SECTION 00100

INDEX TO PROJECT MANUAL

Section:

Division 1- General Requirements

Division 2 – Site Work

Division 3- Concrete

Division 4 - Masonry

Not Used

Division 5 – Metals

Not Used

Division 6 - Wood & Plastics

06100 Rough Carpentry
06190 Timber Trusses
06200 Finish Carpentry

Division 7 - Thermal & Moisture Protection

07200 Insulation & Vapor Barriers
07300 Roofing & Flashing & Asphalt Shingle Nail Application
07317 Wood Shingles
07900 Joint Sealers

Division 8 - Doors & Windows

08200 Doors and Finish Hardware
08550 Wood Windows

Division 9 - Finishes

09250 Gypsum Board
09650 Sheet Flooring
09680 Carpet
09900 Painting

Division 10 - Specialties

10200 Postal Specialties (Mailboxes)
10800 Toilet & Bath Accessories

Division 11 – Equipment

11450 Residential Equipment & Kitchens

Division 12 - Furnishings

Not Used

Division 15 – Mechanical

15010 Basic Mechanical Requirements

Division 16 – Electrical

15010 Basic Electrical Requirements

END OF SECTION

SECTION 00200

INVITATION TO BID

Proposal for the construction of additions to the Shalom Apartments, Portland, Maine will be available to the General Contractor on November 25, 2003. Proposals should be addressed to:

Shalom Apartments, Inc.
P.O. Box 560
Portland, Maine 041 12

The project consists of (10) one-bedroom apartments and related site work.

A mandatory site walk is scheduled for Wednesday, December 10,2003 at 10:00 A.M.

Proposals will be received at the office of the Architect by 4 P.M. on Friday December 19, 2003.

Contract Bid Documents may be viewed at the office of the Architect, Archetype, P.A., 48 Union Wharf, Portland, Maine 04101 (207) 772-6022. Sets may be ordered from Express Copy, Portland, ME (207) 775-2444.

The Owner reserves the right to accept or reject any or all bids.

END OF SECTION

ARTICLE 4
CONTRACT SUM

4.1 The Owner shall pay the Contractor in current **funds** for the Contractor's performance of the Contract the Contract Sum of Dollars ($), subject to additions and deductions as provided in the Contract Documents.

4.2 The Contract **Sum** is based upon the following alternates, if any, which are described in the Contract Documents **and** are hereby accepted by the Owner:

(State the numbers or other identification of accepted allernates. If decisions on other alternates are to be made by the Owner subsequent to the execution of this Agreement, attach a schedule of such other allernates showing the amount for each and the date until which that amount is valid.)

4.3 Unit prices, if any, are as follows:

SECTION *00300*

BID FORM

BIDDERS PROPOSAL

DATE: _____

TO: Shalom Apartments, Inc.
P.O. Box 560
Portland, ME 04112

In response to your invitation for bids, and subject to all the consideration thereof, the undersigned

_____

_____

_____

A corporation organized and existing under the laws of the state of _____

a partnership consisting of _____

or an individual trading as _____

of the city or town of _____

state of _____: Hereby proposes to furnish all labor and

materials and to perform all work required for the construction of the additions to the Shalom Apartments,

180 Auburn Street, Portland, ME.

In strict accordance with the specifications, plans and the articles of contract, therein and dated

_____ for the consideration of _____

_____Dollars.

Construction Start Date: Two weeks after award of contract and notice to proceed.

Construction Completion Date: To be seven (8) months, after which liquidated damages will be incorporated at a cost of $300 per calendar day.

The undersigned bidder agrees to execute the contract for the amount of the total of this bid

within ten (10) calendar days from the date when the written notice to commence construction (Notice To Proceed) is delivered to him at the address given on this proposal. The undersigned bidder agrees to the following schedule.

Seven **(8)** months plus ten (10) calendar days to Substantial Completion and Certificate of Occupancy.

Bidder acknowledges receipt of the deductive alternates.

1. Delete kitchen appliances – refrigerator, range.

   $_____

Contractor

By: _____

Title: _____

Business Address: _____

_____

_____

END OF SECTION

SECTION 00400

SIGNATURE PAGE

Owner: _____ Date: _____

Architect: _____ Date: _____

Contractor: _____ Date: _____

Maine State Housing Authority: _____ Date: _____

Construction Lenders Representative: _____ Date: _____

END OF SECTION

AIA Document A101

Standard Form of Agreement Between Owner and Contractor

where the basis of payment is a

STIPULATED SUM

1987 EDITION

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES; CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS COMPLETION OR MODIFICATION.

The 1987 Edition of AIA Document AZOI, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

This document has been approved and endorsed by The Associated General Contractors of America.

AGREEMENT

made as of the day of in the year of
Nineteen Hundred and

BETWEEN the Owner:
(Name and address)

and the Contractor:
(Name and address)

The Project is:
(Name and location)

The Architect is:
(Name and address)

The Owner and Contractor agree as set forth below.

ARTICLE 1
THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement; these form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 9.

ARTICLE 2
THE WORK OF THIS CONTRACT

The Contractor shall execute the entire Work described in the Contract Documents, except to the extent specifically indicated in the Contract Documents to be the responsibility of others, or as follows:

ARTICLE 3
DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

3.1 The date of commencement is the date from which the Contract Time of Paragraph 3.2 is measured, and shall be the date of this Agreement, as first written above, unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.

(Insert the date of commencement. if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

Unless the date of commencement is established by a notice to proceed issued by the Owner, the Contractor shall notify the Owner in writing not less than five days before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.

3.2 The Contractor shall achieve Substantial Completion of the entire Work not later than

(Insert the calendar date or number of calendar days after the date of commencement Also insert any requirements for earlier Substantial Completion of certain portions of the Work. if not stated elsewhere in the Contract Documents)

, subject to adjustments of this Contract Time as provided in the Contract Documents.

(Insert provisions, if any, for liquidated damages relating to failure to complete on time)

ARTICLE 5
PROGRESS PAYMENTS

5.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

5.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

5.3 Provided an Application for Payment is received by the Architect not later than the day of a month, the Owner shall make payment to the Contractor not later than the day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment shall be made by the Owner not later than days after the Architect receives the Application for Payment.

5.4 Each Application for Payment shall be based upon the schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work and be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

5.5 Applications for Payment shall indicate the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

5.6 Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

5.6.1. Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the total Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of Ten percent (10 %). Pending final determination of cost to the Owner of changes in the Work, amounts not in the dispute may be included as provided in Subparagraph 7.3.7 of the General Conditions even though the Contract Sum has not yet been adjusted by Change Order.

5.6.2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of Ten percent (10 %);

5.6.3 Subtract the aggregate of previous payments made by the Owner; and

5.6.4 Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Paragraph 9.5 of the General Conditions.

5.7 The progress payment amount determined in accordance with Paragraph 5.6 shall be further modified under the following circumstances:

5.7.1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to One-Hundred percent (100 %) of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work and unsettled claims; and

5.7.2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Subparagraph 9.10.3 of the General Conditions.

5.8 Reduction or limitation of retainage, if any, shall be as follows:

(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Subparagraphs 5.6.1 and 5.6.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

ARTICLE 6
FINAL PAYMENT

Final payment, constituting the entire unpaid balance of the Contract **Sum,** shall be made by the Owner to the Contractor when (1) the Contract **has** been fully performed by the Contractor except for the Contractor's responsibility to correct nonconforming Work as provided in Subparagraph **12.2.2** of the General Conditions and to satisfy other requirements, if any, which necessarily survive **final** payment; and (2) a final Certificate for Payment has been issued by the Architect; such final payment shall be made by the Owner not more than 30 days after the issuance of the Architect's final Certificate for Payment, or **as** follows:

ARTICLE 7
MISCELLANEOUS PROVISIONS

7.1 Where reference is made in this Agreement to a provision of the General Conditions or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

7.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rule of interest agreed upon, if any.)

