS

A. As Built Drawings

1. All subcontracts shall have prepared and submit at the completion of the project "As Built" drawings for their work as follows:
   a. One (1) set of reproducibles.
   b. One (1) set of white prints.

   The above will be at the Subcontractors expense.

B. Record Drawings

1. Maintain a white-print set (blue-line or black line) of Contract Drawings and shop drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawing is most capable of showing "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding location on other colors to distinguish between variations in separate categories of work. Mark-up new information which is recognized to be of importance to Owner, but was for some reason not shown on either Contract Drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change-order numbers where applicable. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on cover of each set.

C. Maintenance Manuals

1. Organize maintenance and operating manual information into suitable sets of manageable size, and bind into individual binders properly identified and indexed (thumb-tabbed). Include emergency instructions, spare parts listing, copies of warranties, wiring diagrams, recommended "turn-around" cycles, inspection procedures, shop drawings, product data, and similar applicable information. Bind each manual of each set in a heavy-duty 2", 3-ring vinyl-covered binder, and include

pocket folders for folded sheet information. Mark identification on both front and spine of each binder.

1.21 SUBSTANTIAL COMPLETION AND DATE OF COMPLETION

A. A contract shall be deemed to be "substantially complete" when all work has been satisfactorily completed except for "punch list" items and those of a minor nature which may be, at the present time, beyond the Contractor's control, or delayed in completion with the concurrence of the Owner or Architect.

B. Final certificate will be issued when punch list items of final inspection are complete, with the exception of items that cannot be completed at once through no fault of the Contractor, or when certain pieces of punch list work are held up at Owner's or Architects request. If such items are, in the opinion of the Architect, substantial in nature, an amount sufficient to cover the reasonable cost of their correction as determined by the Architect, may be withheld from payment due under the final certificate until they have been corrected and subsequently approved by the Architect.

1.22 FINAL CERTIFICATE OF OCCUPANCY

A. The Construction Manager, prior to and before turning the building over to the Owner, shall apply for, and obtain a Certificate of Occupancy.

B. All required inspections for Certification of Occupancy by governmental agency shall be the responsibility of the Construction Manager.

1.23 RIGHT OF OCCUPANCY

The Owner shall have the right to take possession of any portion of the project after the Certificate of Substantial Completion and Certificate of Occupancy by the local building officials have been issued.

1.24 CLEAN-UP

A. Periodic Cleaning - The Subcontractor shall at all times, during construction, keep the site free from the accumulation of waste materials and rubbish, resulting from their respective work. Removal of waste materials and rubbish must be done at least once a week.

B. Final Clean-Up

1. Upon completion of the project the Subcontractors shall clean the interior and exterior of the building, so all areas are ready for occupancy by the Owner without need for further cleaning.

2. Provide final cleaning of the work, at time indicated, consisting of cleaning each surface or unit of work to normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturer's instruction for

cleaning operations. The following are examples, but not by way of limitation, of cleaning levels required:

a. Remove labels which are not required as permanent labels.
b. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances which are noticeable as vision-obscuring materials. Replace broken glass and damaged transparent materials.
c. Clean exposed exterior and interior hard-surfaced finished, to a dirt-free condition, free of dust, stains, films and similar noticeable distracting substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.
d. Wipe surfaces of mechanical and electrical equipment clean.
e. Remove debris and surface dust from limited-access spaces.
f. Vacuum clean carpeted surfaces and similar soft surfaces.
g. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.

3. Clean light fixtures and lamps so as to function with full efficiency.
4. Clean project site (yard and grounds), including landscape development areas, of litter and foreign substances. Sweep paved areas to a broom-clean condition; remove stains, petrochemical spills and other foreign deposits. Rake grounds which are neither planted nor paved, to a smooth, even textured surface.

C. Damaged Work - Any damages to building materials, finishes or equipment, shall be repaired or replaced by the Subcontractor to the satisfaction of the Architect without cost to the Owner.

1.25 UNLOADING AT SITE

Materials shall be unloaded at the site at the expense of the Contractor furnishing such materials, unless otherwise specified.

1.26 OBLIGATION OF CONTRACTOR

At the time of awarding contracts, each Contractor will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Plans and Contract Documents (including all addenda). The failure or omission of any Contractor to receive or examine any form, instrument or document shall in no way relieve any Contractor from any obligation in respect of his contract.

1.27 ACCEPTANCE OF PRECEDING WORK

Before starting any operation the Prime Contractors shall examine work performed by others to which

their work adjoins or is applied and shall report to the Architect any conditions that will prevent satisfactory accomplishment of their contract. Failure to notify the Architect in writing of deficiencies or fault in preceding work will constitute acceptance thereof and waive any claim of unsuitability.

1.29 SUB-SURFACE DATA

Sub-surface soil investigations have been made and results are incurred at the end of this section. Data shown is for general information of bidders and is not guaranteed. Bidders are expected to examine the site and record of investigations and then decide for themselves the character of the materials to be encountered.

END OF SECTION

SECTION 01025 -APPLICATIONS FOR PAYMENT

1.1 GENERAL:

A. Submit Applications for Payment to Architect in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.

B. Related requirements in other parts of the Project Manual:

1. Stipulated sum: Agreement between Owner and Contractor.
2. Progress payments, retainage and final payment: Conditions of the Contract.

C. Related requirements specified in other sections:

1. SCHEDULE OF VALUES - Section 01370
2. CONTRACT CLOSEOUT- Section 01700

1.2 FORMAT AND DATA REQUIRED:

A. Each Contractor signing an Owner-Contractor Agreement, submit itemized applications typed on A.I.A. Document G702 (1992 Edition), Application and Certificate for Payment, and Continuation Sheet G703 (1992 Edition).

1. One (1) "Red Lettered" original document is to be included with all sets of payment applications unless the Electronic Format is used.

2. A letter of Electronic Format Authenticity is required to assure use of A.I.A. forms.

3. Non-compliant forms will be returned to the contractor.

4. Forms considered to be in violation of copyright laws may be forwarded to the A.I.A. for investigation.

B. Forms used shall be furnished by Contractors.

1. A.I.A. forms are available through: A.I.A./Rochester
311 Alexander Street, Ste. 217
Rochester, New York 14604

Phone: (716) 232-7650
Fax: (716) 262-2525

*C. Submit forms separately by project as identified by name and NYSED Control Number on the cover of the project manual.

1.3 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT:

A. Application Form:

1. Fill in required information, including that for change orders executed prior to date of submittal of application.

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

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

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.

   a. Round off values to nearest dollar, or as specified for schedule of values.

3. List each change order executed prior to date of submission, at end of continuation sheets.

   a. List by change order number, and description, as for an original component item of work.

1.4 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS:

A. When Owner or Architect requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:

1. Project.

2. Application number and date.

3. Detailed list of enclosures.

4. For stored products:

   a. Item number and identification as shown on application.
   b. Description of specific material.

B. Submit one copy of data and cover letter for each copy of application.

1.5 PREPARATION OF APPLICATION FOR FINAL PAYMENT:

A. Fill in application form as specified for progress payments.

B. Use continuation sheet for presenting final statement of accounting as specified in Section 01700 - CONTRACT CLOSEOUT.

1.6 SUBMITTAL PROCEDURE:

A. Submit Applications for Payment to Architect at time stipulated in agreement.

B. Number: Five (5) copies of each application.

C. When Architect finds application properly completed and correct, Architect will transmit a Certificate for Payment to Owner, with a copy to Contractor.

END OF SECTION

SECTION 01040 - PROJECT COORDINATION

1.1 GENERAL:

A. Each prime contractor shall fully coordinate their construction activities with other prime contractors, and make provisions to accommodate requirements of other prime contractors. Each prime contractor shall coordinate their construction activities in order that overall work on project may progress in accordance with approved construction progress schedule. This coordination shall occur on a continuous basis, proactively communicated through e-mail, Superintendent's meetings, and other venues initiated by the Prime Contractors.

B. Related Requirements in Other Parts of Project Manual:

1. General and Special Conditions of the Contract.

C. Related Requirements Specified in Other Sections:

1.	SUMMARY OF WORK	- Section 01010
2.	PROJECT MEETINGS	- Section 01200
3.	CONSTRUCTION SCHEDULES	- Section 01310
4.	CONTRACT CLOSEOUT	- Section 01700
5.	CLEANING	- Section 01710
6.	PROJECT RECORD DOCUMENTS	- Section 01720

2.1 OWNER'S REPRESENTATIVE:

A. A Construction Manager will be employed by the Owner for the project to assist the Prime Contractors' coordination of the work, make periodic on-site observations of the work throughout the construction period, and work in conjunction with the Architect as the Owner's Representative.

B. Duties and Responsibilities:

1. Construction Manager shall have the following duties and responsibilities:

a. Assist the Prime Contractor to understand Contract Documents.

b. Observations: Conduct on-site observations to assist the Architect in determining conformance of work, material and equipment with contract drawings and specifications.

c. Additional information: Assist in obtaining from the Architect additional details or information if and when required at job site for proper execution of work.

d. Modifications: Consider and evaluate suggestions for modifications, which may be submitted by Contractor to Architect.

e. Liaison: Serve as liaison between Prime Contractors and Architect.

f. Construction schedule and completion: Receive and integrate the Prime Contractor's schedules. Monitor conformance to schedules during construction and report delay issues to the Architect.

g. Job conferences: Attend and report to Owner and Architect on all required conferences held at job site.

h. Observe tests: Administer testing required by the Contract Documents and cause communication of test results to affected parties.

i. Inspections by others: If inspectors representing local state or federal agencies having jurisdiction over the project visit the job site, accompany such inspectors during their trips through project. Record outcome of these inspections and report same to Architect's office.

j. Samples: Receive samples which are required to be furnished at job site. Record date received and from whom. Notify Architect of their readings for examination. Record Architect's review or rejection and maintain custody of reviewed samples.

k. Records: Cause Prime Contractors to have current copies of the Contract Documents and shop drawings at the project site

l. Shop drawings: Advise Contractor against installation of materials, equipment or any other construction item requiring shop drawings until shop drawings have been reviewed.

m. Contractor's requisitions for payment: Review with all concerned requisitions for payment as submitted by Contractor and forward them with recommendations to Architect for disposition.

n. List of items for correction: Upon substantial completion, assist the Architect in making a list of items for correction before final inspection and check each item as it is corrected.

o. Owners occupancy of building: If Owner occupies (to any degree) building prior to actual completion of work by Contractor, be especially alert to possible claims for damage to completed work prior to acceptance of building.

p. Guarantees, certificates, maintenance and operation manuals: During course of work, collect guarantees, certificates and maintenance operation manuals and keying schedule and, at acceptance of project, assemble this material and deliver it to Architect for forwarding to Owner.

C. Limitations of Authority:

1. Construction Manager will not become involved in any of following areas of responsibility unless specific exceptions are established by written instructions issued by Architect.

   a. Authorizing deviations from Contract Documents.

   b. Conduction of any tests personally.

   c. Entering into area of responsibility of contractor's field superintendent.

   d. Expediting job for Contractor unless so instructed by Architect and Owner in writing.

   e. Giving advice or issuing directions relative to any aspect of building technique or sequence unless a specific technique or sequence is called for in specifications or by written instructions from Architect.

   f. Review of shop drawings or samples.

   g. Authorizing or advising Owner to occupy project in whole or in part prior to final acceptance of building.

   h. Sole approval of Certificate for Payment. Certificate for Payment must be reviewed by Construction Manager, Architect and Owner.

END OF SECTION

SECTION 01200 -PROJECT_MEETINGS

1.1 DESCRIPTION:

A. Construction Manager Shall:

1. Schedule and administer preconstruction meeting, periodic progress meetings, and specially called meetings throughout progress of work.

2. Prepare agenda for meetings.

3. Unless previously established, distribute written notice of meeting four days in advance of meeting date.

4. Preside at meetings.

5. Record minutes; include all significant proceedings and decisions.

6. Reproduce and distribute copies of minutes within a reasonable time after each meeting to all participants in meeting.

B. Contractor:

1. Contractors shall cooperate with Architect to expedite requirements set forth in Paragraph 1.1 A.

2. General Trades Contractor shall make physical arrangements for meetings.

C. Representatives of contractors, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of entity each represents.

D. Related Requirements Specified in Other Sections:

1. Division 01 - General Requirements.

E. General Trades Contractor shall keep a daily diary or log book recording hours of job site, weather conditions, list of visiting officials and jurisdiction, daily activities, decisions, observations in general and specific observations in more detail as in case of observing test procedures.

F. Record names, addresses and telephone numbers of all Contractors and subcontractors.

1.2 PRECONSTRUCTION_MEETING:

A. Schedule by CM prior to date of notice to proceed date of notice to proceed.

B. Location: Wesleyan Church of Orchard Park, 7295 Ellicott Road, Orchard Park, NY 14127.

C. Attendance:

1. Owner's representative.
2. Architect and Architect's professional consultants.
3. Construction Manager.
4. Contractor's superintendent.
5. Major subcontractors.
6. Major suppliers.
7. Others as appropriate.

D. Suggested Agenda:

1. Distribution and discussion of:

   a. List of major subcontractors and suppliers.

   b. Projected construction schedules.

   c. Insurance requirements.

2. Critical work sequencing.

3. Major equipment deliveries and priorities.

4. Project coordination.

   a. Designation of responsible personnel.

5. Procedures and processing of:

   a. Field decisions.
   b. Proposal requests.
   c. Submittals.
   d. Change orders.
   e. Applications for payment.
   f. Construction photographs.

6. Adequacy of distribution of Contract Documents.

7. Procedures for maintaining record documents.

8. Use of premises:

    a. Office, work and storage area.
    b. Owner's requirements.

9. Construction facilities, controls and construction aids.

10. Temporary utilities.

11. Safety and first-aid procedures.

12. Security procedures.

13. Housekeeping procedures.

14. Other pertinent requirements in Division 01 - General Requirements.

15. Determine location of progress meetings.

1.3 PROGRESS_MEETINGS:

A. Schedule regular periodic meetings, generally on a weekly basis.

B. Hold special meetings as required by particular issues affecting the progress of work.

C. Location of Meetings: At the project site.

D. Attendance:

1. Architect and Architect's professional consultants as needed.
2. Each Prime Contractor.
3. Subcontractors as appropriate to agenda.
4. Suppliers as appropriate.
5. Construction Manager.
6. Others as appropriate.

E. Each Prime Contractor shall meet with the Architect and/or Construction Manager at the site each week for a short meeting to resolve issues affecting the progress of the Work. Such Progress Meetings will be held at 9:00 a.m. each Tuesday morning and should include the following agenda:

1. Schedule Review
    - current status
    - 2 week look ahead
    - resolution of pending schedule issues

2. Submittals Review
    - Status of Shop Drawings
    - Status of Requests for Information (RFI)

3. Change Review
    - Status of Change Proposals & Change Orders

4. Safety, Cleanup & Temporary Protection
    - review procedures & results

F. Each Prime Contractor shall prepare and continuously maintain computerized logs to track the status of submittals, requests for information (RFI) and the change order process. At each regular Progress Meeting the Prime Contractor shall deliver to the Construction Manager updated logs indicating the current status of all active submittals, RFI's and Change Proposals/Orders. Such updated logs shall be current (updated within the last 12 hours), accurate and in a format acceptable to the Construction Manager.

G. The Construction Manager shall conduct the meeting, prepare the agenda and issue minutes of Progress Meetings.

END OF SECTION

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Submit, to the Construction Manager for the Architect/Engineer's review, shop drawings, product data and samples required by the specification section.

1.02 SHOP DRAWINGS

A. Original drawings, prepared by Contractor, Subcontractor, supplier or distributor, which illustrate some portion of the work showing fabrication, layout, setting or erection details.

1. Identify details by reference to sheet and detail numbers shown on shop drawings.

2. Sheet size, multiple for 8-1/2 by 11 inches, not to exceed size of contract drawings when unfolded.

3. Reproduction for Submittals: Reproducible transparency with one bond copy.

4. Photographic reproductions of contract drawings will not be accepted as shop drawings and will be rejected.

1.03 PRODUCT DATA

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

1. Modify product data to delete information which is not applicable to project.

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

3. Clearly mark each copy to identify applicable materials, products or models.

4. Show dimensions and clearances required.

5. Show performance characteristics and capacities.

6. Show wiring or piping diagrams and controls.

1.04 SAMPLES

A. Physical examples to illustrate materials, equipment or workmanship, and to establish standards by which completed work is judged.

1. Office samples to be of sufficient size and quantity to clearly illustrate:

a. Functional characteristics of product or material, with related parts and method of attachment.
b. Full range of color samples.

2. Field Samples and Mock-Ups

a. Erect at project site at location acceptable to Construction Manager.
b. Construct samples or mock-up complete, including work of all trades required in finish work.

1.05 CONTRACTOR RESPONSIBILITIES

A. Each Prime Contractor shall, within 30 days of contract award and prior to the first application for payment, submit a schedule of submittals listing every item, which is required to be submitted and approximate date(s) when submission is forthcoming.

B. Do not start, fabricate or install work requiring submittals until submittals meeting Contract Requirements have been returned to the Contractor.

C. Review, approve, stamp and sign shop drawings, product data and samples prior to submission.

D. Verify
1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and other data.

E. Coordinate each submittal with requirements of Work and Contract Documents.

F. Contractor's responsibility for errors and omissions in submittals is not relieved by Construction Manager's or Architect/Engineer's review of submittals.

G. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Construction Manager's or Architect/Engineer's review of submittals unless Architect/Engineer gives written acceptance of the specific deviations.

H. Notify Construction Manager and Architect/Engineer in writing, at time of

submission of deviations in submittals from requirements of Contract Documents.

I. After Construction Manager and Architect/Engineer's review, Contractor is to distribute copies of submittals to parties requiring same for coordination of work.

J. Make required copies for distribution of shop drawings and product data that have been stamped and signed by the Architect/Engineer.

1.06 SUBMISSION REQUIREMENTS

A. Schedule submissions to allow 10 working days for review.

B. Submit one reproducible transparency and one diazo print of shop drawings.

C. Submit number of copies of product data that will be required for distribution plus two copies that will be retained by Construction Manager and Architect/Engineer.

D. Submit number of samples specified in each technical section.

E. Accompany submittal with transmittal letter, containing:

1. Date.
2. Construction Manager's project title and number.
3. Architect/Engineer's project title and number.
4. Contractor's name and address.
5. Notification of deviations from Contract Documents.
6. Additional pertinent data.

F. Submittals shall include:

1. Date and revision dates.
2. Construction Manager's project title and number.
3. Architect/Engineer's project title and number.
4. The names of:
   a. Architect/Engineer.
   b. Contractor.
   c. Subcontractor.
   d. Supplier.
5. Identification of product.
6. Relation to adjacent structure or materials.
7. Field dimensions, clearly identified as such.
8. Technical Specification section number.
9. Applicable standards.
10. Two blank spaces, 4 x 4 inches, for the Construction Manager's and Architect/Engineer stamp.

11. Identification of deviations from Contract Documents.
12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract Documents.
    a. Submittals without Contractor's stamp will be returned without being reviewed.

G. Shop Drawing Submittal Cover Sheet
1. Attach submittal cover sheet, with all blanks filled in for each shop drawing, product data and sample.

1.07 RESUBMISSION REQUIREMENTS

A. Shop Drawings

1. Revise initial drawings as required and resubmit as specified for initial submittal.

2. Indicate on drawings changes which have been made other than those requested by the Architect/Engineer.

B. Product Data and Samples: Submit new data and samples as required for initial submittal.

1.08 CONTRACTOR'S DISTRIBUTION OF SUBMITTALS

A. Distribute copies of shop drawings and product data which carry the Construction Manager and Architect/Engineer stamp to:

1. Contractor's file.
2. Job site file.
3. Record Document file.
4. Other Contractors, as required for coordination.
5. Subcontractors, as required for coordination.
6. Supplier.
7. Fabricator.

B. Distribute samples as directed by Architect/Engineer.

1.09 ARCHITECT/ENGINEER

A. Review design concept of Project.

B. Review of separate items does not constitute review of an assembly in which item functions.

C. Stamp and initial or sign certifying to review of submittal.

D. Explanation of Architect/Engineer's Stamp

1. NO EXCEPTION TAKEN: No corrections, no marks.
2. MAKE CORRECTIONS NOTED: Minor amount of corrections; all items can be fabricated at Contractor's risk without further correction; checking is complete and all corrections are obvious without ambiguity.
3. REVISE AND RESUBMIT: Minor amount of corrections; noted items must not be fabricated without further correction; checking is not complete; details of items noted by checker are to be further clarified; items not noted to be corrected can be fabricated at Contractor's risk under this stamp.
4. REJECTED: Drawings are rejected as not in accordance with the Contract, too many corrections, or other justifiable reason. The drawing must be corrected and resubmitted. No items are to be fabricated under this stamp.
5. SUBMIT SPECIFIED ITEM: Item is not as specified. Submit named manufacturer.

E. Return submittals to Construction Manager for distribution.

1.10 SUBMITTALS REQUIRED FOR REVIEW

A. Contractor is responsible for reviewing each section to determine required submittals.

1.11 CLOSEOUT SUBMITTALS

A. Upon completion of the Work of this Section, Contractor shall submit to the Construction Manager, all required closeout documents.

B. Contractor shall submit a marked-up set of drawings indicating any changes made during construction to the Construction Manager.

C. Upon completion, submit to the Construction Manager, a Contractor's Affidavit of Payment of Debts and Claims, and Release of Liens.

D. Refer to General Conditions for additional requirements.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

SECTION 01310 -CONSTRUCTION_SCHEDULES

PART 1 - GENERAL

1.1 Each Prime Contractor signing an Owner-Contractor Agreement shall submit to Architect an estimated progress schedule and schedules of cost and subcontractors.

1.2 RELATED REQUIREMENTS IN OTHER PARTS OF PROJECT MANUAL:

A. Conditions of Contract.

PART 2 - DESCRIPTION

2.1 CONSTRUCTION SCHEDULES

A. Each Prime Contractor shall prepare and regularly update a detailed bar chart construction schedule, in a form acceptable to the Construction Manager, with the following characteristics:

1. Time scale: weekly
2. Minimum number of activities: 12 per construction category
3. Maximum activity duration: 2 weeks per activity
4. Provide separate activity set for each construction category
5. Provide activities for temporary protection operations
6. Frequency of updates: weekly

B. The Construction Manager shall, with the Prime Contractors' assistance and cooperation, integrate said schedules into a single Approved Project Schedule.

C. Each Prime Contractor shall provide copies of the most recent schedule update at each Progress Meeting

D. Each Prime Contractor shall submit the bar chart schedule within 14 days of the date of Contract award.

E. In the event a delay situation is identified, the Prime Contractor responsible shall submit a remedial action plan within 12 hours of request by the Construction Manager.

END_OF_SECTION

SECTION 01411 – SPECIAL INSPECTIONS AND TESTING SERVICES

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE:

A. Inspections and testing required by laws, ordinances, rules, regulations or orders of public authorities.

B. Certifications of materials, products or equipment: Respective Specifications Sections.

C. Test of materials, adjust and balance of products or equipment: Respective Specification Sections.

1.02 GENERAL REQUIREMENTS

A. Provide special inspections and testing in accordance with Chapter 17 of the Building Code of New York State

B. The program of Special Inspections and Testing is a Quality Assurance program intended to ensure that the work is performed in accordance with the Contract Documents.

C. This specification section is intended to inform the Contractor of the Owner's quality assurance program and extent of the Contractor's responsibilities. This specification section is also intended to notify the Special Inspectors, Testing Laboratories, and other Agents of the Special Inspectors of their requirements and responsibilities.

1.03 SCHEDULE OF INSPECTIONS AND TESTS

A. Required inspections and tests are described in the attached Statement of Special Inspections and in the individual specification sections for the items to be inspected or tested.

B. The services and quantities of testing specified are approximate and may vary. Actual services and quantities of testing will be determined by the Owner and/or Architect and Construction Manager during the construction period.

C. The Architect and Construction Manager will determine the locations for taking sample specimens for testing in accordance with the specifications.

1.04 EMPLOYMENT OF SPECIAL INSPECTOR AND AGENTS:

A. Special Inspectors must demonstrate, to the Engineer of Record and Building Official's satisfaction, experience and skills to satisfactorily conduct testing indicated without delaying the progress of the work.

B. The Owner will employ and pay for the services of the Special Inspector's to perform the services specified herein; however, the Contractor shall reimburse the Owner for the cost of those services which, in the opinion of the Architect/Engineer (and Construction Manager), are required due to the following:

1. Failure of materials or workmanship to meet contract requirements.

2. Materials or practices, not complying with the Specifications which could possibly result in defective work thereby rendering it necessary or advisable to perform tests to determine whether or not work is acceptable.

3. Changes in source, quality or characteristics of materials.

4. Site cured cylinders requested by the Contractor.

C. The Special Inspector shall retain the services of a full time registered Professional Engineer who shall certify all test reports. The Engineer shall be responsible for the training of the testing technicians and shall be in responsible charge of the field and laboratory testing operations.

D. Special inspections shall be performed by Special Inspectors who are certified as identified below, or are working under the direction of a registered Professional Engineer.

1. Technicians performing sampling and testing of concrete shall be ACI certified Concrete Field Testing Technicians – Grade 1.

2. Inspectors performing inspections of concrete work such as inspections of concrete placement, batching, reinforcing placement, curing and protection, shall be ACI certified Concrete Construction Inspectors or ICBO certified Reinforced Concrete Special Inspectors.

3. Technicians performing visual inspection of welding shall be AWS Certified Welding Inspectors or ICBO certified Structural steel and

Welding Special Inspectors; technicians performing non-destructive testing such as ultrasonic testing, radiographic testing, magnetic particle testing, or dye-penetrate testing shall be certified as an ASNT-TC Level II or Level III technician.

4. Technicians performing standard tests described by specific ASTM Standards shall have training in the performance of such tests and must be able to demonstrate either by oral or written examination competence for the test to be conducted. They shall be under the supervision of a licensed Professional Engineer and shall not be permitted to independently evaluate test results.

1.05 CONTRACTOR'S RESPONSIBILITIES

A. COOPERATION AND ACCESS:

1. Cooperate with laboratory personnel and provide access to the work and to manufacturers. Fabricator's facilities as required for the performance of their services.

2. Retain the latest set of construction drawings, field sketches, approved shop drawings, and specification at the project site for use by the inspectors and testing technicians.

B. CASUAL LABOR AND FACILITIES:

Provide Casual Labor and Facilities:

1. To provide access to the work to be inspected or tested.

2. To obtain and handle samples at the site.

3. To facilitate inspections and tests.

4. To construct a storage box on the site of sufficient size to store cylinders, which will afford protection, required by ASTM C-31.

C. SAMPLES:

1. Provide the laboratory with preliminary representative samples of materials to be tested, in requested quantities.

2. When the source, quality or characteristic of an approved material changes or indicates lack of compliance with contract requirements, submit additional samples of materials to testing laboratory.

D. MISCELLANEOUS REPORTS, LISTS, ETC.:

1. When requested by the Architect/Engineer, or the testing laboratory, the Contractor shall immediately provide copies of mill reports, cutting lists, material bills, shipping bills, time and place of shipment of materials to shop and field and any relevant data on previous testing and investigations of materials.

E. NOTIFICATION:

1. Review the Statement of Special Inspections and be responsible for coordinating and scheduling inspections and tests to facilitate the timely sequence of inspection and testing, the Contractor shall give advanced notification to the testing laboratory and the Architect/Engineer (and Construction Manager) that work has progressed to a point where inspection and testing may proceed.

2. Advanced notification, shall be 48 hours (min.) prior to commencement of the following:

   a. Site Preparation

      1. Excavation for foundations and slab on grade.

      2. Proof-rolling of slab on grade subgrade.

   b. Soil Compaction:

      1. Delivery of fill to the site.

      2. Placement and compaction of fill or backfill.

   c. Concrete:

      1. Setting of reinforcing and formwork.

      2. Placing concrete.

   d. Masonry:

      1. Delivery of masonry units.

2. Setting of reinforcement.

3. Installation of mortar, grout and masonry units.

e. Structural Steel and Steel Joists:

1. Shop fabrication.

2. Delivery.

3. Erection.

4. Alignment and leveling of structure.

5. Welding and bolting of connections.

f. Metal Deck:

1. Delivery.

2. Erection and fastening to structure.

F. CONTRACTOR'S QUALITY CONTROL:

1. The Special Inspection program does not, in any way, relieve the Contractor of his obligation to perform work in accordance with the requirements of the Contract Documents or from implementing an effective Quality Control program. All work that is to be subjected to Special Inspections shall first be reviewed by the Contractor's quality control personnel.

2. Services of testing laboratory retained by the Owner is for verification of Contractor's compliance and if such tests of inspection indicates failure to comply with the Contract Documents, the Contractor shall bear all cost associated with additional testing and inspection, after the work has been corrected, to verify compliance.

G. PATCHING:

Areas where samples are taken for purposes of testing shall be patched to the satisfaction of the Architect.

1.06 LIMITS ON AUTHORITY

A. The Special Inspectors or Testing Laboratories may not release, revoke, alter, or enlarge on the requirements of the Contract Documents.

B. The Special Inspectors or Testing Laboratories will not have control over the Contractor's means and methods of construction.

C. The Special Inspectors or Testing Laboratories are not responsible for construction site safety.

D. The Special Inspectors or Testing laboratories have no authority to stop the work.

1.07 STATEMENT OF SPECIAL INSPECTIONS

A. The Engineer of Record (EOR) will prepare the Statement of Special Inspections.

B. Submit the Statement of Special Inspections with the application for Building Permit.

1.08 RECORDS OF REPORTS

A. Submit Bi-Weekly reports of each inspection or test to the registered design professional in responsible charge. Reports shall include:

1. Date of test or inspection.

2. Name of inspector or technician.

3. Location of specific areas tested or inspected.

4. Description of test or inspection and results.

5. Applicable ASTM standard.

6. Weather conditions.

7. Signature of special inspector or technician.

B. Submit interim reports to the Building Official which include all inspections and test reports received that week. Provide copies to the Architect, and Contractor. The frequency of the interim reports shall be as required by the Township.

C. Any discrepancies from the Contract Documents found during a Special Inspection shall be immediately reported to the Contractor. If the discrepancies

are not corrected, the Special Inspector shall notify the EOR and Building Official. Reports shall document all discrepancies identified and the corrective action taken.

D. The Testing laboratory shall immediately notify the registered design professional in responsible charge by telephone or fax of any test results which fail to comply with the requirements of the Contract Documents.

E. Provide a statement to the registered design professional in responsible charge at the completion of the work requiring Special Inspections from each inspection agency and testing laboratory that all work was completed in substantial conformance with the Contract Documents and that all appropriate inspections and tests were performed.

1.09 FINAL REPORT OF SPECIAL INSPECTIONS

A. Complete Final Report of Special Inspections by the registered design professional in responsible charge and submit to the EOR and Building Official prior to the insurance of a Certificate of use and Occupancy.

B. Use C.A.S.E. Form 102 – 2001 for the Final Report of Special Inspections.

C. The Final Report of Special Inspections will certify that all required inspections have been performed and will itemize any discrepancies that were not corrected or resolved.

1.10 SUBMITTALS:

A. The Special Inspectors and Testing Laboratories shall submit to the EOR and Building Official for review a copy of their qualifications which shall include the names and qualifications of each of the individual inspectors and technicians who will be performing inspections or tests.

B. The Special Inspectors and Testing Laboratories shall disclose any past or present business relationship or potential conflict of interest with the Contractor or any of the Subcontractors whose work will be inspected or tested.

C. Submit three copies of the following:

1. Reports of all tests performed on soils, concrete, masonry, structural steel, joists, and deck.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 FREQUENCY OF INSPECTIONS

A. Shall conform to the attached program of Special Inspections.

B. Definitions:

1. Periodic – In general, no more than a half day site visit, not less than 48 hours apart, unless otherwise directed by Owner, Architect, or Engineer, or specified below.

2. Continuous – In general, the Special Inspector or Agent should be on site before, during, and after operation requiring inspection.

3.02 EXISTING SUBGRADES

A. Field Verification

a. Observe proofrolling operations.

b. Identify location and extent of soft, loose, or yielded subgrade material that must be removed or undercut.

c. Inspect undercut subgrade.

3.03 SOILS:

A. Laboratory Tests:

1. Existing site material

a. Cohesive soils and semi-cohesive soils: Provide one optimum moisture-maximum density curve for each type of subgrade soil encountered in accordance with ASTM D-1557.

b. Non-Cohesive soils: Provide maximum and minimum index densities and relative densities for each type of subgrade soil encountered in accordance with ASTM D-4254.

2. Borrow materials: Analyze each type of borrow materials before acceptance and delivery to the site. Any change in the source or quality of the material will require a new series of tests to determine acceptability.

a. Particle size analysis of soils ASTM D-422, ASTM D-421, ASTM D-420, ASTM C-117 recommended practice.

b. Plasticity index determination ASTM D-4318.

c. Moisture-density curve determination ASTM D-1557 or relative density (ASTM D-4253 or ASTM D-4254) as specified above.

d. Frost susceptibility analysis.

B. Field Tests:

1. The Owner's soils testing agency representative shall be present during delivery and compaction of fill materials.

2. Establish suitable bearing grades for foundations and structural fill below slabs on grade.

3. Verify natural soil and structural fill subgrades for all slabs on grade.

4. In-place density tests: Test in accordance with ASTM D-1556 (sand cone method) or ASTM D-2922 (nuclear method) on compacted natural soils or structural fill materials as follows:

a. One test for each 2000 sq. ft. of slab on grade and pavement subgrade per 12" lift.

b. One test for each 200 cu. yd. of fill and backfill at exterior side of foundation walls and unpaved areas.

5. Verify and monitor compaction operations and equipment.

6. Monitor proof-rolling operations for foundation and slab-of-grade subgrades.

3.04 CONCRETE:

A. Sampling:

1. Concrete samples shall be taken in accordance with ASTM C-172 "Sampling Fresh Concrete".

2. Inspection/Testing proposed materials.

3. Aggregate Analysis.

4. Conduct compression tests to verify that design mix complies with Contract Documents.

B. Formwork and Reinforcing:

1. Inspect formwork and reinforcing prior to placing of concrete.

C. Batching Inspection:

1. Inspect batching, mixing and delivery operations for compliances with the Specifications.

D. Compressions Tests:

1. Label each compression test cylinder identifying the truckload of concrete from which sample was taken and the exact location in construction where deposited.

2. Test specimens in accordance with ASTM C-39 "Methods of Tests for Compressive Strength of Molded Concrete Cylinders". Include weight test.

3. One compression test, as used herein shall consist of 3 test cylinders made from composite samples secured from a single truckload of concrete.

4. Break 1 test cylinder at 7 days and the remaining 2 at 28 days. If desired by the architect, engineer, or construction manager a fourth test cylinder can be made and held for 56 days.

E. One compression test will be required for each of the following conditions:

1. Each 50 cu. yd. of concrete or fraction thereof.
2. Each class of concrete placed in one day.

F. Slump Tests:

1. Slump test shall be made in accordance with ASTM C-143 "Methods for Slump of Portland Cement Concrete".

2. Test Slump of concrete at same frequency and from same truckload as compression tests and more often when directed by the Owner's representative.

G. Air Content Tests:

1. Determine air content by ASTM C-231 "Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method".

2. Determine air content at same frequency and from same truckload as for compression tests.

3.05 STRUCTURAL STEEL AND STEEL JOISTS

A. Shop Testing and Inspection:

1. Verify and monitor all welder qualifications, welding procedures and welding processes.

2. Monitor fabrication operations.

3. Review all mill reports.

4. Visually inspect and measure weld profiles, at random, prior to application of paint.

5. Review Shop Quality Control Manual and Procedures with shop foreman.

B. Field Testing and Inspection:

1. Visual inspection:

a. Verify and monitor welder qualifications and welding processes.

b. Inspect field erection of structural elements.

c. Inspect field bolting operations.
d. Inspect field welding operations.

e. Inspect anchor bolt installation and tightening.

2. High Strength Bolted Connections

a. Test all bolted connections for conformance with the AISC "Specification for Structural Joints using ASTM A325 or A490 Bolts", 2000 edition.

3. Magnetic Particle Testing

a. Test 5% of field fillet welds, at random, final pass only for conformance with ASTM E709 and ASTM E1444.

4. Ultrasonic Testing

a. Test 100% of all field partial and full penetration welds, at random, for conformance with ASTM E164 and AWS D1.1.

3.06 UNIT MASONRY

A. Brick: Test each type, grade and class of brick per ASTM C67.

B. Concrete masonry units: Test each type, class and grade per ASTM C140.

C. Inspect rebar reinforcing, joint reinforcing, ties and anchors for general compliance with the Contract Documents.

D. Mortar: Test one set of three cubes per ASTM C780 for each days work or every 5000 sq. ft. of wall area, whichever is the lesser.

E. Grout: Test on set of three compression test cylinders per ASTM C-1019 for each days work or every 25 cu. yds., whichever is the lesser.

F. Masonry Prisms:

1. Prism tests shall be performed for the purpose of checking the compressive strength of each masonry assembly, including grouted cells but excluding reinforced cells and face brick.

2. Test one set of three prisms per ASTM E447, Method B, for each 5000 sq. ft. of each type of wall construction or a minimum of three sets for the project, whichever provides the greater number of sets.

3.07 METAL DECKING

A. Visual Inspection

1. Verify and monitor welder's qualifications and welding processes.

2. Inspect field erection procedures for metal decking.

3. Inspect field welding operations.

4. Inspect mechanical fastening operations.

END OF SECTION 01411

Statement of Special Inspections

Project: *Jaffarya Kitchen Addtion*

Location: *Amherst, NY*

Owner:

Design Professional in Responsible Charge: *Petrilli Structural and Consulting Engineering P.C.*

This *Statement of Special Inspections* is submitted as a condition for permit issuance in accordance with the Special Inspection and Structural Testing requirements of the Building Code. It includes a schedule of Special Inspection services applicable to this project as well as the name of the Special Inspection Coordinator and the identity of other approved agencies to be retained for conducting these inspections and tests. This *Statement of Special Inspections* encompass the following disciplines:

☒ Structural ☐ Mechanical/Electrical/Plumbing

☐ Architectural ☐ Other: _____

The Special Inspection Coordinator shall keep records of all inspections and shall furnish inspection reports to the Building Official and the Registered Design Professional in Responsible Charge. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official and the Registered Design Professional in Responsible Charge. The Special Inspection program does not relieve the Contractor of his or her responsibilities.

Interim reports shall be submitted to the Building Official and the Registered Design Professional in Responsible Charge.

A *Final Report of Special Inspections* documenting completion of all required Special Inspections, testing and correction of any discrepancies noted in the inspections shall be submitted prior to issuance of a Certificate of Use and Occupancy.

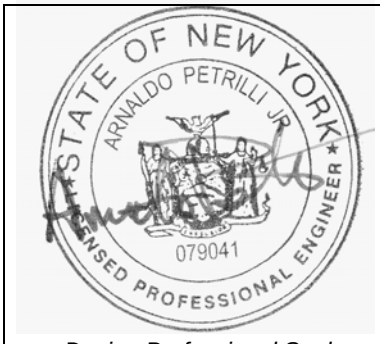
Job site safety and means and methods of construction are solely the responsibility of the Contractor.

Interim Report Frequency: *Weekly* or ☐ per attached schedule.

Prepared by:

Arnaldo Petrilli J., P.E.
(type or print name)

08/07/18
Signature Date



Design Professional Seal

Owner's Authorization:

Signature Date

Building Official's Acceptance:

Signature Date

Schedule of Inspection and Testing Agencies

This Statement of Special Inspections / Quality Assurance Plan includes the following building systems:

- ☒ Soils and Foundations
- ☒ Cast-in-Place Concrete
- ☐ Precast Concrete
- ☒ Masonry
- ☒ Structural Steel
- ☐ Cold-Formed Steel Framing
- ☐ Spray Fire Resistant Material
- ☐ Wood Construction
- ☐ Exterior Insulation and Finish System
- ☐ Mechanical & Electrical Systems
- ☐ Architectural Systems
- ☐ Special Cases

Special Inspection Agencies	**Firm**	**Address, Telephone, e-mail**
1. **Special Inspection Coordinator**	*Petrilli Structural & Consulting Engineering, P.C.* *Arnaldo Petrilli, PE*	*245 Kinsey Ave. Suite 100* *Kenmore, NY 14217* *(716) 854-3508* *ajpetrilli@petrilliengineering.com*
2. Inspector	*TBD*	
3. Inspector		
4. Testing Agency	*TBD*	
5. Geotechnical Engineer	Empire Geo Previous firm for prior work	*5167 SOUTH PARK AVE.* *HAMBURG, NY*
6. Other		

Note: The inspectors and testing agencies shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official, prior to commencing work.

Quality Assurance Plan

Quality Assurance for Seismic Resistance

Seismic Design Category	***B***
Quality Assurance Plan Required (Y/N)	*N*

Description of seismic force resisting system and designated seismic systems:
ORDINARY REINFORCED MASONRY SHEAR WALLS. *Quality assurance plan is required for Sds>0.5g and >35ft in height. There for a QAP is* ***not*** *required.*

Quality Assurance for Wind Requirements

Basic Wind Speed (3 second gust)	*115 mph*
Wind Exposure Category	*B*
Quality Assurance Plan Required (Y/N)	*N*

Description of wind force resisting system and designated wind resisting components:
ORDINARY REINFORCED MASONRY SHEAR WALLS. *3 Second gust is required when >120 MPH in exposure B and >110MPH in Exposure C and D, quality assurance plan is* ***not*** *required since Exposure is* ***B*** *and velocity is 115mph.*

Statement of Responsibility

Each contractor responsible for the construction or fabrication of a system or component designated above must submit a Statement of Responsibility.

Qualifications of Inspectors and Testing Technicians

The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided if requested.

Key for Minimum Qualifications of Inspection Agents:

When the Registered Design Professional in Responsible Charge deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designation shall appear below the *Agency Number* on the Schedule.

PE/SE	Structural Engineer – a licensed SE or PE specializing in the design of building structures
PE/GE	Geotechnical Engineer – a licensed PE specializing in soil mechanics and foundations
EIT	Engineer-In-Training – a graduate engineer who has passed the Fundamentals of Engineering examination

American Concrete Institute (ACI) Certification

ACI-CFTT	Concrete Field Testing Technician – Grade 1
ACI-CCI	Concrete Construction Inspector
ACI-LTT	Laboratory Testing Technician – Grade 1&2
ACI-STT	Strength Testing Technician

American Welding Society (AWS) Certification

AWS-CWI	Certified Welding Inspector
AWS/AISC-SSI	Certified Structural Steel Inspector

American Society of Non-Destructive Testing (ASNT) Certification

ASNT	Non-Destructive Testing Technician – Level II or III.