(Usury laws and requirements under the Federal Truth in Lending Act, similar state and local consumer credit laws and other regulations at the Owner's and Contractor's principal places of business, the location of the Project and elsewhere may affect the validity of this provision. Legal advice should be obtained with respect to deleriotis or modifications, and also regarding requirements such as written disclosures or waivers.)

7.3 Other provisions:

ARTICLE 8
TERMINATION OR SUSPENSION

8.1 The Contract may be terminated by the Owner or the Contractor as provided in Article *14* of the General Conditions

8.2 The Work may **be** suspended by the Owner as provided in Article 14 of the General Conditions.

ARTICLE 9
ENUMERATION OF CONTRACT DOCUMENTS

9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated as follows:

9.1.1 The Agreement is this executed Standard Form of Agreement Between Owner and Contractor, AIA Document A101, 1987 Edition.

9.1.2 The General Conditions are the General Conditions of the Contract for Construction, AIA Document A201, 1987 Edition.

9.1.3 The Supplementary and other Conditions of the Contract are those contained in the Project Manual dated , and are as follows:

Document	Title	Pages

9.1.4 The Specifications are those contained in the Project Manual dated as in Subparagraph 9.1.3, and are as follows:

(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

Section	Title	Pages

9.1.5 The Drawings are as follows, and are dated unless a different **date** is shown **below:**

(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

Number	Title	Date

9.1.6 The addenda, if an): are as follows

Number	Date	Pages

Portions of addenda relating to bidding requirements are not **part of** the Contract Documents unless the **bidding** requirements are **also** enumerated in this Article 7.

9.1.7 Other documents, if any, forming part of the Contract Documents are as follows

(List here any additional documents which are intended to form part of the Contract Documents. The General Conditions provide that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)

This Agreement is entered into as of the day and year first written above and is executed in at least three original copies of which one is to be delivered to the Contractor, one to the Architect for use in the administration of the Contract, and the remainder to the Owner.

OWNER	CONTRACTOR
(Signature)	*(Signature)*
(Printed name and title)	*(Printed name and title)*

CAUTION: You should sign an original AIA document which has this caution printed in red. An original assures that changes will not be obscured as may occur when documents are reproduced.

AIA Document A201

General Conditions of the Contract for Construction

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES; CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS MODIFICATION

1987 EDITION

TABLE OF ARTICLES

This document has been approved and endorsed by the Associated General Contractors of America.

INDEX

ARTICLE 1

GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Conuact Documents consist of the Agreement between Owner and Contractor (hereinafter 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 wrinen 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 other documents such as bidding requirements (advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or portions of addenda relating to bidding requirements).

1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Conuact 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 Contnct Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect and Contractor, (2) between the Owner and a Subcontractor or Subsubcontractor or (3) between any persons or entities other than the Owner and 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.

1.13 THE WORK

The term "Work" mans the construction and services required by the Contract Documents, whether completed or partially completed, arid 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 consmaion of which the Work performed under the Contract Documents may be the whole or a part and which may include consmaion by the Owner or by separate contractors.

1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, 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, consmaion systems, standards and workmanship for the Work, and performance of related services.

1.1.7 THE PROJECT MANUAL

The Project Manual is the volume usually assembled for the Work which may include the bidding requirements, sample forms. Conditions of the Contract arid Specifications.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 The Contract Documents shall be signed by the Owner and Contnctor as provided in the Agreement. If either the Owner or Contractor or both do not sign all the Contract Documents. the Architect shall identify such unsigned Documents upon request.

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

1.2.3 The intent of the Contract Documents is to indude all items necessary for the proper execution and completion of the Work by the Conulctor. 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 intended results.

1.2.4 Organization of the Specifications into divisions, sections and articles, arid 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.

1.2.5 Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance wirh such recognized meanings.

1.3 OWNERSHIP AND USE OF ARCHITECTS DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS

1.3.1 The Drawings, Specifications and other documents prepared by the Architect are instruments of the Architect's service through which the Work to be executed by the Contractor is described. The Contractor may retain one contract record set. Neither the Contractor nor any Subcontractor, Subsubcontractor or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications arid other documents prepared by the Architect, and unless otherwise indicated the Architect shall be deemed the author of than and will retain all common law, statutory and other reserved rights, in addition to the copyright. All copies of than, except the Contractor's record set, shall be returned or suitably accounted for to the Architect, on request, upon completion of the Work. The Drawings, Specifications and ocher documents prepared by the Architect, and copies thereof furnished to the Contractor. are for use solely wirh respect to this Project. They are not to be used by the Contractor or any Subcontractor, Subsubcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the

Work without the specific written consent of the Owner and Architect. The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this license shall bear the statutory copyright notice. if any, shown on the Drawings, Specifications and other documents prepared by the *Architm.* Submittal or distribution *to* meet official regulatory requirements or for other purposes in connection with *this* Project is not to be construed as publication in derogation of the Architect's copyright or other reserved rights.

1.4 CAPITALIZATION

1.4.1 Terms capitalized *in* these General Conditions indude those which are (1) specifically defined, (2) the titles of numbered articles and identified references *to* Paragraphs, Subparagraphs and Clauses in the document or (3) the titles *of* ocher documents published by *the American* Institute of Architects.

1.5 INTERPRETATION

1.5.1 In the interat of brevity the Contract Documents frequently omit modifying words such as "all" and "my" and articles *such* as "the" and "an." but the fact *rhat* a modifier or an article is absent from one statement and appears in mother is not intended *to* affect *the* interpretation of either statement.

ARTICLE 2

OWNER

2.1 DEFINITION

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 term "Owner" means the Owner or the Owner's authorized representative.

2.1.2 The Owner upon revonable *written* request shall furnish *to* the Conuactor in writing information which is necessary and relevant for *the* Contractor to evaluate. give notice of or enforce mechanic's lien rights. Such information shall indude a correct statement of the record legal tide to the property on which *the* Project is located, usually referred to as the site, and the Owner's interat therein at *the* rime of execution of the Agreement and, within five days after my change, information of such change *in* tide. recorded or unrecorded.

2.2 INFORMATION AND SERVICES REQUIRED *OF* THE OWNER

2.2.1 The Owner shall. at the request of the Contractor, prior to execution of the Agreement and promptly from time to time thereafter, furnish to the Contractor reasonable evidence rhat financial arrangements have been made to fulfill the Owner's obligations *under* the Contract. *[Note: Unless such reasonable evidence were furnished on request prior to the execution of the Agreement, the prospective contractor would not be required to execute the Agreement or to commence tbe Work.]*

2.2.2 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.*

2.2.3 Except for permits and fees which are the responsibility of the Contractor *under* the Contract Documents, 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.

2.2.4 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid dehy in orderly progress of the Work.

2.2.5 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, such copies of Drawings and Project Manuals as are reasonably necessary for execution of *the* Work.

21.6 The foregoing are in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to Article 6 (Construction by Owner or by *Separate* Contractors), Article *9* (Payments and Completion) and Article 11 (Insurance and Bonds).

2.3 OWNER'S RIGHT *TO* STOP THE WORK

2.3.1 If the Contractor fails *to correct* Work which is not in accordance with the requirements of *the* Contract Documents as required by Paragraph 12.2 or persistently fails to carry out Work in accordance with the Contract Documents, the Owna. by written order signed personally or by an agent specifically so empowered by the Owner in writing, may order 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 Subpangraph 6.1.3.

2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

24.1 If *the* Contractor defaults or neglects to carry out the Work in accordance with the Contna Documents and fails within a seven-day period after receipt of *written* notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness. the Owner may after *such* seven-day period give the Conmaor a second written notice to correct such deficiencies within a second seven-day period. If the Conmaor within such second seven-day period after receipt of such second notice fails to commence and continue to correct any deficiencies. the Owner may, without prejudice to other remedies *the* Oaner m y have, correct such deficiencies. In such case an appropriate *Change* Order shall be issued deducting from payments *then* or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for *the Architect's* additional *services* and expenses made necessary by *such* default, neglect or failure. Such action by *the* Owner and amounts charged to the Contractor are both subject to prior approval of the *Architect.* If payments *then* or thereafter due the Contractor are not sufficient *to* cover *such* amounts. the Contractor shall pay the difference *to* the Owner.

ARTICLE 3

CONTRACTOR

3.1 DEFINITION

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 term "Contractor" means the Contractor or the Contractor's authorized representative.

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.1 The Contractor shall carefully study and compare the Contract Documents with ach other and with information furnished by the Owner pursuant to Subparagraph 2.2.2 and shall at once report to the Architm errors, inconsistencies or omissions discovered. The Contnctor shall not be liable to the Owner or Architect for damage resulting from errors, inconsistencies or omissions in the Contnct Documents unless the Contractor recognized such error, inconsistency or omission and knowingly failed to report it to the Architect. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contncr Documents without such notice to the Architect, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate mount of the attributable costs for correction.

322 The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Conma Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be reported to the Architect at once.

3.2.3 The Contractor shall perform the Work in accordance with the Contract Documents and submittals approved pursuant to Paragraph 3.12.

33 SUPERVISION AND CONSTRUCTION PROCEDURES

3.3.1 The Contnctor shall supervise and direct the Work. using the Conmaor's best skill and attention. The Contractor shall be solely responsible for and have control over construction mans. methods. techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless Conrnct Documents give other specific instructions concerning these matters.

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, arid other persons performing portions of the Work under a contract with the Contractor.

3.3.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contna Documents either by activities or duties of the Architect in the Architect's administration of the Contnct, or by tats, inspections or approvals required or performed by persons orher than the Conmctor.

3.3.4 The Contractor shall be responsible for inspection of portions of Work already performed under this Contract to determine chat 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 hbor, materials, equipment, tools. construction equipment and machinery, water, heat, utilities, transportation, arid 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 The Contractor shall enforce strict discipline and good order among the Contractor's employes and ocher persons carrying out the Contract. The Contractor shall not pamit employment of unfit persons or persons not skilled in tasks assigned to them.

3.5 WARRANTY

3.5.1 The Conmaor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new Unless otherwise required or permitred by the Contncr Documents. that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Conmaor's warranty excludes remedy for damage or defect caused by abuse, modifications nor executed by the Contractor. improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

3.6 TAXES

3.6.1 The Contractor shall pay sales, consumer. use and similar taxes for the Work or portions thereof provided by the Contractor which 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 AND NOTICES

3.7.1 Unless otherwise provided in the Contract Documents. the Contnctor shall secure and pay for the building permit and orher permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required when bids are received or negotiations concluded.

3.7.2 The Conuactor shall comply with and give notices required bv laws. ordinances, rules. regulations and lawful orders of public authorities bearing on performance of the Work.

3.7.3 It is not the Conmaor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations. However. if the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Architm and Owner in writing. and necessary changes shall be accomplished by appropriate Modification.

3.7.4 If the Contractor performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Architect and Owner, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs.

38 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 Conmaor shall not be required to employ persons or entities against which the Contractor makes reasonable objection.

3.8.2 Unless otherwise provided in the Contract Documents:

.1 materials and equipment under an allowance shall be selected promptly by the Owna to avoid delay in the work;

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

.3 Conmaor's costs for unloading and handling at the site, labor, installation costs, overhad, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum and not m the allowances;

.4 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 Clause 3.8.2.2 and (2) changes in Contractor's costs under Clause 3.8.2.3.

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. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit For the Owner's and Architect's informadon a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under *the* Contract Documents, shall be revised at appropriate intervals as required by the conditions of *the* Work and Project. shall be related to the *entire* Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

3.102 The Contractor shall prepare and keep current, for *the* Architect's approval. a schedule of submittals a-hich is coordinated with the Contractor's construction schedule and allows rhe Architm reasonable time to review submittals.

3.10.3 The Conmaor shall conform to the most recent schedules.

3.11 DOCUMENTS AND *SAMPLES* AT THE SITE

3.1 1.1 The Contractor shall maintain at the site for the Owner one record copy of the Dnwings. Specifications, addenda. *Change* Orders and other Modifications, in good order and marked currently to *record* changes and selections made during construction. and in addition approved Shop Drawings. Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submital to the *Owna* upon completion of the Work.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.121 Shop Dnwings 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 which 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. The purpose of *their* submittal is to demonstrate for those portions of the Work for which submittals are required the way the Conmaor proposes to conform to the information given and *the* design *concept* expressed in the Contract Documents. Review by the Architm is subject to the limitations of Subparagraph 4.2.7.

3.12.5 The Contractor shall review, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents 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. submittals made by the Contractor which are not required by the Contract Documents may be returned without action.

3.12.6 The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect. Such Work shall be in accordance with approved submittals.

3.12.7 By approving and submitting Shop Drawings, Product Data. Samples and similar submittals, *the* Contractor represents that the Contractor has *determined* and verified materials. field measurements and field construction criteria related thereto, or will do *so,* and has checked and coordinated *the* information contained within such submittals with the requirements of the Work and of the Contract Documents.

3.12.8 The Contractor shall not be relieved of responsibility for deviations from *requirements* of the Conrnct Documents by the Architect's approval of Shop Drawings, Product Data. Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the *rime* of submittal and the Architect has given written approval to the specific deviation. The Conmaor 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.

3.12.10 Informational submittals upon which the Architect is *not* expected to take responsive action may be so identified in the Contract Documents.

3.12.11 When professional certification of performance criteria of materials. systems or equipment is required by the Contna Documents. the Architect shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

3.13 USE OF SITE

3.13.1 The Contractor shall confine operations *at* the site to areas permitted by law, ordinances, permits 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.

3.142 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 such construction by the

Owner or a separate contractor *except* with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's 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 or rubbish caused by operations under the Contract. At completion of the Work the Conmaor shall remove from and about the Projm waste materials, rubbish, the Contnctor's tools. construction equipment. machinery and surplus materials.

3.15.2 If the Conactor fails to clean up as provided in the Contract *Documents.* the Owner may do so and the cost thereof shall be charged to the Contractor.

3.16 ACCESS TO WORK

3.16.1 The Conmaor shall provide the Owner and *Architect* access to the Work in preparation and progress wherever located.

3.17 ROYALTIES *AND* PATENTS

3.17.1 *The* Contractor shall pay all royalties and license fees. The Conmaor shall defend suits or claims for infringement of patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall nor be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents. However, if *the* Conmaor has reason to believe that the required design, process or product is an infringement of a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

3.18 INDEMNIFICATION

3.18.1 To the fullest extent permitted by law, the Contncror 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 our 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) including loss of use resulting therefrom, but only to the extent caused *in* whole or in part by negligent acts or omissions of the Contnctor. a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or nor 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 which would otherwise exist as to a party or person described in *this* Paragraph 3.18.

3.18.2 In claims against any person or entity indemnified under this Paragraph 3.18 by an employee of the Conmaor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts *they* may be liable, *the* indemnification obligation under this Paragraph 3.18 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' or workmen's compensation acts, disability benefit acts or *other* employee benefit acts.