International Code Council (ICC) Certification

ICC-SMSI	Structural Masonry Special Inspector
ICC-SWSI	Structural Steel and Welding Special Inspector
ICC-SFSI	Spray-Applied Fireproofing Special Inspector
ICC-PCSI	Prestressed Concrete Special Inspector
ICC-RCSI	Reinforced Concrete Special Inspector

National Institute for Certification in Engineering Technologies (NICET)

NICET-CT	Concrete Technician – Levels I, II, III & IV
NICET-ST	Soils Technician - Levels I, II, III & IV
NICET-GET	Geotechnical Engineering Technician - Levels I, II, III & IV

Exterior Design Institute (EDI) Certification

EDI-EIFS	EIFS Third Party Inspector

Other

Soils and Foundations

Item	Agency # (Qualif.)	Scope: Weekly UON
1.Shallow Foundations	*2 PE/GE*	*Inspect soils below footing for adequate bearing capacity and consistency with the geotechnical report.* *Inspect Removal of unsuitable material and preparation of subgrade prior to placement of controlled fill. (continuous)*
2. Controlled Structural Fill	*2* PE/GE	*Perform sieve tests (ASTM D422 and D1140) and modified proctor tests, D1557, for each source of material.* *Inspect placement, lift thickness and compaction of controlled fill. (Continuous)* *Test Density of each lift of fill by nuclear test methods (ASTM D2922)*
3. Deep Foundations	*PE/GE*	*Inspect and log pile driving operations. Record pile driving resistance and verify compliance with driving criteria.* *Inspect piles for damage from driving and plumbness.* *Verify pile size, length and accessories.* *Inspect installation of drilled pier foundations. Verify pier diameter, bell diameter, lengths, embedment into bedrock and suitability of end bearing strata.*
4. Load Testing		
5. Other:		*NA*

Cast-in-Place Concrete

Item	Agency # (Qualif.)	Scope: Weekly
1. Mix Design	*2* ACI-CCI PE	*Review concrete batch tickets and verify compliance with approved mix design. Verify that water added at the site does not exceed that allowed by the mix design.*
2. Material Certification	2 ACI-CCI	*Review with conformance to contract specification.*
3. Reinforcement Installation	*2* ACI-CCI ICC-RCSI	*Inspect size, spacing, cover, positioning and grade of reinforcing steel. Verify that reinforcing bars are free of form oil or other deleterious materials. Inspect bar laps and mechanical splices. Verify that bars are adequately tied and supported on chairs or bolsters*
4. Post-Tensioning Operations		
5. Welding of Reinforcing		
6. Anchor Rods	*2 ACI-CCI ICC-RCSI*	*Inspect size, positioning and embedment of anchor rods. Inspect concrete placement and consolidation around anchors.*
7. Concrete Placement	*2* *ACI-CCI ICC-RCSI*	*Inspect placement of concrete. Verify that concrete conveyance and depositing avoids segregation or contamination. Verify that concrete is properly consolidated.*
8. Sampling and Testing of Concrete	*4 ACI-CFTT ACI-STT*	*Test concrete compressive strength (ASTM C31 & C39), slump (ASTM C143), air-content (ASTM C231 or C173) and temperature (ASTM C1064). Continuous during pour.*
9. Curing and Protection	*2 ACI-CCI ICC-RCSI*	*Inspect curing, cold weather protection and hot weather protection procedures.*
10. Other:		

Masonry

Required Inspection Level: ☒ **1** ☐ **2**

Item	Agency # (Qualif.)	Scope
1. Material Certification		
2. Mixing of Mortar and Grout	*ICC-SMSI*	*Inspect proportioning, mixing and retempering of mortar and grout.*
3. Installation of Masonry	*ICC-SMSI*	*Inspect size, layout, bonding and placement of masonry units.*
4. Mortar Joints	*ICC-SMSI*	*Inspect construction of mortar joints including tooling and filling of head joints.*
5. Reinforcement Installation	*ICC-SMSI*	*Inspect placement, positioning and lapping of reinforcing steel.*
6. Prestressed Masonry		
7. Grouting Operations	*ICC-SMSI*	*Inspect placement and consolidation of grout. Inspect masonry clean-outs for high-lift grouting.*
7. Weather Protection	*ICC-SMSI*	*Inspect cold weather protection and hot weather protection procedures. Verify that wall cavities are protected against precipitation.*
9. Evaluation of Masonry Strength	*ICC-SMSI*	*Test compressive strength of mortar and grout cube samples (ASTM C780).* *Test compressive strength of masonry prisms (ASTM C1314).*
10. Anchors and Ties	*ICC-SMSI*	*Inspect size, location, spacing and embedment of dowels, anchors and ties.*
11. Other:		

Structural Steel

Item	Agency # (Qualif.)	Scope
1. Fabricator Certification/ Quality Control Procedures ☐ Fabricator Exempt	*AWS/AISC-SSI* *ICC-SWSI*	*Inspect Fabricator Quality Control Procedures*
2. Material Certification	*AWS/AISC-SSI* *ICC-SWSI*	*Review certified mill test reports and identification markings on wide-flange shapes, high-strength bolts, nuts and welding electrodes*
3. Open Web Steel Joists	*AWS/AISC-SSI* *ICC-SWSI*	*Inspect installation, field welding and bridging of joists.*
4. Bolting		
5. Welding	*AWS-CWI* *ASNT*	*Visually inspect all welds. Inspect pre-heat, post-heat and surface preparation between passes. Verify size and length of fillet welds.* *Ultrasonic testing of all full-penetration welds.*
6. Shear Connectors		.
7. Structural Details	*PE/SE*	*Inspect steel frame for compliance with structural drawings, including bracing, member configuration and connection details.*
8. Metal Deck	*AWS-CWI*	*Inspect welding and side-lap fastening of metal roof and floor deck.*
9. Other:		

SECTION 01510 -TEMPORARY_UTILITIES

PART_1_-_GENERAL

1.1 DESCRIPTION:

A. Furnish, install and maintain temporary utilities required for construction; remove on completion of work. Responsibility for providing specified temporary utilities shall be as follows:

1. Temporary sanitary facilities: General Trades Contractor.

2. Temporary light and power: Electrical Contractor install, maintain and meter. The Owner shall bear cost for energy consumed.

3. Temporary water: Plumbing Contractor shall provide and maintain the system. The Owner shall bear cost of water used during construction.

4. Temporary heat: HVAC contractor shall install, maintain and clean system. The Owner shall bear cost of energy consumed.

B. Related Requirements Specified in Other Sections:

1. SUMMARY OF WORK - Section 01010
2. FIELD OFFICES AND SHEDS - Section 01590

1.2 REQUIREMENTS OF REGULATORY AGENCIES:

A. Comply with National Electric Code.

B. Comply with federal, state and local codes and regulations and with utility company requirements.

PART_2_-_PRODUCTS

2.1 MATERIALS, GENERAL:

A. Materials may be new or used, but must be adequate in capacity for required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

B. Materials used for any temporary utility shall not be used in permanent system unless written approval is received from Architect.

2.2 TEMPORARY SANITARY FACILITIES:

A. General Trades Contractor shall:

1. Provide sanitary facilities in compliance with laws and regulations for use by all workers, all Contractors or Subcontractors, engaged on work.

2. Provide enclosed weatherproof, portable, chemical type temporary toilet facilities located where directed.

3. Provide and maintain temporary toilet accommodations for duration of project.

4. Service, clean and maintain facilities and enclosures in constant approved condition conforming to requirements of local governing health department sanitary codes.

5. Remove temporary toilet when directed.

2.3 TEMPORARY LIGHT AND POWER:

A. Electrical Contractor, provide temporary electric service, service switch and service panel for use on project as herein specified.

1. Locate service switch and panel in area as designated by the Architect.

2. Install service consisting of 200 amp., 120/208 volt, 60 HZ, single phase, 3 wire, with minimum of 20 circuits.

3. Install temporary service within fourteen (14) calendar days following written request by any Prime Contractor.

a. Contractor requesting temporary service installation, furnish Architect with one copy of request letter.

4. Electrical Contractor shall subfeed temporary field offices with 120/208 volt service.

5. Make all arrangements for installation of temporary electric service, pay all installation and related charges for this work and include costs in bid price.

B. The Electrical Contractor shall provide, maintain and remove temporary 120 volt convenience outlets spaced 50' o.c. each way for entire floor area of building. Install convenience outlets as work progresses and as required by various Contractors working on project.

C. The Electrical Contractor shall provide, maintain and remove temporary lighting. Install 100 watt lamp sockets and lamps spaced so that there will be 1/4 watt per sq. ft. of floor area. Install 100 watt lamps every 25 ft. at corridors and passages. Provide additional temporary lighting as required by local governing ordinances.

D. Extension cords or trailers for use with convenience outlets shall be provided by Contractor or trades using or requiring same.

E. Temporary lighting, in addition to that indicated above, shall be provided by Contractor or trades using or requiring same.

F. Power tools not exceeding 1 HP may be operated from temporary system.

G. Permanent installation shall not be used for temporary work without written approval from Architect.

H. Contractor or trades requiring electric service of a type other than that indicated above shall make provisions for and install such service as required. Costs involved for installing special service and energy consumed shall be borne by Contractor requiring same. Upon completion of work, remove temporary power lines referred to under this paragraph.

I. As soon as temporary light and power service lines are no longer required, they shall be removed. Damage to building or grounds resulting from installation or removal of temporary power and light service shall be restored to their original condition with costs for restoration work being borne by the Electrical Contractor.

J. Material used for temporary light and power system shall not be used in permanent system unless written approval is received from Architect.

K. Keep temporary lighting and power system operational commencing fifteen (15) minutes before established starting time of that trade which starts work earliest in morning and ending fifteen (15) minutes after established quitting time of that trade which stops work latest in evening. This applies to all weekdays, Monday through Friday inclusive, which are established as regular working days for any trade engaged in the work, and shall continue until final acceptance of the work or until these services are ordered terminated by Owner or Construction Manager.

L. All temporary wiring and equipment shall be in conformity with National Electric Code and OSHA Requirements.

2.4 TEMPORARY WATER:

A. The Plumbing Contractor shall install a temporary water meter service line connected to incoming water service at a point where directed by Architect.

1. Valve temporary water service adjacent to meter.

2. Extend temporary water line to one temporary hose bibb adjacent to building exterior.

3. Insulate temporary water line or otherwise install in such manner as to protect freezing or damage.

B. Prime Contractors shall provide all hoses and extensions from temporary hose bibb as required for performance of work.

C. Metered cost of all temporary water shall be borne by Owner until issuance of certificate of substantial completion.

D. As soon as temporary water lines, valves, hose bibbs, and water meter are no longer required, Plumbing Contractor shall remove them. Damage to building or grounds resulting from installation or removal of temporary water service shall be restored to their original condition with costs for restoration work being borne by Plumbing Contractor.

E. Material used for temporary water system shall not be used in permanent system unless written approval is received from Architect.

2.5 TEMPORARY HEAT:

A. Prior to new building areas being enclosed by walls and roof, if outside temperature shall fall below forty (40) degrees F. at any time during day or night and work in progress requires temporary heat for execution and protection, each Prime Contractor shall provide, at their own expense, all cold weather protection, approved temporary heat and fuel as necessary to maintain a temperature of at least fifty (50) degrees F., carry on work expeditiously during inclement weather, to protect all work and materials against injury from dampness and cold, to dry out building and to provide suitable working conditions for installation and curing of materials.

1. No work shall be stopped due to inclement weather.

2. Contractor(s) responsible for temporary heat under this subparagraph shall bear costs for same including fuel and operating costs.

B. As soon as building exterior walls have been erected and roof has been substantially completed, all exterior openings are closed up by either permanently glazed windows and doors or by adequate and approved temporary closings as determined in writing by Architect. The HVAC Contractor shall provide temporary heat whenever the outside temperature falls below forty (40) degrees F. at any time during the day or night.

1. Temporary heating system shall be sufficient to maintain a temperature inside building of a minimum of fifty (50) degrees F. at all times, twenty-four (24) hours per day, seven (7) days per week, as required to meet fully the contract requirements.

2. Provide higher temperatures at specific areas as required by Architect.

3. Heating method shall be by means of temporary unit heaters, fan coil units or other approved methods (electric heat is prohibited) conforming to all governing codes and OSHA Requirements, **or,**

4. The HVAC Contractor may utilize the permanent system to provide temporary heat. If utilized, the permanent equipment shall be refurbished as recommended by the manufacturer, and ductwork cleaned, prior to final acceptance.

5. Provide adequate ventilation for all heating units.

C. The HVAC Contractor shall bear costs to operate and maintain the temporary heat system. The Owner shall bear the costs of gas energy and duct cleaning.

D. Temporary heating system shall remain until date of issuance of certificate of substantial completion, after which Owner shall assume responsibility of operation and fuel/energy costs for permanent heating system.

E. Contractor responsible for temporary heat shall remove all soot smudges, foreign matter, and all other deposits resulting from heating equipment from all walls, ceilings, floors, and all exposed surfaces.

1. Repair damages to building resulting from installation, operation, or removal of temporary system without additional cost to Owner.

2. Clean interior surfaces of all ductwork and refurbish permanent HVAC equipment per Manufacturer’s recommendations.

2.6 TELEPHONE SERVICE:

A. The General Trades Contractor shall arrange for telephone service and provide a multiple page capable copy / fax machine in the General Trades Contractor provided field offices. Separate line for phone and fax are required.

PART_3_-_EXECUTION

3.1 GENERAL: Comply with requirements, if any, stipulated by Owner for use of existing utilities.

3.2 REMOVAL:

A. Completely remove materials and equipment when their use is no longer required.

1. Contractor responsible for installing temporary services assume responsibility and cost for removal.

B. Contractor responsible for installation of temporary service, clean and repair damage caused by temporary installations or use of temporary facilities.

1. Restore permanent facilities used for temporary services to satisfaction of Architect.

END_OF_SECTION

SECTION 01590 - FIELD_OFFICES_AND_SHEDS

PART_1_-_GENERAL

1.1 DESCRIPTION:

A. Furnish, install and maintain temporary field office during entire construction period.

1. General Trade Contractor shall provide for as long as required an approved temporary watertight field office for himself/herself and his/her subcontractors and Architect's temporary office. Office shall be provided with a vented space heater and lights.

a. Temporary office shall be a minimum of 10' x 40' with outside windows, outside door with provisions for locking either by means of cylinder lock or padlock, plan rack, plan table, one stool, and one 4-drawer locked file cabinet, one desk with chair. Office with large room for project meetings provide table and chairs for 18 attendees.

2. All other Prime Contractors, with construction manager’s approval can provide and maintain a separate field office which shall be located in vicinity of General Trade Contractor's field office.

3. At completion of project or when directed by Architect, remove all temporary offices, storage and work sheds and contents from site. Removal shall be performed by Contractors erecting temporary offices.

4. Costs for fuel consumed in conjunction with temporary offices shall be borne by the Prime Contractor.

5. Costs for electrical energy consumed in conjunction with temporary offices shall be borne by Owner.

6. Temporary offices shall be located on project site as designated by Architect. Damage to grounds resulting from installation, use and removal of temporary office shall be restored to its original condition with cost of restoration work being borne by Contractor responsible for offices.

B. Furnish, install and maintain storage and work sheds needed for construction. Coordinate location with construction manager.

C. Related Requirements Specified in Other Sections:

1. TEMPORARY ELECTRICITY - Section 01510
2. TEMPORARY TELEPHONE - Section 01510

1.2 REQUIREMENTS OF REGULATORY AGENCIES: Conform to applicable requirements of federal, state and local codes and regulations.

1.3 OTHER REQUIREMENTS:

A. Prior to installation of offices and sheds, consult with construction manager or owner on location, access and related facilities.

1.4 REQUIREMENTS FOR FACILITIES:

A. Construction:

1. Structurally sound, weathertight, with floors raised above ground.

2. Temperature transmission resistance: Compatible with occupancy and storage requirements.

3. Portable or mobile buildings may not be used.

B. Storage Sheds:

1. To requirements of various trades.

2. Dimensions: Adequate for storage and handling of products.

3. Ventilation: Comply with specified and code requirements for products stored.

4. Heating: Adequate to maintain temperatures specified in respective sections for products stored.

PART 2 - PRODUCTS

2.1 MATERIALS, EQUIPMENT AND FURNISHINGS: New or used, but serviceable and adequate for required purpose, and must not violate applicable codes or regulations.

PART 3 - EXECUTION

3.1 PREPARATION: Fill and grade sites for temporary structures for positive surface drainage.

3.2 INSTALLATION:

A. Construct temporary field offices and sheds on proper foundations; provide connections for utility services.

1. Secure portable or mobile buildings, if used.

2. Provide steps and landings at entrances.

B. Mount thermometer at convenient outside location, out of direct sunlight.

3.3 MAINTENANCE AND CLEANING: Maintain temporary structures, furnishings and equipment in clean, operable condition.

3.4 REMOVAL:

A. Remove temporary field offices, contents and services at a time they are no longer needed.

B. Remove sheds when no longer required.

C. Remove foundations and debris, grade site to required elevations and clean areas.

D. Removal work and clean up shall be executed by Contractor installing temporary structure.

3.5 TEMPORARY ROADS, PARKING & STAGING AREAS:

A. The Sitework Contractor shall provide and continuously maintain (while active on the site) the roadways, parking and staging areas indicated on the Contract Documents.

B. The parking and staging areas, and the site in general, shall be kept neat and free of construction debris at all times.

C. The General Trades Contractor shall provide and continuously maintain all temporary roads required for access to the building footprint and/or point of work.

D. The Contractor responsible shall suppress any dust, and immediately remove any mud/dirt from roadways, which result from their Work, and shall provide and maintain all necessary safety signage, flagman services, etc necessary for safe movement of vehicles and equipment into and around the site.

END OF SECTION

SECTION 01700 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Related Requirements Specified Elsewhere
1. Project Record Documents: Section 01720.
2. Closeout Submittals Required of Trades: The respective sections of specifications.

1.02 SUBSTANTIAL COMPLETION

A. Contractor

1. Submit written notice to Construction Manager that Project, or designated portion of Project, is Substantially Complete.

2. Submit list of major items to be completed or corrected.

1.03 INSPECTION

A. Contractor shall submit written certification that:

1. Contract Documents have been reviewed.

2. Project is completed and is in compliance with Contract Documents.

3. Equipment and systems have been tested in presence of Owner's Representative and are operational.

B. Construction Manager will make final inspection within seven days after receipt of certification.

C. Should Construction Manager consider that Work is finally complete in accordance with requirements of Contract Documents, he shall request Contractor to make Project Closeout submittals.

1.04 CLOSEOUT SUBMITTALS

A. Upon completion of the Work of this Section, Contractor shall submit to the Construction Manager, all required closeout documents.

B. Contractor shall submit a marked-up set of drawings indicating any changes made during construction to the Construction Manager.

C. Upon completion, submit to the Construction Manager, a Contractor's Affidavit of Payment of Debts and Claims, and Release of Liens.

D. Refer to General Conditions for additional requirements.

1.05 INSTRUCTION OF OWNER'S REPRESENTATIVE

A. Before final acceptance, thoroughly instruct a designated representative of the Owner in the proper operation of all systems and apparatus installed under this contract.

B. The Contractor shall prepare and forward to the Construction Manager at the completion of the job three brochures, each neatly bound, of the following items.

1. Typed or printed instructions covering the care and operation of mechanical and electrical equipment furnished and installed under this Contract.

2. Manufacturer's instruction books, diagrams, and spare parts lists covering all equipment.

3. All approved shop drawings.

4. Air and water systems balancing reports.

5. Certificates of compliance and inspection.

C. Each brochure shall be a hard cover, three-ring binder or binders.

1.06 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS

A. Contractor's Affidavit of Payment of Debts and Claims: AIA G706.

B. Contractor's Affidavit of Release of Liens: AIA G706A, with:

1. Consent of Surety to Final Payment: AIA G707.

2. Separate written releases of waivers of liens for subcontractors, suppliers, and others with lien rights against property of Owner, together with list of those parties.

3. Contractor's written release or waiver of lien upon payment to the Contractor pursuant to New York State Lien Law.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

SECTION 01720 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Related Requirements Specified Elsewhere

1. Shop Drawings, Product Data and Samples: Section 01300.

1.02 MAINTENANCE OF DOCUMENTS

A. Maintain, at job site, one copy of:

1. Contract Drawings
2. Project Manual
3. Addenda
4. Approved Shop Drawings, Product Data, and Samples
5. Supplemental Instructions
6. Other Modifications to Contract
7. Field Test Records
8. Correspondence File

B. Store documents in approved locations, apart from documents used for construction.

C. Provide files and racks for storage of documents.

D. Maintain documents in clean, dry, legible conditions.

E. Do not use record documents for construction purposes.

F. Make documents available at all times for inspection by Construction Manager, Architect/Engineer, and Owner.

G. File documents in accordance with Table of Contents of Project Manual.

1.03 MARKING DEVICES

A. Provide felt marking pen for marking, conforming to following color code:

1. Red for general construction work.
2. Blue for plumbing work.
3. Green for heating, ventilating work.
4. Brown for electrical work.

5. Black for other written notations.
6. Orange for sitework.

1.04 RECORDING

A. Label each document "PROJECT RECORD" in 2 inch high printed letters.

B. Keep record documents current.

C. Do not permanently conceal any work until required information has been recorded.

D. Contract Drawings

1. Legibly mark to record actual construction:

a. Depths of various elements of foundation in relation to the finish floor.

b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.

c. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.

d. Field changes of dimension and detail.

e. Changes made by Supplemental Instructions or Change Order.

f. Details not on original Contract Drawings as directed by the Construction Manager.

E. Specifications and Addenda

1. Legibly mark-up each section to record:

a. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.

b. Changes made by Supplemental Instructions or Change Order.

c. Other matters not originally specified.

F. Shop Drawings, Product Data and Samples: Maintain as record documents. Legibly mark-up approved submittals to show changes made after review.

1.05 SUBMITTAL

A. At completion of project or your portion of work, deliver record documents to Construction Manager.

B. Accompany submittal with transmittal letter, in duplicate containing:

1. Date
2. Project title and number
3. Contractor's name and address
4. Title and number of each record document
5. Certification that each document as submitted is complete and accurate
6. Signature of Contractor, or his authorized representative.

1.06 CLOSEOUT SUBMITTALS

A. Upon completion of the Work of this Section, Contractor shall submit to the Construction Manager, all required closeout documents.

B. Contractor shall submit a marked-up set of drawings indicating any changes made during construction to the Construction Manager.

C. Upon completion, submit to the Construction Manager, a Contractor's Affidavit of Payment of Debts and Claims, and Release of Liens.

D. Refer to General Conditions for additional requirements.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

SECTION 01730 - OPERATIONS AND MAINTENANCE DATA

1.0 GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Shop Drawings, Product Data and Samples: Section 01300.

B. Maintenance Manuals for mechanical and electrical work: Division 15 and 16.

1.2 DESCRIPTION

A. Manuals: Purpose

1. Operation and maintenance manuals will be used for training of, and use by, Owner's personnel in operation and maintenance of mechanical and electrical systems and equipment. A separate manual or chapter within a manual shall be prepared for each class of equipment or system.
2. For additional requirements refer to various specification sections.

B. Required: Manuals are required for all systems and equipment.

C. Contents: Each manual or chapter shall include:

1. Table of contents.
2. Description of system or equipment.
3. Operating sequence and procedures
4. Safety instructions
5. Maintenance instructions and requirements, including preventative and corrective maintenance.
6. Spare parts list.

D. Shop Drawings: Each manual shall be accompanied by shop drawings of the system or equipment as installed.

E. Copies

1. Submit three (3) copies of manuals to Architect for review.
2. After Architect's review, he will submit two (2) copies of manuals to Owner for review and acceptance prior to final payment.

F. Instructions of Owner's Personnel

1. Fully instruct Owner's designated operating and maintenance personnel in operating, adjustments and maintenance of all mechanical and electrical systems and equipment as required by respective and pertinent sections, after all final inspection, tests and repairs have been completed.
2. Operating and maintenance manuals shall constitute the basis of instructions. Contents of manual shall be reviewed in full detail, explaining all aspects of operations and maintenance.
3. Prepare and include additional data when need for such data becomes apparent during instruction and training sessions.
4. Training sessions shall be jointly arranged with Owner during Contractor's normal week and daily hours. The Owner shall have the responsibility of scheduling its shift work personnel accordingly.
5. Owner and Contractor shall coordinate and cooperate to keep training sessions to a reasonable minimum.

1.3 INSTRUCTIONS FOR MAINTENANCE OF SURFACES

A. Purpose: To instruct Owner's maintenance personnel in proper methods and materials to use in the proper care of all exposed surfaces.

B. Content

1. Recommended cleaning materials.
2. Recommended preventative maintenance.
3. Recommended methods and procedures.

C. Copies

1. Submit three (3) copies of Instructions for Maintenance to Architect for review.
2. After Architect's review, he will submit two (2) copies of Instructions for Maintenance to Owner for review and acceptance prior to final payment.

2.0 PRODUCTS - NOT USED

3.0 EXECUTION - NOT USED

SECTION 01750 - WARRANTIES

1.0 GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Operation and Maintenance Data: Section 01730

1.2 DESCRIPTION

A. Warranties shall include

1. One (1) year warranty as required by General Conditions.
2. Extended warranties required by various specification sections.

B. Submit warranties to Architect for his review.

C. After Architect's review, he will submit warranties to Owner for review and acceptance, prior to final payment.

2.0 PRODUCTS - NOT USED

3.0 EXECUTION - NOT USED

SECTION 02050 -DEMOLITION

PART 1 -GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification Sections apply to this section.

1.2 SUMMARY:

A. Extent of demolition is indicated on drawings and in provisions of this section.

B. Execute removals, extractions, demolition or portions of existing building(s) required for renovation work as indicated on drawings.

C. Erect temporary dust barriers, temporary fire rated barriers, protection barriers, as specified and/or as required for proper execution of work.

D. Remove demolition debris from site.

1.3 QUALITY ASSURANCE:

A. Regulatory Agencies: Conform to applicable regulations, codes, statutes of agencies having jurisdiction over work and transportation incidental thereto. Include but do not limit to following:
   1. State of New York Department of Labor.
   2. State of New York Department of Health.
   3. OSHA.

1.4 PROTECTION:

A. Erect barriers, fences, guard rails, enclosures and shoring to protect personnel, structure and utilities.

B. Protect designated trees and shrubs from damage.

1.5 SHORING AND BRACING SYSTEM:

A. General: Engineer, design, fabricate and erect shoring and bracing system to protect existing buildings, streets, walkways, utilities and other improvements and excavation against loss of ground, caving embankments or collapse. Design system to withstand loads from winds, gravity, structural movement including movement thermally induced and to resist in-service use conditions that the building will experience, including exposure to the weather without failure.

PART 2 – PRODUCTS
NOT USED

PART 3 - EXECUTION

3.1 INSPECTION:

A. Verify that demolition indicated on drawings can be accomplished without damage to remaining portions of building(s) or other improvements indicated to remain.

B. Report to Architect any conditions in building or environs appearing to prevent demolition conforming to these specifications.

C. Do not proceed with execution until unsatisfactory conditions are corrected.

3.2 PREPARATION:

A. Prior to Start and During Execution of Demolition Work:
   1. Protect adjacent buildings and property against damage which might occur from falling debris or other causes.
   2. Provide protection against damage to existing roof areas on portions of buildings below and/or adjacent to areas where demolition work is required. Assume responsibility for satisfactory repair to existing roof areas damaged by reason of work under this section, without additional cost to Owner.
   3. Take precautions against movement or settlement of buildings. Provide, place bearing or shoring necessary or proper in connection therewith. Be responsible for safety, support of such buildings. Be liable for any such movement or settlement, any damage or injury caused thereby or resulting therefrom. If at any time safety of buildings appears to be endangered, cease operation. Notify Architect. If Architect considers additional bracing, or shoring necessary to safeguard, prevent such movement or settlement, install bracing or shoring upon Architect's order. If contractor fails to comply promptly with such order, bracing and shoring may be placed by Architect at contractor's expense.
   4. During demolition operations, install dust barriers as required to prevent infiltration of dust to parts of building not effected by demolition work.
   5. At existing interior areas of building requiring renovation and at transitions between existing and new construction, erect a temporary one-hour wall constructed between work area(s) and the remainder of functioning area(s).
      a. Any openings required in these walls shall have a solid core wood door with positive latching and closer hardware.
      b. Hold-open devices and/or wedges to hold door open will not be permitted.
   6. In areas where existing structures and chimney are indicated to be demolished, provide protection of adjacent structures, erect barricades, establish zones of demolition, and any additional precautions necessary, in accordance with requirements set forth in State of New York Department of Labor Industrial Code Rule 23.
      a. Conform to Section No. 23-3.2 "General Requirements, Industrial Code Rule 23, for Preparations Required Prior to Demolition of Existing Structures".
   7. Where existing materials are removed from scheduled openings in exterior walls, provide necessary protection for such openings as required for security and to prevent infiltration caused by inclement weather.

3.3 DEMOLITION:

A. Condition of Premises: Accept premises as found; perform demolition work indicated. Owner assumes no responsibility for condition of existing building(s) at site nor continuation of condition existing at time of proposal invitation or thereafter.

B. Materials forming permanent part of building requiring demolition become contractor's property and shall be removed from site unless scheduled to be relocated or reinstalled. Sale of salvaged material at site will not be allowed.

C. Demolish walls and slabs in small sections, remove, lower carefully, structural steel, metal framing or other structural members.

D. Where removal of existing bearing walls affects bearing of structures or concrete slabs above, install new beam or other support of sufficient size to carry load previously imposed on wall.

E. Repair damage done to Owner's property or any other person or persons on or off premises by reason of required work without additional cost to Owner.

F. With exception of structures required to be demolished, any utility line, cable or pipe damaged during demolition shall be repaired and left in complete working condition. Plug or cap any lines no longer required. Work on damaged utilities shall be done by skilled workmen.
   1. All utility lines, in and beneath existing concrete floor slab to be removed shall remain intact and new slab poured over.
   2. All utility lines in existing walls being removed shall be relocated to new partitions and remain in service. Appropriate trade shall relocate at no additional cost to Owner.

G. Carefully extract items of equipment scheduled to be retained by Owner and store where directed by Owner.

H. Examine contract documents carefully for requirements indicating various existing building materials forming parts of building scheduled for demolition that shall be relocated, reinstalled or reused in work required on this project. It is imperative that contractor exercise caution during demolition operations to retain said material intact and to salvage and carefully store materials as required for reuse.

I. Work involving use of noise producing tools and machinery (air hammer, power tools, and any other similar item) shall be coordinated with Owner before proceeding with work.

J. Any blasting work to be performed shall be coordinated with Owner before proceeding with work.

K. Where existing structures are required to be demolished, execute removal of materials by picking method. Do not permit structures to be demolished by collapsing or swing ball methods.

3.4 SPECIAL REQUIREMENTS:

A. Do not block or interfere with designated access to building for emergency vehicles and/or personnel.

B. Do not interfere with designated ingress and egress to existing building(s) required to function normally day to day.

C. Do not interfere with use of designated existing parking lots.

D. Where cranes and/or similar equipment are employed on project, it will be required that operations be licensed as required by governing laws of State of New York.

3.5 CLEANING:

A. Remove excess debris as it accumulates from demolition operations. Do not store or permit debris to accumulate on site.

B. Transport demolition debris to lawful off-site disposal area.

END OF SECTION

SECTION 02200 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns, and plantings.
2. Excavating and backfilling for buildings and structures.
3. Drainage course for slabs-on-grade.
4. Subbase course for concrete walks and pavements.
5. Base course for asphalt paving.
6. Excavating and backfilling trenches within building lines.
7. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.

B. Related Sections include the following:
1. Division 1 Section "Construction Facilities and Temporary Controls."
2. Division 2 Section "Site Clearing" for site stripping, grubbing, removing topsoil, and protecting trees to remain.
3. Division 2 Section "Excavation Support and Protection."
4. Division 2 Section "Landscaping" for finish grading, including placing and preparing topsoil for lawns and plantings.
5. Division 3 Section "Cast-in-Place Concrete" for granular course over vapor retarder.
6. Division 15 and 16 Sections for excavating and backfilling buried mechanical and electrical utilities and buried utility structures.

1.3 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.
1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Layer placed between the Sub-base course and asphalt paving.

C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations.

1. Additional Excavation: Excavation below subgrade elevations as directed by Architect. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

2. Bulk Excavation: Excavations more than 10 feet (3 m) in width and pits more than 30 feet (9 m) in either length or width.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.

J. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

K. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1.5 inches (50 mm) in diameter; and free of weeds, roots, and other deleterious materials. On-site topsoil to be screened to 1" maximum, prior to reuse.

L. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

A. Samples: For the following:
1. 30-lb (14-kg) samples, sealed in airtight containers, of each proposed soil material from on-site or borrow sources.

B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
1. Laboratory compaction curve according to ASTM D-1557 (AASHTO T-180) for each on-site or borrow soil material proposed for fill and backfill.

1.5 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.

B. Pre-excavation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.6 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.
3. Contact utility-locator service for area where Project is located before excavating.

4. Protect existing utilities indicated to remain.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils:
1. Fill and Backfill: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; R.O.B. gravel or run of crushed stone: NYSDOT Section 304 Type 4 (stone or gravel only) free of rock or gravel larger than 2" in any dimension, debris, waste, frozen material, vegetation, or other deleterious matter.
2. General fill: Outside of building and not under walls and pavement: excavated material.

C. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Select structural or engineered fill: sub-base or base materials.

E. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; complying with NYSDOT Section 304 Type 4.

F. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; complying with NYSDOT Section 304 Type 3.

G. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

H. Filtering Material: Evenly graded mixture of natural or crushed gravel or crushed stone conforming to New York State D.O.T. Specification 703-02, Size No. 2.

I. Graded Drainage Material: This gravel shall be a washed pea stone or crushed limestone that meets the following criteria: Gravel materials shall not have an LA Abrasion test (ASTM C-131) value exceeding 40, and a loss not exceeding 12% using the sulfate soundness test (ASTM C-88). In addition, the under drainage stone must meet the following particle size criteria:
1. 100% passing a ½" sieve
2. No more than 10% passing a 2-mm (No. 10) Sieve.
3. No more than 5% passing a 1-mm (No. 18) Sieve.
4. A uniformity coefficient (D_{90}/D_{15}) of less than or equal to 2.
5. The D_{15} of gravel must be less than or equal to 5 X D_{85} of the root zone mix.
6. The D_{15} of gravel must be greater than 5 X D_{15} of the root zone mix.

J. Processed Sand: The sand shall meet the following particle size criteria:

	Sieve Mesh	Diameter of sieve (mm)	Allowable range % retained
Gravel	10	2	0 - 5%
Very coarse sand	18	1	0 - 20% combined with Gravel
Coarse	35	0.5	at least 60% in this range
Medium	60	0.25	
Fine	100	0.15	20% maximum
Very fine	270	0.05	3% maximum
Silt		0.002	5% maximum
Clay		<0.002	3% maximum

In addition, there should be 100% passing the No. 5 sieve (4 mm), and no more than 10% combined very fine sand, silt, and clay.

K. Stone Fill: Material shall comply with NYSDOT Standard Specifications Section 620. Stone fill is to be installed as rip-rap stone erosion protection at the location shown on the plans.

L. Topsoil: Topsoil shall be native topsoil from site that has been screened to remove all material that is larger than 1" in largest dimension. If there is insufficient quantity of topsoil, contractor shall provide all extra material needed from off-site sources. Off-site topsoil is the naturally-occurring surface layer of soil, free from admixtures of refuse, subsoil, stumps, roots, brush, stones, clay lumps or similar objects larger than 1½" in greatest dimension or material toxic to plant growth. Acidity/alkalinity range: pH 5.5-7.6. Organic content: not less than 4% nor more than 20%. Particle size: Not less than 20% nor more than 80% passing the No. 200 sieve. Material brought on-site or reused is to be tested if ordered by the engineer or site construction manager. Failure of any parameter listed above may be grounds for rejection of material.

PART 3 - EXECUTION

3.1 PREPARATION

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

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

C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

D. Protection: provide markers indicating limits of work and clear identification of items and areas requiring protection.

E. Provide barricades, warning signs, and warning lights around open excavations as necessary to prevent injury to persons.

F. The contractor is solely responsible for determining the potential for injury to persons and damage to property.
   1. Where such potential is present, take appropriate protective measures.
   2. Protect persons from injury and protect existing and new improvements from damage caused directly or indirectly by construction operations.

G. Provide temporary guards to protect trees and vegetation to remain. Place guards so as to prevent all forms of vehicular traffic or parking within drip lines.
   1. Do not allow excess foot traffic within drip lines.
   2. Do not stockpile construction materials, soil, or aggregates within drip lines.
   3. Water trees and other vegetation to remain within limits of the area of construction activities as required to maintain their health during course of construction operations.

H. Raising Grades:
   1. Minor fills less than six inches: Place specified topsoil without compacting, and finish grade by hand.

I. Promptly repair any damaged trees to prevent death or loss of vigor.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
   1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
   2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

C. Do not allow water to flow in an uncontrolled fashion across the project site or to erode slopes or to undermine foundations. Do not allow water to be diverted onto adjacent properties. Arrange excavation operations so as to provide continual and effective drainage of excavations.

D. Provide and maintain temporary diversion ditches, dikes, and grading as necessary; do not use trench excavations for this purpose. When required by surface or subsurface water conditions, provide sumps, wellpoints, French drains, pumps, and other control measures necessary to keep excavations free of water. When existence of ground water near or above final excavation level is indicated or suspected, provide control measures prior to excavating to water level and maintain water level continuously below working level.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.
   1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
   1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

2. Pile Foundations: Stop excavations from 6 to 12 inches (152 to 305 mm) above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended for bearing surface.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.
   1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (305 mm) higher than top of pipe or conduit, unless otherwise indicated.
   1. Clearance: 12 inches (300 mm) on each side of pipe or conduit.
   2. Clearance: As indicated.

C. Trench Bottoms: Excavate trenches 6 inches (101 mm) deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe. Remove projecting stones and sharp objects along trench subgrade.
   1. Excavate trenches 6 inches (152 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.8 APPROVAL OF SUBGRADE

A. Notify Architect when excavations have reached required subgrade.

B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
   1. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

C. Proof roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Architect.
   1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:
   1. Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
   2. Surveying locations of underground utilities for record documents.
   3. Inspecting and testing underground utilities.
   4. Removing concrete formwork.
   5. Removing trash and debris.
   6. Removing temporary shoring and bracing, and sheeting.
   7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.12 UTILITY TRENCH BACKFILL

A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

B. Backfill trenches excavated under footings and within 18 inches (457 mm) of bottom of footings; fill with concrete to elevation of bottom of footings.

C. Provide 4-inch- (100-mm-) thick, concrete-base slab support for piping or conduit less than 30 inches (750 mm) below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches (100 mm) of concrete before backfilling or placing roadway subbase.

D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch (25 mm), to a height of 12 inches (305 mm) over the utility pipe or conduit.
   1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.

E. Coordinate backfilling with utilities testing.

F. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.

G. Place and compact final backfill of satisfactory soil material to final subgrade.

3.13 FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.
   1. Break up existing pavement in areas indicated before filling over.
   2. Should density of subgrade to receive fill be less than specified for fill, break up and pulverize subgrade to a depth of at least six inches, moisture condition if necessary, and recompact to required density at optimum moisture content.

B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

C. Place and compact fill material in layers to required elevations as follows:
   1. Under grass and planted areas, use satisfactory soil material.
   2. Under walks and pavements, use satisfactory soil material.

3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Playing field surface treatment – topsoil and vessel compost, with infield clay in baseball diamonds, to be mechanically mixed before placement, to a depth shown on plans or as recommended by manufacturer.

3.14 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF BACKFILLS AND FILLS

A. Place backfill and fill materials in layers not more than 8 inches (203 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (101 mm) in loose depth for material compacted by hand-operated tampers.

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

C. Compact soil to not less than the following percentages according to ASTM D-1557 (modified proctor).
1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (305 mm) of existing subgrade and each layer of backfill or fill material at 95 percent.
2. Under walkways, scarify and recompact top 12 inches below subgrade and compact each layer of backfill or fill material at 95 percent.
3. Under lawn or unpaved areas, scarify and recompact top 12 inches below subgrade and compact each layer of backfill or fill material at 90 percent.
4. Under and around playing fields, scarify and recompact top 12 inches below subgrade and compact each layer of backfill or fill material at 92 percent.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Lawn or Unpaved Areas: Plus or minus 1 inch (25 mm).
2. Walks: Plus or minus 1/2 inch (13 mm).
3. Pavements: Plus or minus 1/2 inch (13 mm).

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.

3.17 SUBBASE AND BASE COURSES

A. Install separation fabric on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.

B. Under pavements and walks, place subbase course on separation fabric according to fabric manufacturer's written instructions and as follows:

C. Under pavements and walks, place subbase course on prepared subgrade and as follows:
   1. Place base course material over subbase.
   2. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D-1557.
   3. Shape subbase and base to required crown elevations and cross-slope grades.
   4. When thickness of compacted subbase or base course is 6 inches (152 mm) or less, place materials in a single layer.
   5. When thickness of compacted subbase or base course exceeds 6 inches (152 mm), place materials in equal layers, with no layer more than 6 inches (152 mm) thick or less than 3 inches (76 mm) thick when compacted.

D. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches (305 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D-1557.

3.18 DRAINAGE COURSE

A. Under slabs-on-grade, place drainage course on prepared subgrade and as follows:
   1. Compact drainage course to required cross sections and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D-1557.
   2. When compacted thickness of drainage course is 6 inches (152 mm) or less, place materials in a single layer.
   3. When compacted thickness of drainage course exceeds 6 inches (152 mm), place materials in equal layers, with no layer more than 6 inches (152 mm) thick or less than 3 inches (76 mm) thick when compacted.

3.19 PLACING TOPSOIL

A. Topsoil is to be screened before placement.

B. A uniform layer of 6” topsoil (or as indicated on plans) is to be placed in all areas to be seeded except where playing field top dressing is to be placed. Remove stones, clay lumps and other objects larger than 1” in greatest dimension.

C. Fine grade to within 1” of finished contours. Do not compact topsoil.

3.20 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
   1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
   2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet (46 m) or less of trench length, but no fewer than two tests per lift per trench.
   3. Playing Field Areas: At subgrade and at each compacted fill and backfill layer at least one test for every 2000 sq. ft. (186 sq. m) or less, but in no case fewer that three tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

F. Maximum density at Optimum Moisture Content: Determine in accordance with ASTM D-1557.
   1. For each subgrade, fill, and backfill material, perform one moisture-density relationship test for each 1500 cubic yards, or fraction thereof, of material used.

G. Foundation Wall Backfill: Conduct not less than two in-place density tests per lift.

3.21 PROTECTION

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

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

B. Stockpile any excess satisfactory topsoil in locations on site as directed by the architect. Properly dispose of unsatisfactory topsoil off site.

C. Stockpile or spread any excess satisfactory soil in location site as directed by the architect.

END OF SECTION 02200

SECTION 02210 – EARTHWORK WITHIN THE BUILDING CONSTRAINTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

Furnish all labor, material and equipment necessary to complete all site earthwork, as shown and specified, including but not limited to the following:

1. Excavation, filling, grading and subgrade preparation for building slabs.

2. Excavation, trenching and backfilling for all structures, foundations, and other improvements.

3. Disposal of all excess and waste materials (including oil contaminated soils).

B. Related Work Specified Elsewhere:

1. Subsurface Data Logs - See Bidding Requirements.

2. Testing Laboratory Services - See Section 01410.

3. Site Clearing and Preparation - See Section 02110.

4. Shoring and Bracing - See Section 02150.

5. Excavation and Rough Grade Backfill for Mechanical Work - See Division 15.

6. Excavation and Rough Grade Backfill for Electrical Work - See Division 16.0.

1.02 REQUIREMENTS FOR REGULATORY AGENCIES

A. State and Federal Code requirements shall control the disposal of waste materials and contaminated soils, if encountered.

1.03 STANDARDS

A. Comply with the State Department of Transportation Standards except as otherwise specified herein.

B. Comply with State and Local Environmental Standards as specified herein.

1.04 COOPERATION

A. Examine Drawings and specifications for all Contracts, to determine nature of proposed construction. Perform work to conform with construction called for in such a manner as not to interfere or delay work of other Contractors.

1.05 JOB CONDITIONS

A. Test borings have been made by Owner at the locations shown. The approximate character of the encountered subsoils and depths of various strata, as disclosed by the borings, are shown on the enclosed boring logs. This data is included as general information only and the Owner does not guarantee that conditions differing greatly from those disclosed by the borings will not be encountered at other points on the site.

B. A Geotechnical Report has been prepared by the Owner's Geotechnical Engineer and is available, upon request, from the Owner.

C. As shown on the site drawings, below grade obstructions consisting of previous building foundations, walls, slabs, storage tanks, pits and utility appurtenances are assumed to exist across the proposed building site. The exact quantity, size, location and elevation of existing below grade obstructions to be demolished and removed are unknown. The information provided on the Contract Documents is approximate and is to be used only as a guide during the bidding phase and demolition operations. The Owner/Architect assumes no responsibility for the accuracy or completeness of the Geotechnical Investigation. If actual below grade conditions vary from information shown on the Contract Documents, notify the Architect or Owner's field representative immediately for additional information or direction. Continue with excavation only after receiving a written notice to proceed.

D. Should uncharted or incorrectly charted below grade obstructions, rubble, existing building foundations, fill, or deleterious (organic) materials be encountered during excavation, notify the Architect or Owner's field representative immediately for additional information or direction.

1.06 EXISTING UTILITIES

A. Locate existing underground utilities in the area of work.

B. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the Architect/Engineer immediately for direction.

C. Do not interrupt existing utilities serving facilities occupied or used by the Owner or others except when a temporary utility plan is provided by the Architect.

D. Provide adequate protection for aerial or underground utility lines noted to remain.

E. Demolish and dispose of existing underground utilities indicated to be removed and plug open ends with concrete. Coordinate with utility owners for shut-off of services if lines are active.

F. Repair damaged utility lines to the satisfaction of the utility owner.

1.07 PROTECTION

A. Protect the excavation and/or exposed building walls and foundations from frost and freezing until concrete work can be performed.

B. Protect existing structures and site features noted to remain against damage during all sequences of construction.

C. Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.