3.18.3 The obligations of the Contractor under *this* Paragraph 3.18 shall not extend to the liability Of the Architect, the Architect's consultants, and agents and employees of any of them vising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Architect. the *Architect's* consultants, and agents and employees of any of them provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 4

ADMINISTRATION OF THE CONTRACT

4.1 ARCHITECT

4.1.1 The Architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term *"Architm"* means the Architect or the *Architect's* authorized representative.

4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall nor be restricted, modified or *extended* without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

4.1.3 In case of termination of employment of the Architect, the Owner shall appoint an architect against whom the Contractor makes no reasonable objection and whose status under the Contract Documents shall be that of the former architect.

4.1.4 Disputes arising under Subparagraphs 4.1.2 and *4.1.3* shall be subject to arbitration.

4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents, and will be the Owner's representative (1) during construction. (2) until final payment is *due* and (3) wirh the Owner's concurrence, from time to time during the correction period described in Paragraph 12.2. The Architect will advise and consult with the Owner. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified by written instrument in accordance with other provisions of the Contract.

4.2.2 The Architect will visit the *site* at intervals appropriate to the stage of construction *to* become generally familiar with the progress and quality of *the* completed Work and to determine in general if the Work is being performed in a *manner indicating that the* Work. when 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 quality or quantity of the Work. On the basis of on-site observations as an architect, the Architect will keep the Owner informed of progress of the Work, and will endeavor to guard the Owner against defects and deficiencies in the Work.

49.3 The Architect will not have control o v a or charge of and will not be responsible for construction mans. methods. techniques, sequences or procedures, or for safety precautions and programs in connection with *the* Work, since these are solely *the* Contractor's responsibility as provided in Paragraph 3.3. The Architect will not be responsible for the Contractor's failure to carry out the Work in accordance with *the* Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the con-

tractor, Subcontractors, or their *agents* or employees, or of any orha persons performing portions of the Work.

42.4 Communications Facilitating Contract Administration. Except as otherwise provided in *the* Contract Documents or when *direct* communications have been *specially authorized,* the Owner and Contractor shall endeavor to communicate through the Architect. Communications by and with the Architect's consultants shall be through the *Architea.* Communications by and with Subcontractors and *material* supplies shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

42.5 Based on the Architect's observations and 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* mounts.

42.6 *The* Architect will *have* authority to reject Work which does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable for implementation of the intent of the Contract Documents. the Architect *will* have *authority to require* additional inspection or testing of the Work in accordance with Subparagraphs 13.5.2 and 13.5.3, whether or not such 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. material and equipment suppliers,*their* agents or employees, *or* orher *persons* performing portions of the Work.

42.7 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* with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor or *separate* contractors, while allowing *sufficient* time in the Architect's professional judgment EO 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 Paragraphs 3.3, 3.5 and 3.12. The Architect's review shall *not* constitute approval *of* safety precautions or, unless otherwise specifically stared by the Architect. 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 authorize minor changes in the Work as provided in Paragraph *7.4.*

4.2.9 The Architect will conduct inspections to determine the *date* or data of Substantial Completion and the date of *final* completion. will 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, and will issue a final Certificate for Payment upon compliance with the requirements of the Contract Documents.

4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist m carrying out the *Architect's* responsibilities at the site. The duties, responsibilities and limitations of *authority* of *such* project representatives shall be as *set* forth in an exhibit to be incorporated in *the* Contract Documents.

4.2.11 The Architm will interpret and decide matters concerning performance under and requirements of the Contnct Documents on written request of either the Owner or Contractor. The Architect's *response to* such *requests* will be made with reasonable promptness and within any time limits agreed upon. If no agreement is made concerning *the time* within which interpretations required of the Architect shall be furnished in compliance with this Paragraph *4.2,* then delay shall not be recognized on account of failure by the Architect to furnish such interpretations until 15 days after written request is made for *them.*

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 Contncror, will not show *partiality* to either and will *not be* liable for results of interpretations or decisions so 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 Contnct Documents.

4.3 CLAIMS AND DISPUTES

4.3.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of *right,* adjustment or *interpretation* of Contract terms, payment of money, extension of 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 *vising out* of or relating to the Contract. Claims must be made by written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.

4.3.2 Decision of Architect Claims, including those alleging an error or omission by the Architect, shall be referred initially to the Architect for action as provided in Paragraph 4.4. *A* decision by the Architect, as provided in Subparagraph 4.4.4, shall be required as a condition precedent *to* arbitration or litigation of a Claim between the Contractor and Owncr as to all such matters vising prior to the date final payment is due, regardless of (1) whether *such* matters relate to execution and progress of the Work or (2) the extent to which the Work has been completed. The dedsion by the Archim in response to a Claim shall not *be* a condition precedent to arbitration or litigation in the event (1) the position of Architect is vacant, (2) the Architect has not received evidence or has failed *to* render a decision within agreed time limits, (3) the Architect has failed to take action required under Subparagraph 4.4.4 within 30 days after the Claim is made, (4) 45 days have passed after the Claim has been referred to the Architect or (5) the Claim relates *to* a mechanic's lien.

4.3.3 Time Limits on Claims Claims by either party must be made 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. Claims must be made by written notice. An additional Claim made after the initial Claim has been implemented by Change Order will not be considered unless submitted in a timely manner.

4.3.4 Continuing Contract Performance. Pending final resolution of a Claim including arbitration, unless otherwise agreed in writing the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

4.3.5 Waiver of Claims: Final Payment The nuking 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 wirh the requirements of the Contract Documents; or

.3 tams of special warranties required by the Contract Documents.

4.3.6 Claims for Concealed or Unknown Conditions. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which 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, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and. if 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 an equitable adjustment in the Contnct Sum or Contract Time. or both. If the Architect determines that the conditions at the site are nor materially different from those indicated in the Contract Documents and chat no change in the terms of the Contract is justified, the Architect shall so notify the Owner and Contractor in writing. stating the reasons. Claims by either party in opposition to such determination must be made within 21 days after the Architect has given notice of the decision. If the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time. the adjustment shall be referred to the Archirm for initial determination, subject to further proceedings pursuant to Paragraph 4.4.

4.3.7 Claims for Additional Cost. If the Contractor wishes to make Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Paragraph 10.3. If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Architect, (2) an order by the Owna to stop the Work where the Contractor was nor at fault, (3) a written order for a minor change in the Work issued by he Architect, (4) failure of payment by the Owner. (5) termination of the Contract by the Owner, (6) Owner's suspension or (7) other reasonable grounds, Claim shall be filed in accordance with the procedure established herein.

4.3.8 Claims for Additional Time

4.3.8.1 If the Contractor wishes to make Claim for an increase in the Contract Time, written notice as provided herein 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.

4.3.8.2 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 and could not have been reasonably anticipated, and chat weather conditions had an adverse effect on the scheduled construction.

4.3.9 Injury or Damage to Person or Property. If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, of any of the other party's employees or agents, or of others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after first observance. The nocice shall provide sufficient detail to enable the other party to investigate the matter. If a Claim for additional cost or time related to this Claim is to be asserted, it shall be filed as provided in Subparagraphs 4.3.7 or 4.3.8.

4.4 RESOLUTION OF CLAIMS AND DISPUTES

4.4.1 The Architect will review Claims and take one or more of the following preliminary actions within ten days of receipt of a Claim: (l) request additional supporting data from the claimant, (2) submit a schedule to the parties indicating when the Architea expects to take action, (3) reject the Claim in whole or in pan. stating reasons for rejection, (4) recommend approval of the Claim by the ocher party or (5) suggest a compromise. The Architect may also, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim.

4.4.2 If a Claim has been resolved, the Architect will prepare or obtain appropriate documentation.

4.4.3 If a Claim has not been resolved, rhe party making rhc Claim shall, wirhin ten days after the Architect's preliminary response. take one or more of the following actions: (1) submit additional supporting data requested by the Archirm, (2) modify the initial Claim or (3) notify rhe Architect rhat the initial Claim stands.

4.4.4 If a Claim has not been resolved after consideration of the foregoing and of further evidence presented by the parties or requested by the Architect. the Architect will notify the parties in writing that the Architect's decision will be nude within seven days. which decision shall be final and binding on the parties but subjm to arbitration. Upon expiration of such Lime period. the Architect will render to the parries the Architect's written decision relative to the Claim, including any change in the Conma Sum or Conuact Time or both. If there is a surety and there appears to be a possibility of a Contractor's default, the Architect may, but is not obligated to, notify the surety arid request the surety's assistance in resolving the controversy.

45 ARBITRATION

4.5.1 Controversies and Claims Subject to Arbitration. Any controversy or Claim vising out of or related to the Contract, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator or arbitrators may be entered in any court having jurisdiction thereof, except controversies or Claims relating to aesthetic effect and except those waived as provided for in Subparagraph 4.3.5. Such controversies or Claims upon which the Architect has given notice and rendered a decision as provided in Subparagraph 4.4.4 shall be subject to arbitration upon written demand of either party. Arbitration may be commenced when 45 days have passed after a Claim has been referred to the Architect as provided in Paragraph 4.3 and no decision has been rendered.

4.5.2 Rules and Notices for Arbitration. Claims between the Owner and Contractor not resolved under Paragraph 4.4 shall, if subject to arbitration under Subparagraph 4.5.1, be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect, unless the parties mutually agree otherwise. Notice of demand for arbitration shall be filed in writing with the other party to the Agreement between the Owner and Contractor and with the American Arbitration Association, and a copy shall be filed with the *Architect.*

4.5.3 Contract Performance During Arbitration. During arbitration proceedings, the Owner and Conmaor shall comply with Subparagraph 4.3.4.

4.5.4 When Arbitration May Be Demanded. Demand for arbitration of any Claim may not be made until the earlier of (1) the date on which the Architect has rendered a final written decision on the Claim, (2) the *tenth* day after the parties have presented evidence to the Architect or have been given reasonable opportunity to do so, if *the* Architect has not rendered a final written decision by *that date,* or (3) *my* of the five events described in Subparagraph 4.3.2.

4.5.4.1 When a written decision of the Architea states *that* (1) the decision is final but subject *to* arbitration and (2) a demand for arbitration of a Claim covered by such decision must be made within 30 days after the date on which the party making the demand receives the final written decision, then failure to demand arbitration within said 30 days' period shall result in *the* Architect's dedsion becoming final and binding upon the Owner and Contractor. If the Architect renders a decision after arbitration proceedings have been initiated, such dedsion may be entered as evidence. but shall not supersede arbitration proceedings unless *the* decision is acceptable to all VV— concerned.

4.5.4.2 *A* demand for arbitration shall be made within the time limits specified in Subparagraphs 4.5.1 and 4.5.4 and Clause 4.5.4.1 as applicable. urd in other cases within a reasonable rime after the Claim has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such Claim would be barred by *the* applicable statute of limitations as determined pursuant to Paragraph 13.7.

4.5.5 Limitation *on* Consolidation or Joinder. No arbitration vising out of or relating to the Contract Documents shall indude. by consolidation or joinder or in any *other manner,* the Architect. the Architect's employees or consultants, except by written consent containing *specific* reference *to* the Agreement and signed by the Architect. Owner, Contractor and any other person *or* entity sought to be joined. No arbitration shall indude. by consolidation or joinder or in *my other* manner, parties other than the Owner. Conmaor, a separate contractor as described in *Article 6* and *otha* persons substantially involved in a common question of fact *of* law whose presence *is* required *if* complete relief is to be accorded in arbitration. No person or entity other than the *Owner.* Conmaor or a separate contractor as described in Article 6 shall be included as an original third party or additional third party to an arbitration whose interest or responsibility is insubstantial. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a dispute not described therein or with a person or entity not named or described therein. 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 *my* court having *jurisdiction* thereof.

4.5.6 Claims and Timely Assertion of Claims. A party who files 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. when a party fails to include a Claim through oversight, inadvertence or excusable neglect, or when a Claim has matured or been acquired subsequently, the arbitrator or arbitrators may permit amendment.

4.5.7 Judgment on Final *Award.* 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.

ARTICLE *5*

SUBCONTRACTORS

5.1 DEFINITIONS

5.1.1 A Subcontnctor 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* conmaor or subcontractors of a separate contractor.

5.11 A Sub-subcontractor is a person or entity who has a dirm or indirect contract with a Subconmaor to perform a portion of the Work at the site. The term "Subsubcontractor" 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 AWARO OF *SUBCONTRACTS AND* OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Unless otherwise *stated* in the Conma Documents or the bidding requirements, the Contractor, as soon as practicable after award of *the* Contract, shall furnish in writing to the Owna through the Architect the names of persons or entities (including those who ue *to* furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The .Architect will promptly reply to the Contractor in writing stating whether or not the Owner or *the* Architect, after due investigation, has reasonable objection to *any* such proposed person or entity. Failure of the Owner or Architect to reply promptly shall constitute notice of no reasonable objection.

52.2 The Conmaor shall nor: contract with a proposed person or entity to whom *the* Owner or Architect has *made* reasonable and timely objection. The Conmaor shall not be required to contract with anyone to whom the Contnaor has nude revonable 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. The Contract Sum shall be increased or decreased by the difference in cost occasioned by *such* change and an appropriate Change Order shall be issued. However, no increase in the Contract Sum shall be allowed for *such* change unless the Conmaor has acted promptly and responsively in submitting names as required.

5.2.4 The Contractor shall not change a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to *such change.*

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 By appropriate agreement, wrinen where legally required for validity, the Contractor shall require each Subconmaor, to *the* extent of the Work to be performed by *the* Subcontractor, to be bound to the Conmaor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Conmaor, by these Documents, assumes toward the Owner and *Architect.* Each subcontract agreement shall preserve and protect the rights of the Oaner 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 Conmaor, by *the* Contxact Documents, has against the Owner. Where appropriate, the Contnctor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Conmaor shall make available to each proposed Subconmaor, prior to the execution of the subcontract *agreement,* copies of the Contract Documents to which the Subcontractor will be bound, and, upon wrinen request of the Subcontractor, identify to the Subcontractor terms and *conditions* of the proposed subcontract agreement which m y be at variance with the Contract Documents. Subcontractors shall 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 Paragraph 14.2 and only for *those* subcontract agreements which the Owner accepts by notifying the Subcontractor in writing; and

.2 assignment is subject to the prior rights of the surety, if any, obligated unda bond relating to the Contract.

5.4.2 If the Work has been suspended for more than 30 days, *the* Subcontractor's compensation shall be equitably adjusted.

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 Owner reserves the right to perform construction or operations related to the Projm with the Owner's own forces, and to award separate contracts in connection With other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of *such* action by the Owner, the Contractor *shall* make such Claim as provided *else*where in the Contract Documents.

6.19 When separate contracts are awarded for different portions of the Project or other construction or operations on *ch*~site, *the* term "Conactor" 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 Conmaor, who shall cooperate with than. The Contractor shall participate with other separate con*tractors* and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule and Contract Sum deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute *the* schedules to be used by the Contnaor, 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, the Owner shall be deemed to be subject to the same obligations and to have *the* same rights which apply *to* the Contractor under the Conditions of the Contract, including, wirhout excluding others, those stated in Article 3, *this* Article 6 and Articles 10, 11 and 12.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Conmaor 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.

62.2 If part of *the* Contractor's Work depends for propcr execution or results upon construction or operations by the Owner or a separate contractor, the Contnaor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of *the* Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractors' completed or partially completed consmaion is fit and propcr to receive the Conmaor's Work, *except* as to defects not *then* reasonably discoverable.