D. In case of any damage or injury caused in the performance of this work, the Contractor shall, at his own expense, make good such damage or injury to the satisfaction of the Owner. Existing roads, walks, curbs and buildings damaged during project work shall be repaired or replaced to their original condition at the commencement of operations.

1.08 INSPECTION, TESTING AND QUALITY CONTROL

A. A Soils Testing Agency will be employed by the Owner for quality control, testing and inspection of work and materials during earthwork operations.

B. The service of this testing agency is intended for the Owner's verification and shall in no way relieve the Contractor of his responsibility to be in compliance with the requirements of the Contract Documents and to provide his own inspection and quality control.

C. The following minimum tests shall be made. ASTM Designations specified refer to the latest publication.

1. Existing Subgrades

a. Field verification of proofrolled subgrades.

2. Borrow Materials

a. Particle Size Analysis, ASTM C-117.

b. Maximum Density and Optimum Moisture Content, ASTM D-1557 or Relative Density, ASTM D-4253 or ASTM D-4254.

c. Plasticity Index, ASTM D-4318.

d. Frost Susceptibility Analysis.

3. Compacted Fill Materials

a. In Place Density, ASTM D-1556 (sand cone) or ASTM D-2922 (nuclear).

b. Moisture Content, ASTM D-2216.

c. Verification of all natural soil, structural fill or rock foundation subgrades for a design bearing pressure of 3000 pounds per square foot.

D. All tests on borrow materials shall be performed before acceptance and delivery of fill to the site. Any change in the source of material or change in quality of the material will require a new series of tests to determine acceptability.

E. Delivery and compaction of fill material shall be made during the presence of the Soils Testing Agency and shall be subject to their approval. This inspection by no means absolves the Contractor from responsibility of compaction as specified.

F. Acceptance and rejection of fill placed in accordance with 95%, and 90% (as specified) of maximum density attainable by the Modified Proctor Method of Compaction (ASTM D-1557) shall be based upon the following in place density test result requirements for each lift, and all other requirements as stated in the Specifications.

1. Requirements for 95% of Maximum Density (ASTM D-1557). The results of all in place density tests must meet the following requirements.

a. The average of any three consecutive tests shall be equal to, or greater than, 95% of the maximum density.

b. No more than one in four consecutive tests shall be less than 95% of the maximum density.

c. No test result shall be less than 94.0% of the maximum density.

3. Requirements for 90% of the Maximum Density (ASTM D-1557). The results of all in place density tests must be greater than or equal to 90% of the maximum density.

G. An alternative appropriate density test procedure shall be determined by the Soils Testing Agency to obtain the maximum density where material gradations do not permit use of ASTM D-1557 to determine the maximum density requirement will be based.

H. All earthwork shall be performed by personnel experienced in these operations. It is the responsibility of the Contractor to provide such personnel.

1.09 SUBMITTALS

A. Test Reports - Soils Testing Agency:

Submit reports for all earthwork inspections and tests. Furnish three (3) copies directly to the Architect, one (1) copy to the Contractor, and any others as indicated.

B. Submit evidence to the Architect/Engineer that the borrow material supplier is certified to produce fill material which conforms to the New York State Department of Transportation (NYSDOT).

PART 2 - PRODUCTS

2.01 MATERIALS

A. General Fill:

1. Satisfactory soil materials including sand, gravel, friable earth or clays of low plasticity, free of organic materials, frozen material, trash, masonry, rubble, concrete, debris and free of stones having a dimension of 4-inches or greater.

B. Gravel:

1. Comply with NYSDOT Item 703-02, Type 1. Slag not permitted.

2. Clean, hard, sound, durable, uniform in quality, and free from any organic or deleterious materials, with the following gradation requirements:

Sieve Size	Percent Passing
1"	100
1/2"	90 - 100

1/4"	0 - 15

D. Structural Fill:

1. Comply with NYSDOT Item 304-2.02, Type 2 or Type 4. Slag not permitted.

2. Clean, hard, sound, durable, uniform in quality, and free from any organic or deleterious materials, with the following gradation requirements:

Sieve Size	Percent Passing
2"	100
1/4"	25 - 60
No. 40	5 - 40
No. 200	0 - 10

E. Crushed Stone:

1. Comply with NYSDOT 703-02.

2. Crushed stone or washed crushed gravel, hard, sound, durable, uniform in quality and free of any detrimental quantity of soft, friable, thin, elongated or laminated pieces, disintegrated material, organic matter, oil alkali or deleterious substances.

Sieve Size	Percent Passing
1-1/2"	100
1"	90 - 100
1/2"	25 - 60
No. 4	0 - 10
No. 8	0 - 5

F. Woven Geotextile Fabric:

1. Subject to compliance with project requirements, provide one (1) of the following:

   a. Terratex GS
   b. Exxon GTF 200
   c. Mirafi 500X
   d. Amoco 2002

PART 3 - EXECUTION

3.01 GENERAL

A. Excavate for proper placing of required work to elevations and dimensions indicated, plus sufficient space to permit erection of forms, shoring, drain tile, and the inspection of foundations. Contact pertinent utility company before excavating near underground lines.

B. Excavated materials are assumed to be earth and other materials that can be removed with power shovel, except where rock is indicated.

C. Rock is defined as any material which cannot be dislodged and excavated with modern track-mounted heavy-duty excavating equipment equipped with a 2-3/8 cubic yard bucket and appropriately sized "Ho-Ram" and without drilling, blasting or ripping. Typical of materials classified as rock are boulders 1/2 cubic yard or more in volume, and solid cementitious aggregate deposits.

D. Do not perform rock excavation work until material to be excavated has been cross-sectioned and classified by the Soils Testing Agency. Such excavation will be paid on basis of unit prices as listed in the Bid Form.

E. Rock payment lines are limited to the following:

1. Two feet outside of concrete work for which forms are required, except footings.

2. One foot outside the perimeter and 4" below the bottom of footings.

3. In pipe trenches, 6" below invert elevation (or as indicated) of pipe and 2 feet wider that the indicated width but not less than 3 feet minimum trench width.

4. Outside dimensions of concrete work where no forms are required.

5. Under slabs on grade, 6" below bottom of concrete slab.

F. The cost of any indicated rock removal shall be included in the base bid. For any additional rock removal required, but not indicated, the Contract will be adjusted by change order in accordance with unit prices submitted, or by negotiations as directed. Additional rock removal will be paid for on the line of the foundation or utility trenches as indicated on the Contract Drawings.

G. The use of explosives is not permitted.

H. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Architect or the Soils Testing Agency. Unauthorized excavation, as well as remedial work

directed by the Architect or Soils Testing Agency, shall be at the Contractors expense.

I. Unauthorized excavations below foundations and grade beams may be brought to proper position by the use of lean concrete or approved compacted fill material.

3.02 STABILITY OF EXCAVATIONS

A. Slope sides of excavations are to comply with the local codes, ordinances and requirements of agencies having jurisdiction. Shore and/or 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.

B. Provide materials for shoring and bracing, such as sheet piling, up-rights, stringers, and cross braces, as required. Maintain shoring and bracing in excavations regardless of time period excavations will remain open. Extend shoring and bracing as excavation progresses.

3.03 DEWATERING

A. Prevent surface water and subsurface ground water from flowing into excavations and from flooding project site and surrounding area.

B. 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.

C. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

3.04 EXCAVATION FOR BUILDING FOUNDATIONS AND SLABS ON GRADE

A. Within the limits of the proposed building, remove existing surface soil material, including vegetation, topsoil and loose boulders to a minimum depth of 12 inches below existing surface grade.

B. Prior to the start of excavation for foundations or filling for the slab on grade subbase, the exposed surface soil must be proofrolled, with a minimum 10-ton static roller, in the presence of the Soils Testing Agency. Where uncontrolled fill, soft, loose or yielded material exists, these areas must be undercut a minimum of 2'-0". Testing and inspection of the undercut subgrade, by the Soils Testing

Agency, may require further undercutting on some areas, depending on the type and nature of fill/unsuitable material exposed.

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

D. Take care in excavating not to disturb bottom of excavation. Excavate by hand, if necessary, to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.

E. Excavation for foundations must proceed, as a minimum, to the limits shown on the drawings. All foundations shall bear on compacted undisturbed natural soil that will provide the allowable bearing pressure as indicated in the geotechnical investigation, as tested and approved by the Soils Testing Agency. Any wet, soft, or unsuitable materials shall be undercut until the soil stabilizes or in accordance with the details shown on the drawings. Replace any undercut areas with approved compacted fill.

G. The subgrade surface of all foundations and slabs on grade shall be level and clean, free of loose rock, dirt, debris, standing water, frost or ice, prior to acceptance for casting concrete.

3.05 DISPOSAL OF UNSUITABLE AND EXCESS EXCAVATED MATERIAL

A. Remove from site and dispose of excavated material unsuitable for fill and/or backfill.

B. Place excess excavated materials, suitable for fill and/or backfill, on site where directed.

C. Remove from site and dispose of any excess excavated materials after all fill and backfill operations have been completed.

3.06 COMPACTION EQUIPMENT

A. It is the responsibility of the Contractor to select, furnish, and properly maintain equipment, which will compact the subgrade and fill uniformly to the required density.

B. The Contractor shall have at the site, at all times during earthwork operations, a smooth steel wheel roller, with a rated capacity of at least 10 tons, which shall be used to seal the surface of the fill at the close of each working day to prevent infiltration of precipitation and surface water into the fill material.

C. Excavation to final subgrade shall not proceed and fill shall not be placed until approved compaction equipment is on the site and in working condition.

3.07 PROTECTION OF SUBGRADES

A. Contractors will take every precaution during final stages of excavation to prevent disturbance of the natural soil at proposed subgrade elevations. Such precautions shall include, but not be limited to, keeping equipment off final subgrade during the last several feet of excavation, using excavating buckets without teeth, placing concrete mud mats below foundations and dewatering excavations.

B. Additional excavations, undercutting and/or backfilling operations resulting from failure to properly protect approved subgrades shall be done at the expense of the Contractor.

3.08 GEOTEXTILE FABRIC INSTALLATION

A. All subgrades must be tested and approved by the Soils Testing Agency before installation of geotextile fabric.

B. Above the prepared subgrade surface place a geotextile separation and strength fabric and a minimum 12-inch thick select granular base cover.

3.09 FILLING AND BACKFILLING

A. Preparation:

1. All subgrades must be tested and approved by the Soils Testing Agency before placing fill and/or backfill. Do not backfill against foundation walls until tested and approved by the Soils Testing Agency.

2. Remove all debris from excavations before placing fill and/or backfill.

B. Use of Materials:

1. General Fill

a. Fill and backfill exterior side of site structures to subgrade where no slab on grade, no pavement, and no foundation drains occur.

b. Fill and backfill to subgrade where demolition is required and no building or pavement occurs. In addition to earth fill, block, brick, stone and concrete not exceeding 1 cu. ft. per unit may be used if kept a minimum of 12" below finished subgrade.

c. Fill and backfill in areas not specified on drawings.

2. Gravel

   a. Porous subbase material for slab on grade construction and pavement.

4. Structural Fill

   a. Fill and backfill beneath foundations (minimum of 6" required) or substitution of a lean concrete "mud" mat as approved by the Architect/Engineer.

   b. Fill and backfill building walls and site structures to subgrade where no footing drains occur. Material to extend 24" beyond edge of asphalt pavement and 6" beyond edge of concrete pavement.

   c. Fill and backfill beneath porous subbase material specified for slab on grade construction and pavement.

   d. Porous subbase material, if demonstrated porous, for slab on grade construction and pavement.

5. The Contractor may propose alternate materials with similar engineering properties for consideration by Architect/Engineer. Such materials shall be proposed only where substitution results in a credit to the Owner.

C. Placement of Fill Materials:

1. Backfill excavations and place fill after areas have been tested and approved by Soils Testing Agency.

2. Do not place any fill material when the fill, the previous lift of fill, or the subgrade on which it is to be placed is frozen. In the event that any fill which has been placed or the subgrade becomes frozen, it shall be scarified, as required to break up the frozen material, and recompacted or removed to the satisfaction of the Soils Testing Agency. Any soft areas resulting from frost shall be recompacted or removed to the satisfaction of the Soils Testing Agency.

3. Open areas - The fill shall be spread evenly by mechanical or manual means, in approximately horizontal layers of six (6) to eight (8) inches maximum loose thickness.

4. Limited access - Where large compaction equipment cannot work, the fill material shall be placed in neatly horizontal layers, having a maximum

loose thickness of four (4) to six (6) inches.

5. Underslab fill and backfill shall be placed and compacted before installation of underfloor mechanical lines. Underslab subbase material shall be installed after underslab mechanical lines have been installed, backfilled, and compacted.

6. At the time of compaction, the material in each layer of fill shall have moisture content within +/-2 percent of optimum moisture as determined by ASTM D-1557. If, in the opinion of the Soils Testing Agency, the fill material is too wet, the fill shall be dried by a method approved by the Soils Testing Agency prior to commencing or continuing the compaction operation. If, in the opinion of the Soils Testing Agency, the fill materials are too dry for proper compaction, the fill shall be moistened by a method approved by the Soils Testing Agency prior to commencing or continuing the compaction operation.

7. Avoid routing of construction equipment, including loaded trucks, over approved subgrade or compacted areas.

D. Compaction of Fill:

1. Uniformly spread each layer, moisten or dry as required for optimum moisture content, and then compact so density of the compacted material meets or exceeds the specified percentages below.

Percentage of Maximum Dry Density	Location
95	Above and below foundations, and below slab on grade construction pavement and beneath utilities.
90	Non-loaded grassed areas, as shown.

2. Any lift, or portion thereof, which is not compacted in accordance with Specifications shall be recompacted or removed and replaced to the satisfaction of the Soils Testing Agency. The degree of compaction of each lift shall be checked by the Soils Testing Agency, and each successive lift shall not be placed, or compacted, until the previous lift is tested and approved by the Soils Testing Agency. This fill is to be compacted to the lines and grades specified.

3.13 ROUGH GRADING

A. Subgrade - Depth below finished grade as required for building construction, topsoil, or pavement.

B. Accuracy - Set grade stakes where spot elevations are shown, at breaks in grade, along drainage "swales" and as otherwise required to correctly grade the area according to elevations shown on plans. Maximum spacing of stakes to be 50 feet on center.

C. Grade not otherwise indicated shall be uniform levels or slopes between points where elevations are given or between such points and existing finished grades. Abrupt changes in slopes shall be rounded. All new grades, other than grades for paved areas, to be within plus or minus 0.50" of grades indicated on Drawings or in Specifications.

D. Grade for paved areas, both subgrade and base courses, to be plus or minus 0.25" of indicated grades.

3.14 SPECIAL CONSIDERATIONS

Some locations of the site may warrant special consideration due to the presence of unknown below grade obstructions. Such conditions must be brought to the attention of the Architect/Engineer for evaluation, before work progresses.

3.15 SETTLEMENT

Repair to proper grade any settlement of slab, pavement, utility, structure, or lawn, adversely affected by settlement, within one year after final acceptance at no expense to the Owner.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Excavation and backfill requested by the Architect or Soils Testing Agency to remove deficient or deleterious materials below specified grades shall be paid for at the bid unit price per cubic yard - measured in place. Such payment shall be full compensation for excavation, disposal and compaction of backfill.

4.02 Extraordinary trucking and disposal costs of oil contaminated soil will be paid for in accordance with the "Extra Work" provisions of the Contract. Disposal site and licensed hauling subcontractor shall be subject to the specific approval of the Owner. No extra compensation will be made for stockpiling or special loading required for disposal of oil-contaminated soil.

4.03 Rock excavation shall be paid for on the basis of unit prices as listed in the Bid Form. See Section 3.01 for rock pay limits.

4.04 Excavation, demolition and backfill requested by the Architect or Soils Testing Agency

to remove any existing below grade obstructions below specified grades, shall be paid for at the bid unit price per cubic yard, measured in place. Such payment shall be full compensation for excavation, demolition, disposal and compaction of backfill.

4.05 All other work in this section shall be paid for as a lump sum included in base bid.

END OF SECTION 02210

SECTION 02400 - SITE DRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor for this work shall be held to have read all of the Bidding Requirements, the Proposal Forms, the General Conditions of the Contract, the Supplementary General Conditions and Division 1, and in the execution of the work, he will be bound by all of the conditions and requirements therein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Excavation for Site Drainage Work: Section 02200.

B. Backfill Above Bedding Material At Storm Drain Lines: Section 02200.

C. Backfill Above Filter Material for Underdrains: Section 02200.

D. Backfill Around Drainage Structures: Section 02200.

E. Dewatering-Section 02200.

1.3 QUALITY ASSURANCE

A. Code and Regulations:
Comply with all applicable codes, rules and regulations pertaining to storm drainage system.

B. Verification:
Check inverts of all existing storm structures and pipes to which new lines are to be connected and notify the Architect/Engineer of any discrepancy prior to commencement of work.

1.4 SUBMITTALS

A. Shop Drawings:
For precast concrete drainage structures.

B. Product Data:
For all standard manufactured products.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Precast Concrete Drainage Structures (Catch Basins).
   1. Acceptable Manufacturers:
      a. Kistner Concrete Products, Inc.
      b. Warren Concrete Products, Inc.
      c. United States Concrete Pipe Co.
   2. Material:
      a. All structures shall be able to support HS-20 loads.
      b. Comply with ASTM C-478 Specification for Precast Reinforced Concrete Manhole Risers and Tops.
      c. Joints between units may be one of the following:
         (1) Flexible watertight rubber gaskets.
         (2) Portland Cement Mortar.
         (3) Approved Joint Compound.

B. Precast Concrete Drainage Structures
   1. Acceptable Manufacturers (Drywells)
      a. Kistner Concrete Products, Inc.
      b. Riefler Concrete
      c. Approved Equal
   2. Material:
      a. All structures shall be able to support HS-20 loads.
      b. Comply with ASTM C-478 Specification for Precast Reinforced Concrete Manhole Risers and Tops.
      c. Joints between units may be one of the following:
         (1) Flexible watertight rubber gaskets.
         (2) Portland Cement Mortar.
         (3) Approved Joint Compound.

C. Storm Drain Piping:
   1. Corrugated HDPE Pipe:
      a. Smooth interior pipe.
      b. Conform to AASHTO M294.
      c. Acceptable products:
         (1) N-12 by Advanced Drainage Systems
         (2) HI-Q by Hancor, Inc.
         (3) Approved equal
   2. PVC Pipe:
      a. Material shall conform to ASTM D-3034, SDR 35.
      b. NFS approved, Type 1, Grade 1 PVC meeting ASTM D-1784.
      c. Joints shall be bell and spigot with o-ring gaskets.
      d. Fittings - meet ASTM D-3034.

D. Underdrains:
   The following material may be used:
   1. Corrugated PHDPE:
      a. Smooth interior, perforated plastic pipe with necessary fittings. Include non-perforated pipe where indicated.
      b. Acceptable Manufacturers:
         (1) Advanced Drainage Systems, Inc.
         (2) Hancor, Inc.
         (3) Approved equal

E. Drainage Structure Castings:
   1. Acceptable Manufacturers:
      a. Neenah Foundry Company
      b. Flockhart Foundry Company
      c. Accepted equal
   2. Catalog numbers on drawings are those of Neenah Foundry Company unless otherwise noted.
   3. Material: Gray Iron Castings, ASTM A-48, Class 30.
   4. Finish Coating: One coat of high grade bituminous asphalt paint, Federal Specification Mil-C-450B.

F. Bedding Material:
   1. Crushed aggregate conforming with NYSDOT Section 703-02.
   2. No. 1 crushed stone (NYSDOT Material Designation 702-0201) or No. 1 washed crushed gravel (NYSDOT Material Designation 703-0202).
   3. 100 percent passing 1" sieve, 90-100 percent passing 1/2" sieve, 0-15 percent passing 1/4" sieve.

G. Filter Material:
   1. Crushed aggregate conforming with NYSDOT Section 703-02 (washed, no fines).
   2. No. 1 crushed stone (NYSDOT Material Designation 703-0201) or No. 1 washed crushed gravel (NYSDOT Material Designation 703-0202).
   3. 100 percent passing 1" sieve, 90-100 percent passing 1/2" sieve, 0-15 percent passing 1/4" sieve.

H. Drainage Sand:
   1. Medium to coarse sand (0.4 - 0.75 mm dia.). Use only as directed by Engineer - see Earthwork for coarse sand mix.

I. Erosion Protection Stone:
   1. Fine stone fill, NYSDOT Section 620.02.

PART 3 - EXECUTION

3.1 STORM LINES

A. Fine grade trench bottom with hand tools to an elevation 6" below the bottom elevation of the pipe.

B. Place bedding material and thoroughly compact. Thickness: 6" after compaction.

C. Do not lay pipe in wet trench and do not permit water in trench until joints are completed.

D. Lay pipe to line and grade with inside joints smooth and uniform. A perfect circle shall be evident when lamped.

E. Upon completion of lines or portion thereof test for watertightness. Notify Owner's Representative so he may observe testing. Maintain head of water one foot above highest point of line.

F. Backfill with bedding material to spring line of pipe and compact.

3.2 UNDERDRAINS

A. Lay lines true to line and grade on a 6" minimum bed of filter material and backfill with filter material to a minimum depth of 24" above top of line, unless otherwise indicted.

B. Install perforated lines with holes down.

3.3 CONNECTIONS TO EXISTING STRUCTURE

A. Where pipes are to be connected to existing manholes or other structures, and where no stub or opening has been provided for the connection, core drill an opening of minimum diameter through the side wall of the structure for inserting the pipe.

B. After inserting the pipe, place standard manhole pipe gasket around pipe and completely fill the space remaining outside the pipe with a no-shrink mortar.

C. Make watertight to prevent leakage of water into the manhole or structure.

D. Alter concrete paved inverts in existing structures to form a trough, so that new connections enter the existing pipe smoothly and in the direction of flow.

E. Make connections to existing manholes or structures carefully to avoid damage to the manhole or structure.

F. Repair any damage resulting from the work.

G. Prevent debris from entering existing pipes or structures.

END OF SECTION 02400

SECTION 02485 - LANDSCAPING - LAWN

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor for this work shall be held to have read all of the Bidding Requirements, the Proposal Forms, the General Conditions of the Contract, the Supplementary General Conditions and Division 1, and in the execution of the work, he will be bound by all of the conditions and requirements therein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Placing Topsoil: Section 02200.

1.3 JOB CONDITIONS

A. Seeding shall be done between April 1 and October 15.

B. Do not broadcast seeding during conditions of high wind or excessive moisture.

1.4 PRODUCT DELIVERY

Deliver all materials to the site in original, unopened containers, bearing manufacturer's analysis.

PART 2 - PRODUCTS

2.1 FERTILIZER

A. Standard Commercial Fertilizer, containing by weight 16% nitrogen, 25% phosphorous, 12% potash, and 12% sulfur.

B. Uniform in composition, dry and free flowing.

C. Acceptable Manufacturers:
1. 16-25-12 Fertilizer by Scotts
2. Approved equal

2.2 COMBINATION WEED KILLER AND FERTILIZER

Commercial weed and feed containing by weight 20% nitrogen, 6% phosphorous and 4% potash.

2.3 LAWN SEED

SEED VARIETY	% BY WEIGHT PURITY	GERMINATION
Kentucky Bluegrass	50%	95
Perennial Rye	50%	95

2.4 FIELD SEED (- OVER EXCAVATED AREAS - REFER TO CIVIL PLANS)

SEED VARIETY	% BY WEIGHT PURITY	GERMINATION
Improved Kentucky Bluegrass Blend	80%	95
Improved Perennial Rye Grass Blend	20%	95

A. Improved Kentucky Bluegrass Blend
   1. Blend to consist of 3 varieties of improved turf type Kentucky Bluegrass.

B. Improved Perennial Rye Grass Blend
   1. Blend to consist of 3 varieties of improved turf type Perennial Rye Grass.

2.5 STRAW MULCH

A. Stalks of oats, wheat, rye or other approved crops which are free from weeds.

B. Materials which are low grade and unfit for farm use such as "U.S. Sample Grade: will be acceptable.

C. Base weight calculations on maximum moisture content of 15%.

2.6 EROSION CONTROL BLANKET (if shown on plans)

A. Acceptable Manufacturers
   1. Futerra by Conweb Fibers
   2. Approved Equal

PART 3 - EXECUTION

3.1 FINE GRADING

A. Disc, harrow or otherwise completely pulverized to a minimum depth of three inches where topsoil has been spread and to a depth of six inches where no grade change is required, but new lawn is required. See Earthwork for sand/topsoil/peat mix for playing field top dressing. Baseball and softball infields to include manufactured clay additive.

B. Remove all surface stone and other undesirable materials over 1" in greatest dimension. Infields to be free of stones.

C. Fine grade area to be seeded by machine or hand rakes prior to sowing seed.

D. Carefully round tops and bottoms of slopes to provide smooth transition curves.

3.2 FERTILIZING

Uniformly distribute fertilizer at the rate specified by the manufacturer, and work into the top 3" of soil prior to fine grading.

3.3 SEEDING

A. Quantity: As prescribed by the manufacturer.

B. Method:
1. Place seed to a depth not exceeding 1/4" by mechanical drill or seeders or by broadcasting.
2. If seeder is used, make two passes with seeder over all areas, the second pass at right angle to the direction of the first. Use one-half seed for each pass.
3. If seed is broadcast, rake or chain harrow seed for proper coverage.
4. Lightly roll the seeded area and water with a fine spray.
5. Weight of roller - not more than 65 lbs. nor less than 40 lbs. per foot of width.
Playing field surfaces are to be slit seeded (Hydro-seeding and broadcasting of seed will not be allowed.

C. Mulching:
1. Uniformly spread mulch over entire seeded area, at the rate of 2 tons per acre, immediately after rolling and watering.
2. Remove wind swept mulch piles as necessary to prevent damage to grass.

3.4 HYDRO SEEDING, FERTILIZING AND MULCHING

A. Apply seed, fertilizer and mulch uniformly over the entire area, as visually determined by the intensity of the green vegetable dye.

B. Apply by hydro-seeder at the following mix per acre:
1. Seed: As recommended by the manufacturer.
2. Fertilizer: As recommended by the manufacturer.
3. Mulch: 1200 pounds.
4. Water: 1000 gallons.

C. All overspray from application of hydro seed mix to pavements, building facades, and site amenities is to be cleaned off immediately before material is allowed to dry.

3.5 EROSION CONTROL BLANKET

A. Install as per manufacturer’s recommendations.
1. Futerra by Conweb Fibers
2. Approved Equal

B. Install on slopes greater than 1 vertical to 3 horizontal.

C. Water mat down after installation.

3.6 MAINTENANCE

A. Mow newly seeded areas until final acceptance. At each mowing, cut to a height of 2" after growth has reached approximately 3-1/2".

B. Apply weed and feed at the rate of 176 pounds per acre after the second mowing.

C. Repair, replace and water seeded areas as necessary until the time of final acceptance.

3.7 CRITERIA FOR ACCEPTANCE

A. All lawn areas must be complete in coverage and vigorous in growth.

3.8 CLEAN-UP

A. Remove from the site and dispose of all sticks, rubbish, stones and other debris collected during raking and other operations.

END OF SECTION 02485

SECTION 02500 - PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor for this work shall be held to have read all of the Bidding Requirements, the Proposal Forms, the General Conditions of the Contract, the Supplementary General Conditions and Division 1, and in the execution of the work, he will be bound by all of the conditions and requirements therein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Excavation, Site Fill and Rough Grading: Section 02200.

B. Geotextile Fabric: Section 02275.

1.3 SUBMITTALS

A. Samples:
   1. Sub-Base Course Material (if requested).
   2. Pavers

B. Product Data:
   1. Bituminous Materials
   2. Concrete Materials
   3. Pavement Sealer
   4. Asphalt Pavement – Marking Paint
   5. Geosynthetic Fabric
   6. Playing Surface Coating
   7. Line Marking Paint

1.4 QUALITY ASSURANCE

A. Testing Agency Services - See Section 01410

PART 2 - PRODUCTS

2.1 BITUMINOUS PAVING MATERIALS

A. Sub-Base Course:
   1. Conform to NYSDOT Section 304-2 Type 4, NYSDOT Item No. 304.05.
   2. Material shall be stone or gravel. Slag will not be accepted.
   3. 100 percent passing 2-inch sieve, 30-65 percent passing 1\4 inch sieve, 5-40 percent passing No. 40 sieve, 0-10 percent passing No. 200 sieve.

B. Asphalt Pavement:
   1. Binder: NYSDOT Section 403-1 Type 3 Binder, NYSDOT Item No. 403.13.
   2. Topping: NYSDOT Section 403-1 Type 7 Top, NYSDOT Item No. 403.18.

C. Tack Coat:
   NYSDOT Asphalt Emulsion (HFMS-2h) 702-3401.

D. Bituminous Pavement Sealer:
   1. Acceptable Products:
      a. Sealtight Driveway Sealer by W. R. Meadows, Inc.
      b. Playtime Pavement Sealer by Playtime U.S.A., Inc.
      c. Jennite J-16 by Maintenance, Inc.
   2. Material:
      a. A coal tar emulsion material specifically formulated to seal asphalt concrete pavement.
      b. Add four pounds of sand per gallon of undiluted pavement sealer and mix to a uniform consistency.
      c. Sand: Clean, hard, and durable free from clay, salt and organic matter, and well graded within the following limits:

U.S. Sieve	Total % Passing
No. 16	100%
No. 20	80 to 100%
No. 30	50 to 90%
No. 50	20 to 60%
No. 100	0 to 5%

      d. Dilute sealer with potable water in accordance with the manufacturer's recommendations.

E. Edge Restraints:
Use PVC edge restraints per paver manufacturer’s specifications

F. Pavement Reinforcement Fabric:
Poly Propylene Non-Woven Needle-Punch Fabric over asphalt cement tack coat (applied at 0.25 gal. per sq. yd=), by Amoco Fabrics & Fibres Co.-petromat or approved equal.

2.2 CONCRETE PAVEMENT AND CURB MATERIALS

A. Sub-Base Course:
   1. Conform to NYSDOT 304-2.02 Type 4.
   2. Material shall be stone or gravel. Slag will not be accepted.
   3. 100 percent passing 2-inch sieve, 30-65 percent passing 1/4 inch sieve, 5-40 percent passing No. 40 sieve, 0-10 percent passing No. 200 sieve.

B. Concrete:
NYSDOT Class A, 4000 psi @ 28 days.

C. Reinforcement:
   1. Welded wire fabric ASTM A-185, sizes as indicated.
   2. Supply in flat sheets.

D. Expansion Joint Filler:
   1. Acceptable Products:
      a. Fibre Expansion Joint by W. R. Meadows, Inc.
      b. Flexcell by The Celotex Corp.
   2. Material:
      a. Fiber expansion joint, ASTM D1751.
      b. ½" thick, unless otherwise indicated.

E. Expansion Board and Cap & Pull Off Top:
   1. Greenstreak Removable Top-Expansion Joint Cap #941, #942.
   2. Vinylex Corp. Removable Cap Strip VP 1391, VP 1393.

F. Expansion Joint Sealant:
   1. Acceptable Products:
      a. Pourthane by W. R. Meadows, Inc.
      b. THC-900 by Tremco Manufacturing Co.

2. Material:
   a. Two-component polyurethane sealant, self-leveling.
   b. ASTM TT-S-00227E or TT-S-00230C Type 1, Class A.

G. Concrete Curb Expansion Joint Sealant:
1. Acceptable Products:
   a. Dymeric by Tremco Manufacturing Company.
   b. Sonolastic NP II by Sonneborn Building Products.
2. Material:
   a. Multi-component sealant.
   b. Federal Specification TT-S-00227E, Type II, Class A.

H. Expansion Joint Backer Rod:
1. Acceptable Products:
   a. Sonofoam by Sonneborn Building Products.
   b. Ethafoam by Dow Chemical Company.
   c. Sealtight backer rod by W. R. Meadows, Inc.
2. Size: To allow 30% compression when inserted in joint.

2.3 ASPHALT PAVEMENT MARKING PAINT

A. Acceptable Products:
1. Traffic marking paint by Sherwin Williams.
2. Traffic paint by Pratt & Lambert, Inc.
3. Hi-High plexicolor line paint by California Products Corp.

B. Color: Yellow

2.4 GEOSYNTHETIC FABRIC

A. Approved Manufacturers
1. Typar 3607
2. Approved equal

2.5 ASPHALT TOP COURSE

A. NYSDOT Section 403-1, Item No. 403.18 Type 7

2.6 ASPHALT BINDER COURSE

A. NYSDOT Section 403-1, Item No. 403.13 Type 3

PART 3 – EXECUTION

3.1 SUBGRADE PREPARATION UNDER PAVEMENT

Fine grade and proof roll all areas in accordance with NYSDOT Specifications 203-3.14.

3.2 BITUMINOUS PAVING

A. All Courses:
1. Roll each course with 10-ton roller or equivalent.
2. Commence rolling along lower edge and continue until edge is thoroughly compacted, after which gradually advance to the crown.
3. Continue rolling until the layer has become thoroughly compacted and is true to grade and cross section.

B. Sub-Base Course:

1. Place on dry subgrade over stabilization fabric, in maximum lifts of 4".
2. Remove subgrade material, which becomes mixed with base course and reconstruct.
3. Minimum Compaction: 95% of maximum density.
4. Grade Tolerance: Plus or minus 3/8" from indicated grades.

C. Asphalt Top & Binder Course:
1. Do not install asphalt paving over wet base course or if ambient temperature is below 50 degrees F.
2. Place in two courses to compacted thickness as detailed.
3. Where pavement abuts curbs, concrete walks, or existing pavement, apply a liberal application of tack coat material.
4. Check with 10' straight edge and correct all depressions and high areas greater than 1/4".
5. Form or cut all pavement edges to clean, sharp lines or radius, as indicated.
6. Compaction for wearing course shall be minimum of 92% of laboratory specimen density.
7. Grade tolerance:
   a. All pavement: ±3/8" from indicated grades.

D. Pavement Sealer:
1. Apply pavement sealer to all new asphalt pavement.
2. Allow pavement to weather a minimum of four weeks prior to sealing.
3. Clean surface of dirt and other foreign matter.
4. Apply two coats of sealer uniformly at a minimum total coverage of 0.18 gallons per square yard per coat.
5. Allow a minimum of 24 hours for curing prior to checking sealed pavement for usage.

3.3 CONCRETE PAVING - SIDEWALKS AND SLABS

A. Sub-Base Course:
1. Place on dry subgrade and compact with a 10-ton roller or equivalent. Continue rolling until course is thoroughly compacted and true to grade and cross section.
2. Remove subgrade material, which becomes mixed with base course and reconstruct.
3. Minimum Compaction: 95% of maximum density.
4. Grade Tolerance: Plus or minus 1/4" from indicated grades.

B. Concrete Reinforcement:
1. 6 x 6 - W1.4 x W1.4 unless other size is indicated.
2. Top of slab to reinforcement: 1/3 slab depth.

C. Concrete:
1. Place, cure and protect in accordance with NYSDOT Section 502.
2. Finish: Screed to grade, wood float and give a fine broom finish at walks and coarse broom finish at ramps and landings.

D. Expansion Joints:
1. Install expansion joint filler:
   a. Where concrete walks abut building foundations, perpendicular curbs, steps or concrete structures.
   b. Across walks at maximum intervals of 25 linear feet.
   c. Other locations indicated on the drawings.
2. Remove perforated strip-off cap from premolded joint filler.
3. Apply manufacturer's recommended primer and fill joint with expansion joint sealant.

E. Scored Joints:
1. Use tool which produces a "V" joint ½" depth and not over ¼" wide.
2. Locate joints across walks at intervals of 5'-0", unless otherwise indicated.
3. Walks wider than 5 feet: Provide 5'-0" square pattern, unless otherwise indicated.

3.4 CONCRETE CURBS

A. Reinforcement:

One No. 5 bar top and bottom, except provide slip joint at expansion joints.

B. Concrete:
   1. Place, cure and protect in accordance with NYSDOT Section 502.
   2. Uniform smooth finish on all exposed surfaces.

END OF SECTION 02500

SECTION 02660 – SEWER PIPE AND FITTINGS

PART 1 - GENERAL

1.1 GENERAL:

A. Related work specified elsewhere:
   1. Earthwork, Section 02200.
   2. Precast Concrete Manholes, Section 03470.

1.2 DESCRIPTION:

A. Construct all gravity sanitary sewers and force mains as shown on the plans.

B. Coordinate work in this Contract with utility and local and State Highway authorities.

1.3 SUBMITTALS:

A. Product data on pipe, joints, and fittings.

B. Manufacturer's descriptive literature and recommendations for installation.

C. Manufacturer's certification that products meet specification requirements.
Required for each shipment.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Unload at the point of delivery, haul to and distribute at the site all pipe and accessories. Material is not to be dropped, bumped, or damaged.

B. The Contractor will replace, at his expense, all material found defective in manufacturer or damage handling.

C. Keep the interior of all pipe free from dirt and foreign matter at all times.

D. Drainage and storage of materials is required to prevent damage due to freezing of trapped water.

E. Store to prevent distortion of pipe, both linear and round.

F. Store materials in locations which do not cause interference or safety hazards with private or public access traffic.

1.5 JOB CONDITIONS

A. Protection:
   1. At the end of each day or when pipe laying is not in progress, place watertight plugs in the ends of all pipelines to keep dirt and other substances from entering the pipe.

PART 2 – PRODUCTS

2.1 PVC PIPE

A. Gravity Sewers:
   1. Material shall conform to ASTM D-3034, DR-18 PVC as shown on plans.
   2. Joints shall be bell and spigot with o-ring gaskets.
   3. NSF approved, Type 1, Grade 1 PVC meeting ASTM D-1784.

B. Fittings:
   1. Meet ASTM D-3034 or D-2241 as appropriate.
   2. Joints shall be bell and spigot with o-ring gaskets.

C. Wyes:
   1. Meet C above.
   2. Be of the 45 degree wye type.
   3. Saddle types are not allowed.

2.2 STONE BEDDING

A. Refer to section 02200.

2.3 LOCATOR TAPE

A. Mylar encased aluminum foil tape, orange color.

B. Suitable for direct burial, minimum width – 2 inches.

C. Lettering: CAUTION BURIED SEWER LINE BELOW.

PART 3 – EXECUTION

3.1 INSPECTION

A. Pipe:
   1. Carefully inspect all pipe prior to installation.
   2. Do not use damaged pipe.
   3. Remove defective pipe from site.
   4. Any pipe found to be broken or defective after it has been installed, shall be removed and replaced at the Contractor's expense.
   5. Pipe to be straight to within 3/8" per length.

B. Trench:
   1. Insure that trench bottom is to proper line and grade.
   2. Dig bell holes sufficiently large to insure making and checking of joints properly.

3.2 PREPARATION

A. Trench:
   1. Bed all pipe in stone as shown on the drawings.
   2. Dig bell holes sufficiently large to insure making and checking of joints properly.

B. Any section of pipe found to be laid at the wrong grade or to have settled, shall be dug up and relaid to the satisfaction of the Engineer at the Contractor's expense.

C. Pipe:
   1. Clean pipe thoroughly.
   2. Apply proper lubricant in accordance with the manufacturer's written instruction.
   3. Insert gasket and seal it if required, in accordance with the manufacturer's written directions.
   4. If field cutting of pipe is necessary, leave a smooth end in accordance with the manufacturer's written instructions.

3.3 INSTALLATION

A. Laying pipe: lay pipe in accordance with the following specifications, the manufacturer's instructions and ASTM D 2321.
   1. Carefully handle and lower pipe into the trench so as not to damage pipe or coatings.
   2. Lay pipe with bell end facing upstream in respect to design flow direction.
   3. Properly bed and secure each length of pipe prior to bringing next length of pipe into position.
   4. Firmly bed and backfill each pipe for the full length of the barrel, on a solid stone bed as shown on the drawings.
   5. Abut each length against the next in such a manner that there is no shoulder or unevenness of any kind along the inside of the bottom of the pipe.
   6. Use a method to push or pull the joints home appropriate for size of pipe.
   7. Take appropriate precautions when pushing or pulling the joints home to prevent damage to the pipe or joint.
   8. Keep joints straight while pushing home.
   9. Check the position of the gasket in each joint carefully.
   10. Do not walk on the pipe until at least 12 inches of backfill is properly placed over the pipe.
   11. Install pipe with manufacturer's lettering up.
   12. Maintain specified pipe grade unless otherwise directed by the Engineer.

B. Temporary plug:
   1. At the end of each day, or when pipe laying is not in progress, plugs shall be carefully fitted in or over the ends of all pipelines so as to keep dirt and other substances from entering. Water entry is allowable, if properly filtered, to facilitate dewatering.

3.4 CONNECTIONS TO EXISTING STRUCURE

A. Pipes and Structures:
   1. Where pipes are to be connected to existing manholes or other structures, and where no stub or opening has been provided for the connection, core drill an opening of minimum diameter through the side wall if the structure for inserting the pipe.
   2. After inserting the pipe, place standard manhole pipe gasket around pipe ad completely fill the space remaining outside the pipe with a non-shrink mortar.
   3. Make watertight to prevent leakage of water into the manhole or structure.
   4. Alter concrete paved inserts in existing structures to form a trough, so that new connections enter the existing pipe smoothly and in the direction of flow.
   5. Make connections to existing manholes or structures carefully to avoid damage to the manhole or structure.
   6. Repair any damage resulting from carelessness.
   7. Prevent debris from entering existing pipes or structures.

3.5 CONNECTIONS TO EXISTING STRUCTURE

A. Required Tests:
   1. After backfilling and prior to the final acceptance of the project, perform the following tests on all sewers to be build under this project.
      a. Inspection (lamping and internal).
      b. Infiltration or exfiltration.
   2. No more than 1,000 linear feet of installed sewer shall be allowed to remain untested, unless otherwise approved by the Engineer.
   3. Perform the appropriate tests as specified below on all new gravity sewers and manholes.
   4. Prior to making tests, submit details of testing procedures with description of methods and equipment proposed to be used for approval.
   5. Furnish all necessary labor, equipment, water, watertight bulkheads, weirs, rodding machine, closed circuit television equipment, generator pumps, and all else necessary to carry out the required tests.
   6. If the leakage in the section tested exceeds the specified amount, make necessary repairs to reduce the leakage to within the specified limits and repeat the test until the leakage requirement is achieved.
   7. Conduct tests under the observation of and subject to the approval of the Engineer.

B. Infiltration Test:
   1. Use the infiltration test when groundwater levels are at least two feet above the top of the highest pipe section to be tested, including laterals.
   2. After the pipe is laid and backfilled, isolate section to be tested with temporary dams or bulkheads.
   3. Install sharp-edged weir or other approved measuring device at a lower end of the section being tested.
   4. Test for a minimum period of 24 hours; measure leakage at the end of 6 hours and at the end of 24 hours.
   5. Where test section was installed through wet ground, allow sufficient time to elapse after stopping dewatering to permit the groundwater table to return to its natural level prior to test.
   6. Total leakage shall not exceed 100 gallons per inch diameter of sewer per mile, per 24 hours.
   7. Maximum allowable leakage in accordance with above specification is:

Pipe Diameter	Gal/Min/100 FT
4”	0.005
6”	0.008
8”	0.010
10”	0.013
12”	0.016
15”	0.020

   8. Include lengths of main sewer, laterals, and manholes in test computations.

C. Exfiltration test for gravity sewers, laterals, and manholes:
   1. Use the exfiltration test if the groundwater levels are not two feet above the top of the highest pipe section to be tested, including laterals.
   2. Insert test plugs to isolate section to be tested; test no more than one pipe section and the upstream manhole at a time, unless otherwise approved by the Engineer.
   3. The downstream manhole shall be fitted with a plug into which a water connection can be made for fitting the pipe.
   4. Fill sewer from downstream end, allowing air to escape from upper portion until upstream end of section under test is completely filled.
   5. Continue to fill the pipe and manholes with water to a point two feet above the top of the highest point of the pipeline under test, or two feet higher than the groundwater, whichever is greater.
   6. Allow filled sewer to stand for at least four hours or longer if deemed necessary by the Engineer, before measuring is begun to allow for absorption of water into pipe manholes.
   7. Begin test by adding water to sewer, if necessary, such that the head of not less than four feet is established.

8. The amount of water added to maintain this head shall be leakage.
9. Test for a period of at least four hours.
10. Total leakage of any section tested shall not exceed the rate of 100 gallons per mile of pipe per 24 hours, per inch of nominal internal diameter.

3.7 FINAL INSPECTION

A. Engineer will conduct visual inspection of each section of pipe, between each pair of manholes for final acceptance.

B. Engineer will visually check that the pipe is:
   1. Straight and true to line and grade.
   2. Leak and crack free.
   3. Free of obstructions of projections from connecting pipes or joint material.
   4. Free from deposits of sand, dirt, or other materials which in any way diminish the full cross sectional area.

C. Engineer will visually check that the manhole wall joints are tight and leak free.

D. Contractor to furnish necessary stoppers or bulkheads.

E. Contractor to remedy any defects or clean any deposits found during the Engineer's inspection.

END OF SECTION 02660

SECTION 02665 – WATER DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor for this work shall be held to have read all of the Bidding Requirements, the Proposal Forms, the General Conditions of the Contract, the Supplementary General Conditions and Division 1, and in the execution of the work, he will be bound by all of the conditions and requirements therein.

1.2 SUMMARY

A. The work specified shall include all labor, material, equipment, services and incidentals necessary to furnish and install water pipeline, fittings, specials and all appurtenances and to perform interconnections and abandonments as shown on the plans and specified therein.

B. Related Sections, specified elsewhere, include the following:
1. Earthwork, Section 02200.

1.3 SUBMITTALS:

A. Shop drawings and Product data on pipe and all appurtenances (i.e. joints, fittings, hydrants, etc.). Contractor shall also submit a materials list providing full information for all components of the system, including the materials of construction.

B. Manufacturer's descriptive literature, recommendations for installation and Operation and Maintenance information.

C. Manufacturer's certification that products meet specification requirements. Required for each shipment.

D. Certified copies of all test and disinfection reports.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Unload at the point of delivery, haul to and distribute at the site all pipe and accessories. Equipment for unloading shall be utilized so as to avoid damage to material. Material is not to be dropped, bumped, or damaged. During delivery, handling and storage, all materials shall be braced and protected from any distortion or damage in accordance with the manufacturer's requirements. Any distortion or damage shall be basis for rejection of materials.

B. The Contractor will replace, at his expense, all material found defective in manufacture or during handling.

C. Keep the interior of all pipes and appurtenances free from dirt and foreign matter at all times.

D. All pipe and appurtenances shall be stored in accordance with the manufacturer's recommendations and off the ground unless otherwise stated by the Architect. Store to prevent distortion of pipe, both linear and round.

E. Store materials in locations that do not cause interference or safety hazards with private or public access traffic.

1.5 JOB CONDITIONS

A. Protection:
1. At the end of each day or when pipe laying is not in progress, place watertight plugs in the ends of all pipelines and appurtenances to keep dirt and other substances from entering the pipe.

1.6 QUALITY ASSURANCE

A. Reference Standards (Latest Revisions)
1. AWWA
2. ASTM
3. Other agency or local standards applicable to water distribution systems.

B. Parts Interchangeability
1. Components (pipe and appurtenances) provided under this section shall be the standard product in regular production by manufacturers whose products have proven reliable in similar services for at least two (2) years.
2. In so far as possible, components shall be product of the same manufacturer.

1.7 REGULATORY REQUIREMENTS

A. Sequence, coordinate and perform all work in accordance with applicable codes and regulations, including those of government and/or local agencies of authority and jurisdiction for all related activity. Any conflict arising from differences between the plans, specifications and applicable codes and regulations shall be immediately brought to the attention of the Architect and shall be resolved prior to construction.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Pipe
1. Material shall conform to AWWA C151, Class 52 Ductile Iron Pipe (DIP); Push-on joint per AWWA C111; interior coating of double thickness cement lining per AWWA C104; exterior bituminous coating (standard).
2. Provide minimum of two (2) bronze wedges per joint.

B. Fittings
1. Material shall be ductile iron mechanical joint type conforming to AWWA C110, AWWA C111 and AWWA C153; interior coating of double thickness cement lining per AWWA C104; exterior bituminous coating (standard). All fittings to be furnished with sufficient accessory quantities.
2. Hydrant tees shall be anchoring type; Acceptable manufacturers – Mueller Company or approved equal.

C. Tapping Sleeve and Valve (as needed)
Note: Contractor to coordinate installation with Long Island Water Co. and County D.P.W.
1. Conforming to AWWA C500
2. Tapping sleeves and valves shall be designed and size in accordance with the recommendations of the manufacturer.
3. Service clamps shall be designed for use on the type of pipe to which the connection is being made. All bolts and nuts shall be fluorocarbon coated stainless steel or high strength corrosion resistant alloy steel unless otherwise stated.

4. The sleeve shall be fabricated in two halves, for assembly around the water main by means of bolts and gaskets to form a watertight mechanical joint. Outlet side of the taping sleeve shall be flange or mechanical end for attachment to the tapping valve.
5. Working pressure shall be a minimum of 250 pounds per square inch (psi).
6. Valves for tapping sleeves shall be designed for the intended service.
7. Acceptable manufacturers – Mueller Company or approved equal.

D. Gate Valves (Resilient Seat)
1. Conforming to AWWA C509 and AWWA C111, including working and test pressures for applicable valve sizes
2. Valves shall have mechanical joint ends. Suitable steel rods shall be installed between the main mechanical joint bell outlet and the valve (and/or fittings) to resist movement under pressure when the valve is closed. All bolts and nuts shall be fluorocarbon coated stainless steel or high strength corrosion resistant alloy steel unless otherwise stated.
3. The body, bonnet, seal plate, discs and hub nuts shall be iron. Ends shall conform to applicable standards for ductile iron pipe fittings.
4. Valve shall have non-rising stem. The non-rising valve stem, stem nuts, glands and bushings shall be bronze.
5. Shaft "O-ring" seals shall be synthetic rubber or Buna-N.
6. "O-ring" seals and non-rising stems shall withstand a minimum working pressure of 250 psi and a minimum test pressure of 500 psi.
7. All internal parts shall be accessible without removing the main body from the pressure line.
8. Operators shall be as specified in AWWA C509 for submerged, buried or in-plant service. Operators shall be equipped with a 2-inch square operating nut and shall be fully gasketed and grease packed for buried service. Operating nuts shall turn counterclockwise to close the valve. Buried operators with the operating nut greater than 8 feet below finished grade will be furnished an extension stem, centering device and operating nut. The extension stem shall come within 3 feet of the finished grade.
9. Acceptable manufacturers – Mueller Company or approved equal.

E. Valve Boxes
1. Adjustable screw type valve box; 2 or 3 piece model with minimum 1 foot adjustment.
2. Valve box shall have a barrel not less than 5-1/4" inches in diameter with a base to fit the valve on which is to be installed.
3. The word "WATER" shall be cast in the cover.
4. Acceptable Manufacturers – Mueller Company or approved equal.

2.2 STONE BEDDING

A. Refer to section 02200.

2.3 LOCATOR TAPE

A. Mylar encased aluminum foil tape suitable for direct burial. Minimum width of 2 inches with lettering "CAUTION BURIED WATER LINE BELOW."

PART 3 – EXECUTION

3.1 PAINTING

A. The interior wetted surfaces of system fittings and appurtenances, except finished or bearing surfaces, shall be shop painted in accordance with NSF specifications for potable water and applied in accordance with the manufacturer's recommendations. Exterior surfaces shall receive two coats of heavy coal tar enamel or two-component coal-tar epoxy unless otherwise specified.

3.2 INSPECTION

A. Pipe and Appurtenances
1. All pipe and appurtenances will be inspected by the Architect prior to installation. Carefully inspect all

pipe prior to installation.

2. Do not use damaged components. Remove defective components from site.
4. Any pipe or appurtenance found to be broken or defective after it has been installed, shall be removed and replaced at the Contractor's expense.
5. Pipe to be straight to within 3/8" per length.

B. Trench:

1. Prior to work in this section, the Contractor shall inspect the installation area to determine if the work of other trades has progressed to the point where the installation may properly commence.
2. Contractor shall verify that the installation can proceed in accordance with all pertinent codes and regulations, the original design and referenced standards. The Contractor shall immediately notify the Architect of any discrepancies. The Contractor shall not proceed with the installation in areas of discrepancy until the discrepancy has been resolved.
3. Insure that trench bottom is to proper line and grade.

3.3 PREPARATION

A. Trench:

1. Bed all pipe in stone as shown on the drawings.
2. Dig bell holes sufficiently large to insure proper making , checking and bedding of joints.

B. Location, Grade and Cover

1. Pipelines and appurtenances shall be located as shown on the Contract Drawings or as directed and established from the control survey in accordance with general project requirements. Alignments and grades shall be determined and maintained by methods acceptable to the Architect. Any section of pipe or appurtenance found to be laid at the wrong grade or to have settled shall be dug up and relaid to the satisfaction of the Architect at the Contractor's expense.
2. Pipeline and appurtenances shall be installed with no less than the minimum cover indicated by the Contract drawings and governing authority. No pipe or appurtenance shall be laid upon a foundation in which frost may exist or develop.

C. Pipe and Appurtenances

1. Clean pipe and appurtenances thoroughly.
2. As applicable, apply proper lubricant in accordance with the manufacturer's written instruction.
3. Insert gasket and seal it if required, in accordance with the manufacturer's written directions.
4. If field cutting of pipe is necessary, leave a smooth end in accordance with the manufacturer's written instructions.

3.4 EXECUTION

A. General

1. Excavation, subgrade preparation, pipe bedding and backfilling shall be in accordance with the Contract drawings and Earthwork Specification 02200.
2. Blocking will not be permitted under pipe or appurtenances, except where the pipe or appurtenance is to be laid with concrete cradle or encasement.
3. Pipe and appurtenance shall be laid upon a foundation of select material, unless otherwise specified. The top of this layer shall be considered to be the bottom of the trench.
4. Temporary bulkheads shall be placed in all open ends of the installation (i.e. pipe) whenever installation activities are not actively in progress. The bulkheads shall be designed to prevent the entrance of dirt, debris or water.
5. Precautions shall be taken to prevent flotation or movement.
6. Installation shall include thrust restraints in the form of thrust blocks, tie rods, anchors, etc. of the size and type specified by the Contract drawings or as required by the pressure and stability of the supporting surface. Thrust restraints shall be installed at all changes in direction, changes in size, dead ends or other locations as shown. Thrust restraints shall be in place and concrete shall have developed the required strength prior to testing.

B. Interconnections and Abandonments

1. No work shall begin on the interconnections until the Architect and governing water authority

authorize the work. The Contractor shall not operate existing valves. Existing valves will be operated by the governing water authority only. The Contractor is advised that watertight conditions may not exist when existing valves are closed. The Contractor shall consider this in the bid. The maximum allowable shutdown of any existing water system shall be as per the requirements of the governing water authority. The work shall be scheduled through the Architect and governing water authority to provide a minimum of three (3) days advance notice prior to the work.

2. Caps (or plugs) on iron pipe shall be mechanically restrained watertight caps (or plugs) compatible with the pipe being capped and suitable to resist thrusts due to operating pressures.
3. The Contractor shall perform test pits at existing pipes, valves, etc. to assess conditions and determine requirements for construction activity and interconnections.
4. Removal and/or abandonment of existing pipelines or appurtenances will be carried out as per the requirements of the Architect and governing water authority.

C. Pipe Installation
1. Except as otherwise specified, all pipe shall be installed in accordance with the requirements of the governing water authority, AWWA C600 and applicable codes and regulations.
2. Carefully handle and lower pipe into the trench so as not to damage pipe or coatings.
3. Lay pipe with bell end facing upstream in respect to design flow direction.
4. Properly bed and secure each length of pipe prior to bringing next length of pipe into position.
5. Firmly bed and backfill each pipe for the full length of the barrel, on a solid stone bed as shown on the drawings.
6. Abut each length against the next in such a manner that there is no shoulder or unevenness of any kind along the inside of the bottom of the pipe.
7. All joint surfaces shall be clean prior to connection. Use a method to push or pull the joints home appropriate for size of pipe. Joints shall be assembled using gaskets, lubricants, etc. as furnished by the pipe manufacturer and in accordance with the manufacturer's recommendations.
8. Take appropriate precautions when pushing or pulling the joints home to prevent damage to the pipe or joint. Keep joints straight while pushing home.
9. Check the position of the gasket in each joint carefully.
10. Do not walk on the pipe until at least 12 inches of backfill is properly placed over the pipe.
11. Install pipe with manufacturer's lettering up.

D. Fittings Installation
1. Installation of fittings shall be in accordance with Section 3.4D Pipe Installation, Contract drawings, approved shop drawings and the manufacturer's recommendations.

E. Tapping Sleeves and Valves
1. Installation of Tapping Sleeves and Valves shall be to the configuration shown on the Contract drawings, approved shop drawings and in accordance with the manufacturer's recommendations. All activities involving taps of existing mains are to be carried out as per 3.4B Interconnections and Abandonments and coordinated with governing authorities.

F. Gate Valves
1. Installation of valves shall be to the configuration shown on the Contract drawings, approved shop drawings and in accordance with the manufacturer's recommendations.
2. Valves shall be installed between the hydrant and the main line at each hydrant installation as shown on the Contract drawings.
3. Valves shall be set on solid bearing, installed plumb and in a closed position unless otherwise specified.

G. Valve Boxes
1. Installation of valve boxes shall be to the configuration shown on the Contract drawings, approved shop drawings, in accordance with the manufacturer's recommendations and requirements of the governing water authority.
2. Valve boxes shall be set plumb, centered over the valve and shall be independently supported so no weight is transmitted to the valve or carrier pipe.

3.5 DISINFECTION AND TESTING

A. The Contractor shall disinfect and perform pressure/leakage tests in the new water distribution system elements in accordance with the latest AWWA procedures and requirements of governing agencies (i.e. governing water authority, health department, etc.). Related activity will be carried out prior to connection to existing watermains, unless otherwise specified, and witnessed by applicable representatives.

B. Contractor shall obtain permission from the water system owner or governing agency before using water from any existing system. The Contractor shall conform to the requirements of the owner/agency, pay all costs with the taking or use of water for any purpose and provide sufficient advance notice (at least 24 hours) before the use of water for any reason.

C. Upon completion of each disinfection activity, the Contractor will be required to empty and flush the system. Contractor shall adhere to the requirements of governing agencies for disposition of the system contents resulting from disinfection and flushing.

D. After disinfection and flushing, the Contractor shall collect and submit Bacteriological samples for testing by an approved laboratory as per Health Department requirements. Contractor shall repeat the disinfection procedure, at his expense, until safe results are obtained. The Contractor shall submit the test reports directly to the Health Department, Architect and governing water authority.

E. Contractor shall demonstrate to the satisfaction of the Architect and governing water authority that all system components operate properly, both individually and as a system, and satisfy related pressure/leakage tests. The Contractor shall provide all testing equipment and material required to perform the tests. Contractor shall, at his expense, correct any component or system deficiencies and repeat the related tests as required. The Contractor shall submit the test reports directly to the Architect, governing water authority and other agencies as may be required.

END OF SECTION 02665

SECTION 03310 - CONCRETE, REINFORCEMENT AND FORMWORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. Furnish all labor, material and equipment necessary to complete all cast-in-place concrete, reinforcement, formwork, and related work.

1.02 SUBMITTALS

A. Submit 3 copies of the following:

1. Shop Drawings

a. Bar reinforcement shop drawings shall include setting plans, wall elevations, bending diagrams, cutting lists, and other information so as to completely and unambiguously define and establish the location, spacing, size, length, bending, shape, splicing, keying at construction joints and all other pertinent information as required. Drawings shall show grades of reinforcing steel. Opposite hand reinforcing shall be detailed separately. Wall reinforcing shall be detailed on wall elevations. Each shop drawing shall show splice length for every size and type of bar used.

b. Type, size and location of all accessories required for the proper assembling, placing and support of the reinforcement.

c. All openings, depressions, construction and control joints, trenches, sleeves, inserts and all other project requirements affecting reinforcing details and placing.

d. Placement drawings indicating joint layout, types, location, and dimensions for the following:

1. Slabs on Grade

2. Walls

B. Manufacturer's Data:

For standard factory manufactured materials.

C. Proposed concrete design mixes. 3 copies of proposed mix and 3 copies of back-up data.

1.03 CODES AND STANDARDS

A. Comply with the provisions of ACI-301 "Specifications for Structural Concrete".

B. Perform all work in accordance with rules and regulations of authorities having jurisdiction. In the absence of other authorities comply with State Building Code. In case of conflict most stringent shall govern.

1.04 RESPONSIBILITY OF CONTRACTOR

A. The Contractor alone shall be fully responsible for the design, strength, safety and adequacy of all formwork, shoring, bracing and all methods of construction.

1.05 INSPECTION, TESTING AND QUALITY CONTROL

A. A Testing agency will be employed by the Owner to verify the acceptability of materials and the design of the basic concrete mixes.

B. The Owner shall pay for the cost of the services of the testing agency except that the Contractor shall reimburse the Owner for the cost of those services, which in the opinion of the Architect, are required because of the following:

1. Failure of materials or workmanship to meet Contract requirements.

2. Materials or practices, not complying with the Specifications, which could possibly result in defective work thereby rendering it necessary or advisable to perform tests to determine whether or not work is acceptable.

3. Changes in source, quality or characteristics of materials.

4. Wasted time of inspectors because of cancellations or delays of concrete placement or other work.

5. Site cured cylinders requested by the Contractor to verify strengths for removal of forms.

C. In general, concrete testing will consist of one set of 3 cylinders for each days casting or every 50 cu. yds.

D. The Contractor shall cooperate by allowing clear and safe access to the work for sampling, inspection and storage of specimens and equipment. He shall construct a storage box on the site of sufficient size to store 24 cylinders and which will afford the protection required by ASTM C31, Paragraph 7 (A).

E. Those portions of the structure that do not meet the Contract requirements shall be corrected or removed and replaced as directed by the Architect, and all cost of correction, removal and replacement, shall be at the Contractor's expense.

F. The Contractor shall notify the Architect and testing agency not less that 24 hrs. in advance of the starting of any project concrete operations.

PART 2 - PRODUCTS

2.01 FORM MATERIALS

A. Exposed Concrete: Plywood, metal, metal framed-plywood faced or other acceptable panel type material to provide continuous, straight smooth exposed surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Use overlaid plywood complying with US product standard PS-1 “A-C or B-B High Density Overlaid Concrete form”, Class I

B. Concealed Concrete: Plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for a tight fit.

Thickness as required for spans and pressures.

C. Form Ties:

Shall be of approved design, minimum working strength 3,000 lbs. each, so adjustable as to permit complete tightening of forms. After removal of protruding part of tie no metal to be nearer than 1-1/2" to face of concrete. Ties at exposed surfaces shall have wood, plastic or metal cones. Ties below grade shall have water seal washers.

D. Form Release Agent Shall Be of commercial formulation with maximum VOC of 450 mg/l that will not bond with, stain or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Rich-Cote as manufactured by Richmond Screw Anchor Co., Inc.

2. Formshield as manufactured by W.R. Grace and Co.

3. Bay Cote as manufactured by Bay Oil Co.

2.02 MATERIALS

A. Bar Reinforcement - Newly rolled billet steel conforming to the following:

1. ASTM A615 Grade 40 for ties, stirrups and bars to be welded. Welded bars shall also comply with ASTM A706.

2. ASTM A615 Grade 60 for all other bars.

B. Welded wire fabric reinforcement shall conform to ASTM A185. Sizes as shown on the Drawings. Deliver in sheets, not in rolls.

C. Reinforcement Accessories:

1. Accessories shall be as manufactured by Superior Concrete Accessories, Inc., Dayton Sure-Grip and Shore Co., R.K.L. Building Specialties Co., Inc. or equal.

2. Accessories shall include all spacers, chairs, ties, slab bolsters, clips, chair bars, and other devices for properly assembling, placing, spacing, supporting, and fastening the reinforcement.

3. Accessories in contact with surfaces exposed to view in the finished work shall conform to CRSI Bar Support Specifications, Class C or Class E.

2.03 MISCELLANEOUS RELATED MATERIALS

A. Non-shrink grout shall be a mixture of water and a specially formulated packaged mixture approved by the Architect/Engineer, such as Masterflow 713 by Master Builders, EUCO N-S by Euclid Chemical Co., Crystex by L and M Construction Chemicals, or Sonogrout Hyflow by Sonneborn-Contech.

B. Waterstops shall be extruded from new stock polyvinyl chloride. Provide flat dumbbell type or center – bulb type waterstops at construction joints where indicated.

C. 10 Mil polyethylene shall be installed under all slabs on grade, and shall be used in the widest possible width. Joints shall be lapped a minimum of 6".

D. Concrete Curing and Sealing Compound:

Liquid membrane forming type conforming to ASTM C309, type I, class A, VOC compliant. Acceptable are:

1. Kure-N-Seal WB30 by Sonneborn Contech.

2. Super Diamond Cure by Euclid Chemical Company.

3. Masterkure by Master Builders Company.

4. Dekote 30 by W.R. Grace Company.

E. Joint Filler shall be preformed filler provided at slab expansion and control joints, joints between floor slabs and walls, and other isolation joints. Acceptable are:

1. Precompressed, impregnated open foam cell.

2. Asphalt saturated fiberboard complying with ASTM D1751.

3. Granulated cork between saturated felt or glass fiber felt complying with ASTM D1752, Type H.

2.04 CONCRETE MIX MATERIALS

A. Cement - Portland Cement, ASTM C150 Type I or Type II.

B. Fine aggregate (normal weight) shall consist of washed, inert, natural sand conforming to ASTM C-33.

C. Coarse aggregate (normal weight) shall consist of well graded, crushed stone or washed gravel conforming to ASTM C-33, 3/4" size.

D. Water shall be potable.

E. Water Reducing Admixture, ASTM A494, type A:

"WRDA" - W.R. Grace Co.
"PDA25" - Protex Industries, Inc.
"Pozzolith 200N or 122N" Master Builders Co.

F. Air Entraining Agent, ASTM C260:

"Darex AEA" - W.R. Grace Co.
"Air Mix" - The Euclid Chemical Co.
"MB-VR" - Master Builders Co.

2.05 CONCRETE MIX DESIGN

A. It is the intent of this Specification to secure, for every part of the work, concrete of homogeneous structure which, when hardened, will have the required strength, appearance and resistance to weathering.

B. Basic mix proportions shall be established by the Contractor by means of current laboratory tests made with the constituents to be used in the work. If suitable data are not available, Contractor shall engage a testing laboratory to provide them.

C. Proportions shall be selected to produce an average strength at least 1200 PSI greater than the normal design strength. (Unless standard deviation data are available to justify a lesser factor).

D. Concrete in pavements and where flat surfaces are exposed to the weather shall have an entrained air content in accordance with structural drawings.

E. The consistency of the concrete at time of deposit as measured by ASTM C143, "Standard Method of Test for Slump" shall be as follows:

1.	Portion of the Structure	Slump
	Pavements and slab on ground	3" +/- 1"
	Footings	3" +/- 1"
	Reinforced slabs, beams	3" +/- 1"
	Reinforced walls, columns	4" +/- 1"

F. No concrete may be placed in the work until the appropriate design mix has been reviewed and accepted by the Architect/Engineer.

G. If, during the progress of the work, any difficulty should occur in securing concrete of the required workability and strength, the Architect may order such changes in the proportions or materials, or both, as may be necessary. Any changes so ordered shall be made at the Contractor's expense.

2.06 MIXING AND DELIVERY OF CONCRETE

A. All concrete shall be ready-mixed produced by a plant acceptable to the Architect. All constituents, including admixtures, shall be batched at the central batch plant.

B. Cold weather requirements: When the air temperature is at or below 45 degrees F, or when weather reports indicate that the air temperature may fall below 45 degrees F within 24 hrs immediately following the completion of concrete placement, the mixing water and, if necessary, the aggregates shall be heated so that the concrete shall have a temperature of 55 degrees to 80 degrees when placed. If the mixing water is heated, it shall not have a temperature in excess of 140 degrees F at the time it is added to the cement and aggregates.

C. Hot weather requirements: During hot weather the concrete shall, at the time it is placed, have a temperature from 55 to 80 degrees F but never above 90 degrees F. Provide crushed ice in lieu of equal weight of mixing water if necessary. Ice must be completely dissolved before placing.

PART 3 - EXECUTION

3.01 INSTALLATION OF FORMS AND SHORING

A. Forms shall be so designed by the Contractor to withstand all dead and live loads, including construction live loads, and to not move out of specified tolerances for line and elevation. Forms and form accessories shall be so designed that upon removal they will in no way damage concrete surfaces.

B. Forms shall be built mortar-tight.

C. Holes for concrete placement through sides of forms shall not be used.

D. Forms for beams and other horizontal surfaces shall be constructed with adequate camber resulting in level surfaces before forms are removed.

E. Before form materials are re-used, surfaces that will be in contact with freshly cast concrete shall be thoroughly cleaned, damaged areas repaired, and all projecting nails withdrawn.

F. Before reinforcement is placed on or against formwork, surfaces of forms coming in contact with fresh concrete shall be cleaned and then treated with approved form release agent.

G. Set and maintain concrete formwork to insure completed work is within the tolerance limits listed in ACI 347.

3.02 CONSTRUCTION JOINTS

A. Joints not indicated on Plans shall be located and constructed so as to least impair strength and appearance of work.

3.03 COORDINATE INSTALLATION OF EMBEDDED ITEMS WITH OTHER TRADES

A. Install all embedded items to conform to the requirements of ACI 318 and as specified below. Do not install any accessories until the affected trade has verified their type and location.

B. Coordinate the installation of all inserts required by other trades prior to placing of reinforcing steel.

C. Install anchor bolts, etc., furnished by other Sections. Use line and transit to locate anchor bolts and secure with templates to prevent displacement during concreting operations. Survey of completed anchor bolt placement and submit discrepancy reports to Architect/Engineer immediately for resolution prior to proceeding with erection of other trades.

D. Provide steel sleeves for pipes passing through concrete.

3.04 INSTALLATION OF REINFORCEMENT

A. Reinforcing shall be accurately placed and rigidly secured in position.

B. Tie reinforcing with annealed #18 gauge (min.) wire, and bend all wire back beyond general plane of reinforcing.

C. Welded wire fabric reinforcement in slabs shall be continuous, shall have joints lapped at least one full mesh, but not less than 6" and shall be supported at proper elevations by accessories.

D. Bending, Tack welding, Cutting or substituting reinforcement in the field, other than shown on the Contract Drawings, in any manner is prohibited, unless specific approval for each case is given by the Architect or his designate.

E. At the time the concrete is placed, all reinforcement shall be free from excessive rust, scale, or other coatings, which might destroy or reduce the bond.

F. Before concrete is cast, check all reinforcement after it is placed to insure that reinforcement conforms to Contract Drawings and approved shop detail drawings and Specification requirements. Such checking shall be done only by qualified, experienced personnel. In addition, the Architect's representative shall be notified at least 36 hrs prior to concrete placement and given the opportunity to inspect the completed reinforcement and formwork before concrete placement.

3.05 PLACING CONCRETE

A. Transport concrete mixes to place of final deposit as rapidly as practical by methods, which prevent segregation.

B. Remove water and all foreign matter from place of deposit. Place no concrete on frozen soil.

C. Calcium chloride shall not be used anywhere on the site for any purpose.

D. At construction joints, the surfaces of the concrete already placed shall be thoroughly cleaned of foreign materials and laitance, dampened with water and "Euco Weld" by the Euclid Chemical Company or approved equal, shall be applied. New concrete shall be placed after the bonding compound has dried.

E. Concrete shall be placed in such a manner as will prevent segregation.

F. Vertical lifts shall not exceed 18".

G. Concrete, during and immediately after depositing, shall be thoroughly compacted by means of suitable internal type vibrators.

H. Chutes, hoppers, spouts, adjacent work, etc., shall be thoroughly cleaned before and after each placement.

I. All slabs on grade shall be finished to exact elevations shown on the drawings. The slab thickness shall be increased where necessary to compensate for all settlements and deflection due to the weight of the wet concrete.

3.06 REPAIR AND FINISH OF CONCRETE SURFACES

A. Concrete surfaces shall be repaired by using either the same material as originally cast or by use of a dry-pack material. Areas affected shall be chipped back square and to a depth of 1" min. Holes shall then be moistened with water for minimum of 2 hrs. Then followed by a brush coat of Eucoweld as manufactured by Euclid Chemical Co. As soon as Eucoweld becomes tacky, immediately plug the hole with a dry pack material consisting of 1:1-1/2 mixture of cement and concrete sand mixed slightly damp to the touch. Hammer the dry-pack into the hole until dense and excess of paste appears on the surface. Finish the patch to the same texture as surrounding concrete. Color of patch after curing shall match adjacent concrete exactly. Adjust color if necessary using white cement or limestone aggregate.

3.07 FINISHING OF FORMED CONCRETE SURFACES

A. Formed concrete surfaces to be painted or exposed to view in the finished work shall be finished as follows:

1. As soon as the forms have been stripped, fins and other projections shall be removed, surface defects shall be patched, and repairs to defective concrete and honeycombed areas shall be made, clean all exposed concrete surfaces and adjoining work stained by the leakage of concrete, to the approval of the Architect/Engineer.

2. Immediately after removal of forms, remove form tie plugs. Holes shall then be promptly filled upon stripping as follows: Moisten the hole with water, followed by a 1/16" brush coat of neat cement slurry mixed to the consistency of a heavy paste. Immediately plug the hole with a 1:1.5 mixture of cement and concrete sand mixed slightly damp to the touch (just short of balling). Hammer the grout into the hole until dense, and an excess of paste appears on the surface in the form of a spiderweb. Fill hole flush with concrete surface and finish smooth.

3.08 FINISHING FLATWORK

A. Provide slab surface of following specified flatness and levelness when tested in accordance with ASTM E1155. Remove surface irregularities to provide a continuous smooth finish.

B. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system.

1. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances F_F 30-F_L 18, minimum overall composite and F_F 15 – F_L 10 minimum local value and a Waviness Index $WI_{2\text{-}10}$ of 0.14 inches. Grind smooth surface defects that would telegraph through applied floor covering system.

C. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.

D. Nonslip Broom Finish: Apply nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordination required final finish with Architect before application.

3.09 CURING, PROTECTION AND FORM REMOVAL

A. Formed surfaces shall be periodically sprayed with water while forms are in place and, after forms are stripped, kept continuously wet and at a minimum temperature of 50 degrees F for 7 days.

B. Unformed surfaces such as slabs shall be moist cured at a minimum temperature of 50 degrees F for 7 days or given 2 successive uniform coatings of approved curing and sealing compound. Each coat shall consist of not less than 1 gal to 400 sq. ft.

C. Cold weather protection - When the air temperature is at or below 45 degrees F or when weather reports indicate that the temperature may fall below 45 degrees F within the 24 hr. period following placement of concrete, take all adequate and proper measures as required to maintain the temperature of the concrete between 50 degrees F and 70 degrees F for the specified curing period and to protect the concrete against damage by freezing or the cold, including but not limited to the following:

1. Ascertain that the requirements for heating of aggregates and water have been followed.

2. Heat formwork, reinforcing and underlying subgrades with live saturated steam so as to raise the temperature well above the freezing point. Concrete surfaces shall be covered to prevent direct contact with the steam.

3. After placing of concrete, protect against cold by means of tight covering and supply of sufficient heat, where required, to maintain the temperature of the concrete at a temperature of 50 to 70 degrees F for at least 7 days after placement of concrete. The concrete shall not be protected with salt, hay, manure or any other material containing live or organic acids. Concrete shall be kept continually moist during the curing periods.

4. The section to be concreted shall be completely housed or enclosed wherever practicable before placing of concrete, in a manner that will insure the maintenance of the required temperatures. Such enclosures shall be left in place during the curing period.

D. Hot weather protection - Take special care during the concreting operations during hot or dry weather. Wet forms just before placing of concrete and keep exposed surface continuously damp. Take special precautions in placing of slabs in unshaded locations so as to prevent flash setting of concrete. Provide a continuous fog spray of water immediately after screeding and maintain in moist condition and take such other protective measures as required to prevent damage from flash setting of concrete. Do not use retardant admixtures, other than specified by the Architect. Except as modified above, follow procedures as outlined in ACI 305.

E. Removal of Forms:

1. Remove forms only after concrete has attained sufficient strength to support its own weight and all loads thereon.

3.10 GROUTING OF ANCHOR BOLTS AND BASE PLATES

A. Grout Mixture: Use an approved packaged grout mix with the minimum amount of water required to produce a flowable grout. Extend grout with 3/8" coarse aggregate for grout placement over 2 inches thick.

B. Mixing: Per approved grout manufacturer's printed instructions. Do not mix more grout than can be placed within twenty (20) minutes.

C. Preparation:

1. Remove all defective concrete, laitance, dirt, etc. from the concrete surface. Saturate the surface of the concrete thoroughly with clean water for at least 24 hours. Remove free water just prior to placing the grout.

2. Clean, align, and level the base plate into final position and maintain that position during grouting. Bring the concrete and plate to be grouted to a temperature between 65 degrees to 90 degrees F. just prior to grouting.

D. Grouting:

1. Place the grout quickly and continuously to provide complete bearing and avoid air entrapment.

2. After the grout has acquired its initial set, cut off all unconfined, exposed edges, leaving slopes "shoulders". Paint the entire area within 24 hours with an approved curing compound.

END OF SECTION 03310

SECTION 04200 - UNIT MASONRY

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Concrete unit masonry.

B. Products installed but not furnished under this Section include the following:

1. Reinforcing bars - Section 03310.
2. Steel lintels in unit masonry are specified in Division 5 Section "Metal Fabrications."
3. Wood nailers and blocking built into unit masonry are specified in Division 6 Section "Rough Carpentry."
4. Reglets in masonry joints for metal flashing are specified in Division 7 Section "Flashing and Sheet Metal."
5. Core insulation – Section 07200.

C. Products utilized in this section but specified in other sections:

1. Water repellent admixtures – Section 04050

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide unit masonry that develops the following installed compressive strengths (f'm):

1. For concrete unit masonry: As follows:
   a. f'm = 1500 psi.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

1. Product data for each different masonry unit, accessory, and other manufactured product indicated.
2. Samples for verification purposes of the following:
   a. Include size variation data verifying that actual range of sizes for brick falls within ASTM C 216 dimension tolerances for brick where modular

dimensioning is indicated.

b. Full size unit of brick.

c. Colored masonry mortar samples for each color required showing the full range of colors expected in the finished construction. Label samples to indicate type and amount of colorant used.

d. Plastic weep holes/vents.

e. Accessories embedded in the masonry.

3. Material certificates for the following signed by manufacturer and Contractor certifying that each material complies with requirements.
   a. Each different cement product required for mortar and grout including name of manufacturer, brand, type, and weight slips at time of delivery.
   b. Each type and size of joint reinforcement.
   c. Each type and size of anchors, ties, and metal accessories.

4. Material test reports from a qualified independent testing laboratory employed and paid by Contractor indicating and interpreting test results relative to compliance of the following proposed masonry materials with requirements indicated:
   a. Mortar complying with property requirements of ASTM C 270.
   b. Grout mixes. Include description of type and proportions of grout ingredients.
   c. Masonry units.

5. Cold-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.

6. Hot-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.

7. Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, telephone numbers, names of Architects and Owners, and other information specified.

8. Results from tests and inspections performed by Owner's representatives will be reported promptly and in writing to Architect and Contractor.

1.5 QUALITY ASSURANCE

A. Unit Masonry Standard: Comply with ACI 530.1/ASCE 6 "Specifications for Masonry Structures," except as otherwise indicated.
   1. Revise ACI 530.1/ASCE 6 to exclude Sections 1.4 and 1.7; Parts 2.1.2, 3.1.2, and 4.1.2; and Articles 1.5.1.2, 1.5.1.3, 2.1.1.1, 2.1.1.2, and 2.3.3.9 and to modify Article 2.1.1.4 by deleting requirement for installing vent pipes and conduits built into masonry.

B. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

C. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry materials to project in undamaged condition.

B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.

C. Store cementitious materials off the ground, under cover, and in dry location.

D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.

3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.

C. Cold-Weather Construction: Comply with referenced unit masonry standard for cold-weather construction and the following:

1. Do not lay masonry units that are wet or frozen.
2. Remove masonry damaged by freezing conditions.

D. Hot-Weather Construction: Comply with referenced unit masonry standard.

1.8 CLOSEOUT SUBMITTALS

A. Upon completion of the Work of this Section, Contractor shall submit to the Construction Manager, all required closeout documents.

B. Contractor shall submit a marked-up set of drawings indicating any changes made during construction to the Construction Manager.

C. Upon completion, submit to the Construction Manager, a Contractor's Affidavit of Payment of Debts and Claims, and Release of Liens.

D. Refer to General Conditions for additional requirements.

2.0 PRODUCTS

2.1 MATERIALS, GENERAL

A. Comply with referenced unit masonry standard and other requirements specified in this Section applicable to each material indicated.

2.2 CONCRETE MASONRY UNITS

A. General: Comply with requirements indicated below applicable to each form of concrete masonry unit required.

1. Size: Provide concrete masonry units complying with requirements indicated below for size that are manufactured to specified face dimensions within tolerances specified in the applicable referenced ASTM specification for concrete masonry units.

a. Concrete Masonry Units: Manufactured to specified dimensions of 3/8 inch less than nominal widths by nominal heights by nominal lengths indicated on drawings provided. Scored concrete block at all exterior walls.
b. Concrete Building Brick: Specified dimensions as follows:
(a) Standard Modular: 3-5/8 inches wide by 2-1/4 inches high by 7-5/8

inches long.

2. Provide Type I, moisture-controlled units.

B. Hollow Load-Bearing Concrete Masonry Units: ASTM C 90, Grade N and as follows:

1. Unit Compressive Strength: Provide units with minimum average net area compressive strength indicated below:
   a. 2000 psi.
   b. Not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated.

2. Weight Classification: Lightweight.

C. Concrete Building Brick: ASTM C 55 and as follows:

1. Unit Compressive Strength: Provide units with minimum average net area compressive strength indicated below:
   a. Not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated.
   b. Weight Classification: Lightweight.

D. Split Face Concrete Masonry on Building Exterior Walls
Building Base Color: White

2.4 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce required mortar color.

B. Masonry Cement: ASTM C 91.
1. For colored pigmented mortars use premixed colored masonry cements of formulation required to produce color indicated, or if not indicated, as selected from manufacturer's standard formulations.

C. Ready-Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified in this article, combined with set-controlling admixtures to produce a ready-mixed mortar complying with ASTM C 1142.

D. Hydrated Lime: ASTM C 207, Type S.

E. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100 percent passing the No. 16 sieve.

1. Colored Mortar Aggregates: Ground marble, granite, or other sound stone, as

required to match Architect's sample.

F. Aggregate for Grout: ASTM C 404.

G. Colored Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.

H. Water: Clean and potable.

I. Products: Subject to compliance with requirements, provide one of the following:

1. Colored Masonry Cement:
2. Glen-Gery Color Mortar Blend
3. "Colorbond Custom Color Masonry Cement," Centurion.
4. "Atlas Custom Color Masonry Cement," Lehigh Portland Cement Co.
5. "Flamingo Color Masonry Cement," The Riverton Corporation.

J. Color of Mortar: White

2.5 JOINT REINFORCEMENT

A. General: Provide joint reinforcement complying with requirements of referenced unit masonry standard and this article, formed from the following:

1. Galvanized carbon steel wire hot dip zinc coating, ASTM 153-B2.

B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet, with prefabricated corner and tee units, and complying with requirements indicated below:

1. Wire Diameter for Side Rods: 0.1483 inch (9 gage).
2. Wire Diameter for Cross Rods: 0.1483 inch (9 gage).
3. For single-wythe masonry provide type as follows with single pair of side rods:

a. Truss design with continuous diagonal cross rods spaced not more than 16 inches o.c.
b. Concrete block and brick wythes separated by an insulated cavity, coursing aligned:

(1) Truss type with box ties, containing drips, welded at 16" o.c., equal to “AA Wire Products #AA660 or “Ty-Wal Cavity Truss Tab-Ty” with V-Drip.

C. Manufacturers: Subject to compliance with requirements, provide joint reinforcement by one of the following:

1. AA Wire Products Co.
2. Dur-O-Wal, Inc.
3. Heckman Building Products, Inc.
4. Hohmann & Barnard, Inc.
5. National Wire Products Industries.

2.6 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of referenced unit masonry standard and of this article.

B. Galvanized Carbon Steel Wire: ASTM A 82, coating class as required by referenced unit masonry standard for application indicated.

C. Galvanized Steel Sheet: ASTM A 366 (commercial quality) cold-rolled carbon steel sheet, hot-dip galvanized after fabrication to comply with ASTM A 525, Class B2 (for unit lengths over 15 inches) and Class B3 (for unit lengths under 15 inches), for sheet metal ties and anchors.

1. Thickness of Steel Sheet Galvanized After Fabrication: Uncoated thickness of steel sheet hot-dip galvanized after fabrication:
   a. 0.0747 inch (14 gage).

D. Steel Plates and Bars: ASTM A 36, hot-dip galvanized to comply with ASTM A 123 or ASTM A 153, Class B3, as applicable to size and form indicated.

E. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AA Wire Products Co.
2. Dur-O-Wal, Inc.
3. Heckman Building Products, Inc.
4. Hohmann & Barnard, Inc.
5. National Wire Products Industries

2.7 EMBEDDED FLASHING MATERIALS

A. Laminated Flashing: Manufacturer's standard laminated flashing of type indicated below:

1. Copper-Fabric Laminate: Copper sheet of weight per sq. ft. indicated below, bonded with asphalt between 2 layers of glass fiber cloth.

   a. Weight: 3 oz.

B. Asphalt-Coated Copper Flashing: Manufacturer's standard product consisting of sheet copper of weight per sq. ft. indicated below coated with flexible asphalt.

1. Weight: 3 oz.
2. Application: Use where flashing is fully concealed in masonry.

C. Adhesive for Flashings: Of type recommended by manufacturer of flashing material for use indicated.

D. Products: Subject to compliance with requirements, provide one of the following:

1. Asphalt-Coated Copper Flashing:

a. "Cop-A-Cote," Afco Products Inc.
b. "Type ACC-Asphalt Bituminous Coated," Phoenix Building Products.
c. "Coated Copper Flashing," Sandell Manufacturing Co., Inc.
(1) "Copperseal," York Manufacturing, Inc.

2.8 MISCELLANEOUS MASONRY ACCESSORIES

A. Weep Holes: Provide the following:

1. Round Plastic Tubing: Medium-density polyethylene, 3/8-inch outside diameter by 4 inches long.

2. Products: Subject to compliance with requirements, provide one of the following weep hole/ventilators:

a. Plastic Weep Hole/Vent:
1. ¼" round PVC Weep with Cotton Wick

2.9 MORTAR AND GROUT MIXES

A. General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification for job-mixed mortar and ASTM C 1142 for ready-mixed mortar, of types indicated below:

1. Limit cementitious materials in mortar to portland cement-lime.
2. For masonry below grade and in contact with earth, and where indicated, use type indicated below:

a. Type S.

3. For exterior, above-grade nonloadbearing walls and parapet walls; for interior loadbearing walls; for interior nonloadbearing partitions, and for other applications where another type is not indicated, use type indicated below:

a. Type N.

C. Grout for Unit Masonry: Comply with ASTM C 476 and referenced unit masonry standard. Compression strength of 18 days shall be 3000 psi.

3.0 EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of unit masonry.

B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Comply with referenced unit masonry standard and other requirements indicated applicable to each type of installation included in Project.

B. Thickness: Build cavity and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.

C. Build chases and recesses as shown or required to accommodate items specified in this and other Sections of the Specifications. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.

D. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.

E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.

3.3 CONSTRUCTION TOLERANCES

A. Comply with construction tolerances of referenced unit masonry standard.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.

B. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.

C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less that nominal 4-inch horizontal face dimensions at corners or jambs.

1. One-half running bond with vertical joint in each course centered on units in courses above and below.

D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

E. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.

F. Built-In Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.

G. Concrete block directly supporting steel lintels shall have cores filled with mortar.

3.5 REINFORCED MASONRY

A. In addition to the above, provide the following for reinforced masonry:

1. Securely position all vertical reinforcing at the center of the block unit.
2. Provide cleanout openings at the bottom of all grouted and reinforced cores. After inspection, these openings shall be closed and braced to adequately resist the pressure of the fluid grout.
3. Remove all mortar projections from the cells to be grouted.

4. Remove all mortar droppings and debris from foundation bearing surface and reinforcing bars.

3.6 MORTAR BEDDING AND JOINTING

A. Lay hollow concrete masonry units as follows:

1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and where adjacent to cells or cavities to be filled with grout.