6.2.3 Costs caused by delays or by improperly timed activities or defective construction shall be borne by the party responsible therefor.

6.2.4 The Conmaor shall promptly remedy damage wrongfully caused by *the* Contractor to completed or partially completed construction or to property of the Oaner or separate contractors as provided in Subpangraph 10.2.5.

62.5 Claims and ocher disputes and matters in question between the Conmaor and a separate contractor shall be subject to the provisions of Paragraph 4.3 provided the separate contractor has reciprocal obligations.

6.2.6 The Owner and each separate conmaor shall have the same responsibilities for cutting and patching as are described for the Contractor in Paragraph 3.14.

6.3 OWNER'S RIGHT TO CLEAN UP

63.1 If a dispute arises among the Conulctor, 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 as described in Paragraph 3.15, the Owner m y clean up and allocate the cost among those responsible as the Architect determines to be just.

ARTICLE 7

CHANGES IN THE WORK

7.1 CHANGES

7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contnct. 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.

7.12 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architea 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 Contnct Documents. and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

7.1.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are so changed in a proposed Change Order or Construction Change Directive that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contncror. the applicable unit prices shall be equitably adjusted.

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 a change in the Work:

.2 the amount of the adjustment in the Contract Sum. if any: and

.3 the extent of the adjustment in the Conrnct Time, if any.

7.2.2 Methods used in determining adjustments to the Contract Sum may include those listed in Subpangraph 7.3.3.

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 and stating a proposed basis for 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 Subparagraph 7.3.6.

7.3.4 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 Conmaor'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 Contncr Time.

7.3.5 A Construction Change Directive signed by the Contractor indicates the agreement of the Conulctor 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.

7.3.6 If the Contnctor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the Architea on the basis of reasonable expenditures. and savings of thox performing the Work attributable to the change. including, in case of an increase in the Contract Sum, a reasonable allowance for overhad and profit. In such case, and also under Clause 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 Contncr Documents, costs for the purposes of this Subpangraph 7.3.6 shall be limited to the following:

.1 costs of labor. including social security, old age and unemployment insurance, fringe benefits required by agreement or custom. and workers' or workmen's compensation insurance;

.2 costs of matenals, 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 Conulctor or others;

.4 costs of premiums for all bonds and insurance. permit fees, and sales, use or similar taxes related to the Work: and

.5 additional costs of supervision and field office personnel directly attributable to the change.

7.3.7 Pending final determination of cost to the Oaner, amounts not in dispute may be included in Applications for Payment. The mount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contnct 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 overhad and profit shall be figured on the basis of net increase, if any, with respect to that change.

7.3.8 If the Owner and Contractor do not agree with the adjustment in Conrnct Time or the method for determining it. the adjustment or the method shall be referred to the Architect for determination.

7.3.9 When the Owner and Conuactor agree with the 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 shall be recorded by preparation and execution of an appropriate Change Order.

7.4 MINOR CHANGES IN THE WORK

7.4.1 The Architect will have authority to order minor changes in the Work not involving adjustment in the Contnct Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. The Conrnctor shall carry out such written orders prompdy.

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. The date shall not be postponed by the failure to act of the Conmaor or of persons or entities for whom the Conuactor is responsible.

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

8.1.4 The t a m "day" as used in the Contract Documents shall m a n 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 Conulctor shall nor knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective due of insurance required by Article 11 to be furnished by the Conmaor. The date of commencement of the Work shall not be changed by the effective date of such insurance. Unless the due of commencement is established by a notice to proceed given by the Owner, the Contractor shall notify the Owner in writing nor less than five days or orher agreed period before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.

82.3 The Conmaor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

83 DELAYS AND EXTENSIONS OF TIME

8.3.1 if the Contractor is delayed at any time in progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate conmaor employed by the Owner, or by changes ordered in the Work, or by hbor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, or by delay authorized by the Owner pending arbitration, or by other causes which the Architect determines may justify delay, then the Contract Time shall be extended by Change Order 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 Paragraph 4.3.

8.3.3 This Paragraph 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.

9.2 SCHEDULE Of VALUES

9.2.1 Before the first Application for Payment, the Contractor shall submit to the Architect a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 At least ten days before the date established for a c h progress payment, the Contractor shall submit to the Architect an itemized Appliation for Payment for operations completed in accordance with the schedule of values. Such application shall be notarized, if required, and supported by such data substantiating the Conmaor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material supplies, and reflecting retainage if provided for elsewhere in the Conma Documents.

9.3.1.1 Such applications may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives but nor yet included in Change Orders.

9.3.1.2 Such applications may not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason.

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 Conmaor 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 applicable insurance, storage and transportation to the site for such materials and equipment stored off the sire.

9.3.3 The Contractor warrants that tide to all Work covered by an Appliation 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 b a t of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Conmaor. Subcontractors, material suppliers, or other persons or entities making a claim by reason of having 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 Conmaor's Application for Payment, either issue to the

Owner a Cenifiate for Payment, wid-. a copy to the Contractor. for such mount as the Architect determines is properly due, or notify the Conmctor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Subparagraph 9.5.1.

9.4.2 The issuance of a Cenifiate for Payment will constitute a representation by the Architect to the Owner. based on the Architect's observations at the site and the data comprising the Appliation for Payment, that the Work has progressed to the point indicated and that, to the best of the Architect's knowledge, information and belief, quality of the Work is in accordance with the Contract Documents. 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 minor deviations from the Contract Documents correctable prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Conmaor is entitled to payment in the amount certified. 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, technique, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material 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 Contnctor has used money previously paid on account of the Contract Sum.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

9.5.1 The Architect may decide not to certify payment and may withhold a Certificate for Payment in whole or in put. to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Subparagraph 9.4.2 cannot be made. If the Architect is unable to certify payment in the mount of the Application, the Architea will notify the Contractor and Owner as provided in Subparagraph 9.4.1. If the Contractor and Architect cannot agree on a revised amount. the Architea 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 decide not to certify payment or, beaux of subsequently discovered evidence or subsequent observations, 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 protea the Owner from loss because of:

.1 defective Work not remedied;

.2 third party claims filed or reasonable evidence indicating probable filing of such claims;

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

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

.5 damage to the Owner or another contractor;

.6 reasonable evidence chat the Work will not be completed within the Contract Time. and rhat the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

.7 persistent failure to carry out the Work in accordance wirh the Contract Documents.

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

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 promptly pay a ch Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the mount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such 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 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 Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

9.6.5 Payment to material supplies shall be treated in a manner similar to that provided in Subparagraphs 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.

9.7 FAILURE OF PAYMENT

9.7.1 If the Architm 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 arbitration. then the Contractor may, upon seven additional day' written 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 Conuact Sum shall be increased by the amount of the Conmaor's reasonable costs of shutdown. delay and start-up, which shall be accomplished as provided in Article 7.

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 Conma Documents so 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. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does nor alter the responsibility of the Contractor to compkte all Work m accordance with the Contract Documents. Upon receipt of the Contractor's list. the Architect will make an inspection to determine whether the Work or desig-

nated 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 in accordance with the requirements of the Contract Documents. the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. The Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion. shall establish responsibilities of the Owner and Contractor for security, maintenance, hat, utilities, damage to the Work arid insurance, and shall fix the time within which the Conmaor 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. The Certificate of Substantial Completion shall be submined to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate.

9.8.3 Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Architect, the Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof as provided in 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 as required under Subparagraph 11.3.11 and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use m y commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to ach ofthan for payments, retainage if any. security, maintenance. hac. 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 Conmaor considers a portion substantially complete, the Conmaor shall prepare and submit a list to the Architect as provided unda Subparagraph 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 m order to determine and record the condition of the Work.