B. Cut joints flush for masonry walls to be concealed or to be covered by other materials, unless otherwise indicated.

3.7 CAVITIES/AIR SPACES

A. Keep cavities/air spaces clean of mortar droppings and other materials during construction. Strike joints facing cavities/air spaces flush.

B. Tie exterior wythe to backup with individual metal ties. Stagger alternate courses.

C. Tie exterior wythe to backup with continuous horizontal joint reinforcing.

D. Install vents in vertical head joints at the top of each continuous cavity/air space. Space vents and close off cavities/air spaces vertically and horizontally with blocking in manner indicated.

3.8 HORIZONTAL JOINT REINFORCEMENT

A. General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcing a minimum of 6 inches.

B. Cut or interrupt joint reinforcement at control joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.9 MOVEMENT (CONTROL AND EXPANSION) JOINTS

A. General: Install control joints in unit masonry where indicated. Build in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. Form control joints in concrete masonry as follows:

1. Fit bond breaker strips into hollow contour in ends of block units on one side of control joint. Fill the resultant core with grout and rake joints in exposed faces.
2. Build in joint fillers where indicated.
3. Form open joint of width indicated but not less than 3/8 inch for installation of sealant and backer rod specified in Division 7 Section "Joint Sealers." Maintain joint free and clear of mortar.

C. Build in horizontal pressure-relieving joints where indicated; construct joints by either leaving an air space or inserting nonmetallic 50 percent compressible joint filler of width required to permit installation of sealant and backer rod specified in Division 7 Section "Joint Sealers."

1. Locate horizontal pressure-relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

3.10 LINTELS

A. Install steel lintels where indicated.

B. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

3.11 FLASHING/WEEP HOLES

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated.

B. Prepare masonry surfaces so that they are smooth and free from projections that could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with adhesive/sealant/tape as recommended by flashing manufacturer before covering with mortar.

C. Install flashings as follows:

1. At lintels and shelf angles, extend flashing a minimum of 4 inches into masonry at each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4 inches, and through the inner wythe to within 1/2 inches of the interior face of the wall in exposed masonry. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2 inches, unless otherwise indicated.
2. At heads and sills, extend flashing as specified above unless otherwise indicated but turn up ends not less than 2 inches to form a pan.
3. Install flashing in masonry veneer walls as specified above but carry flashing up face of sheathing at least 8 inches and behind air infiltration barrier.

D. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashings and as follows:

1. Form weep holes with product specified in Part 2 of this Section.
2. Form weep holes by keeping head joints free and clear of mortar.
3. Space weep holes 24 inches o.c.

3.12 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.

C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.

D. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

SECTION 05120 - STRUCTURAL STEEL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. Furnish all labor, material, and equipment necessary to complete all structural steel work as shown and/or specified.

B. Related Work Specified Elsewhere:

1. Testing Laboratory Services: Section 01411.

2. Grouting of Bearing and Base Plates: Section 03310.

3. Miscellaneous Metal: Section 05500.

4. Steel Joists: Section 05210.

5. Field Paint for Exposed Steel.

C. Furnished but Installed Under Other Sections:

1. Anchor Bolts: Section 03310.

2. Loose Lintels: Section 04200.

D. Specified Elsewhere But Included Under This Section:

1. Contractor's Responsibilities Associated with Testing Laboratory Services: Section 01411.

1.02 QUALITY ASSURANCE

A. Erector's Qualifications:

1. Satisfactorily completed projects of similar magnitude.

B. Fabricator's Qualifications:

1. Satisfactorily completed projects of similar magnitude.

2. Facilities and capacity to provide fabricated steel to facilitate timely completion of project.

C. Welder's Qualifications:

1. All shop and field welding is to be performed by operators who have passed the test as prescribed in AWS D1. 1 Chapter 5 "Qualifications", and qualified to perform the type of welding required.

2. Each welder working on the project shall be assigned an identification symbol or mark and shall mark or stamp his identification at each completed weldment, both in the shop and field.

3. The fabricator and erector shall submit to the Architect welder's qualifications prior to fabrication and erection.

D. Inspection and Quality Control:

1. The Fabricator shall provide effective full time quality control over all fabrication activities. This shall include ultra-sonic, magnetic particle, dye penetrant, x-ray, or other effective means of insuring that all welds fully conform to A.W.S. Standards. The Owner's testing agency may visit the plant as directed by the Architect to verify that a quality control program is being maintained and to spot check weldments and welding procedures. All fabricated items may also be subject to inspection in the field including ultra-sonic testing. Inspection by the testing agency is not intended to be comprehensive or complete and full responsibility for quality control shall remain with the Fabricator.

2. The Owner or his representative shall have the right to reject any item not fully conforming to all requirements of the Contract Documents.

1.03 REFERENCE CODES AND STANDARDS

A. Comply with the provisions of the following, except as otherwise indicated.

1. AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings".

2. AISC "Code of Standard Practice for Steel Buildings and Bridges".

3. AISC "Manual of Steel Construction".

4. AISC "Specifications for Structural Joints using ASTM A325 or A490 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Council.

5. AWS D1.7 "Code for Welding in Building Construction".

6. SSPC "Structural Steel Painting Manual".

7. Painting Manual, Vol. 1, "Good Painting Practice" and Painting Manual, Vol. 2, "Systems and Specifications", Steel Structures Painting Council.

8. All pertinent Federal, State, and Local Codes.

B. In case of conflict between specified codes and standards, the most stringent requirements govern. In case of conflict between codes and standards and Project Specifications, Project Specifications shall govern.

1.04 SUBMITTALS

A. Shop Drawings:

1. Include all information necessary for steel fabrication and erection, including:

a. Standard details of proposed beam end connections with load capacities, and other job standards for appropriate parts of the work. Submit for approval before preparation of detail drawings. Consistently use standard details on Detail Drawings where appropriate.

b. Anchor bolt and bearing plate: Plans showing the location, size, and identification marks of all base plates, screws, bolts, grade of steel, and setting elevations.

c. Erection plans, showing type, size, weight, location identification marks of all members and all information regarding field welds and bolts.

d. Detail Drawings, showing complete details of all members including identification marks, dimensions, sizes, grade of steel, holes, shop and field welds, connection details, shop and field bolts, cleaning requirements prior to painting, type of paint and other pertinent data.

e. Include on drawings all temporary members required for erection.

f. Submit one sepia and two prints of shop drawings for review.

2. Product Data:

For all standard manufactured products, including paint.

3. Certificates:

   a. Prior to delivery of steel to the project site, submit certified copies of mill test reports including name and location of mill and analysis of chemical and physical properties of steel to be used on this project.

   b. Provide certification that welders to be employed in the work have satisfactorily passed AWS qualification tests within the previous 12 months.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Rolled Steel Wide-Flange Shapes & WT shapes cut from wide flange: ASTM A-992.

B. Rolled Steel Plates, Bars, and Non Wide-Flange Shapes: ASTM A-36 unless otherwise indicated.

C. Structural Pipe: ASTM A-501 or A-53 Grade B.

D. High Strength Bolts: ASTM A-325. A-490.

E. Standard Anchor Rods: ASTM F1554, Grade 36.

F. Electrodes for Welding: AWS E70 Series.

G. Paint for Shop Primer:

1. Non-exposed Steel

   a. Paint for shop primer shall have not less than 50 percent solids, per volume, and shall withstand the following tests without any change in adhesion, film integrity, hardness, color, blistering or cracking:

      1. Freeze Thaw: ASTM D2246, 30 cycles

      2. Salt Spray Resistance: ASTM B117, 500 hours

      3. Light and Water Resistance: ASTM D822, 5000 hours

   b. Acceptable Products:

      1. #99 or #88 Primer by Tnemec Co., Inc.

      2. Ceco #265 by Cheesman-Elliot Co.

c. Paint shall provide a minimum bond capacity for the adhesion of spray fire-proofing of 100 psf or greater. Submit certificates of compliance.

d. Other products will be considered if request is accompanied by certified test reports showing compliance with all the above requirements.

2. Exposed Steel:

a. Acceptable Product: Series 90-93 Zinc Primer by Tnemec Company.

2.02 DESIGN

A. Connections:

1. Design and detail all connections to resist the loads and reactions indicated on the Drawings or specified herein. Details shall supplement and be consistent with details shown on the Drawings. Proper account of eccentricity shall be taken in the design of connections so that there is no overstressing of any material either in the connections themselves or in the connected members. The design of all connections shall be subject to the approval of the Architect/Engineer.

a. Shop and field connections shall be made using minimum 3/4" diameter high strength bolts or by welding, unless otherwise indicated.

b. Beam-to-column connections shall be such as to minimize eccentric loading on the column. Unrestrained simple beam end connections shall be detailed and fabricated so as to minimize end restraint of the beam. All parts of such connections (such as welds, bolts and material) shall be designed taking eccentricity into account.

2. Temporary Bracing:

The Contractor shall be fully responsible for the design, strength, safety and adequacy of all temporary bracing and all methods of construction. The specifying herein of requirements for bracing or construction methods, preliminary approvals by the Architect, or any other requirements of the Specifications shall be construed as the minimum acceptable, and shall not eliminate, lessen or restrict in any manner the responsibility of the Contractor for all construction methods and for the safety and stability of the structural steel work at all stages of erection, until such time as the permanent bracing system becomes effective.

2.03 FABRICATION

A. Installation of High Strength Bolts:

1. Shop installed high strength bolts shall be installed as specified below under "Execution".

B. Welding:

1. Shop welding shall be done by either shielded metal arc welding, submerged arc welding or flux core arc welding. (SMAW, SAW, FCAW). Gas metal arc welding (GMAW) is not permitted.

2. Prepare joint welding procedures and program of welding sequence (for each component and for welding joining components to each other) and submit to Architect for approval before any welding is done. After approval, welding procedures and sequences shall be followed without deviation unless specific approval for change is obtained from Architect. Architect may require requalifications of operators for such changes in welding procedures by test prescribed in AWS "Standard Qualification Procedures".

C. Cutting:

1. Manual oxygen cutting shall be done only with a mechanically guided torch, except as permitted below:

a. Gas cut edges, which are not to be welded, and which will be free of substantial stresses (as determined by the Architect/Engineer) may be cut manually with an unguided torch provided that specified AISC edge distances to holes are maintained.

b. Gas cut edges which will be subjected to substantial stress (over 1/2 the allowable stress, as determined by the Architect/Engineer), or which are to be welded may be cut manually with an unguided torch to a line not within 1/8" of the finished dimension, with final removal of material completed by chipping or grinding to produce a surface quality equal to that of the base metal edges.

2. Punch and drill steel for attachment of other materials indicated on the Drawings or noted in the Specifications to be attached to the steel.

3. Holes for bolted connections shall not be oxygen cut. Components prepared in this manner will be rejected.

4. All re-entrant corners shall be shaped notch-free to a radius of at least 1/2".

5. Cut no openings without the written approval of the Architect/ Engineer.

D. Milled Ends:

1. Where loads are transferred by bearing at ends of columns, ends shall be milled.

E. Identification:

1. Each structural steel member shall have its assigned position and identification mark or symbol plainly indicated thereon near one end. Marks shall agree with those shown on the Shop Drawings and Erection Drawings.

2.04 SUPPLEMENTAL FRAMING:

A. Provide supplemental framing at all openings as shown on the Drawings and at all suspended loads.

B. Where open web joists are used, provide additional framing to transfer loads from the supplemental framing and suspended loads to panel points. Coordinate with the steel joist Contractor and provide him with sufficient information to enable him to incorporate shop welded connections to panel points on his Shop Drawings. Where such information is not so provided, structural steel Contractor shall supply and install the necessary connections.

2.05 SHOP PAINTING:

A. Cleaning and Preparation:

1. Painted Steel

a. Non-exposed steel specified to be painted shall be cleaned in accordance with SSPC-SP3.

1. Non-exposed steel is defined as steel not exposed to the elements. Usually contained within building envelope.

b. Exposed steel to be painted shall be cleaned and lightly sandblasted in accordance with SSPC-6. Connections are to be included.

1. Exposed steel is steel, which is exposed to the elements.

2. Unpainted Steel

a. Unpainted steel to receive fire-proofing shall be free of all oil, grease, loose mill scale, salt, dirt and any other substance that impairs proper adhesion of the fire-proofing.

b. All other unpainted steel shall be cleaned of oil and grease by solvent cleaners and cleaned of dirt and other foreign materials by thoroughly sweeping with fiber brushes.

B. Surfaces to be Painted:

1. All steel surfaces, except as follows:

a. Surfaces to receive metal deck and/or shear connectors fastened by welding.

b. Contact surfaces of high strength bolted connections.

c. Steel to be encased in concrete.

d. Surfaces within 2" of field welds.

e. Machine finished surfaces (e.g., bearing surfaces of columns and column base plates).

C. Surfaces to Receive Protective Coating:

Machine finished surfaces such as bearing surfaces of column and base plates.

D. Method and Rate of Paint Application:

1. Non-exposed Steel

a. Apply one prime coat of paint to dry, clean surfaces by brush, spray or roller with no running or sagging.

b. The coverage rate per coat shall not be more than 400 sq. ft. per gal. resulting in a minimum wet film thickness of 4 mils and providing a minimum dry film thickness of 2 mils.

c. If for any reason any surface to be field welded or bolted is painted, remove such paint completely to within stated limits before field welding or bolting. If any machine finished surface is painted, remove such paint completely, and touch up specified finish if required, before shipping or erection.

2. Exposed Steel

a. Single coat of Zinc Primer, minimum dry film thickness 4.0 mils, to be applied in strict conformance with manufacturer's printed requirements.

PART 3 - EXECUTION

3.01 ERECTION:

A. Verify that anchor bolts and bearing plates are of the size required and accurately located, prior to erection of the steel.

B. Set base plates and bearing plates level to correct elevations and support temporarily on steel wedges, shims, leveling devices, or as shown on Drawings, until corresponding supported member has been positioned, plumbed and anchor bolted. Leave protruding leveling devices in place until after grout has been placed and has attained required strength, and then cut off flush with top or edges of base plate, or both, except as otherwise noted.

C. Align, level, and adjust all members accurately prior to final fastening. Bearing surfaces and surfaces that will be in permanent contact shall be cleaned prior to final assembly of members. Drift pins shall be used only to bring together the several parts. They shall not be used in such manner as to distort or damage the metal.

D. As erection progresses, the work shall be securely connected to safely resist all dead load, wind and erection forces. Temporary bracing shall be introduced wherever necessary to safely resist all loads to which the structure may be subjected, including erection equipment and its operation. Such bracing shall be left in place as long as may be required for safety.

E. Oxygen cutting in the field shall not be done except with written permission to the Architect. When permitted, it shall be executed in accordance with the requirements herein specified.

F. All temporary supports, flooring, planking, and scaffolding necessary in connection with the erection of the structural steel, or the support of erection equipment, shall be provided as a part of the erection work. The temporary floors shall be as required by Federal, State and Municipal Laws and governing safety regulations.

G. Protect expansion joints during all construction phases such to prevent any accumulation of debris or other deleterious materials in the sliding plane.

3.02 FIELD WELDING:

A. Field welding shall be done with shielded metal arc welding (SMAW) or flux core arc welding (FCAW) only.

B. The Contractor shall provide safe and substantial work platforms at proper height to permit best possible field welding technique. Temporary enclosure, shielding, etc., shall be provided to protect welding operators and joints to be welded against the elements during welding operations.

3.03 INSTALLATION OF HIGH STRENGTH BOLTS:

A. Provide safe and substantial work platform for bolting crews.

B. Each bolting crew working on the project shall be assigned an identification symbol or mark. Each bolting crew shall mark this identification on each joint completed.

C. Joints shall be made without the use of erection bolts, the high strength bolts required for the joint serving that purpose themselves. Where proper fix-up cannot be obtained, corrective work or additional plumbing, leveling, etc. may be required. Use not more than 2 washers per bolt.

D. Correct poor matching of holes by drilling to next larger size and use of larger size bolt, if approved by Architect/Engineer. Welding for redrilling shall not be done.

E. High strength bolts shall be installed by the "modified turn-of-the-nut method", or by the use of load indicator washers, or by the use of torque control bolts. (See below)

3.04 INSTALLATION OF HIGH STRENGTH BOLTS BY "MODIFIED TURN-OF- THE-NUT METHOD":

A. Install high strength steel bolts in accordance with the turn-of-the-nut method in the AISC approved "Specification for Structural Joints using ASTM A325 or A490 Bolts", with the following additional requirements:

1. Use hardened washer under bolt head or nut, whichever is turned in tightening (unless oversize holes have been approved, in which case washers are required under head and nut).

2. At the start of each day, each operator shall field test his power impact wrench as directed by the testing agency or Architect and as described below using bolts representative of those to be used in the work.

3. Field testing of each impact wrench shall consist of tightening, in a hydraulic tension-measuring device such as a Skidmore Wilhelm Calibrator furnished by the Contractor, three bolts of each size to be used, with a hardened washer under either bolt head or nut, whichever is turned in tightening. Bolt tension readings shall be taken at "snug-tight plus fraction of turn" (tabulated in Table 4) conditions to confirm that bolts and equipment have the capacity to develop the minimum tension tabulated in Table 3.

4. While power impact wrenches are being field tested, the testing agency shall be given the opportunity to determine the torque-tension relationship for its manual torque indicator wrench for every combination of impact wrench and bolt size to be used in the work for the day. These torque values shall be used as the inspection standard in testing the actual installations.

5. Install bolts using powered impact wrenches with sufficient capacity and an adequate supply of compressed air.

3.05 INSTALLATION OF HIGH STRENGTH BOLTS BY THE USE OF LOAD INDICATOR WASHERS:

A. Load indicator washers used as direct tension indicators shall be installed as follows:

1. The load indicator washer shall be placed on the bolt with the protrusions facing the bolt head.

2. The assembly shall be fitted into place and the nut installed. Hardened round washers shall be used under the nut to reduce frictional resistance.

3. Sufficient bolts in the joint shall be "snugged" to draw the connecting members into close contact, then all bolts shall be tightened until the average gap between the face of the load indicator washer and the

underside of the bolt head is reduced to at least .015", but not closed completely.

4. Tightening shall progress systematically from the most rigid part of the joint to its free edges until the load indicator washers on all bolts are closed to at least the required gap. Gaps shall be checked with a feeler gauge. Complete closure of the gap should be avoided, but it is not necessarily reason for rejection provided bolts have not been tightened more than one complete turn beyond snug position.

5. When it is required to use the load indicator under the nut, a hardened round washer shall be fitted between the load indicator washer and the nut. After the bolt is installed in the connection, the load indicator washer shall be placed on the bolt with the protrusions facing the nut. The hardened round washer shall be placed against the load indicator washer protrusions before the nut is installed. For this assembly, tightening is continued until the average gap between the load indicator washer and the hardened round washer is closed to at least .0152" if the bolt head is turned during installation, and to a least .010" if the nut is turned in accordance with the procedure given above.

6. If the load indicator washer must be placed under the head, and the head must be turned, then a hardened round washer must be used between the load indicator washer protrusions and the bolt head. For this fastener assembly, the average gap between the load indicator washer and the hardened round washer shall be closed to .010".

7. Install bolts using pneumatic powered impact wrenches with sufficient capacity and an adequate supply of compressed air.

3.06 INSTALLATION OF HIGH STRENGTH BOLTS BY TORQUE CONTROL BOLTS:

A. A hardened washer shall be installed under the nut (unless oversized holes have been approved, in which case washers are required under head and nut).

B. Torque control bolts shall be installed by a special torquing device recommended by the manufacturer. The torquing device shall engage the spline end of the fastener and prevent the bolt from rotating while the nut is being tightened. The bolts shall then be tightened until the counter-torque is sufficient to shear the spline end from the bolt.

C. At least 3 torque control bolts from each shipment shall be tested in a hydraulic tension-measuring device such as a Skidmore-Wilhelm Calibrator furnished by the Contractor. Bolts are to be fully tightened using the same equipment proposed for use in the structure. Tests shall be performed in the presence of the testing

agency. If any bolt fails to reach the minimum tension required by ASTM A325, that bolt shall then be tightened using a calibrated torque wrench until the required tension reading is observed on the calibrator. Bolts from that shipment shall then be tested in the field using the same calibrated torque wrench and the cost of such testing shall be at the Contractor's expense.

3.07 CORRECTIVE WORK:

A. Structural steel members or assemblages having fabrication errors, or which have deformations preventing proper assembly and fitting of parts, shall be reported immediately to the Architect. They shall not be incorporated in the finished work. Such members or assemblages may be corrected if permitted by the Architect, such corrective work shall be in accordance with the Contract Documents.

B. Submit to the Architect for approval Drawings showing reasons for and details of proposed corrective work, and receive approved Drawings prior to performing the corrective work.

3.08 FIELD TOUCH-UP PAINTING:

A. After erection all exposed metal surfaces where shop coat is missing or has been damaged shall be touched-up using the same type of paint as approved for the shop coat.

B. Prior to touch-up, all areas to be painted shall be thoroughly cleaned of rust, dirt and weld slag.

C. Touch-up paint shall extend a minimum of 2" onto undamaged finish.

D. Paint shall be uniformly applied to dry surfaces to a dry film thickness of no less than 2 mils, 4 mils for exposed steel.

END OF SECTION 05120

SECTION 05 22 00 - STEEL JOIST FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to this section.

1.2 SUMMARY

A. This section includes steel joists for roof framing. Types of joists required include the following:

1. LH and K - Series Steel Joists.

B. Refer to Division 3 sections for installation of anchors set in concrete.

C. Refer to Division 4 sections for installation of anchors set in masonry.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product Data and installation instructions for each type of joist and accessory.

1. Include manufacturer's certification that joists comply with SJI "Specifications".

C. Shop Drawings: Submit detailed drawings showing layout of joist members, special connections, joining and accessories. Include mark, number, type, location and spacing of joists and bridging.

1. Provide templates or location drawings for installation of anchor bolts and metal bearing plates.

1.4 QUALITY ASSURANCE

A. General: provide joists fabricated in compliance with the following, and as herein specified.

1. Steel Joist Institute (SJI) "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders".

B. Qualification of Field Welding: Qualify processes and welding operators in accordance with American Welding Society "Structural Welding Code - Steel," AWS D1.1.

C. Inspection: Inspect joists and girders in accordance with SJI "Specifications".

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle steel joists as recommended in SJI "Specifications". Handle and store joists in a manner to avoid deforming members and to avoid excessive stresses.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel: Comply with SJI "Specifications" for chord and web sections.

B. Steel Bearing Plates: ASTM A 36 unless noted otherwise.

C. High Strength Threaded Fasteners: ASTM A 325 or A 490 heavy hexagon structural bolts with nuts and hardened washers.

D. Unfinished Anchor Bolts: ASTM A 307, Grade A, low carbon steel.

E. Steel Prime Paint: Comply with SJI "Specifications".

2.2 FABRICATION

A. General: Fabricate steel joists in accordance with SJI "Specification".

B. Holes in Chord Members: Provide holes in chord members where shown for securing other work to steel joists; however, deduct area of holes from the area of chord when calculating strength of member.

C. Extended End: Provide extended ends on joists where shown, complying with SJI "Specifications" and load tables.

D. Top Chord Extensions: Provide "S" type top chord extensions on joists where indicated, compying with SJI "Specifications" and load tables.

E. Provide bottom chord extensions for all steel joists framing at columns.

1. Provide joists with a bottom chord of sufficient strength to sustain compressive stresses induced by partial end fixity.

F. Ceiling Extensions: Provide ceiling extensions in areas having ceilings attached directly to joist bottom cord. Provide either an extended bottom chord element or a separate unit, to suit manufacturer's standards, of sufficient strength to support ceiling construction.

1. Extend ends to within 1/2" of finished wall surface unless otherwise indicated.

G. Bridging: Provide horizontal or diagonal type bridging for joists and joist girders, complying with SJI "Specifications".

1. Provide bridging anchors for ends of bridging lines terminating at walls or beams.

H. End Anchorage: Provide end anchorages including steel bearing plates, to secure joists to adjacent construction, complying with SJI "Specifications".

I. Header Units: Provide header units to support tail joists at openings in floor or roof system not framed with steel shapes.

J. Shop Painting: Remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories before application of shop paint.

1. Apply one shop coat of steel prime paint to joists and accessories, by spraying, dipping, or other method to provide a continuous dry paint film thickness of not less than 0.50 mil.

PART 3 - EXECUTION

3.1 ERECTION

A. General: Place and secure steel joists in accordance with SJI "Specifications", final shop drawings, and as herein specified.

B. Anchors: Furnish anchor bolts, steel bearing plates, and other devices to be built into concrete and masonry construction.

1. Provide unfinished threaded fasteners for anchor bolts, unless high strength bolts are indicated.

C. Placing Joists: Do not start placement of steel joists until supporting work is in place and secured. Place joists on supporting work, adjust and align in accurate locations and spacing before permanently fastening.

1. Provide temporary bridging, connections, and anchors to ensure lateral stability during construction.

a. Where "open web" joist lengths are 40 feet and longer, install a center row of bolted bridging to provide lateral stability before slackening of hoisting lines.

D. Bridging: Install bridging simultaneously with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.

E. Fastening Joists: Comply with the following:

1. Field weld joists to supporting steel framework and steel bearing plates where indicated in accordance with SJI "Specifications" for type of joists used. Coordinate welding sequence and procedure with placing of joists.

2. Bolt joists to supporting steel framework where indicated in accordance with SJI "Specifications" for type of joists used.

a. Provide high-strength threaded fasteners or bolted connections of steel joists to supporting steel framework and at other locations where shown, installed in accordance with AISC "Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts".

3. Touch-Up Painting: After joist installation, wire brush welded areas, abraded or rusty surfaces, and clean with solvent. Paint field applied bolt heads and nuts and prepared surfaces on joists and steel supporting members. Use same type of paint as used for shop painting.

END OF SECTION 052200

SECTION 05300 - METAL DECKING

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Testing Laboratory Services: Section 01411.

B. Concrete Reinforcement: Section 03310.

C. Temporary Shoring of Metal Deck (If Required): Section 03310.

1.02 QUALITY ASSURANCE

A. Welder's Qualifications:

1. Qualifications of welders shall be as prescribed in the "Standard Qualification Procedures" by the American Welding Society.

2. Welding operators shall have been previously qualified to perform the type of work required for this project.

B. Reference Standards:

Unless otherwise indicated herein, perform work in accordance with the following standards:

1. Steel Deck Institute: "Code of Recommended Standard Practice".

2. American Welding Society: "Code for Welding in Building Construction".

3. American Iron and Steel Institute: "Specifications for the Design of Light Gauge Cold-Formed Steel Structural Members".

4. Factory Mutual: Loss Prevention Data 1-28 Insulated Steel Deck.

1.03 SUBMITTALS

A. Shop Drawings:

1. Indicate all details of fabrication and installation.

2. Deck: Include type, gauge, finish, location, openings, dimensions, anchorage details, lap details, accessories and shoring requirements (if any).

B. Product Data:

1. For each type of Deck.

C. Certification:

1. Evidence of welders qualifications.

2. Certifications from an approved independent Testing Laboratory indicating compliance with specified fire resistance requirements.

1.04 STORAGE AND HANDLING

A. Do not store deck in direct contact with ground.

B. Do not damage deck during handling.

C. If mud, dirt or other foreign matter does accumulate on the deck, completely remove such accumulation prior to erection.

PART 2 - PRODUCTS

2.01 DESIGN

A. Span each deck unit over 3 or more spans, minimum load capacity equivalent to SDI Standard Load Tables.

B. Where deck spans less than 3 spans, increase the gauge of the deck to provide the same load capacity as shown in SDI Standard Load Tables for 3 or more spans.

2.02 NON-COMPOSITE METAL ROOF DECK, 1-1/2"

A. Acceptable Products:

1. Type B by United Steel Decking.

2. Type B by Bowman Construction Products.

3. Type BP 1-1/2 by Rollform Products, Inc.

4. Type B of BW by Wheeling Corrugating Co.

5. Section 3 by Centria, Inc.

6. Type 1.5B by Vulcraft Div. Nucor Corp.

7. Type B or IB by Epic Metals Corp.

B. Material:

1. Steel Sheet, ASTM A611 with a minimum yield strength of 33,000 PSI.

2. Physical Properties:

a. Depth 1-1/2"

b. Gauge 22

C. Fire Resistance Requirements:

Comply with "FM Loss Prevention Data 1-28" for attaching deck.

D. Finish:

Protect with a zinc coating conforming to ASTM A-525 coating designation G60.

2.03 ACCESSORIES

A. Roof Sump Plates: 24" square, minimum 20 gauge flat sump pan, required at each roof drain where metal deck is to receive rigid insulation.

B. Closures:

1. Metal Closures: Minimum 20 gauge steel with same finish as adjacent deck.

2. Flexible Closure Strips: Rubatex by Rubtex Corporation, or approved equal and shall conform to profile of various decks as required.

2.04 FIELD TOUCH-UP (Galvanized Surfaces)

A. Acceptable Products:

1. Z.R.C. Cold Galvanizing Compound by Z.R.C. Chemical Products Company.

2. Zinc clad 5 primer by Sherwin Williams Company.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prior to proceeding with installation of deck, the following shall have been completed:

1. Related steel framework plumbed, aligned and completed.

2. Temporary shoring installed (if required).

3. Ice, oil, dirt, rust, and other materials which may adversely affect welding shall have been removed.

3.02 INSTALLATION

A. Placing Deck Units:

1. Position metal deck units on supporting steel and accurately align to final position with units resting tightly on top of all supporting members. Do not stretch or contract the side lap interlocks.

2. Minimum bearing on steel supporting members shall be 2".

3. Minimum end laps shall be 2".

4. Center ends of deck over center of supports.

B. Cutting and Fitting:

1. Shop Cutting: Cut to proper length before shipping to the field.

2. Field Cutting By Metal Deck Erector:

a. Notch to fit around columns and other similar fabrication.

b. All holes and openings which are located and dimensioned on the structural drawings.

c. Holes in deck larger than 6" and up to 12" in diameter:

1. Deck erector shall furnish and install 1-1/2" x 1-1/2" x 3/16" galvanized steel angle 5'-0" long on one or both sides of each hole, perpendicular to flutes, as required. (Both sides if any portion of hole occurs in middle 1/3 of deck span, otherwise one side.)

2. Attach angle to underside of deck by bolting or puddle welding at each bottom flute.

3. Do not space holes closer than 5'-0" on center in any span.

3. Field Cutting By Other Trades:

a. Holes and openings required for work under other Sections of the Specifications, which are not located and dimensions on the structural drawings and are 6" in diameter or less shall be cut by the respective trade. Not more than one rib shall be cut per panel per span.

b. Method and Quality of Cutting: All cuts shall be neat and trim in appearance, cut deck with metal saw, drills or cutting torch.

C. Closures:

1. Provide metal closures for all openings in composite metal deck 1/16" wide and over, including the following:

a. Cover plate to close panel edge and end conditions and where panels change direction or abut.

b. Column closures to close openings between metal deck and structural steel columns.

c. Where deck is cut for passage of pipes, ducts, columns, etc. and deck is to remain exposed, provide a neatly cut sheet metal collar to cover edges of deck.

2. Restrictions:

Do not cut openings greater than 6" diameter in deck unless they are shown on the reviewed shop drawings or unless approved in writing.

D. Fastening Deck Units:

1. Arc weld deck to supporting steel as follows:

a. Use welding washers for decks less than 22 gauge.

b. Refer to drawings for requirements indicated.

2. Fasten deck to supporting steel less than 1/4" in thickness as follows:

a. Self-drilling fasteners (#10 minimum) with size and spacing as required to provide a diaphragm shear capacity equal to or greater than provided by welding requirements above.

b. Submit diaphragm shear capacity data for approval prior to installation.

3. Longitudinal side laps of adjacent panels shall be 3/4" diameter welded or #12 self-drilling fasteners between support at intervals not exceeding 3'-0". Confine welding to decks 20 gauge or heavier.

3.03 FIELD TOUCH-UP PAINTING

A. Preparation:

1. Thoroughly clean areas to receive touch-up paint of all rust, dirt, oil and weld slag.

2. Accomplish touch-up soon after deck is erected.

3. Touch-up shall include but not limited to abrasions, scars, cut edges and welds.

4. Extend paint minimum of 2" onto undamaged finish.

5. Minimum dry film thickness: 2 mils.

B. Galvanized Surfaces:

Apply material specified for galvanized surfaces.

C. Painted Surfaces:

Apply same material used for prime coat.

END OF SECTION 05300

SECTION 05500 - METAL FABRICATION

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This section includes the following metal fabrications:

1. Rough hardware.
2. Ladders.
3. Loose steel lintels.
4. Miscellaneous framing and supports for the following:
   a. Applications where framing and supports are not specified in other sections.

B. Related Sections: The following sections contain requirements that relate to this section:

1. Division 5 Section "Structural Steel" for structural steel framing systems components.

1.3 DEFINITIONS

A. Definitions in ASTM E 985 for railing-related terms apply to this section.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. Structural Performance of Handrails and Railing Systems: Design, engineer, fabricate and install handrails and railing systems to comply with requirements of ASTM E 985 for structural performance based on testing performed in accordance with ASTM E 894 and E 935.

1.5 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data for products used in miscellaneous metal fabrications, including paint products and grout.

C. Shop drawings detailing fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections.

D. Samples representative of materials and finished projects as may be requested by Architect.

E. Welder certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" article.

F. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project name, addresses, names of Architects and Owners, and other information specified.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Firm experienced in successfully producing metal fabrications similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the Work.

B. Installer Qualifications: Arrange for installation of metal fabrications specified in this section by same firm that fabricated them.

C. Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel," D1.3 "Structural Welding Code - Sheet Steel", and D1.2 "Structural Welding Code - Aluminum."

1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.7 CLOSEOUT SUBMITTALS

A. Upon completion of the Work of this Section, Contractor shall submit to the Architect/Engineer, all required closeout documents.

B. Contractor shall submit a marked-up set of drawings indicating any changes made during construction to the Architect/Engineer.

C. Upon completion, submit to the Architect/Engineer, a Contractor's Affidavit of Payment of Debts and Claims, and Release of Liens.

D. Refer to General Conditions for additional requirements.

1.8 PROJECT CONDITIONS

A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of Work.

1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabrication of products without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

1.9 SEQUENCING AND SCHEDULING

A. Sequence and coordinate installation of wall handrails as follows:

1. Mount handrails only on completed walls. Do not support handrails temporarily by any means not satisfying structural performance requirements.

2. Mount handrails only on gypsum board assemblies reinforced to receive anchors, and where the location of concealed anchor plates has been clearly marked for benefit of Installer.

2.0 PRODUCTS

2.1 FERROUS METALS

A. Metal Surfaces, General: For metal fabrications exposed to view upon completion of the Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.

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

C. Uncoated Structural Steel Sheet: Product type (manufacturing method), quality, and grade, as follows:

1. Cold-Rolled Structural Steel Sheet: ASTM ! 611, grade as follows:

a. Grade A, unless otherwise indicated or required by design loading.

D. Steel Pipe: ASTM A 53; finish, type, and weight class as follows:

1. Black finish, unless otherwise indicated.
2. Galvanized finish for exterior installations and where indicated.

Type F, standard weight (schedule 40), unless otherwise indicated, or another weight, type and grade required by structural loads.

E. Malleable Iron Castings: ASTM A 47, grade 32510.

F. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as

supported rails, unless otherwise indicated.

G. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A 153.

H. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications of the metal alloy to be welded.

2.2 GROUT AND ANCHORING CEMENT

A. Nonshrink Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with CE CRD - C 621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

B. Interior Anchoring Cement: Factory-prepackaged, nonshrink, nonstaining, hydraulic controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching and grouting compound. Use for interior applications only.

C. Erosion-Resistant Anchoring Cement: Factory-prepackaged, nonshrink, nonstaining, hydraulic controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching and grouting compound. Provide formulation that is resistant to erosion from water exposure without need for protection by a sealer or waterproof coating and is recommended for exterior use by manufacturer.

D. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include but are not limited to the following:

E. Products: Subject to compliance with requirements, provide one of the following:

1. Nonshrink Nonmetallic Grouts:

    a. "Bonsal Construction Grout"; W.R. Bonsal Co.
    b. "Masterflow 713"; Master Builders.
    c. "Sealtight 588 Grout"; W.R. Meadows, Inc.
    d. "Sonogrout"; Sonneborn Building Products Div., Rexnord Chemical Products, Inc.
    e. "Stoncrete NM1"; Stonhard, Inc.

2. Interior Anchoring Cement:

    a. "Bonsal Anchor Cement"; W.R. Bonsal Co.
    b. "Por-Rok"; Minwax Construction Products Division

2.3 FASTENERS

A. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.

B. Bolts and nuts: Regular hexagon head type, ASTM A 307, Grade A.

C. Lag Bolts: Square head type, FS FF-B-561.

D. Machine Screws: Cadmium plated steel, FS FF-S-92.

E. Wood Screws: Flat head carbon steel, FS FF-S-111.

F. Plain Washers: Round, carbon steel, FS FF-W-92.

G. Drilled-In Expansion Anchors: Expansion anchors complying with FS FF-S-325, Group VIII (anchors, expansion, [nondrilling]), Type I (internally threaded tubular expansion anchor); and machine bolts complying with FS FF-B-575, Grade 5.

H. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class, and style as required.

I. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

2.4 PAINT

A. Shop Primer for Ferrous Metal: Manufacturer's or fabricator's standard, fast-curing, lead-free, universal modified alkyd primer selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated, and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure complying with performance requirements of FS TT-P-645.

2.5 CONCRETE FILL AND REINFORCING MATERIALS

A. Concrete Materials and Properties: Comply with requirements of Division 3 section "Concrete Work" for normal weight, ready-mix concrete with minimum 28-day compressive strength of 2,500 psi, 440 lb cement per cu. ft. minimum, and W/C ratio of 0.65 maximum, unless higher strengths indicated.

2.6 FABRICATION, GENERAL

A. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.

B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

C. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.

1. Temperature Change (Range): 100□F (55.5□C).

D. Shear and punch metals cleanly and accurately. Remove burrs.

E. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

F. Remove sharp or rough areas on exposed traffic surfaces.

G. Weld corners and seams continuously to comply with AWS recommendations and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

H. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

J. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

K. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware, screws and similar items.

L. Fabricate joints that will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.

2.7 ROUGH HARDWARE

A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 6 sections.

B. Fabricate items to sizes, shapes and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

2.8 STEEL LADDERS

A. General: Fabricate ladders for the locations shown, with dimensions, spacings, details and anchorages as indicated. Comply with requirements of ANSI A14.3.

B. Siderails: Continuous steel flat bars, ½" x 2½", with eased edges, spaced 18 inches apart.

C. Bar Rungs: Round steel bars, ¾" diameter, spaced 12 inches o.c.

D. Fit rungs in centerline of side rails, plug weld and grind smooth on outer rail faces.

E. Support each ladder at top and bottom and at intermediate points spaced not more than 5'0" o.c. by means of welded or bolted steel brackets.

1. Size brackets to support design dead and live loads indicated and to hold centerline of ladder rungs clear of the wall surface by not less than 7 inches.
2. Extend side rails 42 inches above top rung, and return rails to wall or structure unless other secure handholds are provided. If the adjacent structure does not extend above the top rung, goose-neck the extended rails back to the structure to provide secure ladder access.

F. Provide non-slip surface on top of each rung, either by coating the rung with aluminum oxide granules set in epozy resin adhesive, or by using a type of manufactured rung which is filled with aluminum oxide grout.

G. Exterior Ladders shall be hot dipped galvanized after fabrication.

2.9 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of required thickness and bearing area. Drill plates to receive anchor bolts and from grouting as required. Galvanize after fabrication.

2.10 LOOSE STEEL LINTELS

A. Fabricate loose structural steel lintels from steel angles and shapes of size indicated for

openings and recesses in masonry walls and partitions at locations indicated.

B. Weld adjoining members together to form a single unit where indicated.

C. Size loose lintels for equal bearing of one inch per foot of clear span but not less than 8 inches bearing at each side of openings, unless otherwise indicated.

D. Galvanize loose steel lintels located in exterior walls.

2.11 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports for applications indicated or which are not a part of structural steel framework, as required to complete work.

B. Fabricate units to sizes, shapes and profiles indicated and required to receive adjacent other construction retained by framing and supports. Fabricate from structural steel shapes, plates and steel bars of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware, hangers and similar items.

1. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.

a. Except as otherwise indicated, space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1¼" W x ¼" x 8" long.

C. Galvanize miscellaneous framing and supports in the following locations:

1. Exterior locations.
2. Interior locations where indicated.

2.12 MISCELLANEOUS STEEL TRIM

A. Provide shapes and sizes indicated for profiles shown. Unless otherwise indicated, fabricate units from structural steel shapes, plates and steel bars with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings and anchorages as required for coordination of assembly and installation with other work.

B. Galvanize miscellaneous framing and supports in the following locations:

1. Exterior locations.
2. Interior locations where indicated.

2.13 FINISHES, GENERAL

A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application

and designations of finishes.

B. Finish metal fabrications after assembly.

2.14 STEEL AND IRON FINISHES

A. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B): SSPC-SP6 "Commercial Blast Cleaning."
2. Interiors (SSPC Zone 1A): SSPC-SP3 "Power Tool Cleaning."

B. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finish or to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA1 "Paint Application Specification No. 1" for shop painting.

1. Stripe paint all edges, corners, crevices, bolts, welds and sharp edges.

3.0 EXECUTION

3.1 PREPARATION

A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.2 INSTALLATION, GENERAL

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.

B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment and elevation; with edges and surfaces level, plumb, true and free of rack; and measured from established lines and levels.

C. Provide temporary bracing or anchors in formwork for items that are to be build into concrete masonry or similar construction.

D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size

limitations. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

E. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, methods used in correcting welding work, and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood or dissimilar metals with a heavy coat of bituminous paint or zinc chromate primer.

3.3 SETTING LOOSE PLATES

A. Clean concrete and masonry bearing surfaces of any bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.

B. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the bearing plate before packing with grout.

1. Use metallic nonshrink grout in concealed locations where not exposed to moisture; use nonmetallic nonshrink grout in exposed locations, unless otherwise indicated.

2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections and abraded areas of shop paint and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 requirements for touch-up of field painted surfaces.

1. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

B. Touch-Up Painting: Cleaning and touch-up painting of field welds, bolted connections and abraded areas of the shop paint on miscellaneous metal is specified in Division 9 Section "Painting" of these specifications.

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to this section.

1.2 SUMMARY:

A. Types of work in this section include rough carpentry:

1. Preservative treated wood blocking/nailers for roofing.

2. Wood grounds, nailers and blocking.

1.3 SUBMITTALS:

A. Wood Treatment Data: Submit chemical treatment manufacturer's instructions for handling, storing, installation and finishing of treated material.

1. Preservative treatment: For each type specified, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained and conformance with applicable standards.

1.4 PRODUCT HANDLING:

A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.

1. For lumber and plywood pressure treated with waterborne chemicals, sticker between each course to provide air circulation.

1.5 PROJECT CONDITIONS:

A. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow attachment of other work.

PART 2 - PRODUCTS

2.1 LUMBER, GENERAL:

A. Lumber Standards: Manufacture lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.

B. Inspection Agencies: Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:

1. NLGA - National Lumber Grades Authority (Canadian).
2. SPIB - Southern Pine Inspection Bureau.
3. WCLIB - West Coast Lumber Inspection Bureau.
4. WWPA - Western Wood Products Association.

C. Grade Stamps: Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

D. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.

1. Provide dressed lumber, S4S, unless otherwise indicated.

2. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less in nominal thickness, unless otherwise indicated.

3. Provide lumber with 15 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less in nominal thickness, unless otherwise indicated.

2.2 DIMENSION LUMBER:

A. Light lumber framing, wood blocking and grounds, including wood blocking for wall attached shelving, cabinets, and toilet accessories:

1. Dimensions:

a. Where indicated and/or specified, lumber dimensions are nominal.
b. Actual dimensions to conform to PS20 for structural framing.

2. Surfacing: Surface four sides (S4S) unless specified otherwise.

3. Grades shall conform to the grading rules of manufacturer's association for the kinds of wood. Lumber shall bear the grade and trademark of the association under whose rule it is produced and shipped and a mark of the mill identification.

4. Species: Douglas fir-larch, hem-fir or southern pine graded under SPIB, WCLIB or WWPA Rules.

5. Grade: SPF No. 2 or better.

6. Moisture content: 19% or less.

7. Sizes: As indicated on drawings and/or as required to suit conditions encountered.

B. Shoring Lumber: Dimensions, species and adequate stress characteristics as required to suit conditions encountered.

2.3 WOOD TREATMENT BY PRESSURE PROCESS:

A. Preservative Treatment: Where lumber or plywood is indicated as "Trt-Wd" or "Treated", or "PT" is specified herein to be treated, comply with applicable requirements of AWPA Standards C2 (Lumber) and C9 (Plywood) and of AWPB Standards listed below. Mark each treated item with the AWPB Quality Mark Requirements.

1. Pressure-treat aboveground items with water-borne preservatives to comply with AWPB LP-2. After treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent. Treat indicated items and the following:

   a. Wood nailers, curbs, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.
   b. Blocking, furring, stripping and similar concealed members in contact with masonry or concrete.

2. Treat coated cut surfaces with heavy brush coat of same chemical used for treatment and to comply with AWPA M4.

2.5 MISCELLANEOUS MATERIALS:

A. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.

1. Where rough carpentry work is exposed to weather, used with preservative treated wood, or in area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A-153).

2.6 FIRE RETARDANT LUMBER

A. Provide fire retardant lumber as required by the applicable authorities where called for on the drawings and as required by Code.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Verify that surfaces to receive rough carpentry materials are prepared to required grades and dimensions and that they are reasonably clean, smooth, level and/or plumb.

B. Assure that anchor bolts required to secure blocking and nailers are properly located and installed.

C. Assure that preservative treatment used on blocking and nailers is compatible with roof deck insulation and membrane roofing materials.

3.2 INSTALLATION, GENERAL:

A. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.

B. Set carpentry work to required levels and lines, with members plumb and true and cut and fitted.

C. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards.

3.3 INSTALLATION:

A. Wood Blocking and Nailers: Used in conjunction with roof deck insulation, membrane roofing, fascia, copings and flashings:

1. Coordinate wood blocking and nailer requirements with appropriate applicators and approved shop drawings.

2. In general, install preservative treated wood nailers at perimeter of each roof level, curb flashing, roof hatch, similar penetrations and as required for fascia, copings, and at other locations as indicated on drawings and/or as required.

3. Firmly anchor all roof nailers to meet FM Loss Prevention Data Bulletin 1-49.

4. Unless otherwise indicated, thickness of nailers used in conjunction with roofing membrane shall be such that top of nailer is flush with surface to which roofing membrane is applied and/or attached (top of roof deck insulation) at horizontal plane.

5. Coordinate installation of vertical nailers, where required, with work of roofing material applicator.

6. Provide and install solid blocking at all wall door bumper locations.

B. Properly frame, closely fit, accurately set all framing, blocking, grounds, nailers, furring and other rough woodwork to required lines and levels and rigidly secure in place.

C. Install all woodwork level, plumb, square and true to details.

D. Expansion Joints: Worked to permit section to expand or contract without buckling.

E. Furnish and set all grounds, bucks and nailing clips required throughout building, including blocking required in Division 9, for attachment of all finished carpentry and millwork or for work of other trades requiring same. Provide grounds or blocking for all finished wood trim, grounds being ample to take nailing and securely anchored to studs.

F. Shoring Timber: Install all shoring and miscellaneous timber required to complete work properly.

3.4 Patch or repair any work of this section that may be cut or damaged by other trades.

3.5 Supervise all cutting for work by others and be responsible for any damage. Furnish means for proper access to different portions of work to Architect or his representative.

3.6 Details showing intent of design and construction are indicated on drawings and should be followed as closely as possible in keeping with best construction practices of trade involved. Work shall meet with approval of Architect.

3.7 Take and verify all measurements required for proper execution and fit of work. Check Architect's dimensions against field conditions. Report to Architect any discrepancies which will involve corrections. Adjust before fabrication. Be responsible for proper connections to adjoining work.

END OF SECTION

SECTION 07200 - INSULATION

1.0 GENERAL

The drawings, Instructions to Bidders, Form of Proposal, General Conditions, Supplementary General Conditions, and Division 1 are included herein and govern work under this section.

1.1 SCOPE OF WORK

A. Provide labor and materials and everything necessary for and incidental to the complete installation of building insulation shown on the drawings and described herein.

B. The following items are specifically included without limiting the generality implied by these specifications and the drawings.

1. Perimeter insulation.
2. Blanket insulation.
3. Acoustical insulation.
4. Masonry Core Insulation

1.2 CERTIFICATION

The manufacturers shall submit the insulation characteristics and tests of types to be used. The Contractor shall submit a list of insulation types and thicknesses and their intended places of use with the manufacturers submittal for the Architect's approval. A minimum of five (5) copies shall be submitted.

1.3 MANUFACTURERS

A. The following manufacturers' products are acceptable for use:

1. Celotex
2. Cetainteed
3. Owens Corning
4. US Gypsum

2.0 MATERIALS

A. Rigid Perimeter Insulation: 2" thick with minimum 2 pcf density and a minimum R Value of of 14.4. Supply with reflective foil skin. Factory mutual approved.
B. Exterior Walls: 2" Thick, Unfaced rigid

C. Acoustical Insulation: Thermafiber Sound Attenuation Blankets B3 USG

D. Masonry Core Insulation: Korfil preformed insulation designed to fit in core of block.

3.0 EXECUTION

A. Installation (General):

1. All materials shall be installed in strict accordance with the manufacturer's recommendations.

2. Surfaces to receive insulation with bonding adhesives shall be clean and free of protrusions. All form release agents on concrete shall be completely removed. Bonding adhesives shall be used in strict conformance with manufacturer's requirements.

3. Where caulk joint is shown, insulation shall be held back 3/4".

4. Rigid insulation shall be neatly cut and fitted with firm contact to adjacent surfaces.

5. Batt and loose insulation shall be tucked into voids of exterior walls. Care shall be taken to avoid holes in vapor barrier.

6. All joints shall be taped.

7. Maintain minimum temperatures when adhesives require curing or warm surfaces for application is recommended by manufacturer.

B. Protection: All insulation to be protected and kept under cover both in transit and on job site. Materials shall not be delivered unduly long before required for proper conduct of work.

C. Inspection: Upon completion of insulation work, and prior to the application of finishing materials, the contractor shall notify the Architect before proceeding.

END OF SECTION

SECTION 07535 - FULLY ADHERED EPDM ROOFING

1.0 GENERAL

The drawings, Instructions to Bidders, Form of Proposal, General Conditions, Supplementary General Conditions, and Division 1 are included herein and govern work under this section.

1.1 SCOPE

A. Furnish all labor, materials and equipment necessary and incidentals to execute the complete installation of the Fully Adhered Roofing System as indicated on the drawings and specified herein.

B. Furnish and install membrane roofing system in strict accordance with drawings, specifications, manufacturer recommendations and instructions. This specification is written around the membrane roofing system as manufactured by Firestone Building Products Company for the purpose of establishing standards of quality of materials construction and workmanship.

C. Furnish roof insulation related to Fully Adhered Roof System as specified in this section.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. Wood Nailers: Section 06100

B. Flashing and Sheet Metal: Section 07600

C. Roof Accessories: Section 07800

1.3 QUALITY ASSURANCE

A. Applicator:

1. Applicator must be licensed to install roof system by Firestone Building Products Company.
2. Applicator must have a minimum of three (3) successive years experience.

B. Store materials on clean raised platforms under weather protective coverings when store outside. Store adhesives, caulking, primers, etc. at room temperature (60-80 degrees F). If stored at lower temperature, restore to proper temperature before using.

C. Damaged materials shall be replaced at roofing contractors expense.

1.4 JOB CONDITIONS

A. Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with manufacturers recommendations and warranty requirements.

B. Do not allow oil based products (petroleum, grease, oil, solvents, etc.), mineral oil, animal fat or direct steam vents to come in direct contact with EPDM membrane.

C. Coordinate roofing work with other trades.

D. All surfaces to receive roofing shall be thoroughly dry and free of dew or frost.

1.5 WARRANTY

A. The contractor shall guarantee the roof for a period od two years from date of acceptance and provide a 10 year Manufacturer's Warranty against defective workmanship and manufacturers 20 year warranty against defective materials.

1. The contractor guarantees that the total roof installation together with all related composition flashing, metal flashing, roof insulation, blocking, and adhesives installed in connection with the roof, will be watertight and free of defects of material and workmanship for a period of two (2) years from final acceptance of the completed roof.
2. During this two year period, the roofing contractor agrees that within 48 hours of being notified, he will inspect and make all repairs necessary at no cost to the owner with exception of natural disaster.

B. Firestone Building Products Company shall issue a ten (10) year warranty against material workmanship and labor not limited to the dollar value of the original contract and a 20 year warranty against defective material.

1. The Firestone agrees to make all repairs necessary within 72 hours of notification.
2. Two copies of the properly executed warranty shall be delivered to the owners representative before final payment will be made.

1.6 PRE-ROOFING CONFERENCE

A. Prior to the beginning of work, a pre-roofing conference is to be held, attended by the Architect, the Roofing Contractor, a representative of Firestone and the owners representative if required. The purpose of this conference is to review the specifications, details, application, storage areas, protection and safety precautions and establish lines of communications with other subcontractors of this project.

2.0 GENERAL

A. The components of this roof system are to be products of the Firestone Building Products Company or as approved by Firestone in writing.

2.1 MEMBRANE MATERIAL

A. The membrane shall be free to streaks, particles of foreign matter, pinholes, cracks, tears and must be uniform in thickness. When unrolled in the relaxed position, the membrane must be free of wrinkles, distortions and blisters.

B. Membrane shall be Unreinforced .060 "FR" EPDM (Ethylene Propylene Diene Terpolymer)

1. Tensile Strength: 1305 psi minimum ASTM-D-412
2. Elongation: 300% minimum ASTM-D-412
3. Tear Resistance: 150 lbs/in minimum ASTM-D-624
4. Ozone Resistance: No cracks ASTM-D-1149
5. Heat Aging: Tensile minimum 1205 psi, minimum elongation 200% ASTM-D-573
6. Brittle Temperature: -49F (-45C) ASTM-D-746
7. Water Vapor Permeability Maximum Per Mil: 2.0 ASTM-E-96
8. Thickness: 0.060"

C. Flashing shall be uncured EPDM or cured EPDM.

1. Tensile Strength: 1306 psi minimum ASTM-D-412
2. Elongation: 300% minimum ASTM-D-412
3. Brittleness Temperature: -49F (-45C) ASTM-D-746
4. Tear Resistance: 150 lbs/in minimum ASTM-D-624
5. Thickness: 0.060"

D. Related Materials

1. Bonding Adhesive: Compatible with materials to which the membrane is to be bonded, furnished by Firestone.
2. Cleaner/Primer: A wash supplied by Firestone clean mica or talc on the surface of membrane and to prepare surface for splicing, bonding or tapes.
3. Splice Adhesive: Furnished by Firestone.
4. Lap Sealant: Compatible with material with which it is used and supplied by Firestone.
5. Water-Block Seal: Compatible with materials with which it is used and supplied by Firestone.
6. Molded Pipe Boots: Furnished with a stainless steel clamping ring and supplied by Firestone.
7. Pourable Sealer: Two part polybutadine/polyethylene formula compatible with material with which it is to be used and supplied by Firestone.
8. Termination Bar, Batten Strip, Reinforced Strip: Furnished by Firestone.
9. Walkway Pads: 30" x 30" x .300 thick supplied by Firestone.
10. Sponge Tubing and Compressible Filler: As recommended by Firestone.

E. Other Related Materials

1. Wood Nailers: Pressure treated for rot resistance (Womanized or Osmose K-33) #2 or better lumber. Asphaltic or creosote treated lumber is not acceptable.

2.2 INSULATION

A. Insulation shall be flat or tapered Firestone ISO 95+ Polyisocyaniurate with a black glass fiber mat facer.

1. To meet Federal Spec #HH-I-1972/2 Class 1
2. Flame Spread: 25 maximum ASTM-E-84
3. Density: Nom. 2pcf ASTM-D-1622
4. Compressive Strength: 20 psi ASTM-D-1621
5. Factory Mutual Approved for Class 1 insulated steel roof deck construction and concrete roof slab construction.
6. Underwriters Laboratory classified as a roof deck material with resistance to internal fire exposure for construction #120 and 123. UL-1256.

B. Minimum Aged R Value shall be 5.83 inch as determined in accordance with the PIMA conditioning procedure as outlined in PIMA Tech. Bulletin 101.(Minimum R value R29)

C. Provide tapered insulation where shown on roof plan.

2.3 INSULATION FASTENERS

A. Fasteners specifically designed to be used in roofing applications for the attachment of roof insulation (with metal insulation plates), batten bars, termination bars, and other accessories to steel, wood and structural concrete surfaces by Firestone (AP or HD fasteners type.)

1. Determine length as follows:
   a. Steel Deck: Penetrate deck minimum 1/2"

2. Corrosion Coating: Fluorocarbon Polymer.

B. Metal Plates: Specifically designed for insulation attachment and having a Factory Mutual approval.

2.4 VAPOR RETARDER

A. A six (6) mil poly vapor retarder shall be provided on the deck below the first layer of insulation. Seams shall be lapped a minimum of 4" and sealed with a pressure sensitive tape a minimum of 2" wide.

3.0 GENERAL

Comply with manufacturer's recommendations, except where more stringent requirements are indicated by architect.

3.1 SUBSTRATE PREPARATION

A. Substrate shall be structurally sound, clean, smooth free of fins, sharp edges, oil, grease, water and roof cement.

3.2 EXAMINATION

A. Verify proper placement of all roof openings, pipes, curbs, sleeves ducts, vents and drains.

3.3 VAPOR RETARDER

A. Install vapor retarder directly over roof deck lapping edges a minimum of 4" and seal joints with pressure sensitive tape. Do not apply more than can be covered and sealed in one day.

3.4 INSULATION INSTALLATION

A. Extend insulation over entire area to be insulated, neatly cutting and fitting around obstructions. Install in layers no more than 2" thick. Joints shall be 1/4" or less. Cover crickets, saddles, and tapered areas with material as required for proper drainage of membrane. Install only dry insulation and only as much as can be covered the same day with membrane and completed.

1. Secure insulation to the deck with Firestone fasteners at the rate of 1 every 2 square feet of surface area or as recommended by Firestone to meet an RM I-90 wind uplift.
2. A minimum of 300 lbs pull-out is required on all decks.

3.5 ELASTOMERIC SHEET ROOFING INSULATION

A. Install membrane to Firestone's printed instructions.

1. Loosely lay EPDM membrane over roof insulation. Allow membrane to relax 30 minutes minimum.

2. After making sure the sheet is placed in its final position, fold it back onto itself so as to expose the underside.
3. Remove excess dusting agent, or other contaminants from the mating surfaces.
4. Apply bonding adhesive at about the same time to both the underside of the membrane and the substrate to which it is to be bonded to with heavy napped roller or spray equipment. Do not allow globs or puddles to form. Note coverage rate as

recommended by the manufacturer.

5. Care must be taken not to apply bonding adhesive over the area that is to be later cleaned and spliced to another sheet.

6. Allow bonding adhesive to flash off until slightly tacky to the touch with a clean dry finger and does not string. Also push forward to ensure that the adhesive is ready throughout its thickness. Flash off time will vary depending on ambient air conditions.
7. Starting at the fold, roll the previously coated portion of the sheet into the coated substrate slowly and evenly to minimize wrinkles.
8. To insure proper contact, compress the bonded membrane to the substrate with a stiff push broom.
9. Repeat procedure on second half of sheet.

B. Membrane Splicing

1. Position membrane to overlap a minimum of 3" along the entire length of the splice.
2. Clean and dry mating surfaces using clean cotton cloths with splice cleaner or splice primer to remove all contaminants that will affect the finished seam strength. Allow to dry. Additional cleaning may be required. Discard cotton cloth as it becomes dirty and replace with clean one to assure proper cleaning.
3. Thoroughly stir splice adhesive before and during use. Apply splice adhesive using a 3" or 4" wide by 1/2" thick solvent resistant paint brush in a thick, even, smooth coat with long painting type strokes, yielding a smooth glossy adhesive surface. Apply splice adhesive to both mating surfaces at about the same time to allow approximately the same drying time. (**DO NOT USE CIRCULAR MOTIONS WITH BRUSH OR ROLLERS TO APPLY SPLICE ADHESIVE.**)
4. Apply splice adhesive at specified coverage rate as recommended by the manufacturer.
5. Allow adhesive to flash off. Touch with clean dry finger to be certain that the adhesive does not stick or string. Roll top sheet into the bottom allowing to fall freely as not to stretch or wrinkle the membrane.
6. Apply hand pressure along the entire lap. Then using a steel 2" or 3" wide steel roller, roll the entire splice applying pressure toward the outside edge of the lap.
7. Wait a minimum of 4 hours before applying lap sealant, weather permitting. Clean lap edge and apply a continuous bead of lap sealant approximately 3/8" x 1/4" centered over the lap edge. Feather lap sealant immediately using special lap sealant tool.

3.6 MEMBRANE SECUREMENT

A. Provide membrane securement (base tie-in) where the membrane ends or goes through an angle change greater than 2" in 12" (i.e. roof edge, curbs, walls). Round pipes 18" or smaller in diameter and square penetrations less than 4" do not require a base tie-in, but must be flashed to Firestone's details and specifications.

B. Install Firestone metal batter strip, polymer batten strip or reinforced perimeter fastening strips as required using standard printed manufacturer's details.

3.7 GRAVEL STOPS

A. Metal flange of gravel stop shall be secured to wood blocking at perimeter making sure that metal flange is completely supported by wood. Clean metal using Firestone Splice Primer #SP-1924. Apply QuickSeam Flashing PS-4020 per Firestone's specifications and standard details.

B. Special considerations must be given to copper edging. Copper may be weathered or lacquer coating and require special cleaning with acetone or lacquer thinner.

3.8 FLASHING - CURBS, WALLS, ETC.

A. Using longest pieces practical flash all walls, curbs, etc. to the height specified by project designer.

B. The following substrates require an overlayment of 5/8" exterior grade plywood.

1. Gypsum board
2. Stucco
3. Textured masonry
4. Corrugated metal panels
5. Other uneven substrates

C. Install all flashing to current Firestone specifications and details.

3.9 PENETRATIONS

A. Pipes: Flash using pre-molded EPDM pipe flashing where practical.

B. Roof Drains: (For cast iron drains only. Contact Firestone Technical Deparmtnet for all other types.) Remove existing flashing, lead and roofing from existing drain bowl. Taper insulation around drain to 4" in 12" or less to provide a smooth transition. Position membrane over drain and cut hole allowing 1/2" minimum inside clamping ring. Cut round holes for clamping bolts. (Do not cut membrane back to bolts.) Place water block seal on the clamping ring seat below membrane using a minimum of 1/2 tube per drain. Install roof drain clamping ring and bolts. Tighten clamping ring bolts to achieve constant compression.

C. Pipe Clusters: Fabricate metal penetration pocket with a minimum of 1" clearance on all sides. Secure penetration pocket to deck as required. Fill with Pourable Sealer to shed water. A 2" minimum depth is required.

D. Hot Pipes: Protect rubber components from direct contact with steam or heat sources when in-service temperature exceeds 180 degrees F.

E. Flexible Penetrations: Provide a weathertight gooseneck set in water block seal and secured to the deck. Flash in accordance with "Pipes" as listed above 3.9A).

F. Expansion Joints: Flash as detailed and in accordance with manufacturer's specifications.

END OF SECTION

SECTION 07600 - FLASHING AND SHEET METAL

1.0 GENERAL

The drawings, Instructions to Bidders, Form of Proposal, General Conditions, Supplementary General Conditions, and Division 1 are included herein and govern work under this section.

1.1 SCOPE

A. Provide labor and materials and everything necessary for, and incidental to the execution and completion of the Flashing and Sheet Metal work indicated on the drawings and specified herein.

B. The following items are specifically included without limiting the generality implied by these specifications and the drawings:

1. Flashing for mechanical pipes and fixtures
2. Metal sump pans at roof drains
3. Coping System
4. Metal Cap Flashing
5. Reglet and Counterflashing

1.2 COOPERATION

Examine drawings and specifications to determine nature of construction. Provide items in advance of use that are to be built into work by other trades, or may interfere with the normal installation or quality of their work.

2.O PRODUCTS

2.1 MATERIALS

A. Cap Flashing - Aluminum pre-finished sheet or strip of Alloy and temper recommended by the aluminum producer for the use intended. Thickness shall be 24 gauge. Finish shall be clear anodized. Cap flashing shall be shaped to profiles shown on drawings; workmanship shall follow SMACNA standards. Field work shall provide sharp clean profiles and properly fitted joints to exclude weather.

B. Coping System

Furnish and install snap-lock coping system as manufactured by MM Systems. Coping shall be .063 aluminum with smooth finish.

Gutter/splice plate shall be aluminum finished to match coping. Anchor plate shall be galvanized steel.

Finish shall be color as selected by Architect.

C. Reglet & Counterflashing

Furnish and install SNAP-TITE reglet and counterflashing system by MM Systems Corporation (RC-3).

3.0 EXECUTION

3.1 INSTALLATION

Flashing shall be installed where shown on drawings. Provide cements as recommended by the manufacturer and install with laps and cemented joints as recommended by the manufacturer.

3.2 VERIFICATION OF ROOF GUARANTY

A. The General Contractor shall verify and coordinate with the Cap Flashing Contractor and Roofing Contractor compatibility, acceptance and written roof guaranty.

END OF SECTION

SECTION 07900 - CAULKING AND SEALANTS

1.0 GENERAL

The drawings, Instructions to Bidders, Form of Proposal, General Conditions, Supplementary General Conditions and Division 1 are included herein and govern work under this section.

1.1 DESCRIPTION OF WORK

A. The work covered by this section of the specifications consists of providing all equipment, materials and labor, and performing all the work as required for the complete execution of caulking and sealing as indicated. Included, but not necessarily limited to, are the following:

1 Sealing all joints between precast concrete panels and aluminum and hollow metal frames and other items built into wall.
1. Sealing all joints between masonry and steel and aluminum frames.
3 Sealing all around all exterior door frames, louvers and other items built into exterior walls.
4 Sealing all joints between exterior architectural metal work and other materials.
1. Caulking all exterior door saddles.
1. Caulking all joints between flashing and other work beneath flashings.
7. Sealing at control and expansion joints.
1. Sealing or caulking at all other locations where sealant or caulking is indicated.

B. The following work is specified under other divisions and/or sections of the specifications:

1. Premolded expansion joint filler at concrete slabs - Division 3.
2. Glass and Glazing - Division 8.
3. Joint filler and sealer for sidewalks - Division 2.

1.2 GENERAL PERFORMANCE

Except as otherwise indicated, joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealers to comply with this requirement will be recognized as failures of materials and workmanship.

1.3 SUBMITTALS

A. Product Data

Submit manufacturer's product specifications, handling, installation, curing

instructions, and performance tested data sheets for each elastomeric product required.

B. Certified Tests

With product data submit test reports for elastomeric sealants on aged performances as specified, including hardness, stain resistance, adhesion, cohesion or tensile strength, elongation, low-temperature flexibility, compression set, modulus of elasticity, water absorption, and resistance (aging, weight loss, deterioration) to heat and exposures to ozone and ultraviolet.

1.4 JOB CONDITIONS

A. Weather Conditions

Do not proceed with installation of liquid sealants under unfavorable weather conditions. Install elastomeric sealants when temperature is in lower third of temperature range recommended by manufacturer for installation.

1.5 SAMPLES

A. Submit in duplicate, samples of all material specified herein, for approval of Architect.

B. Approved samples shall be the standard for comparison of all installed work.

1.5 WARRANTY

DC 795, 790, 756	20 yr Non Stain Warranty
DC 795, 790, 756	20 yr Weatherseal Warranty
DC CWS CCS	5 yr Weatherseal Warranty

1.6 SWRI VALIDATION

All sealants to be validated by the Sealant Weatherproofing Restoration Institute (www.SWRIONLINE.org)

2.0 PRODUCTS

2.1 PLAIN CAULKING COMPOUND

A. Use plain caulking compound under door saddles, at metal flashing and for interior caulking.

B. Plain caulking compound shall be the best grade manufactured by one of the following companies and shall comply with specification requirements:

1. A.C. Horn Company
2. Tremco Manufacturing Company
3. Pecora, Inc.
4. Minwax Company, Inc.
5. Martin Marietta Company
6. DAP, Inc.
7. Dow Corning

C. It shall be furnished in proper consistency for gun or knife application as required.

D. Color shall be approved by the Architect.

2.2 ELASTOMER SEALANT COMPOUND

A. Except as otherwise specified, all sealant and caulking work shall be done with elastomer sealant compound.

B. All elastomer sealing compound shall be a one part 100% silicone sealant, . Primer shall be used in accordance with manufacturer's recommendations.

C. It shall have a Shore Hardness Durometer reading of 25 to 35 as recommended by manufacturer for specific conditions and shall withstand temperature extremes from minus 20 degrees F. to plus 260 degrees F.

D. It shall absorb movement not to exceed 100% of its applied width after ten (20) years exposure without loss of adhesion or cohesion.

E. It must be non-staining and non-blushing after contact with masonry terra cotta, mortar or metal of any kind.

F. Color shall be selected by the Architect.

G. All Silicone compound furnished under this section shall be of the same brand unless otherwise approved by the Architect in writing.

H. Elastomeric sealant shall be of a brand and as manufactured by a firm listed below:

1.

1. Dow Corning 795 or 790 Silicone Building Sealant by Dow Corning
2. Dow Corning 756 SMS – Low Dirt Pick-up, Non Stain
3. Dow Corning CWS or CCS by Dow Corning – Low cost silicone option

1.1 MILDEW RESISTANT SILICONE SEALANTS

A. Mildew resistant silicone for bathroom applications.
1. Available Products

a. Dow Corning® 786 Mildew resistant silicone
b. Dow Corning® Tub Tile and Ceramic

1.2 AIR/WEATHERBARRIER SEALANT –

1. Available Products
a. Dow Corning® 758 Weather barrier Sealant
b. Dow Corning® 756 SMS Silicone Building Sealant

1.3 AIR BARRIER MATERIALS
Transition from glazing system air barrier and tying into building envelope air barrier system.

.1 Available Products
a. Dow Corning® Silicone Transition System (STS)
b. Dow Corning® 123 Silicone Seal

1.4 LIQUID APPLIED AIR/WATER BARRIER COATING
100% silicone- water based, breathable elastomeric coating

1. Available Products
Dow Corning® DefendAir 200 – Silicone Elastomer Coating

2.3 JOINT BACKUP

A. Joint backup material shall be compatible with sealant used.

B. Size of backup material shall be determined by the condition and as recommended by the manufacturer.

C. One of the following brands and manufacturers shall be used providing they are compatible with sealant used:

1. Aerocor PL-336 fiberglass as manufactured by Owens Corning Fiberglass Corp.
2. Ethafoam as manufactured by Dow
3. Foam Polyethylene as manufactured by the Tremco Manufacturing Co.
2. Sonofoam Backer Rod as manufactured by Sonneborn, Inc.

3.0 EXECUTION

3.1 INSPECTION

Installer must examine substrates, (joint surfaces) and conditions under which joint sealer work is to be performed, and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with joint sealer work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 JOINT PREPARATION

A. Clean joint surfaces immediately before installation of gaskets, sealants or caulking compounds. Remove dirt, insecure coatings, moisture and other substrate which could interfere with seal of gasket or bond of sealant or caulking compound. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer. Roughen vitreous and glazed joint surfaces as recommended by sealant manufacturer.

B. Prime or seal joint surfaces where recommended by sealant manufacturer. Confine primer/sealer to areas of sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION

A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.

B. Rake out, clean out thoroughly all joints and recesses to be caulked or sealed so as to be free of all loose or foreign material, just prior to sealing.

C. Remove all foreign matter including methacrylate lacquer that would prohibit bond adhering to metal with a solvent recommended by manufacturer of compound.

D. Pack all joints deeper than 3/8" with joint filler to 3/8" from face of as detailed on drawings.

E. Apply manufacturer's recommended primer to concrete, masonry and stone surfaces

before sealing if recommended by manufacturer.

F. Apply compound only to dry surfaces, preferably only when temperature is above 40 degrees F.

G. Fill all joints and recesses completely. Finish all compounds against stop where this is provided. Elsewhere finish to a neat uniform bevel. Finish all joints with beading tool.

H. Consistency of compound shall be such as to prevent sagging.

I. Use all possible precautions to avoid smearing any compound of finished work.

J. Remove immediately all compound smeared on any adjacent surfaces, using a non-staining solvent recommended by manufacturer of compound.

3.4 CURE AND PROTECTION

A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Advise Contractor of procedures required for cure and protection of joint sealers during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of substantial completion.

B. All existing work shall be adequately protected from damage and staining during all caulking and sealing operations.

END OF SECTION

SECTION 08110 - STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 WORK INCLUDED

1. The work under this section shall include the furnishing of all items of steel doors and frames as listed hereinafter except items which are specifically excluded from this section.

2. Steel Doors, A60 galvanized at exterior locations, cold rolled steel at interior locations. Factory primed.

3. Steel Door Frames, welded, A60 galvanized at exterior locations, cold rolled steel at interior locations. Factory primed.

4. Steel Sidelite Door Frames

5. Steel Borrowed Lite Frames

6. Louvers Installed in Steel Doors

7. Glass lites installed in steel doors

8. Job site Delivery

9. Field Measuring

10. Job site Service

11. Project close out information for owner.

1.2 RELATED WORK

Items not included in this section but listed elsewhere

1. Overhead Door – Section 08360

2. Aluminum Entrances and Store Front – Section 08410

3. Aluminum Windows – Section 08520

4. Finish Hardware – Section 08710

5. Glass and Glazing – Section 08800

6. Installation of any Material.

1.3 QUALITY ASSURANCE

1. Provide Steel Doors and Frames manufactured by a single firm specializing in the production of this type of work.

2. Provide Steel Doors and Frames complying with the Steel Door Institute recommended specifications for Standard Steel Doors and Frames (ANSI/SDI 100-91), and as herein specified.

3. Compliance with all standards listed under paragraph 1:04 "References" is required.

4. Compliance with all building, fire and life safety codes as listed by State and local codes along with those listed under paragraph 1:04 "References" is required.

5. Insulation properties: Polyurethane core doors shall have a U factor of 0..67. Honeycomb core doors shall have a U factor of 0.41. Tests must be performed in accordance with SDI-113.

1.4 REFERENCES

1. Steel Doors and Frames in this section must meet all standards as established by the following listing.

   A. Door and Hardware Preparation ANSI 115.1.
   B. Life Safety Codes NFPA101 (Latest edition).
   C. Fire Doors and Windows NFPA80 (Latest edition).
   D. Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcing ANSI A151.1.
   E. ANSI/SDI-100-91

1.5 SUBMITTALS

1. Coordinate approved shop drawings with all other trades and manufacturers whose products are used in conjunction with the Steel Doors and Frames as listed under section 08110.

2. Templates: Finish hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel supplier in order to cut, reinforce or otherwise prepare the doors and frames to receive the finish hardware items.

3. Each floor of the building is to be detailed separately.

4. The steel door and frame supplier shall furnish to the architect (6) complete copies of the proposed steel door and frames schedule and/or shop drawings. Using the same reference number for details and openings as those on the contract drawings. This is to be done within (10) days of acceptance of the General Contractor's purchase order. After receipt of the approved door schedule the steel door and frame supplier shall make any corrections to the door schedule and submit to the architect (4) sets of corrected schedules for file and field use.

5. All door openings including wood, aluminum, overhead etc. must be listed on the door schedule. If any opening is not by the steel door manufacturer only the door opening number should be shown along with the type of door (wood etc.) and a "not by steel manufacturer." Include details of each frame type, elevations of door designs, types, conditions at openings, details of construction, location and installation requirements for finish hardware on all reinforcements, and details of joints and connections, show anchorage and accessory items.

1.6 DELIVERY, STORAGE AND HANDLING

1. All steel doors and frames being supplied under section 08100 of this specification must be properly marked with door opening mark number to correspond with the door schedule.

2. Steel doors and frames shall be delivered to the General Contractor according to the contractors, Architect's, or construction manager's request to insure the proper and timely completion of the work.

3. Deliver all steel doors and KD frames cartoned and/or palletized to provide protection during transit and job storage. Welded frames will not be palletized.

4. Inspect doors and frames upon delivery for damage. Minor damage may be repaired, provided the finish items are equal in all respects to new work and acceptable to the architect, otherwise, remove and replace damaged items as directed.

5. Store doors and frames at the building site under cover. Place units on at least 4 inch high wood sills or on the floor in a manner that will prevent rust and damage. Avoid the use of non-vented plastic or canvas shelters which could create a humidity chamber. If the cardboard wrapper on the door becomes wet, remove the carton immediately. Provide a 1/4 inch space between stacked doors to promote air circulation.

1.7 JOB CONDITIONS

1. Installer must examine the substrate and conditions under which steel doors and frames are to be installed and notify the contractor in writing of any condition detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

1.8 ALTERNATES

1. "Alternates may affect the scope of the work in this section. See Division 1 for alternates that affect the project.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

1. Ceco Door Products

2. Pioneer Industries

3. Steelcraft Manufacturing Company

2.2 HARDWARE LOCATIONS

1. Location of hardware on doors and frames shall be the steel and frame manufacturers standard published locations.

2. Prepare steel units to receive mortised and concealed hardware, including cutouts, reinforcing, drilling and tapping in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of American National Standards Institute (ANSI) A115 "Specifications for Door and Frame Preparations for Hardware".

   A. For concealed overhead door closers or holders, provide space, cutouts, reinforcing and provisions for fastening in tops of doors or in frame heads as applicable.

   B. Reinforce steel units to receive surface applied hardware. Drilling and tapping for surface applied finish hardware shall be done at the project site.

3. Locate finish hardware at door frame manufacturer's standard published locations in accordance with "Recommended Locations for Builder's Hardware", published by the Door and Hardware Institute.

4. When steel frames only are specified, for use with doors to be furnished by others, hardware preparation on the doors is normally governed by its location on the frames. If the doors are to be factory mortised, the door supplier is responsible for coordinating hardware locations. If they are to be mortised at the site, proper hardware location is the responsibility of the trade doing the work.

2.3 CLEARANCES

1. Edge clearances shall be as follows:

   A. Between doors and frames, at head and jambs - 1/8 inch

2. At door sills where no threshold is used - 3/4 inch standard except if otherwise shown on architectural drawings.

3. At door sills where a threshold is used, 1/4 inch maximum between door and threshold.

4. At door sills when carpet is used, 1/4 inch higher than the thickness of the carpet.

5. Between meeting edges of pairs of doors 1/8 inch.

6. Doors with vertical rod exit devices as required by the exit device template.

2.4 STEEL DOORS

1. Materials

A. Doors shall be made of commercial quality, level, cold rolled steel conforming to ASTM A-366 or A-620 and ASTM A568 and free of scale, pitting or other surface defects. **Face sheets shall not be less than 18 gauge.**

B. Hot dipped zinc coated steel shall comply with ASTM designations A526 or A642 and A525. The coating weights shall meet or exceed the minimum requirements shown for A60 in the case of alloyed coatings and G60 for spangled coatings.

2. Fabrication

A. General Design and Construction

1. All doors shall be of the types and sizes shown on approved shop drawings. Door thickness shall be 1 3/4".

Exterior doors to be hot dipped galvanized. Interior doors to be cold rolled steel.

2. All doors shall be strong, rigid and neat in appearance, free from warpage or buckle.

3. All doors shall be constructed with smooth, flush surfaces, without visible joints or seams or exposed faces, except around glass lite trim or louvered panel inserts.

4. Doors swinging in pairs

a. Non-labeled doors shall have a two piece over lapping astragals which consist of an 18 gauge steel channel applied to the inactive leaf and either a plain extruded aluminum leaf and either a plain aluminum overlap strip with wool pile (specify which) applied to the active leaf. All metal parts are painted to match door.

b. When both leaves are active, an extruded aluminum split astragal consisting of a two-piece, adjustable base and cover set, in either anodized aluminum

with a wool pile insert and shall be packaged separately from the door for field attachment.

c. For labeled fire doors a two piece overlapping astragal consisting of a 16 gauge steel edge channel applied to the inactive door and a 12 gauge steel overlap strip applied to the active door in accordance with procedures of the various labeling agencies.

5. Seamless vertical edges: Not required.

a. Join door faces at their vertical edges by a continuous weld extending the full height of the door. Grind, fill and dress smooth all welds to make them invisible and provide a smooth flush surface.

6. Hardware Reinforcements

a. Minimum gauges for reinforcing doors for required finish hardware is as follows:

1. Hinges and pivots steel plate - 7 gauge thick x 1 1/4 inches wide X 9 inches secured by not less than 6 spot welds.

2. Mortise locksets (Govt # 86 Series) and deadlocks 16 gauge steel, secured with not less than 4 spot welds.

3. Cylindrical locksets (Govt #160 and 161 Series) 16 gauge steel, secured with not less than 4 spot welds.

4. Flush bolts 12 gauge steel, secured with not less than 4 spot welds.

5. Surface - applied closers - 12 gauge steel.

6. Surface - applied exit devices - 14 gauge steel.

7. Automatic door bottoms - 16 gauge steel for mortise type.

b. Doors shall be mortised, reinforced drilled and tapped at the factory for fully templated hardware only, in accordance with the approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware is to be applied, doors shall have reinforcing only, drilling and tapping shall be done by others.

7. Top and Bottom Channels

A. Reinforce tops and bottoms of all doors with a continuous steel, channel not less than 16 gauge, extending the full width of the door and spot welded to the face sheet. Top channel to be flush steel. Plastic fillers not acceptable.

8. Door Cores

The following are acceptable cores for doors

a. Exterior doors: polyurethane core. R=10 MINIMUM
b. Interior doors: Kraft Honeycomb

9. Finish:

1. Factory Prime Finish

a. Doors and frames are to be thoroughly cleaned, and chemically treated to insure maximum paint adhesion. All surfaces of the door and frame exposed to view shall receive a factory applied coat of rust inhibiting primer, either air-dried or baked-on. The finish shall meet the requirements for acceptance stated in ANSI A224.1 "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces." The prime finish is not intended to be the final layer of protection from the outside elements. Field painting shall be performed in accordance with the recommendations of the door and frame manufacturer. For specialty types of finished coatings, the paint supplier should also be consulted.

2.5 STEEL PANELS

1. Steel panels shall be made of the same materials, constructed and finished in the same way as specified for steel doors.

2.6 STEEL FRAMES 16 GA.

1. Materials

A. Frames shall be either cold rolled steel conforming to ASTM A366- 68 or commercial grade hot rolled and picked steel conforming to ASTM A569-66T, or not less than 16 gauge, unless otherwise specified.

B. Hot dipped zinc coated steel shall comply with ASTM designations A526 or A642 and A525. The coating weights shall meet or exceed the minimum requirements shown for A40 in the case of alloyed coatings and G60 for spangled coatings.

2. Fabrication

A. General design and construction

1. Provide steel frames for doors, transoms, sidelites, borrowed lites, and other openings to the size and design as shown on the architectural drawings. Exterior frames to be hot dipped galvanized. Interior frames to be cold rolled steel. **All frames to be welded with 2 spreader bars tack welded to the bottom of frame.**

2. All finished work shall be strong and rigid, neat in appearance square, true and free of defects, warp or buckle.

3. Jamb depths, trim, profile and backbends shall be as scheduled by the architect and shown on approved shop drawings.

4. Minimum depth of stops shall be 5/8 inches, cut off (sanitary or hospital type) stops, where scheduled, shall be capped 45 degrees at heights shown on approved shop drawings, and all jamb joints below cut-off stops shall be ground and filled smooth.

5. When shipping limitations so dictate, frames for large openings shall be fabricated in sections designed for splicing in the field by others.

3. Hardware reinforcements

A. Frames shall be mortised, reinforced, drilled and tapped at the factory for fully templated mortised hardware only, in accordance with approved hardware schedule and templates provided by the hardware contractor. Where surface-mounted hardware is to be applied, frames shall have reinforcing plates only; all drilling and tapping shall be done by others.

B. Reinforce frames for finish hardware as follows:

1. Hinge reinforcements for 1 3/4 inches thick doors steel plate 7 gauge thick x 1 1/4 inches wide x 9" inches long. Reinforcement shall be attached to the door frames by not less than 6 spot welds.

2. Strike reinforcements - steel plate 12 gauge x 1 1/2 inches wide.

3. Flush bolts - steel plate 12 gauge.

4. Surface applied closers - 14 gauge steel.

5. Concealed closers - not used

6. Reinforcements for -Surface mounted hardware 14 gauge steel.

Hold open arms 14 gauge steel Surface mounted exit devices 14 gauge steel.

7. Floor Anchors

a. Floor anchors shall be securely welded or screwed inside each jamb, with two holes provided at each jamb for floor anchorage.

b. Where so scheduled or specified adjustable floor anchors providing not less than 1" height adjustment.

c. Minimum thickness of floor anchors shall be 16 gauge.

8. Jamb Anchors

a. Frames for installation in masonry walls shall be provided with adjustable jamb anchors of the wire type. Anchors shall be not less than 0.156 inch

diameter steel wire. The number of anchors provided on each jamb shall be as follows:

Frames up to 90" height 3 anchors
Frames 90" to 96" height 4 anchors
Frames over 96" height 1 anchor for each 2' or fraction there of over 96"

b. Frames for installation in stud partitions shall be provided with steel anchors of suitable design, not less than 18 gauge thickness, securely welded inside each jamb or insert type with notched clip to engage stud inserted to back of the frame as follows:

Frames up to 90" height 4 anchors
Frames 90" to 96" height 5 anchors
Frames over 96" height 5 anchors

plus one additional anchor for every 24 inches or fraction there of over 96"

c. Frames to be anchored to previously placed concrete, masonry or structural steel shall be provided with anchors of suitable design as shown on approved shop drawings. Fasteners for such anchors shall be provided by others.

9. Dust cover boxes (or mortar guards) of not thinner than 26 gauge steel shall be provided at all hardware mortises on frames to be set in masonry or plaster partitions.

10. All frames that are to be welded shall be provided with 2 steel spreaders temporarily attached to the feet of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and shall not be used to size the frame.

11. Except on weatherstripped doors, drill stop to receive 3 silencers on single-door frames and 2 silencers on double-door frames. Drill for 2 silencers on heads of double-swing frames.

12. Welded Frames

    1. Assemble frame, bend the tabs after assuring that the face miter seam is "closed and tight". Weld the entire face miter seam. Grind the exterior face and dress the face miter seam (exterior) and spot paint, inside and out.

13. Finish:

1. Factory Prime Finish

See 2.04 - 11.

2.7 FIRE LABELED DOORS AND FRAMES

1. Fire-rated assemblies: Wherever a fire resistance classification is shown or scheduled for steel work, provide fire rated steel doors and frames investigated and tested as a fire door assembly, complete with type of fire door hardware to be used. Identify each fire door and frame with recognized testing laboratory labels, indicating applicable fire rating of both door and frame.

    A. Construct and install doors and frames to comply with current issue of National Fire Protection Association (NFPA) Standard Number 80, as herein specified.

2. Label doors and frames shall be provided for those openings requiring fire protection ratings as determined and scheduled by the architect.

3. If any door or frame specified by the architect to be fire-rated cannot qualify for appropriate labeling because of its design, hardware or any other reason, the architect shall be so advised before fabricating work on that item is started. If the architect still wants that material fabricated as shown on the architect's shop drawings, provide a manufacturer's letter of certification that the assembly has been constructed with materials and methods equivalent to a fire rated label construction.

PART 3 - EXECUTION

3.1 INSPECTION

1. Examine the substrate and conditions under which steel work is to be installed and remedy conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

2. It is the responsibility of the General Contractor to make sure that all dimensions for existing opening or existing frames (strike height,hinge spacing, hinge backset, etc.) given to the steel manufacturer are accurate.

3. It is the responsibility of the General Contractor to see that any scratches or disfigurements caused in shipping or handling are properly cleaned and touched up with a rust inhibitive primer.

3.3 INSTALLATION

1. Door Frames

A. Prior to installation, all frames must be checked for rack, twist and out of square.

B. Except for frames located at in-place concrete or masonry and at drywall installation, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.

C. Fill frames in masonry walls with mortar as the wall is laid up. Frames in solid plaster or steel stud walls may be completely filled with plaster except when drywall is used.

D. When temperature conditions necessitate an additive to be used in the plaster or mortar to prevent freezing, the contractor installing the frames shall coat the inside of the frames in the field with a corrosion inhibiting bituminous material.

E. SDI-105, "Recommended Erection Instructions for Steel Frames" and SDI-110 "Standard Steel Doors and Frames for Modular Masonry Construction" shall indicate the proper installation procedures.