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 written 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 and, 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 observations and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in said final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Subparagraph 9.10.2 as precedent to the Conmaor'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 Architm (1) an affidavit that payrolls, bills for materials and equipment, and ocher 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 ocherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be cancelled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. (3) a written statement that the Conmaor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Conulct Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations. such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as m y 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. If such lien 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 such lien, 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 Owna 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 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 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. The making of final payment shall constitute a waiver of claims by the Owner as provided in Subparagraph 4.3.5.

9.10.4 Acceptance of final payment by the Contractor, a Subcontractor or material 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 Appliation for Payment. Such waivers shall be in addition to the waiver described in Subparagraph 4.3.5.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

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

10.1.2 In the event the Contractor encounters on the site material reasonably believed to be asbestos or polychlorinated biphenyl (PCB) which has not been rendered harmless, the Conmaor shall immediately stop Work in the area affected and report the condition to the Owner and Architect in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the Owner and Contractor if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos or polychlorinated biphenyl (PCB), or when it has been rendered harmless, by written agreement of the Owner and Contractor, or in accordance with final determination by the Architect on which arbitration has not been demanded, or by arbitration under Article 4.

10.1.3 The Conmaor shall not be required pursuant to Article 7 to perform without consent any Work relating to asbestos or polychlorinated biphenyl (PCB).

10.1.4 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Conmaor, Architect, Architea'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 ha the material is asbestos or polychlorinated biphenyl (PCB) and has not bear 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) including loss of use resulting therefrom, but only to the extent caused in whole or in part by negligent acts or omissions of the Owner, anyone directly or indirectly employed by the Owna or anyone for whox acts the Owner may be liable, regardless of whether or nor 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 ocher rights or obligations of indemnity which would otherwise exist as to a party or person described in this Subparagraph 10.1.4.

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:

.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 or the Contractor's Subcontractors or Sub-subcontractors; 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, docation or replacement in the course of construction.

10.2.2 The Contractor shall give notices and comply with applicable laws, ordinances, rules, 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 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 owners and users of adjacent sites and utilities.

102.4 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 arry 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 Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Conuactor, 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 Clauses 10.2.1.2 and 10.2.1.3, except damage or loss 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 Contnaor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Paragraph 3.18.

10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whox duty shall be the prevention of accidents. This person shall be the Conmaor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

10.2.7 The Conmaor shall not load or permit my part of the construction or site to be loaded so as to endanger its safety.

10.3 EMERGENCIES

10.3.1 In an emergency affecting safety of persons or property, the Contractor shall act, at the Conmaor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Conmaor on account of an emergency shall be determined as provided in Paragraph 4.3 and Article 7.

ARTICLE 11

INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor m y be legally liable, whether such operations be by the Contractor or by a Subconmaor or by anyone directly or indirectly employed by m y of than, or by anyone for whose acts any of than may be liable:

.1 claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed;

.2 claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employes;

.3 claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employes;

.4 claims for damages insured by usual personal injury liability coverage which are sustained (1) by a person as a result of an offense directly or indirectly related to employment of such person by the Conmaor. or (2) by another person;

.5 claims for damage, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

.6 claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle; and

.7 claims involving contractual liability insurance applicable to the Contractor's obligations under Paragraph 3.18.

11.1.2 The insurance required by Subparagraph 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is grater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment.

11.1.3 Certificates of Insurance acceptable to the Owna shall be filed with the Owner prior to commencement of the Work. These Certificates and the insurance policies required by this Paragraph 11.1 shall contain a provision that coverages afforded under the policies will not be cancelled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Subparagraph 9.10.2. Information concerning reduction of coverage shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

11.2 OWNER'S LIABILITY INSURANCE

11.2.1 The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance. Optionally, the Owner may purchase and maintain other insurance for self-protection against claims which may arise from operations unda the Contract. The Conmaor shall not be responsible for purchasing and maintaining this optional Owner's liability insurance unless specifically required by the Contract Documents.

11.3 PROPERTY INSURANCE

11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance in the amount of the initial Contract Sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis without voluntary deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Paragraph 9.10 or until no person or entity ocher than the Owner has an insurable interest in the property required by this Paragraph 11.3 to be covered. whichever is earlier. This insurance shall include interests of the Owner, the Contncror, Subcontractors and Sub-subcontractors in the Work.

11.3.1.1 Property insurance shall be on an all-risk policy form and shall insure against the perils of fire and extended coverage and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, false-work. temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's services and expenses required as a result of such insured loss. Coverage for other perils shall not be required unless otherwise provided in the Contract Documents.

11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the mount described above, the Owner shall so inform the Conmaor in writing prior to commencement of the Work. The Contmctor may then effect insurance which will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above. without so notifying the Contractor, then the Owner shall bear all reasonable costs properly attributable thereto.

11.3.1.3 If the property insurance requires minimum deductibles and such deductibla are identified in the Conma Documents, the Contnctor shall pay costs not covered because of such deductibles. If the Owna or insurer increases the required minimum deductibles above the mounts so identified or if the Owner elects to purchase this insurance with voluntary deductible amounts, the Owner shall be responsible for payment of the additional costs not covered beaux of such increased or voluntary deductibles. If deductibles are not identified in the Contract Documents, the Owner shall pay costs not covered because of deductibles.

11.3.1.4 Unless otherwise provided in the Contract Documents, this property insurance shall cover portions of the Work scored off the site after written approval of the Owner at the value established in the approval, and also portions of the Work in transit.

11.3.2 Boiler and Machinery Insurance. The Owna shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall indude interests of the Owner. Conmaor. Subcontractors and Sub-subcontractors in the Work, and the Owner and Conmaor shall be named insureds.

11.3.3 Loss of Use Insurance. The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owna against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

113.4 If the Contractor requests in writing that insurance for risks other than those described herein or for other special hazards be included in the property insurance policy, the Owner shall, if possible. include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, adjoining 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, the Owner shall waive all rights in accordance wirh the terms of Subpangraph 11.3.7 for damages caused by fire or other perils covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Paragraph 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision rhat the policy will not be cancelled or allowed to expire until at least 30 days' prior written notice has been given to the Contractor.

11.3.7 Waivers of Subrogation. The Owner and Conmaor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect. Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Paragraph 11.3 or other property insurance appliable to the Work, except such rights as they have to proceeds of such insurance held by the Owna as fiduciary. The Owner or Conmaor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

11.3.8 A loss insured under Owner's property insurance 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 Subparagraph 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owna shall distribute in accordance with such agreement as the parties in interest may reach, or in accordance with an arbitration award in which case the procedure shall be as provided in Paragraph 4.5. If after such loss no other special agreement is made, replacement of damaged property shall k covered by appropriate Change Order.

11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interat shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection be made, arbitrators shall be chosen as provided in Paragraph 4.5. The Owner as fiduciary shall, in that case, make settlement with insurers in accordance with directions of such arbitrators. If distribution of insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

11.3.11 Partial occupancy or use in accordance with Paragraph 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Conmaor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

11.4 PERFORMANCE BONO AND PAYMENT BOND

11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as Stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

11.4.2 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 permit a copy to be made.

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 Conma Documents, it must, if required in writing by the Architect, be uncovered for the Architect's observation and be replaced at the Contractor's expense without change in the Contncr Time.

12.1.2 If a portion of the Work has been covered which the Architect has not specifically requested to observe 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, costs of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work is not in accordance with the Contract Documents, the Conmaor shall pay such costs unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

12.2 CORRECTION OF WORK

12.2.1 The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bar costs of correcting such rejected Work, including additional testing and inspections and compensation for the Architect's services and expenses made necessary thereby.