F. Install fire-rated frames in accordance with NFPA Standard No. 80.

G. Anchors

1. In masonry construction, locate wall anchors in jambs at hinge and strike levels.

2. At in-place concrete or masonry construction, set frame and secure to with machine screws and masonry anchorage devices.

3. In metal stud partitions, install wall anchors in jambs at hinge and strike levels. In open steel stud partitions, place studs in wall anchor notches and wire tie. In closed steel stud partitions, attach studs to wall anchors with self drilling screws.

H. Make field splices in frames as detailed on final shop drawings.

2. Doors

A. Install doors plumb and in true alignment in a prepared opening and fasten them to achieve the maximum operational effectiveness and appearance of the unit.

B. Proper door clearance must be maintained in accordance with Part 2, Section 2.03, except for special conditions otherwise noted.

C. Where necessary, metal hinge shims are acceptable to maintain clearances.

D. "The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames, and Builders Hardware" published by DHI is recommended for further details.

3. Hardware must be applied in accordance with hardware manufacturer's templates and instructions. Also in compliance with installation instructions as specified under the "Finish Hardware Section of Division 8".

3.3 ADJUST AND CLEAN

1. Final adjustments

A. Check and re-adjust operating finish hardware items in hollow metal work just prior to final inspection. Leave work in complete and proper condition. Remove and replace defective work, including doors or frames which are warped, bowed or otherwise unacceptable.

2. Prime Coat Touch-Up

A. Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

3.4 SCHEDULES AND CLOSE OUT DOCUMENTS

1. Follow Architect's instructions to provide project close out documents. These documents will include, but are not limited to :

Copies of hollow metal schedule " as built"
Warranty
Care and maintenance instructions to owner.
Manufacturer's painting recommendations.
Other documents required Division 1 of the specifications.
Other Documents required by the Construction Manager.

SECTION 08520 - ALUMINUM WINDOWS

1.0 GENERAL

The drawings, Instructions to Bidders, Form of Proposal, General Conditions, Supplementary General Conditions, and Division 1 are included herein and govern work under this section.

1.1 SCOPE OF WORK

A. Furnish all labor and materials necessary to complete all Aluminum Window work shown on drawings and specified herein:

1. Metal Windows – Fixed and Operable
2. All misc. hardware screws, bolts, etc.

B. Related work specified elsewhere:

1. Glass and Glazing - see Section 08800.

1.2 SHOP DRAWINGS

Submit one (1) print and one (1) sepia reproducible showing construction details and installation details and intended method of glazing. Contractor to field verify all dimensions.

1.3 PERFORMANCE REQUIREMENTS

A. Air infiltration shall be tested in accordance with ASTM E 283. Infiltration shall not exceed 0.06 CFM per lineal foot (.003 M3/S-M2) of fixed area.

B. Water infiltration shall be tested in accordance with ASTM E 331. No water penetration at a test pressure of 6.24 P.S.F. (300 Pa).

C. Structural performance shall be based on:
Maximum deflection of 1/175 of the span and allowable stress with a safety factor of 1.65

D. Thermal Performance

Mullion and perimeter gutters shall be separated from mullion and perimeter faces by a special designed clip, eliminating all metal to metal contact between exterior and interior of the frame. Performance shall be such that condensation will appear on the interior surface of 1" insulated glass before on the metal.

Thermal Performance. When tested in accordance with AAMA 1502.7-1981 and 1503.1-1980, the following results should be attained:

U - Maximum of 0.45
SHGC – Maximum of 0.10
VT – Maximum of 0.60
CRF - Minimum of 57

E. The Aluminum Window Contractor shall be responsible for verification of all window frame sizes in order to meet manufacturer's structural performance and wind load requirements. The Window Subcontractor shall be responsible for any internal frame reinforcing or frame upsizing as required to meet manufacturer's requirements at no cost to the Owner.

2.0 PRODUCTS

2.1 APPROVED MANUFACTURERS

This Specification is based on the standard items as manufactured by Vistawall, Naturalite and Skywall Group,
P.O. Box 629, 803 Airport Road
Terrell, TX 75160
(972)-551-6100
A manufacturer considered equal to Vistawall is Kawneer.

2.2 MATERIALS

A. Extrusions shall be 6063-T5 alloy and temper (ASTM B221 alloy G.S. 10A-T5). Fasteners, where exposed, shall be aluminum, stainless steel or zinc plated steel in accordance with ASTM A 164. Perimeter anchors shall be aluminum or steel, providing the steel is properly isolated from the aluminum. Glazing gaskets shall be elastomeric. Single acting entrance frame weathering shall be nonporous, polymeric material.

B. All exterior windows shall be "NUCORE" system as manufactured by Kawneer Co., Inc.

2.3 FABRICATION

A. Mullion and perimeter framing shall be of two-part construction consisting of gutter and face sections, designed to permit unobstructed face glazing with through site lines and no protecting stops. All exterior face members will be seamless. All vertical and horizontal framing members shall have a nominal face dimension of 1 3/4". Overall depth shall be 4-1/2" and 6” where indicated on architectural drawings.

All assemblies shall be secured internally be means of face clips of special form, in such manner as to be positively held against accidental disassembly in the event of glass breakage. Face clips shall be such a design as to provide a non-reversible snap action, and prevent metal to metal contact of the face and gutter sections.

2.4 FINISH – See Window Schedule Drawing A-709 & A-710

Frame Color: Dark Bronze Anodized.

A. All exposed framing surfaces shall be free of scratches and other serious blemishes.

B. Finish shall be Dark Bronze Anodized finish unless noted otherwise.

3.0 EXECUTION

3.1 INSTALLATION

A. All glass framing shall be set in correct locations as shown in the details and shall be level, square, plumb and in alignment with other work in accordance with the manufacturer's installation instructions and approved shop drawings. All joints between framing and the building structure shall be sealed in order to secure a watertight installation.

3.2 COMPLETION

A. After installation, the General Contractor shall adequately protect exposed portions of aluminum surfaces from damage by grinding and polishing compounds, plaster, lime, acid, cement, or other contaminants. The General Contractor shall be responsible for final cleaning.

SECTION 08710 –FINISH HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division One Specification sections, apply to this work of this section.

1.02 DESCRIPTION OF WORK

A. Definition of finish hardware includes items known commercially as finish hardware which are required for swing, sliding and folding doors, except special types of unique and non matching hardware specified in the same section as the door and door frame.

B. Extent of finish hardware required is indicated on drawings and schedules.

C. Types of finish hardware required include the following:

Continuous Hinges
Butt hinges
Lock cylinders
Lock and latch sets
Master keying of locks & cylinders
Electric Strikes
Exit devices
Bi-fold Door Hardware
Door bolts
Push/pulls
Protection plates
Closers
Door stops
Door Silencers
Smoke Gasketing
Weatherstripping
Thresholds
Key Cabinet
Key Control Software
Spares

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS:

A. Steel Doors and Frames-Section 08110
B. Flush Wood Doors-Section 08211

C. Aluminum Entrances and Storefronts
D. Installation by Finish Carpentry
E. Card Access System By Security Contractor
F. Automatic Door Operators

1.04 QUALITY ASSURANCE

A. Manufacturer: Obtain each type of hardware (lock and latch sets, butts, closers, exit devices, etc.) from a single manufacturer, although more than one may be indicated as offering products complying with specifications' requirements.

B. Qualifications of supplier: An established and recognized finished hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 5 years. Supplier shall have in his employ an experienced full time Architectural Hardware Consultant(AHC) in good standing with the Door and Hardware Institute. AHC shall be available for consultation, at reasonable times during the work, to Architect, Owner and Contractor.

C. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80 and local building code requirements. Provide only hardware that has been tested and listed by UL for sizes and types of doors required. All UL labeled doors shall have door closer whether or not required by Hardware Set Group.

D. Where emergency exit devices are required on fire rated doors provide UL label on exit devices indicating "Fire Exit Hardware".

1.05 SUBMITTALS:

A. Product Data: Submit manufacturer's technical data for each item of hardware in accordance with Division-1 section SUBMITTALS". Include all necessary information to show compliance with requirements. Submit catalog cuts with first submission of hardware schedule.

B. Samples: Submit samples as requested by architect. Samples may be incorporated into job if in good condition after submittal process.

C. Hardware Schedule: Submit horizontal style hardware schedule showing following:

a. Architect's door numbers.
b. Location of doors.
c. Frame material.
d. Door material.

e. Door opening size.
f. Door thickness.
g. Door hand and swing.
h. Hardware set number.
i. Type, style, function, size, finish of each hardware item.
j. Description, name and manufacturer of each hardware item.
k. Keying information.

D. Submittal sequence: Submit 6 copies of hardware within 10 working days of notice to proceed by general contractor. Include all of above information, in addition to catalog cuts.

E. Keying schedule: After approval of hardware schedule submit keying schedule on approved hardware schedule. Spend what ever time is necessary with Architect and/or Owner to finalize keying.

F. Templates: Furnish paper templates to fabricators of hollow metal, wood doors, aluminum doors and others who have need of them.

PART 2 - PRODUCTS

2.01 SCHEDULED HARDWARE:

A. Requirements for grade, design, function, finish, size etc.,is indicated in the Materials and Fabrication section and hardware sets.

B. Manufacturer's product designations:(specified)

Continuous Hinges:	(Roton), Markar, Select
Butts:	(Hager) McKinney, Stanley
Locksets:	(Sargent), Schlage
Exit Devices	(Sargent), Precision, Von Duprin
Electric Strikes:	(Folger Adam) Von Duprin, HES
Closers:	(Sargent), Norton, LCN
Concealed OH Closers:	(Dorma) No Substitution
Push/Pulls	(Rockwood), Baldwin, Burns
Protection plates:	(Rockwood), Baldwin, Burns
Door bolts:	(Hager) Baldwin, Ives
Door stops:	(Ives) Baldwin, Hager
Bi-fold Hardware:	(Hager), Stanley
Bi-pass Hardware:	(Hager), Stanley
Weatherstripping	(Pemko) National Guard
Thresholds:	(Pemko) National guard
Key Cabinet:	(Telkee), Lund

2.02 MATERIALS AND FABRICATION

A. General:

1. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

2. Manufacturers name plate: Do not use manufacturer's products that have anufacturer's name or trade name displayed in visible location, except in conjunction with required UL labels and as otherwise acceptable to architect. Manufacturer's identification is permitted on face rim or mortise lock cylinders, on latch bolt of cylindrical type locksets, or on scalp plate of mortise locks only.

3. Finish: Approved lockset finish shall be the basis of approval of the finishes for all finished metal hardware items, except as otherwise indicated or approved. Finish of all interior and exterior hardware shall match **US26D**

4. Lockset design: Lever handle and rose design shall be **Sargent LL** Schlage RHO

5. Fasteners: Provide hardware manufactured to manufacturer's published templates, generally prepared for machine screw installation. Do not provide hardware prepared for self tapping sheet metal screws, except as specifically indicated. Furnish screws for installation for each item of hardware. Provide Phillips head flat head screws unless otherwise indicated. Finish of plated exposed screws to exactly match hardware finish. Provide concealed fasteners for hardware units which are exposed when door is closed, except to the extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to reinforce work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.

6. Tools and maintenance instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for the Owner's continued adjustment, maintenance, removal and replacement of finish hardware.

2.03 HINGES, BUTTS AND PIVOTS:

A. Templates: Except for hinges and pivots to be installed entirely into wood doors and frames, provide only templated units.

B. Screws: Furnish Phillips flat head with under cut heads machine or wood. Finish

to match surface of hinges, butts, or pivots.

C. Hinge pins: Except as otherwise indicated, provide hinge pins as follows:
1. Steel hinges: steel pins.
2. Non-ferrous hinges: stainless steel pins.
3. Exterior doors: non removable pins.
4. Reverse bevel doors with locks: non removable pins.
5. Interior doors: non rising pins.

D. Tips: Flat button and matching plug, finished to match hinges.

E. Number of hinges: Provide number of hinges as follows:
2ea Hinges for doors 60" in height or less.
3ea Hinges for doors 61" to 90".
4ea Hinges for doors 91" to 120".
Provide one additional hinge for each additional 30" of door height or fraction thereof.

F. Size of hinges:

1 3/8" thick door: 3 1/2" x 3 1/2"
1 3/4" thick door 36" wide or less: 4 1/2" x 4 1/2"
1 3/4" thick door over 36" wide: 4 1/2" x 4 1/2"

G. thickness of hinges:
3 1/2" high, standard weight: .123" thick
4 1/2" high, standard weight .134" thick
4 1/2" high, heavy weight .180" thick
5" high, standard weight .146" thick
5" high, heavy weight: .190" thick

2.04 CONTINUOUS HINGES:

A. Continuous hinges shall be a pinless assembly of three interlocking extrusions applied to the full height of door and frame, less one inch, without mortising. The door leaf and jamb shall be geared together for the entire length of the hinge and joined by a channel. Hinge knuckle shall be monolithic in appearance. Continuous hinges with visible knuckle separations are not acceptable.

2.05 LOCK CYLINDERS AND KEYING:

A. General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.

B. Review the keying system with owner and provide a new master key system of

the type required (master, grand master or great grand `master).

C. Equip locks with manufacturer's Patented Key Control 6 pin tumbler cylinders. Sargent Signature or Schlage Primus. Furnish Construction Master Key System, for contractor's use during construction.

D. Comply with owner's instructions for master keying and provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.

E. Key material: Provide keys of nickel silver only.

F. Key quantity: Provide cut keys as follows;
3 keys per lock
6 keys per keyed alike set
6 ea master, grand master or GGMK set.
10 Construction Master Keys.

G. Deliver master or higher level of keys directly to owner's representative.

2.06 LOCKS AND LATCHES :

A. All locks shall be standard or heavy duty commercial as manufactured by Sargent, or approved equal manufactured by Schlage.

Furnish functions and duty ratings as specified in the hardware sets.

Standard Duty Commercial:

Sargent 7 Line LL Design
Schlage AL series RHO Design

B. Provide manufacturer's standard wrought box strikes for each latch or lock bolt with extended curved lip of sufficient length to protect frame. Finish to match lock or latch set.

C. Provide minimum latch throws as follows:

Single doors: 1/2"
Pairs of doors: 5/8"
Pairs of fire doors: 3/4"
Dead bolts: 1"

All latch bolts for fire doors to have UL listed latch bolts.

2.07 EXIT DEVICES

A. Exit devices shall be Sargent 80 Series . Design and function as listed in the hardware sets, or approved equal by Precision or Yale.

Sargent 80 Series ETL Design
Precision Apex Series
Von Duprin 98 Series

B. All exit devices must be UL listed for emergency exit. Exit devices for use on fire doors shall be additionally listed for use on fire doors. All exit devices shall be tested in accordance to ANSI A156.3 Grade 1.

2.08 DOOR CLOSERS

A. All closers for both interior and exterior doors shall be the product of one manufacturer and shall be matched in design.

B. All closers shall be adjustable to provide sizes 2 through 6. Closing speed, latching speed and backcheck shall be controlled by separate key valves. Delayed action feature, when specified, shall be controlled bya separate valve.

C. All closers shall be suitable for standard, corner bracket, top jamb applications. Provide suitable arms, brackets, drop plates, etc., to provide least conspicuous application.

D. All closers shall have high impact resistant covers, spray painted to match closer arm and body.

E. All closers shall be Sargent 1430/ 1431 Series. Sprayed aluminum.
Sargent 1430, 1431 Series
Norton 8501, 8501 BF Series
LCN 1460, 1461 Series with full cover

F. Where manual door closers are specified for doors required to be accessible to the physically handicapped, provide adjustable units complying with ANSI A117.1 provisions for door opening force and delayed action closing.

2.09 DOOR STOPS AND HOLDERS:

A. Wherever door or hardware shall strike wall, column or fixed equipment furnish a door stop or bumper, either wall, floor or overhead type. Wall bumper similar to Ives 407 1/2 are preferred. Where wall bumpers are impractical, furnish dome stops similar to Ives 436 or 438 or overhead similar to Glynn-Johnson GJ320/330 series. Furnish roller bumpers of proper type wherever the swing of two doors conflict. Floor or wall type holders shall be of the type specified.

2.10 KICK AND ARMOR PLATES

A. Kick plates shall be 8" high, stretcher plates shall be 10" high,mop plates shall be 6" high and armor plates shall be 36" high by 2" less than nominal door width unless otherwise specified.

B. Kick, mop and armor plates to be .050" thick stainless steel, with countersunk screws.

2.11 BOLTS

A. Manual and automatic flush bolts shall be UL listed and fit door and frame preparation in accordance with ANSI A115.4. Face plate to match door edge conditions.

B. Manual flush bolts shall be similar to Ives 458. Length of manual bolt head and rod assemblies shall be: Bottom bolt: 12" from bottom of door to center of face plate. Top bolt as required to locate center of face plate 6'-0"from floor.

2.12 WEATHERSTRIPPING AND THRESHOLDS:

A. Weather strip sets shall consist of three pieces, one for each jamb and head. Length as required per size of opening. Type to be Pemko 305CN. Furnish TEK screws for hollow metal frame application.

B. Door sweeps to be Pemko 315CN. Furnish one per door leaf. Furnish TEK screws for hollow metal frame application.

C. Thresholds to be extruded aluminum, Pemko type 170A, unless otherwise scheduled or detailed. Furnish length as required for full length of opening. Furnish wood screw/lead shields for fastening.

2.13 SILENCERS

A. At interior hollow metal door frames furnish 3 rubber door silencers for each single door frame and 2 for each double door frame. Silencers shall be similar to Glynn -Johnson GJ64.

2.14 KEY CABINET

A. Telkee RWC Series 150% Capacity.

PART 3 EXECUTION

3.01 INSTALLATION BY SECTION 06200

A. Mount finish hardware in accordance with Door and Institute recommendations, applicable code requirements, and reviewed shop drawings.

B. Install each hardware item in compliance with manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed.

C. Set units level, plumb and true to line and location. Adjust all hardware to operate perfectly.

D. Set thresholds for exterior doors in a full bed of sealant.

3.02 INSPECTION

A. After installation has been completed hardware supplier shall have qualified hardware consultant check the job to determine the proper application of hardware according to the approved hardware and keying schedule. Check operation and adjustment of all hardware items.

3.03 ADJUST AND CLEAN

A. At final completion, all hardware shall be left clean and free from disfigurement. Subcontractor shall adjust all door closers and other items of hardware. Where hardware is found to be defective repair, replace or otherwise correct as directed.

B. Clean adjacent surfaces soiled by hardware installation.

C. Final adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy to a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware. Clean operating items to restore proper function and finish. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct owner's personnel in proper adjustment and maintenance of hardware and hardware finishes. Turn over maintenance manual and special tools at this time.

3.04 PROTECTION

A. The general contractor is responsible for the proper protection of all items of hardware until the owner accepts the project as complete.

PART 4 – HARDWARE SETS

See door schedule for assignment of hardware sets. Review floor plans, door schedule, and other contract documents and advise Architect, prior to bid, if discrepancies are found.

HW-1

3 Hinges
1 Closer w/ Stop
1 weatherseal – 3 sides of door
1 exit device, no exterior trim
1 door sweep
1 threshold

HW-2

3 Hinges
1 Closer
1 Wall Stop
1 Classroom Lockset

All existing hardware to remain

SECTION 08800 - GLASS AND GLAZING

1.0 GENERAL

The drawings, Instructions to Bidders, Form of Proposal, General Conditions, Supplementary General Conditions and Division 1 are included herein and govern work under this section.

1.1 DESCRIPTION OF WORK

A. Definitions: "Glass" includes prime glass, processed glass, and fabricated glass products. "Glazing" includes glass installation and materials used to install glass.

B. Included, but not necessarily limited to, are the following:

1. Plate glass
2. Tempered glass
3. Insulating Glass
4. Glazing of windows, doors, transoms, side lights, and all other glazed openings as indicated.

1.2 QUALITY ASSURANCE

A. Prime Glass Manufacturer: One of the following for each type of glass:

1. RIG-Glass Products
2. C-E Glass Division
3. ASG Industries, Inc
4. Libbey-Owens-Ford Company
5. PPG Industries, Inc.

B. SUBMITTALS

1. Samples: Furnish duplicate samples, for approval, of the various types of glass specified herein. Samples shall be 12" x 12" and shall include an assembled 12" x 12" insulating glass sample. Samples of other glazing materials shall be submitted in duplicate if requested by Architect.
2. Approved samples shall become the standard for comparison for all installed work.
3. Shop Drawings: Submit shop drawings and descriptive literature for all products for use. Shop drawings shall include full scale glazing details of window wall. Shop drawings shall be submitted in accordance with Division 1.

C. JOB CONDITIONS

1. Pre-installation: Meet with Glazier and other trades affected by glass installation, prior to beginning of installation. Do not perform work under adverse weather or job conditions. Install liquid sealants when temperatures are within lower or middle third

of temperature range by manufacturer.

D. Specified Product Warranty

1. Warranty on Hermetic Seals: Provide insulating glass manufacturer's written warranty, agreeing to, within specified period, furnish FOB project site, replacement units for insulating glass units which have defective hermetic seals (excluding that due to glass breakage); defined to include intrusion of moisture or dirt, internal condensation at temperatures above -20 degrees F (-31 degrees C), deterioration of internal glass coatings, and other visual evidence of seal failure or performance failure, provided manufacturer's instructions for handling, installation, protection and maintenance have been adhered to during warranty period.

2.0 PRODUCTS

2.1 GLASS PRODUCTS

A. Polished Plate Glass

1. All polished plate glass shall be 1/4" thick, unless otherwise indicated, glazing quality. Equal quality float glass will be acceptable. "U" factor for glass shall be 1.13 or better. Provide Solar Cool Bronze Reflective glass at all exterior windows.

B. Tempered Plate Glass

1. Tempered plate glass shall be heat tempered of sizes indicated. Thickness shall be 1/4" unless otherwise indicated or unless a thicker glass is recommended by manufacturer for size of opening in which used.
2. Tempered glass shall be "Tuf-Flex" as manufactured by RIG-Glass Products, Libbey-Owens-Ford Glass Co. or equal product of PPG Industries or ASG Industries. Glass shall conform to federal Specification DD-G-1403B. "U" factor for glass shall be 1.13 or better.
3. Provide bronze tinted glass at all exterior doors.

C. Insulating Glass and Textured Insulated Glass

1. Insulating glass shall be RIG-Glass Products as manufactured by RIG-Glass Products, or equal product.
2. Where indicated "1" Insulating Glass", provide the following:
   Units shall consist of ¼" Bronze Annealed polished plate glass outer pane, a ½" air space and a ¼" clear annealed glass inner pane. At tempered insulating glass provide: Units shall consist of tinted ¼" Solar Cool Bronze Reflective tempered glass outer panes, a ½" air space and a ¼" clear tempered glass inner pane.
3. Panes shall be hermetically sealed with a metal to glass bond and separated with a dehydrated air space.

4. Separators between glass panes shall be hot dipped galvanized with welded corners. Glass to be metal shall be sealed with a primary seal of polyisobutalene and two-part polysulphide for the secondary seal. Unit shall be bonded with a continuous metal band and sealed with a two-part polysulphide between metal and glass. "U" factor for glass assembly shall be 0.69 or better. Shading coefficient shall be at least 0.54. Separator to be bronze finish.

   U - Maximum of 0.45
   SHGC – Maximum of 0.10
   VT – Maximum of 0.60

2.2 GLAZING SEALANTS AND COMPONENTS

A. General: provide color of exposed sealant/compound as selected by Architect from manufacturer's standard colors. Comply with manufacturer's recommendation for selection of hardness, depending upon the location of each application of each application, conditions at the time of installation, and performance requirements as indicated. Select materials, and variations or modifications, carefully for compatibility with surfaces contacted in the installation.

B. Silicone Glazing Compound

1. Silicone sealant 1200 as manufactured by General Electric Company or equal product of Dow Corning shall be used to set all joints as shown on drawings. Color shall be as selected by Architect from stock.

C. Elastomeric Glazing Compound

1. All channel glazing shall be with a one part, 100% liquid polymer, acrylic base sealant. Product shall be "Mono-Lasto-Metric" as manufactured by the Tremco Manufacturing Company or equal product of Pecora, Inc. or Toch Brothers, and shall be used in strict conformance with manufacturer's instructions. Color as selected by Architect.
2. Primers shall be used if and as recommended by manufacturer.

D. Elastomeric Glazing Compound

1. Elastic glazing compound shall be oleo-resinous, knife consistency sealant, for use on non-porous surfaces under compression. It shall be non-corrosive on metal.
2. Color shall be approximately the same as adjacent surfaces and shall be approved by Architect.

3. This compound shall be as manufactured by Tremco Manufacturing Company, Pecora, Incorporated, or Presstite Division of Martin Marietta Corp.
4. All elastic glazing compound shall be formulated from selected processed oils and pigments which will remain plastic and resilient over a long period of time. Comply with latest revision of the Aluminum Window Manufacturer's Association.

2.3 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

B. Glazing Tape

1. Glazing tape shall be a polyisobutylene-butyl base with an integral shim equal to Tremco 440 Shimmed Tape, as manufactured by the Tremco Manufacturing Company. Tape and elastomeric sealing compound shall be by same manufacturer.
2. Verify thickness of tape required by glazing a sample window on the job. Sample shall be inspected and approved by Architect before proceeding with glazing work.

C. Spacer Shims and Setting Blocks:

1. All spacer shims shall be of 40 to 50 durometer neopreme.
2. All setting blocks shall be lead or 80 durometer neopreme as recommended by glass manufacturer based on weight of glass.
3. All spacer shims and setting blocks shall be at least 1/4" thick by 3" long by width of recess.

3.0 EXECUTION

3.1 STANDARDS AND PERFORMANCE

A. Watertight and airtight installation of each glass product is required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and air tight, deterioration of glazing materials and other defects in the work.

B. Protect glass from edge damage during handling and installation, and subsequent operation of glazed components of the work. During installation, discard units with significant edge damage or other imperfections.

C. Labels

1. Deliver all glass on the job carefully paper packed and protected, each pane bearing manufacturer's identifying label, giving name, quality and grade of glass.

D. Glazing channel dimensions as shown are intended to provide for necessary bite on glass, minimum edge clearance, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by job conditions at time of installation.

E. Comply with combined recommendations and technical reports by manufacturers of glass and glazing products as used in each glazing channel, and with recommendations of Flat

Glass Marketing Association "Glazing Manual", except where more stringent requirements are indicated.

F. Install insulating glass units to comply with recommendations by Sealed Insulating Glass Manufacturers Association, except as otherwise specifically indicated or recommended by glass and sealant manufacturers.

3.2 PREPARATION FOR GLAZING

A. Clean glazing channel and other framing members to receive glass, immediately before glazing. Remove lacquer from metal surfaces where elastomeric sealants are used.

B. Remove all coatings in glazing rebate area with a solvent that will not etch or mar surface of metal, recommended be manufacturer of glazing compound.

C. All surfaces to be glazed shall be free of moisture.

D. Avoid glazing at temperature below 40 degrees F. If glazing schedule requires work during cold periods, warm the glass and rabbeted surfaces to avoid condensation.

E. Remove manufacturer's instruction tags from windows.

F. Cover metal surfaces liable to be damaged by smear of sealing compound with tape. Remove tape after glazing.

G. Prepare all glazing compounds in strict accordance with manufacturer's instructions. Compounds shall not be cut or thinned.

H. Apply primer or sealant to joint surfaces where recommended by sealant manufacturer.

3.3 GLAZING

A. Install setting blocks of proper size in still rabbet, located 1/4th of glass width from each corner. Set blocks in thin course of heel-bead compound, if any.

B. Provide spacers inside and out, of proper size and spacing, for glass sizes larger the 50 united inches, except where gaskets or preshimmed tapes are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compresses thickness of tape.

C. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

D. Voids and Filler Rods Prevent exudation of sealant or compound by reforming voids or installing filler rods in channel at heel of jamb and head (do not leave voids in sill channels), except as otherwise indicated and depending on light size, thickness and type of glass, and complying with manufacturer's recommendations.

E. Force sealants into channel to eliminate voids and to ensure complete "wetting' or bond of sealant to glass and channel surfaces.

F. Tool exposed surfaces of glazing liquids and compounds to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.

G. Clean and trim excess glazing materials from glass and stops or frames promptly after installation, and eliminate stains and discolorations.

H. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel bead.

I. Gasket Glazing: Miter cut and bond ends together at corners where gaskets are used for channel glazing, so that gaskets will no pull away from corners and result in voids or leaks in glazing system.

3.4 CURE, PROTECTION AND CLEANING

A. Protect exterior glass from breakage immediately upon installation, by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces. Cure sealants for high early strength and durability.

B. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

C. Wash and polish glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Comply with glass product manufacturer's recommendations for final cleaning.

SECTION 09250 - METAL STUDS, GYPSUM WALLBOARD & GYPSUM SHEATHING

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Extent of each type of gypsum drywall construction required is indicated on Drawings.

B. This Section includes the following types of gypsum board construction

1. Interior Gypsum Board
2. Exterior Gypsum Sheathing

1.3 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA 505 for definitions of terms for gypsum board construction not otherwise defined in this section or other referenced standards.

1.4 SUBMITTALS

A. Product data from manufacturers for each type of product specified.

1.5 CLOSEOUT SUBMITTALS

A. Upon completion of the Work of this Section, Contractor shall submit to the Construction Manager, all required closeout documents.

B. Contractor shall submit a marked-up set of drawings indicating any changes made during construction to the Construction Manager.

C. Upon completion, submit to the Construction Manager, a Contractor's Affidavit of Payment of Debts and Claims, and Release of Liens.

D. Refer to General Conditions for additional requirements.

1.6 QUALITY ASSURANCE

A. Fire-Resistance Ratings: Where indicated, provide materials and construction which are identical to those of assemblies whose fire resistance rating has been determined per ASTM

E 119 by a testing and inspecting organization acceptable to authorities having jurisdiction.

1. Provide fire-resistance-rated assemblies identical to those indicated by reference to GA File No's. in GA-600 "Fire Resistance Design Manual" or to design designations in U.L. "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.

B. Single Source Responsibility: Obtain each type of gypsum board and related joint treatment materials from a single manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.

C. Handle gypsum boards to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.8 PROJECT CONDITIONS

A. Environmental Conditions, General: Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.

B. Minimum Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board maintain not less than 50 deg F (10 deg C) for 48 hours prior to application and continuously thereafter until drying is complete.

C. Ventilate building spaces to remove water not required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials form drying too rapidly.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

B. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

1. Steel Framing and Furring:
   a. Gold Bond Building Products Div., National Gypsum Co.
   b. Marino Industries Corp.
   c. United States Gypsum Co.

2. Gypsum Boards and Related Products:

   a. Domtar Gypsum Co.
   b. Georgia-Pacific Corp.
   c. Gold Bond Building Products Div., National Gypsum Co.
   d. United States Gypsum Co.

2.2 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS

A. General: Provide components which comply with ASTM C 754 for materials and sizes, unless otherwise indicated.

B. Concrete Inserts: Inserts designed for attachment to concrete forms and for embedment in concrete, fabricated from corrosion-resistant materials, with holes or loops for attachment of hanger wires and capability to sustain, without failure, a load equal to 3 times that imposed by ceiling construction, as determined from testing per ASTM E 488, conducted by an independent testing laboratory.

C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.

D. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

E. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

F. Channels: Cold-rolled steel, 0.0598 inch minimum thickness of base (uncoated) metal and 7/16 inch wide flanges, protected with rust-inhibitive paint, and as follows:

1. Carrying Channels: 1-1/2 inch deep, 475 lbs per 1000 ft., unless otherwise indicated.
2. Furring Channels: 3/4 inch deep, 300 lbs per 1000 ft., unless otherwise indicated.

2.3 STEEL FRAMING FOR WALLS AND PARTITIONS

A. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 deg and doubled over to form 3/16" minimum lip (return) and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:

1. Thickness: As indicated.
2. Depth: 3-5/8 inches, unless otherwise indicated.

3. All metal studs extending to underside of metal roof deck and over 12'-0" in height shall be 20 gauge. Partitions under 12'-0" in height shall be 25 gauge. All studs shall be rolled formed from galvanized steel with matching sill and plate runners. Studs shall be 16" o.c. in sizes as shown on drawings.

B. Steel Rigid Furring Channels: ASTM C 645, hat-shaped, depth and minimum thickness of base (uncoated) metal as follows:

1. Depth: 7/8 inch.
2. Thickness: 0.0329 inch, unless otherwise indicated.

C. Z-Furring Members: Manufacturer's standard zee-shaped furring members with slotted or nonslotted web, fabricated from hot-dip galvanized steel sheet complying with ASTM A 525, Coating Designation G60; with a minimum base metal (uncoated) thickness of 0.0179 inch, face flange of 1-1/4 inch, wall-attachment flange of 7/8 inch, and of depth required to fit insulation thickness indicated.

D. Fasteners: Provide fasteners of type, material, size, corrosion resistance, holding power and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum drywall manufacturers for applications indicated.

2.4 GYPSUM BOARD

A. General: Provide gypsum board of types indicated in maximum lengths available to minimize end-to-end joints.

1. Thickness: Provide gypsum board in thicknesses indicated, or if not otherwise indicated, in either 1/2 inch or 5/8 inch thicknesses to comply with ASTM C 840 for application system and support spacing indicated.

B. Products: Subject to compliance with requirements, provide one of the following products where Type X gypsum wallboard is indicated:

1. "Gyprock Fireguard 'C' Gypsum Board"; Domtar Gypsum Co.
2. "Fire-Shield G"; Gold Bond Building Products Div., National Gypsum Co.
3. "SHEETROCK Brand FIRECODE 'C' Gypsum Panels"; United States Gypsum Co.

C. Water-Resistant Gypsum Backing Board: ASTM C 630, and as follows:

1. Type: Regular, unless otherwise indicated.
2. Type: Type X for fire-resistance-rated assemblies.
3. Thickness: 5/8 inch where indicated.

2.5 TRIM ACCESSORIES

A. Cornerbead and Edge Trim for Interior Installation: Provide corner beads, edge trim and control joints which comply with ASTM C 1047 and requirements indicated below:

1. Material: Formed metal, or metal combined with paper, with metal complying with the following requirement:

a. Sheet steel zinc-coated by hot-dip process.

2. Edge trim shapes indicated below by reference to designations of Fig. 1 in ASTM C 1047:

a. "LC" Bead, unless otherwise indicated.
b. "L" Bead where indicated.

3. One-Piece Control Joint: Formed with vee-shaped slot per Fig. 1 in ASTM C 1047, with slot opening covered with removable strip.

2.6 GYPSUM BOARD JOINT TREATMENT MATERIALS

A. General: Provide materials complying with ASTM C 475, ASTM C 840, and recommendations of manufacturer of both gypsum board and joint treatment materials for the application indicated.

B. Joint Tape: Paper reinforcing tape, unless otherwise indicated.

1. Use pressure sensitive or staple-attached open-weave glass fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.

2. Setting-Type Joint Compounds: Factory-prepackaged, job-mixed, chemical-hardening powder products formulated for uses indicated.

a. Where setting-type joint compounds are indicated for use as taping and topping compounds, use formulation for each which develops greatest bond strength and crack resistance and is compatible with other joint compounds applied over it.
b. For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer for this purpose.
c. For filling joints and treating fasteners of water-resistant gypsum backing board behind base for ceramic tile, use formulation recommended by gypsum board manufacturer for this purpose.

D. Drying-Type Joint Compounds: Factory-prepackaged vinyl-based products complying with

the following requirements for formulation and intended use.

1. Job-Mixed Formulation: Powder product for mixing with water at Project site.
2. Taping compound formulated for embedding tape and for first coat over fasteners and flanges of corner beads and edge trim.
3. Topping compound formulated for fill (second) and finish (third) coats.
4. All-purpose compound formulated for use as both taping and topping compound.

2.7 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum drywall construction which comply with referenced standards and the recommendations of the manufacturer of the gypsum board.

B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum boards.

C. Spot Grout: ASTM C 475, setting-type joint compound of type recommended for spot grouting hollow metal door frames.

D. Gypsum Board Screws: ASTM C 1002.

E. Concealed Acoustical Sealant: Nondrying, nonhardening, nonskinning, nonstaining, nonbleeding, gunnable sealant complying with requirement specified in Division-7 section "Joint Sealers."

F. Sound Attenuation Blankets: Unfaced mineral fiber blanket insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing); and as follows:

1. Mineral Fiber Type: Fibers manufactured from glass.

3.0 EXECUTION

3.1 EXAMINATION

A. Examine substrates to which drywall construction attaches or abuts, preset hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of drywall construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Ceiling Anchorages: Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure that inserts and other structural anchorage

provisions have been installed to receive ceiling anchors in a manner that will develop their full strength and at spacing required to support ceiling.

1. Furnish concrete inserts and other devices indicated, to other trades for installation well in advance of time needed for coordination with other construction.

B. After sprayed-on fireproofing has been applied, remove only as much fireproofing as needed to complete installation of drywall construction. Protect fireproofing that remains from damage.

3.3 INSTALLATION OF STEEL FRAMING, GENERAL

A. Steel Framing Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.

B. Install supplementary framing, blocking and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar construction to comply with details indicated and with recommendations of gypsum board manufacturer, or if none available, with "Gypsum Construction Handbook" published by United States Gypsum Co.

C. Isolate steel framing from building structure to prevent transfer of loading imposed by structural movement, at locations indicated below to comply with details shown on Drawings:

1. Where edges of suspended ceilings abut building structure horizontally at ceiling perimeters or penetration of structural elements.
2. Where partition and wall framing abuts overhead structure.
   a. Provide slip or cushioned type joints as detailed to attain lateral support and avoid axial loading.

D. Do not bridge building expansion and control joints with steel framing or furring members; independently frame both sides of joints with framing or furring members or as indicated.

3.4 INSTALLATION OF STEEL FRAMING FOR SUSPENDED AND FURRED CEILINGS

A. Secure hangers to structural support by connecting directly to structure where possible, otherwise connect to anchorage devices or fasteners as indicated.
1. Do not attach hangers to metal deck tabs.
2. Do not attach hangers to metal roof deck.
3. Do not attach hangers to underside of concrete slabs with powder-actuated fasteners.

B. Do not connect or suspend steel framing from ducts, pipes or conduit.

C. Keep hangers and braces 2 inches clear of ducts, pipes and conduits.

D. Sway-brace suspended steel framing with hangers used for support.

E. Install suspended steel framing components in sizes and at spacings indicated but not less than that required by referenced steel framing installation standard.

1. Wire Hangers: 0.1620 inch diameter (8 gage), 4 ft. on center.
2. Carrying Channels (Main Runners): 1-1/2 inch, 4 ft. on center.
3. Rigid Furring Channels (Furring Members): 16 inches on center.

F. Installation Tolerances: Install steel framing components for suspended ceilings so that cross furring members or grid suspension members are level to within 1/8 inch in 12 ft. as measured both lengthwise on each member and transversely between parallel members.

G. Wire-tie or clip furring members to main runners and to other structural supports as indicated.

3.5 INSTALLATION OF STEEL FRAMING FOR WALLS AND PARTITIONS

A. Install runners (tracks) at floors, ceilings and structural walls and columns where gypsum drywall stud system abuts other construction.

B. Installation Tolerances: Install each steel framing and furring member so that fastening surface do not vary more than 1/8 inch from plane of faces of adjacent framing.

C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board. See drawings for extent of partition types and installation techniques.

D. Terminate partition framing at suspended ceilings where indicated.

E. Install steel studs and furring in sizes and at spacings indicated but not less than that required by referenced steel framing installation standard.

1. For single layer construction: 16 inches on center.

F. Install steel studs so that flanges point in the same direction and gypsum boards can be installed in the direction opposite to that of the flange.

G. Frame door openings to comply with details indicated, with GA-219 and with applicable

published recommendations of gypsum board manufacturer. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

1. Extend vertical jamb studs through suspended ceilings and attach to underside of floor or roof structure above as detailed on drawings.

H. Frame openings other than door openings to comply with details indicated, or if none indicated, in same manner as required for door openings; and install framing below sills of openings to match framing required above door heads.

3.6 APPLICATION AND FINISHING OF GYPSUM BOARD, GENERAL

A. Gypsum Board Application and Finishing Standard: Install and finish gypsum board to comply with ASTM C 840.

B. Install sound attenuation blankets where indicated, prior to gypsum board unless readily installed after board has been installed.

C. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 24 inches in alternate courses of board.

D. Install ceiling boards across framing in the manner which minimizes the number of end-butt joints, and which avoids end joints in the central area of each ceiling. Stagger end joints at least 24 inches.

E. Install wall/partition boards in manner which minimizes the number of end-butt joints or avoids them entirely where possible. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs.

F. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16 inch open space between boards. Do not force into place.

G. Locate either edge or end joints over supports, except in horizontal applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.

H. Attach gypsum board to steel studs so that leading edge or end of each board is attached to open (unsupported) edge of stud flange first.

I. Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cutouts.

J. Spot grout hollow metal door frames for solid core wood doors, hollow metal doors and doors over 32 inches wide. Apply spot grout at each jamb anchor clip just before inserting board into frame.

K. Form control joints and expansion joints at locations indicated, with space between edges of boards, prepared to receive trim accessories.

L. Cover both faces of steel stud partition framing with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls which are braced internally.

1. Except where concealed application is indicated or required for sound, fire, air or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. area, and may be limited to not less than 75 percent of full coverage.
2. Fit gypsum board around ducts, pipes, and conduits.

M. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4 inch to 1/2 inch space and trim edge with "U" bead edge trim. Seal joints with acoustical sealant.

N. Space fasteners in gypsum boards in accordance with referenced gypsum board application and finishing standard and manufacturer's recommendations.

3.7 METHODS OF GYPSUM BOARD APPLICATION

A. Single-Layer Application: Install gypsum wallboard as follows:

1. On ceilings apply gypsum board prior to wall/partition board application to the greatest extent possible.

2. On partitions/walls apply gypsum board vertically (parallel to framing), unless otherwise indicated, and provide sheet lengths which will minimize end joints.

B. Wall Tile Base: Where drywall is base for thin-set ceramic tile and similar rigid applied wall finishes, install gypsum backing board.

1. In "dry" areas install gypsum backing board or wallboard with tapered edges taped and finished to produce a flat surface.
2. At showers, tubs and similar "wet" areas, install water- resistant gypsum backing board to comply with ASTM C 840 and recommendations of gypsum board manufacturer.

C. Single-Layer Fastening Methods: Apply gypsum boards to supports as follows:

1. Fasten with screws.

3.8 INSTALLATION OF DRYWALL TRIM ACCESSORIES

A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges to comply with manufacturer's recommendations.

B. Install corner beads at external corners.

C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound except where "U" bead (semi-finishing type) is indicated.

1. Install "L" bead where edge trim can only be installed after gypsum board is installed.
2. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).

D. Install U-bead where indicated, and where exterior gypsum board edges are not covered by applied moldings or indicated to receive edge trim with face flanges covered with joint compound.

E. Install control joints at locations indicated, or if not indicated, at spacings and locations required by referenced gypsum board application and finish standard, and approved by the Architect for visual effect.

3.9 FINISHING OF DRYWALL

A. General: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects and elsewhere as required to prepare work for decoration.

B. Prefill open joints and rounded or beveled edges, if any, using setting-type joint compound.

C. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.

D. Finish interior gypsum wallboard by applying the following joint compounds in 3 coats (not including prefill of openings in base), and sand between coats and after last coat:

1. Embedding and First Coat: Ready-mix drying-type all-purpose or taping compound.
2. Fill (Second) Coat: Ready-mix drying-type all-purpose or topping compound.
3. Finish (Third) Coat: Ready-mix drying-type all-purpose or topping compound.

E. Partial Finishing: Omit third coat and sanding on concealed drywall construction which is indicated for drywall finishing or which requires finishing to achieve fire-resistance rating, sound rating or to act as air or smoke barrier.

3.10 PROTECTION

A. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall construction being without damage or deterioration at time of Substantial Completion.

SECTION 09300 - TILE (CERAMIC)

1.0 GENERAL

The drawings, Instructions to Bidders, Form of Proposal, General Conditions, Supplementary General Conditions and Division 1 are included herein and govern work under this section.

1.1 DESCRIPTION OF WORK

A. Definitions: Tile includes ceramic surfacing units made from clay or other ceramic materials. The types of work of this section include:

1. Ceramic tile, floors/walls
2. Tile base, treads and trim
3. Special shapes as required or indicated
4. Setting beds as required or indicated
5. Grout and setting materials
6. Cutting and setting materials
7. Cutting, drilling and fitting tile work in connection with work by others
8. Waterproofing, uncoupling and drainage membranes
9. Edge protection and control joints

1.2 RELATED SECTIONS

A. Section 03300- Cast In Place Concrete
B. Section 03350- Concrete Finishing: concrete floor finishing
C. Section 05510- Metal Stairs: tread reinforcing
D. Section 06100- Rough Carpentry: plywood subfloor and underlayment
E. Section 07900- Joint Sealers
F. Section 09250-Gypsum Board
G. Section 15400- Plumbing Fixtures and Equipment

1.3 REFERENCES

A. ANSI A108.1-1999: Installation of Ceramic Tile
B. ANSI A137.1-1998: Ceramic Tile
C. ANSI C144-99: Standard Specification for Masonry Aggregates
D. ANSI C150-90: Standard Specification for Portland Cement
E. ASTM C207-91 (1992): Standard Specification for Hydrated Lime
F. ASTM C503-99: Standard Specification for marble Dimension Stone
G. ASTM C568-99: Standard Specification for Limestone Dimension Stone
H. ASTM C615-99: Standard Specification for Granite Dimension Stone
I. ASTM C629-99: Standard Specification for Slate Dimension Stone
J. ASTM C847-95: Standard Specification for Reinforcing Metal lath

1.4 QUALITY ASSURANCE

A. Manufacturer: Provide products by the following for type of tile:

1. Tile
   a. American Olean

2. Grout
   a. Laticrete Epoxy

B. Tile Manufacturing Standard: TCA 137.1 Furnish tile complying with Standard Grade requirements unless indicated otherwise.

C. Proprietary Materials: Handle, store, mix and apply proprietary setting and grouting materials in compliance with manufacturer's instructions.

1. Provide materials obtained from one source for each type and color of tile, grout, and setting materials.

D. Certificates:

1. Master Grade Certificates:

   a. Conform to ANSI A 137.1, standard grade

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's technical information and installation instructions for materials required, except bulk materials. Include certifications and other data to show compliance with these specifications.

B. Submit Manufacturer’s maintenance guides for Owner’s use in maintaining all ceramic tile work included for project.

C. Submit shop drawings for architect’s review showing location of expansion joints based on building control joints, cold joints, sawed joints and recommended expansion joints based on TCA Specifications.

1.4 SAMPLES

A. Submit samples in duplicate for approval showing quality, color, texture and finish for each kind of tile. Submit 12" x 12" panels of floor tile patterns and all custom patterns.

1. Quarry Tile:
   a. Panel for each color, pattern and type
   b. Minimum panel size: 6” x 6”, mounted to a ¾” plywood backer

B. No work for which such samples are required shall proceed until samples have been approved by the Architect, and all tile work shall be executed in strict accordance with the approved samples.

1.5 DELIVERY AND STORAGE OF TILE

A. All tile shall be graded, sealed and delivered in accordance with Department of Commerce Simplified Practice Recommendation R-61, latest issue, and this specification.

B. Deliver all tile in unbroken packages bearing the brand and manufacturer's name and store them on platforms, properly covered to protect them from moisture, damage and contamination.

C. Keep all containers in which tiles are packed, dry until tiles are removed. Take every precaution to see that tiles are not stained.

D. Manufactured mortars and grouts to contain hallmarks certifying compliance with referenced standards and be types recommended by the tile manufacturer for application.

1.6 CERTIFICATION

A. The Contractor shall furnish a master grade certificate bearing the certification mark of the Tile Council of America, signed by the manufacturer of the tile and the tile applicator. Certificates shall state the type and quality of the material furnished.

1.7 MAINTENANCE INSTRUCTIONS

A. Furnish in triplicate (3) copies of instructions for the care, cleaning, and maintenance of ceramic tile.

1.8 EXTRA TILE

A. Upon completion of work, deliver to Owner, tile of same size, color, pattern and type as used on the project for use in future repair and maintenance work.

1. 2% if resultant quantity exceeds 5 sq. ft.

2. Minimum, 5 sq. ft.

2. Include each trim shape, inside/outside corners, and any other special pieces in quantities in keeping with the conditions encountered.

3. Clearly mark extra stock to identify:

a. Manufacturer’s name
b. Product name
c. Product color and pattern

B. Provide extra tile in above noted quantities for each color, tile, pattern and type employed on project.

C. Package tile products neatly in original containers, to prevent damage.

1.9 JOB CONDITIONS

A. Environmental:

1. Maintain temperature no lower than 50 degrees F and no higher than 100 degrees F during tile work and for seven (7) days after completion.

2. Vent temporary heaters to outside to avoid carbon dioxide damage to new tile work.

3. Provide adequate lighting for good grouting and clean up.

B. Protection: Protect adjoining work surfaces before tile work begins.

2.0 PRODUCTS

2.1 KINDS OF TILE

A. All tile shall be of domestic manufacture, standard grade, meeting the requirements of recommended standard Specification for Ceramic Tile TCA 137.1-1980. All packages shall bear quality triangle of Tile Council of America, Inc.

B. All porcelain and slate as specified in Finish Schedule by Architect. Edges shall be plain or cushion as selected.

C. All base shall be coved and match floor tile.

D. Include all special shapes required such as bullnose, cove, trim, caps, etc. These shall be of the same kind and finish as adjacent tile.

2.2 COLOR, PATTERNS, SIZES OF TILE AND GROUT SELECTIONS

1. All colors of tile shall be as selected by the Architect from manufacturer's standard colors and listed as follows in schedule. Refer to finish plans for location.

2. TILES AND ACCESSORIES:
   a. Refer to drawings

2.3 TERMINAL EDGES AND WATERPROOFING

A. Furnish and install bullnose tiles at terminal edges of porcelain tile (tile base and wall tile wainscot)

B. If bullnose is unavailable use Schluter Systems, Inc. L-Channel Top cap. Color and finish to be selected by architect.

C. Tile Edge Protection: Provide appropriate Schluter Systems, Inc. edge protection to transition between floor types when applicable. Submit samples for approval by Architect.

D. Tile Expansion and Control Joints: Provide appropriate Schulter Systems, Inc., tile expansion and control joint profile when applicable. Submit samples for approval by Architect.

E. Waterproofing Membrane System: Provide Schluter Systems, Inc or approved equal waterproof membrane in shower areas or other wet locations. Install per manufacturer's recommended instructions.

F. Waterproofing & Crack Isolation Membrane: Provide Flextile Ltd, WP-980 waterproof membrane system in areas where large expanses of tile are installed. Install per manufacturer's recommended instructions.

2.4 MORTAR AND GROUTING MATERIALS

A. All cement shall be Portland Cement conforming to ASTM Specifications C150, latest edition, type 1.

B. All hydrated lime shall comply with ASTM Specifications C206 and C207, type S.

C. All sand shall be clean, sharp, durable, fine natural aggregate, free from salt, loam, clay, soluble salts organic impurities, conforming to ASTM C144.

1. Sand for floor setting beds shall be well graded, passing #8 sieve, not over 5% passing #100 mesh screen.
2. Sand for grout shall pass #30 mesh sieve, not over 5% passing #100 mesh screen.

D. Water shall be clean, free from injurious amount of oil, acid, soluble salts, organic impurities.

E. Dry-set mortar - conform with ANSI A118.1, and be prepared under Tile Council Formula. Package shall bear quality triangle of Tile Council of American, Inc.

F. Latex-Portland Cement Mortars to conform to ANSI A118.4.

G. Organic adhesives to conform to ANSI A136.1.

H. Epoxies:

a. Floor and wall adhesive: Equivalent to Mapei Corp. Kerapoxy adhesive.
b. Heavy duty floor mortar:
    1. Equivalent to Mapei Corp. Kerapoxy epoxy mortar.
    2. Conform to ANSI A118.3

I. All materials shall be measured accurately by volume thoroughly mixed and placed within a reasonable time after mixing. Do not re-temper.

3.0 <u>EXECUTION</u>

3.1 EXAMINATION

A. Verify existing condition are ready to receive work.

B. Ensure substrates are clean, dimensionally stable, cured and free of contamination such as oil, sealers and curing compounds.

C. Ensure concrete has been allowed to cure for a minimum of 28 days.

D. Ensure that floor substrate is troweled to a fine broom finish.

E. Notify Architect in writing of unacceptable substrate conditions.

3.1 SETTING METHODS

A. All ceramic tile installation work shall be in accordance with latest recommendations of the Tile Council of America, Inc. and as indicated on drawings and specified herein. In case of confliction, the more stringent shall apply.

B. Porcelain tile floors and walls shall be applied direct, using dry set mortar (thin set method).

C. Average thickness of thin set mortar bed shall be 1/8" and shall not exceed 1/4".

D. Coordinate with concrete work for recess at area of tile.

E. Providing waterproofing membrane at all shower walls.

F. Verify size and field dimensions for Entry Mat at Vestibules

3.2 STANDARD FOR TILE WORK

A. Except as otherwise specified, all details of tile setting and workmanship shall conform with the requirements of the "2003-2004 Handbook for Ceramic Tile Installation" of the Tile Council of America, Inc.

3.3 TILE SETTING PROCEDURE

A. A detailed inspection of all surfaces on which tile is to be placed shall be made. A report, in writing, of any defects found as a result of this inspection, shall be made to the Contractor, who shall immediately remedy such defects before the placing of the tile.

B. All rooms or spaces in which tile floors are being laid, shall be closed to traffic or other work, and kept closed until the floors are completed and the tile firmly set.

C. No tile shall be set on surfaces where other work is specified or shown to be embedded in the tile work until such work has been installed and approved.

D. Tile work shall be laid out so as to avoid small cuts. All cuts shall be rubbed smooth and even.

E. Replace All tile misfits with properly cut tile.

F. No tile shall be placed or allowed to set in temperatures below 40 degrees F.

3.4 SETTING TILE

A. Installation of the tile shall comply with standards previously specified and with ANSI 108.5.

B. Clean surface of all dust, deleterious film and non-compatible matter, moisten well with water, allow no free water to remain on surface. Do not saturate.

C. Spread specified setting mortar, screen to true plane at proper height, sloped to drains or level as indicated.

D. Do not spread more setting mortar at one time than can be covered during same working period.

E. Lay all tiles to straight edge, maintain uniform joint between tiles. All joints shall align in all directions.

F. Press tile into still plastic mortar and beat to true surface, using approved tools.

G. Provide expansion joints in locations and as required by recommendations of Tile Council of America, Inc.

3.5 GROUTING

A. After removal of paper, grout all tile joints. Fill be screening or brushing specified grout until joints are full, avoiding air traps or voids.

B. Pre-seal tiles requiring protection form grout staining.

C. Tool all cushion edge joints to depth of cushion.

D. Remove all surplus grout from tile, using diagonal strokes across joints. Check for gaps or air holes, filling same.

3.6 PROTECTION

A. Immediately after initial set of grouts, apply a coat of non-corrosive soap to all wall tile or cover it completely with heavy gauge plastic sheets, properly secured and joints well taped.

B. Cover all tile floors with building paper with taped joints. Where necessary to truck over tile floors, General Contractor shall provide planking.

C. Close all rooms to traffic for ten (10) days after grouting tile.

D. Protect all finished work until the Architect authorizes the removal of protection.

3.7 CLEANING

A. After grout has set, wash and rinse all tile work with sponge and clean water. Polish with dry cloth.

B. Avoid the use of acid if possible. If absolutely necessary, obtain approval of Architect and use 10% muriatic solution and rinse thoroughly with clean water.

B. All cleaning shall be done in such a manner as not to adversely affect mortar joints and finish of tile.

3.8 REPAIR AND REPLACEMENT

A. Remove all broken tiles and replace with new tile. Provide adequate “back up” in base coat to prevent further cracking tile. Provide protection to replaced floor tile as specified.

END OF SECTION

SECTION 09510 - ACOUSTICAL TREATMENT

1.0 GENERAL

1.1 RELATED DOCUMENTS

The drawings, Instructions to Bidders, Form of Proposal, General Conditions, Supplementary General Conditions and Division 1 are included herein and govern work under this section.

1.2 DESCRIPTION OF WORK

A. Extent of each type of acoustical ceiling is shown and scheduled on drawings.

1. Refer to Room Finish Schedule, reflected ceiling plans and other pertinent details as indicated on drawings.

B. Types of acoustical ceilings specified in this section include the following:

1. Acoustical panel ceilings, exposed suspension.

1.3 SEISMIC REQUIREMENTS

A. Suspended ceiling grid systems shall provide all necessary components to comply with the New York State Seismic Design Criteria as dictated by the specific Seismic Design Category. This requirement includes suspension of all HVAC, lighting and any other ceiling installed items

1.4 QUALITY ASSURANCE

A. Installer: Firm with not less than three years of successful experience in installation of acoustical ceilings similar to requirements for this project and which is acceptable to manufacturer of acoustical units, as shown by current written statement from manufacturer.

B. All acoustical tile panels specified herein, shall have a flame spread rating of 25 or less when tested by an independent Testing Laboratory in accordance with ASTM E84-70.

C. Manufacturer shall submit substantiating data as evidence of compliance.

1.5 SUBMITTALS

A. Product Data: Manufacturer's product specifications and installation instructions for each acoustical ceiling material required, and for each suspension system, including certified laboratory test reports and other data as required to show compliance with these specifications. Include manufacturer's recommendations for cleaning and refinishing acoustical units, including precautions against materials and methods which may be detrimental to finishes and acoustical performances.

B. Samples: Set of 12" square samples for each acoustical unit required showing full range of exposed color and texture to be expected in completed work. Set of 12" long samples of each exposed runner and molding.

C. Maintenance Stock: At time of completing installation, deliver stock of maintenance material to Owner. Furnish full size units matching units installed, packaged with protective covering for storage, and identified with appropriate labels. Furnish amount equal to 2.0% of each type of acoustical units and exposed suspension installed.

1.6 CLOSEOUT SUBMITTALS

A. Upon completion of the Work of this Section, Contractor shall submit to the Construction Manager, all required closeout documents.

B. Contractor shall submit a marked-up set of drawings indicating any changes made during construction to the Construction Manager.

C. Upon completion, submit to the Construction Manager, a Contractor's Affidavit of Payment of Debts and Claims, and Release of Liens.

D. Refer to General Conditions for additional requirements.

1.7 JOB CONDITIONS

A. Recommendations of the Acoustical Materials Association in their latest bulletin shall apply. Acoustical materials shall be installed under temperature and humidity conditions closely approximating those which will exist when the building is occupied. They should not be installed when buildings are damp and cold or dry and hot. Plastering, concrete and flooring shall be completed and then allowed to dry before the installation of acoustical tiles. All windows and doors shall be in place and glazed. Heating system should be installed and operating where necessary to maintain proper conditions before, during and after the acoustical ceiling installation. Concrete should be thoroughly dry.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Products of the following manufacturer’s are subject to compliance with requirements will be acceptable:

a. USG

2.2 CEILING UNITS

Refer to drawings for style and color selections.

2.2 CEILING SUSPENSION MATERIALS

A. Exposed Tee Suspension System

1. System shall include all hangers, wire, carrying tees, cross tees, edge angles, clips and all other components to complete installation. Provide proper amount and proper type of "hold down" clips as required to prevent "uplift" and "shifting" of tiles.

2. Suspension system for type A ceiling tile shall be as manufactured by USG or equal as follows:
   b. Grid to be 15/16” D x 24 x 48, Color #50 Flat White

3. All lights in exposed grid suspension system shall be supported by the suspension system. Diffusers, grilles, etc. shall be independently supported.

4. Main tees shall be sufficiently supported to carry load imposed, which shall include weight of lights. A minimum of four hangers per light shall be used and for lights over 4'-0" long.

5. Main tees and cross tees shall be made of fully zinc coated steel of gauges as previously noted. All connections of main tees, cross tee, perimeter moldings, etc., shall be mechanically interlocked. All work shall be level, square and at proper height. Provide perimeter moldings where ceiling abuts walls or partitions.

6. Hanger wire shall be No. 12 annealed galvanized wire, spaced not to exceed 4" o.c.

7. All ceiling suspension shall be supported from floor and roof construction above. Provide all supplementary framing as required to adequately support the suspended ceiling.

3.0 EXECUTION

3.1 INSPECTION

A. Installer must examine conditions under which acoustical ceiling work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 PREPARATION

A. Coordination: Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings.

B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible.

3.3 INSTALLATION

A. General: Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire resistance rating requirements as indicated, and industry standards applicable to work.

B. Installation - Lay-In Type

1. Attach to carrying channels, at right angles, the tee bars or exposed grid at spacing determined by the tile size. Provide additional support to exposed grid carrying tees at recessed lights. (light to bear on tees). Ceiling diffusers to be supported independently by Heating Contractor. Provide tee bar splices as required.

2. Ceiling contractor to coordinate his work with that of electrical and heating contractors to insure satisfactory installation of lights, diffusers and ceiling and with metal deck installer to assure proper placement of strap hangers. Frame around ceiling diffusers to support ceiling tile as required.

3. Furnish and install all accessories and items necessary for proper suspension.

4. Acoustical ceiling tile shall be placed in an approved manner as recommended by the manufacturer.

5. Lay out work to avoid small pieces at room perimeters. All damaged ceiling tile shall be replaced before final acceptance of structure and all acoustical installations shall be made by an acoustical contractor approved by the manufacturer of the acoustical materials as being thoroughly experienced in erection of acoustical materials.

6. Anchorage and fastenings shall be secure and adequate for the use intended.

7. Acoustical ceilings shall be erected in a rigid and secure manner, level with tight joints, free from wave, buckles and sags. All acoustical tile shall be properly supported.

8. Cut and fit all acoustical units neatly and accurately against beams and walls and around pipes, electrical outlets and equipment so that flanges will cover units where cut.

9. All joints shall be kept in proper alignment and parallel to walls, unless otherwise indicated.

10. All finished ceiling areas shall be flat with not tile or edges of the tile protruding or recessed in relation to adjacent tile.

11. Metal edge channels, fillers, moldings, etc., shall be in as long pieces as possible and joints shall be neatly and as inconspicuously as possible. Trim shall be attached with approved concealed fastenings. All angles, corners and filler shall have mitered joints.

12. Insert for support of suspended ceilings from slab above and for attachment of suspension wire shall be of type recommended by manufacturer and shall be of a type to support ceiling loads imposed.

3.4 ADJUST AND CLEAN

A. Upon completion, all exposed surfaces of factory finished acoustical work shall be cleaned and left in a condition entirely satisfactory to the Architect. Remove all debris, equipment and material from premises.

END OF SECTION

SECTION 09771– SPECIAL WALL SURFACES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Special wall surfaces, rigid vinyl sheet for wall protection and decoration.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Provide Acrovyn rigid vinyl sheet system which have been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM)
B. National Building Code of Canada (NBC)
C. National Fire Protection Association (NFPA)
D. Society of Automotive Engineers (SAE)
E. Underwriters Laboratory (UL)
F. Underwriters Laboratory of Canada (ULC)
G. Uniform Building Code (UBC)

1.04 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

B. Product Data: Submit product data and detailed specifications for each system components and installation accessory required.

C. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures. Indicate location and dimension of joints and fastener attachment. Include mounting details with the appropriate adhesives for specific project substrates.

D. Samples: Submit selection and verification samples for finishes, colors and textures. Submit 2- 8” square samples of each type of panel, trim and fastener.

E. Quality Assurance Submittals: Submit the following:

1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.

3. Manufacturer's Printed Instructions: Manufacturer's installation instructions for inclusion in operating and maintainance specified in Division 1.

F. Closeout Submittals: Submit the following:

1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Date) Section. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.

2. Warranty: Warranty documents specified herein.

1.05 QUALITY ASSURANCE

A. Qualifications:

1. Installer Qualifications: Installer should be experienced in performing work of this section and should have specialized in installation of work similar to that required for this project.

2. Installer must have a minimum of three (3) years experience.

3. Manufacturer Qualifications: Manufacturer should be capable of providing field service representation during construction and should be capable of approving application method.

B. Code Compliance: Wall covering product should comply to all applicable codes.

1. Fire Performance Characteristics:
   a. UL Classified with NFPA Class 1 Fire Rating
   b. Surface Burning Characteristics determined in accordance with ASTM E-84-01for
      1. Flame Spread: 25 or less
      2. Smoke developed: 450 or less

2. Impact Strength: Provide Rigid Sheet Vinyl products that conform with the applicable provisions of ASTM-F476-76.

3. Chemical Satin Resisitance: Provide Rigid Sheet Vinyl product that show resistance to stain in accordance with the applicable provisions of ASTM D-1308.

4. Color Consistancy: Provide components matched in accordance with Delta E, with color difference no greater that 1.5 units using Hunter Lab Scale.

C. Provide all Rigid Vinyl Sheet Wall Protection form a single source to ensure compatibility of color, texture and physical properties.

1.06 DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 1 Product Requirements Sections.

B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Package sheets on skids or pallets for shipment to project site.

D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store panels indoors in a dry place at the project site out of direct sunlight. A room temperature of 40-100 degree should be maintained.

E. Materials must be stored flat. Do not stand rolls on end.

1.07 PROJECT CONDITIONS

A. Environmental Requirements:

1. Installation shall not begin until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from plaster, concrete or terrazzo work has dissipated.

2. Materials must be acclimated in an environment of 65-75 degrees for at least 24 hours prior to beginning installation.

2. Provide ventilation to disperse fumes during application of adhesive as recommended by adhesive manufacturer.

B. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.08 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

1.09 MAINTENANCE

A. Extra Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals (Maintenance Materials) Section.

1. Quantity: Furnish quantity of Rigid Vinyl Sheet units equal to 3% of amount installed.

2. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra materials.

PART 2 PRODUCTS

2.01 RIGID VINYL SHEET WALL PROTECTION.

A. Acceptable Manufacturer's:

1. Crane Composites

B. Proprietary Product(s) / System(s):

1. Fiberglass Reinforced Plastic

C. Size: .075" thickness in 4' x 8' or 4' x 10' sheet sizes as required for full sheet installation

D. Style: Glasbord Smooth

2.02 FABRICATION

A. General: Fabricate wall covering product to comply with requirements indicated for design, dimensions, detail finish, and sizes.

B. Accessories: Trims and adhesives shall be furnished as a complete package system, containing all trim members, primers and adhesive.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

3.02 EXAMINATION

A. Site Verification of Conditions: Examine areas and conditions under which work is to be performed and verify conditions are acceptable for product installation in accordance with manufacturer's instructions.

1. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails are countersunk and joints and cracks are filled flush and smooth with the adjoining surface.

2. Complete all finish operations, including painting, before beginning installation.

3. Wall surface shall be dry and free from dirt, grease and loose paint.

4. Do not begin installation until backup surfaces are in satisfactory condition.

3.03 PREPARATION

A. Surface Preparation: Prior to installation, clean substrate to remove dust, debris and lose particles. Perform additional preparation per manufacturer instructions.

B. Prevent damage to material during installation

C. Locate the rigid vinyl sheet as indicated on the approved detail drawing for the appropriate substrate. Install level and plumb at the height indicated on the drawings.

3.04 INSTALLATION

A. Install the work of this section in strict accordance with the manufacturer's recommendations, using approved adhesive.

B. Locate the rigid vinyl sheet as indicated on the approved detail drawing for the appropriate substrate and install level and plumb at the height indicated on the drawings.

C. Temperature at the time of installation must be between 65-75 degrees and be maintained for at least 48 hours after the installation, to allow proper adhesive set up.

D. Relative humidity shall not exceed 80%.

E. Do not expose wall covering to direct sunlight during or after installation.

F. Color match caulk.

3.05 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace products that have been installed and are damaged. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.

1. Remove any adhesive or excessive sealant from panel face using solvent or cleaner recommended by panel manufacturer.

3.06 PROTECTION

A. Protection: Protect installed product and finish surfaces from damage during construction.

END OF SECTION

SECTION 09900 - PAINTING

1.0 GENERAL

The drawings, Instructions to Bidders, Form of Proposal, General Conditions, Supplementary General Conditions and Division 1 are included herein and govern work under this section.

1.1 SUMMARY

A. Extent of painting work is shown on drawings and schedules, and as herein specified.

B. The work includes painting and finishing of interior exposed items and surfaces throughout the project, except as otherwise indicated.

1. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of work.

C. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

D. Paint exposed surfaces whether or not colors are designated in "schedules", except where natural finish of material is specifically mentioned, paint same as adjacent similar materials or areas. If color or finish is not designated, Architect will select these from colors available for materials systems specified.

E. Paint in accordance with Room Finish Schedule, all drywall, wood trim and base.

F. Paint all exposed surfaces that are shop or job primed under other sections of the specifications. Touch-up all primed surfaces where prime coat has been marred or damaged.

G. Finish all architectural woodwork, millwork, including counters, and all other millwork items that cannot be completely prefinished at the factory.

H. Paint all hollow metal doors, frames, and other hollow metal work of a ferrous material.

I. Back prime all wood trim.

1.2 FOLLOWING CATEGORIES OF WORK ARE NOT INCLUDED AS PART OF FIELD-APPLIED FINISH WORK, OR ARE INCLUDED IN OTHER SECTIONS OF THE SPECIFICATIONS.

A. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, miscellaneous metal, hollow metal work, and similar items. Also, for fabricated components such as architectural work, and similar items. Also, for fabricated or factory-built mechanical and electrical equipment or accessories.

B. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer finishing is specified for such items as (but not limited to) architectural woodwork and casework, finished mechanical and electrical equipment, including light fixtures, distribution cabinets, doors, and equipment.

C. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas.

D. Finished Metal Surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze, and similar finished materials will not require finish painting, unless otherwise indicated.

E. Operating Parts and Labels: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinks, sensing devices, motor and fan shafts will not require finish painting, unless otherwise indicated.

F. Do not paint over any code-required labels, such as underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name or nomenclature plates.

1.3 RELATED WORK

A. Shop Painting:

1. Structural_Steel as specified in Division 5.
2. Steel_Joists as specified in Division 5.
3. Metal_Fabrications as specified in Division 5.
4. Hollow_Metal_Doors as specified in Division 8.
5. Hollow_Metal_Frames as specified in Division 8.
6. Hydraulic_Passenger_Elevator as specified in Division 14.

B. Sealants and Caulking as specified in Division 7.

C. Wood Doors as specified in Division 8.

D. Factory prefinished items as specified.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.

B. Samples: Submit samples for Consulting Officer's review of color and texture only. Provide a listing of material and application for each coat of each finished sample.

1. On 12" x 12" hardboard, provide two samples of each color and materials, with texture to simulate actual conditions. Resubmit samples as requested by the Architect until acceptable sheen, color, and texture is achieved.

2. On actual wood surfaces, provide two 4" x 8" samples of natural and stained wood finish. Label and identify each as to location and application.

1.5 DELIVERY AND STORAGE

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

1 Name or title of material
2. Manufacturer's stock number and date of manufacturer
3. Manufacturer's name
4. Contents of volume, for major pigment and vehicle constituents.
5. Thinning instructions
6. Application instructions
7. Color name and number

B. Storage of materials: Store and mix all materials only in such rooms as may be assigned for this purpose. Take all necessary precautions in storage of painting materials and implements to prevent fire.

1. Provide galvanized iron pans of suitable size in which all mixing pails must be placed. No mixing shall be done outside of these pans. Pay for repairs for all damage caused be mixing or spillage.
2. Remove all oily rags and waste each night after being placed in a covered metal receptacle during the day.

1.6 JOB CONDITIONS

A. Before commencing painting, make certain that surfaces to be coated are in perfect condition to receive the coating by being clean, dry, smooth, and at the proper temperature. No materials shall be applied if and when unfavorable atmospheric conditions prevail which could adversely affect the drying, appearance, color, or adhesion of the materials. If surface, atmospheric, or other conditions to be improper for paint or finishing are found, report such conditions to the Architect at once and do not proceed until the situation is corrected. Commencement of work in any given areas shall be construed to mean acceptance of such areas by the Contractor.

B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degrees F (7 degrees C) and 95 degrees F (35 degrees C), unless otherwise permitted by paint manufacturer's printed instructions.

C. Do not apply paint in snow, rain, fog or mist; or when relative humidity exceeds 85%; or damp or wet surfaces; unless otherwise permitted by paint manufacturer's printed instructions.

D. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

E. Material List and Maintenance Instructions: Furnish triplicate (3) copies of a complete list of materials being used, including type, brand and color used for painting and finishing each room and portion of building, interior and exterior. Include instructions for proper maintenance.

2.0 PRODUCTS

2.1 COLORS AND FINISHES

A. Prior to beginning work, Architect will select colors for surfaces to be painted.

1. Use representative colors when preparing samples for review.
2. Final acceptance of colors will be from samples applied on the job.

B. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

1. Lead content in pigment, if any, is limited to contain not more than 0.5% lead, as lead metal based on the total non-volatile (dry-film) of paint by weight.

C. Paint Coordination: provide finish coats which are compatible with prime paints used. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information on characteristics of finish materials proposed for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.

2.2 MATERIAL QUALITY

A. Provide best quality grade of various types of coating as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

2.3 MANUFACTURERS

A. Use the same brand of each respective material throughout the job.

B. Primers and undercoats shall be those made by manufacturers of respective finish coats.

C. The following manufacturer's first line products are approved for use on this project:

1. Sherwin Williams

D. Galvanized surface pre-treatment shall be manufactured by American Chemical Paint Company of Nielson Chemical Company.

2.4 STANDARD MATERIALS

A. Comply with requirements of latest editions of these standard specifications for the following materials, whether used directly or as ingredients of factory prepared products:

1. Raw Linseed Oil - ASTM A-234
2. Boiled Linseed Oil - ASTM D-260
3. Liquid Drier - Federal Spec. TT-D-651
4. White Shellac - Federal Spec. TT-V-91a
5. Turpentine - ASTM D-13
2. Mineral Spirits - ASTM D-235
3. Interior Wood Filler - Federal Spec. TT-F-336
4. Pigments-in-Oil - Federal Spec. FF-P-381

2.5 PAINTING MATERIALS

A. All basic materials entering into the compounding and manufacture of paints and other finishing materials specified, shall be of the best quality products of recognized manufacturers, subject to approval of the Architect. Reference to ASTM or Federal Specifications id for the purpose of establishing a testing basis for requirements of quality.

B. Coloring materials shall be pure tint colors, and of the highest grade of tinting strength and fineness obtainable. Coloring materials shall be composed of ingredients that will mix with the various coatings specified without impairing the ultimate result for which coatings are selected.

C. All materials shall be delivered in original unopened containers, each container bearing the brand and maker's name, completely identifying the contents, including formula, and given directions for its proper use.

D. All materials shall be used without thinning, unless otherwise specified or approved by the Architect. If any material is thus thinned, use only the thinner recommended by paint manufacturer.

2.6 TYPES OF FINISHES

Provide the following systems for various substrates, as indicated. Unless otherwise noted, all materials specified are the products of Sherwin Williams. The specifying of the products of one manufacturer is intended to indicate the type of product desired and equivalent products of approved manufacturers such as Benjamin Moore will be accepted, subject to conformance with specifications.

A. Gypsum Drywall Systems

1. Interior Drywall Walls
   a. Primer - Sherwin Williams Harmony Low Odor Interior B11W900
   b. 2nd Coat – Sherwin Williams Harmony Low Odor Eggshell, B9 series
      3rd Coat – Sherwin Williams Harmony Low Odor Eggshell, B9 series

   OR
   c. 2 nd Coat – Sherwin Williams Harmony Low Odor Interior Latex Semi-Gloss B10 series
   d. 3 rd Coat – Sherwin Williams Harmony Low odor interior latex Semi-Gloss B10 series
      NOTE: See Finish Schedule

2. Drywall Ceilings
   a. Primer – Sherwin Williams Harmony Low Odor Interior Latex Primer B11W900
   b. 2nd Coat– Sherwin Williams Harmony Low Odor Latex Flat Ceiling White
   d. 3rd Coat – Sherwin Williams Harmony Low Odor Latex Flat Ceiling White

B. Paint **all** unprimed and pre-primed Metal as follows:
   Includes: Metal Doors and Frames and Other Factory Primed Metal Work

   a. One (1) coat Pro-Cryl Universal primer
   b. 2nd Coat- Sherwin Williams Pro classic Interior Latex Semi-Gloss
   c. 3rd Coat- – Sherwin Williams Williams Pro classic Interior Latex Semi-Gloss

C. Natural Finish Woodwork & Stained Wood

   a. Patch, sand and prepare wood for Wood Finish and/or Wood Stain
   b. Match stain sample
   c. Varnish Surface with 1 coat clear gloss polyurethane
   d. Two (2) coats clear satin polyurethane
   See finish schedule for locations.

D. Interior Wood (Painted)

   a. Primer – Sherwin Williams Prep Rite Classic Primer B28W101
   b. 2nd Coat – Sherwin Williams Harmony Low Odor Interior Latex Semi-Gloss B10 Series
   c. 3rd Coat – Sherwin Williams Low Odor Interior Latex Semi-Gloss B10 Series

E. Interior Concrete Block Walls

a. Primer – Sherwin Williams Loxon Block Surfacer A24W200
b. 2nd Coat – Sherwin Williams Harmony Interior Semi-Gloss B10 Series
c. 3rd Coat – Sherwin Williams Harmony Low Odor Interior Semi-Gloss B10 Series

F. Concrete Walls to be sealed

a. Son-No-Mar Sonneborn Building Products or approved equal.

G. Exterior Masonry Block

a. PrepRite Block Filler
b. 1st Coat- A-100 Exterior Latex Satin
c. 2nd Coat- A-100 Exterior Latex Satin

H. Epoxy at Interior Concrete Block Walls

a. Primer - Kemcati Coat Epoxy filler/sealer
b. 1st Coat- Sher-tile HS Epoxy
c. 2nd Coat- Sher-tile HS Epoxy

3.0 EXECUTION

3.1 INSPECTION

A. Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Applicator.

B. Starting of paint work will the construed as Applicator's acceptance of surfaces and conditions within any particular area.

C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

3.2 SURFACE PREPARATION

A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.

Remove hardware, hardware accessories, machine surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting

of items and adjacent surfaces. Following completion of paint of each space or area, reinstall removed items.

Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so the contaminants from cleaning process will not fall onto wet, newly-painted surfaces.

B. Cementitious materials: Prepare cement plaster to be painted be removing efflorescence, chalk, dust, dirt, grease, oils and by roughening as required to remove glaze.

C. Wood: Clean wood surfaces to be painted of dirt, oil or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finish surfaces exposed to view, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.

Prime, stain, or seal wood required to be job-painted immediately upon delivery to job. Prime edges, ends, faces, undersides and backsides of wood, including cabinets, counters, cases, paneling.

When transparent finish is required, use spar varnish for backpriming.

D. Ferrous Metals: Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.

Touch up shop-applied prime coats wherever damaged or bare, where required by other sections of these specifications. Clean and touch up with same type shop primer.

E. Galvanized Surfaces: Clean free of oil and surface contaminants with nonpetroleum based solvent.

3.3 MATERIALS PREPARATION

A. Mix and prepare painting materials in accordance with manufacturer's directions.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.

C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

3.4 APPLICATION

A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

Apply additional coats when undercoats, strains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.

Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.

Finish exterior and interior doors on tops, bottoms and side edges same as exterior or interior faces, unless otherwise indicated.

Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.

B. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for paint as soon as practicable after preparation and before subsequent surface deterioration.

Allow sufficient time between successive coatings to permit proper drying. Do no recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.

D. Wherever a door is cut or planed, the surfaces affected must be immediately primed with a primer sealer.

3.5 CLEAN-UP AND PROTECTION

A. Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day.

Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

B. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.

At the completion of the work of other trades, touch up and restore all damaged or defaced painted surfaces.

C. Provide five gallons of each color and type of paint to the owner upon completion of all work.

3.6 GUARANTEE

This subcontractor shall guarantee all work under this Section of the Contract for one year after the date of acceptance against blistering, checking, alligatoring, and other defects attributing to faulty surface preparation, materials or workmanship. Re-finish all defective areas as directed.

END OF SECTION

SECTION 10522 - FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES

1.0 GENERAL

1.0 RELATED DOCUMENTS

The drawings, Instructions to Bidders, Form of Proposal, General Conditions, Supplementary General Conditions and Division 1 are included herein and govern work under this section.

1.1 DESCRIPTION OF WORK

A. Extent of fire extinguishers, cabinets and accessories is indicated on drawings.

B. Definition: "Fire extinguishers" as used in this section refers to units which can be hand-carried as opposed to those which are equipped with ;wheels or to fixed fire extinguishing systems.

C. Types of products required include:

1. Fire extinguishers
2. Fire extinguisher cabinets
3. Mounting brackets

1.2 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain products in this section from one manufacturer.

B. UL-Listed Products: Provide new portable fire extinguishers which are listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

C. FM Listed Products: Provide new portable fire extinguishers which are approved by Factory Mutual Research Corporation for type, rating, and classification of extinguisher indicated and carry appropriate FM marking.

1.3 SUBMITTALS

Product Data: Submit product data for each type of product included in this section. For fire extinguisher cabinets include roughing-in dimensions and details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, and panel style and materials.

1.4 CLOSEOUT SUBMITTALS

A. Upon completion of the Work of this Section, Contractor shall submit to the Architect/Engineer, all required closeout documents.

B. Contractor shall submit a marked-up set of drawings indicating any changes made during construction to the Architect/Engineer.

C. Upon completion, submit to the Architect/Engineer, a Contractor's Affidavit of Payment of Debts and Claims, and Release of Liens.

D. Refer to General Conditions for additional requirements.

1.5 SAMPLES

Submit for verification purposes, samples of each required finish. Prepare samples on metal of same gage as used for actual production run. Where normal color variations are to be expected, include two (2) or more units in each sample set showing limits of variation.

For initial selection of colors and finishes, submit manufacturer's color cards showing full range of standard colors available.

2.0 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

Manufacturer: Subject to compliance with requirement, provide products of one of the following:

A. J.L. Industries

B. Larsen's Manufacturing Company

2.2 FIRE EXTINGUISHERS

A. General: Provide fire extinguishers for each extinguisher cabinet and other locations indicated, in colors and finishes selected by Architect from manufacturer's standard which comply with requirements of governing authorities.

1. Fill and service extinguishers to comply with requirements of governing authorities and manufacturer's requirement.
2. Abbreviations indicated below to identify extinguisher types related to UL classification and rating system and not, necessarily to type and amount of extinguishing material contained in extinguisher.

B. Multi-Purpose Dry Chemical Type: UL-rated 4-A:60-B:C, 10 lb. nominal capacity, in enameled steel container, for Class A, Class B and Class C fires.

2.3 MOUNTING BRACKETS

A. Provide manufacturer's standard brackets designed to prevent accidental dislodgement of extinguisher, of sizes required for type and capacity of extinguisher indicated, in manufacturer's standard plated finish.

1. Provide brackets for extinguishers not located in cabinets.
2. B-2 wall bracket by Larsen's to be used as a standard.

2.4 FIRE EXTINGUISHER CABINETS

A. General: Provide fire extinguisher cabinets where indicated, of suitable size for housing fire extinguishers of types and capacities indicated.

B. Construction: Manufacturer's standard enameled steel box, with trim, frame, door and hardware to suit cabinet type, trim style, and door style indicated. Weld all joints and grind smooth. Miter and weld perimeter door frames.

C. Cabinet Type: Suitable for mounting conditions indicated, of the following types:

1. Recessed: Cabinet box (tub) fully recessed in walls of sufficient depth to suit style of trim indicated.
2. Model 2409-R2-V-Duo Door by Larsen's to used as a standard.

D. Trim Style: Fabricate trim in one piece with corners mitered, welded and ground smooth.

E. Exposed Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).

1. Square-Edge Trim: Square edges with backbend depths as follows: 1/4" to 5/16".
2. Trim Metal: Enameled steel.

F. Door Material and Construction: Manufacturer's standard door construction of material indicated, coordinated with cabinet types and trim styles selected.

1. Enameled Steel: Manufacturer's standard finish, hollow steel door construction with tubular stiles and rails.

G. Door Style: Manufacturer's standard design as indicated below and on drawing.

1. Vertical Duo Panel: DSA Glass with catch.

H. Door Hardware: Provide manufacturer's standard door operating hardware of proper type for cabinet type, trim style and door material and style indicated. Provide either level handle with cam action latch, or door pull, exposed or concealed, and friction latch. Provide concealed or continuous type hinge permitting door to open 180 degrees.

2.5 FACTORY FINISHING OF FIRE EXTINGUISHER CABINETS

A. General: Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations except as otherwise indicated. Apply finishes in factory after products are assembled. Protect cabinets with plastic or paper covering, prior to shipment.

B. Painted Finishes: Provide painted finish to comply with requirements indicated below for extent, preparation and type:

1. Extent of Painted Finish: Apply painted finish to both concealed and exposed surfaces to cabinet components except where other than a painted finish is indicated.
2. Color: Provide color as selected by Architect from Manufacturer's standard colors.
3. Preparation: Clean surfaces of dirt, grease and loose rust or mill scale.
4. Baked Enamel Finish: Immediately after cleaning and pretreatment, apply Cabinet Manufacturer's standard baked enamel finish system to the following surfaces:
   a. Interior of cabinet.
   b. Exterior of cabinet.

3.0 EXECUTION

3.1 INSTALLATION

A. Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.

1. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
2. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.
3. Install fire extinguishers 3'-6" from finish floor to top of extinguisher.
4. Top of cabinet shall be 3'-6" from finish floor.

3.2 IDENTIFICATION

A. Identify existence of fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" applied to door by process indicated below. Provide lettering to comply with requirements indicated for letter style, color, size, spacing and location or, if not otherwise indicated, as selected by Architect from Manufacturer's standard arrangements.

1. Application Process: Silk screen.

B. Identify bracket-mounted extinguishers with red letter decals spelling "FIRE EXTINGUISHER" applied to wall surface. Letter size, style and location as selected by Architect.

END OF SECTION

SECTION 10540 - SPECIALTY SIGNS

1.0 GENERAL

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work in this section.

1.1 DESCRIPTION OF WORK

A. Extent of specialty signs is shown on drawings.

B. Specialty signs include the following:

1. Room identification system.

C. Modular Signature System includes all tactile requirements meeting ADA specifications.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for each type of sign required.

B. Samples: Submit samples of each color and finish of exposed materials and accessories required for specialty signs. Architect's review of samples will be for color and texture only. When requested, furnish full-size samples of specialty sign materials.

C. Shop Drawings: Submit shop drawings for fabrication and erection of specialty signs. Include plans, elevations and large scale details of sign wording and lettering layout. Show anchorages and accessory items. Furnish location template drawings for items supported or anchored to permanent construction. Signage must be approved by Owner prior to fabrication.

1.3 QUALITY ASSURANCE

A. Obtain all products from a single supplier.

B. Products shall meet requirements of the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and local amendments and modifications.

C. Installation shall be performed by installer specialized and experienced in work similar to that required for this project.

1.4 DELIVERY, STORAGE AND HANDLING

A. Comply with manufacturer ordering instructions and lead-time requirements to avoid construction delays.

B. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Store products protected from weather, temperature and other harmful conditions as recommended by supplier.

D. Handle products in accordance with manufacturer's instructions.

2.0 PRODUCTS

2.1 IDENTIFICATION SYSTEMS

A. Manufacturer: Provide interior signs as manufactured by one of the following:

1. Architectural Graphics
2. Lynn Sign Co.
3. Mid-Michigan Stamps and Signs, Inc.
4. Takeform Architectural Graphics

B. Room Identification: Surface mount signs of type indicated, on face of doors.

C. Plastic Sign Plates: Plastic signs consist of 1/16" matte acrylic that is engraved through the exposed ply of the plastic laminate sheet to expose the contrasting core ply laminated to a base of 1/8" opaque acrylic.

D. Mounting of Signs: To be silastic adhesive with vinyl foam tape for temporary adhesion.

3.0 EXECUTION

3.1 INSTALLATION

A. Inspect signage prior to shipping to verify dimensions, materials, colors, graphics, and spellings with shop drawings, samples and contract documents, or plots.

B. Inspect signage prior to installation for defects or damage and document defective products before removal from the site.

C. Install product at height to conform to ADAAG and applicable local amendments and regulations.

D. Install sign units and components at locations shown securely mounted with concealed theft-resistant fasteners, unless otherwise indicated. Attach signs to substrates in accordance with manufacturer's instructions.

E. Install level, plumb, and at proper height. Cooperate with other trades for installation of sign units to finish surfaces. Repair or replace damaged units as directed by Architect.

F. Location of Signs

All Doors - Names to be provided by Owner.

3.2 MAINTENANCE

A. Remove all finger prints, dust and soil. Clean according to manufacturer recommendations.

B. Protect signage from construction debris until completion of project.

3.3 WARRANTY

A. Supply Owner with manufacturer's warranty.

END OF SECTION