12.2.2 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 Subparagraph 9.9.1, or by terms of an applicable s — 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 written notice from the Owner *to* do so unless the Owner has previously given rhc Contractor a written acceptance of *such* condition. This period of one year 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 performance of *the* Work. This obligation under *this* Subparagraph 12.2.2 shall survive acceptance of the Work under the Conact and *termination* of the Contract. The Owner shall give *such* notice promptly after discovery of the condition.

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

1224 If the Contractor fails to correct nonconforming Work within a revonable time. the Owner may correct it in accordance with Paragraph 2.4. If the Contractor does not proceed with correction of such nonconforming Work within a reasonable time fixed by written notice from the Architect, the Owner *may* remove it and store the salvable materials or equipment at the Contractor's expense. If the Contractor does not pay costs of such removal and *storage* within ten days after written notice. the Owner may upon *ten* additional days' written notice sell such materials and equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including compensation for the Architect's services and expenses made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne. the Contract Sum shall be reduced by the deficiency. If payments then or thereafter due the Contractor *are* not sufficient to cover such *mount*. the Contnctor shall pay the difference to *the* Owner.

12.2.5 The Contnctor shall bar the cost of correcting destroyed *or* damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work which is nor in accordance with the. requirements of the Contract Documents.

72 – 26 *Nothing* contained in this Paragraph 12.2 shall be con*strued* to establish a period of limitation wich respect to other obligations which *the* Contractor might have under the Contract Documents. *Establishment* of the time period of one year as described in Subparagraph 122.2 relates *only* to the *specific* obligation of the Conmaor *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 wirhin which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations *orha* than specifically to correct the Work.

12.3 ACCEPTANCE OF NONCONFORMING WORK

12.3.1 If the Owner prefers *to* accept work which 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

13.1.1 The Contract shall be governed by *the* law of the place where the Project is located.

13.2 SUCCESSORS *AND* ASSIGNS

13.2.1 The Owner and Conuactor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect *to* covenants, agreements and obligations contained in the Con*tract* Documents. Neither party *to* the Contnct shall assign the Contract *as* a whole without written consent of the other. If either party attempts to make such an assignment a-ithour such consent, that *party* shall nevertheless remain legally responsible for all obligations under the Contract.

13.3 WRITTEN NOTICE

13.3.1 Written notice *shall* be deemed *to* have been duly served if delivered in person to *the* individual or a member of *the firm* or entity or to an officer of the corporation for which *it was* intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

13.4 RIGHTS AND REMEDIES

13.4.1 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.

13.42 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 brach thereunder, except as may be specifically agreed in writing.

13.5 TESTS AND INSPECTIONS

13.5.1 Tests, inspections and approvals of portions of the Work required by *the* Contract *Documents* or by laws. ordinances. rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time. 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 tats, inspections and approvals. The Contractor shall give the Architect *timely* notice of when and where tests and inspections are to be made so the Architect may observe such procedura. The Owner shall bear *costs of tests*, inspections or approvals which do not become requirements until *after* bids are received or negotiations concluded.

13.52 If *the* Architect. Owner or public authorities having jurisdiction determine *that* portions of the Work require additional testing. inspection or approval not included under Subparagraph 13.5.1, *the* Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for *such* additional *toting*. 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 the *Architect* m y observe *such* procedures.

The Owner shall bear such costs except as provided in Subparagraph 13.5.3.

13.5.3 If such procedures for testing, inspection or approval under Subparagraphs 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, the Contractor shall bear all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's service and expenses.

13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Conma Documents, be secured by the Contnctor and promptly delivered to the Architect.

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

13.5.6 Tats or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

13.6 INTEREST

13.6.1 Payments due and unpaid under the Contncr Documents shall bear interat from the &re payment is due at such rate as the parties may 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.

13.7 COMMENCEMENT OF STAMORY LIMITATION PERIOD

13.7.1 As between the Owner and Contnctor:

.1 Before Substantial Completion. As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such date of Substantial Completion:

.2 Between Substantial Completion and Final Certificate for Payment. As co acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of issuance of rhe final Certificate for Payment; and

.3 After Final Certificate for Payment As to acts or failures to act occurring after the relevant date of issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to my warranty provided under Paragraph 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Paragraph 12.2. or the date of actual commission of any other act or failure to perform my duty or obligation by the Contractor or Owner, whichever occurs last.

ARTICLE 14

TERMINATION OR SUSPENSION OF THE CONTRACT

14. TERMINATION BY THE CONTRACTOR

14. .1 The Conulctor may terminate the Conuact if the work is stopped for a period of 30 days through no act or fault of the Contractor or a Subcontnctor, Sub-subcontractor or their agents or employes or any other persons performing portions of the Work under contract with the Contractor, for any of the following reasons:

.1 issuance of an order of a court or other public authority having jurisdiction;

.2 an act of government, such as a declaration of national emergency, making material unavailable;

.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 Subparagraph 9.4.1, or beaux the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents;

.4 if repeated suspensions, delays or interruptions by the Owner as described in Paragraph 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; or

.5 the Owner has failed to furnish to the Conmaor promptly, upon the Contractor's request. reasonable evidence as required by Subparagraph 2.2.1.

14.1.2 If one of the above reasons exists, the Contractor may. upon seven additional days' written notice co the Owner and Architect. terminate the Contnct and recover from the Oaner payment for Work executed and for proven loss with respect to materials, equipment. cools, and construction equipment and machinery, including revonable overhad, profit and damages.

14.1.3 If the Work is stopped for a period of 60 days through no act or fault of the Contractor or a Subcontractor or their agents or employes or my other persons performing portions of the Work under contract with the Conmaor because the Oaner has persistently 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' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Subpangraph 14.1.2.

14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1 The Owner may terminate the Contract if the Contractor:

.1 persistently or repeatedly refuses or fails to supply enough property skilled workers or proper materials;

.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

.3 persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; or

.4 otherwise is guilty of substantial brach of a provision of the Contract Documents.

14.2.2 when any of the above reasons exist, the Owner, upon certification by the Architect that sufficient cause exists to jus-

tify such action, 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' wrinen notice, terminate employment of the Contractor and may, subject to my prior rights of the surety:

.1 take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 accept assignment of subcontracts pursuant to Paragraph 5.4; and

.3 finish the Work by whatever reasonable method the Owner may deem expedient.

14.2.3 When the Owner terminates the Conma for one of the reasons stated in Subparagraph 14.2.1, the Conmaor 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, such excess shall be paid to the Contractor. If such costs 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 Architect, upon application, and this obligation for payment shall survive termination of the Conma.

14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

14.3.1 The Owner m y , without cause, order the Contractor in writing to suspend, dehy or interrupt the Work in whole or in pur for such period of time as the Owner m y determine.

14.32 A n adjustment shall be made for increases in the cost of performance of the Contnct. including profit on the increased cost of performance, caused by suspension, delay or interruption. 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 this Contract.

14.3.3 Adjustments made in the cost of performance may have a mutually agreed fixed or percentage fee.

TI- E *Ah,* ERICAN INSTITUTE OF **ARC** IITECTS

AIA Document *A311*

Performance Bond

KNOW ALL *MEN* **BY** THESE PRESENTS:. that

(Here insert full name and address or legal title of Contractor)

as Principal, hereinafter called Contractor, and,

(Here insert full name and address or legal title of Surety)

as Surety, hereinafter called Surety, are held and firmly **bound** unto

(Here insert full name and address or legal title of Owner)

as **Obligee,** hereinafter called Owner, in the amount **of**

Dollars ($),

for the payment whereof Contractor and **Surety bind** themselves, their heirs, executors, administrators, **successors** and **assigns,** jointly **and** severally, **firmly by** these presents.

WHEREAS,

Contractor has by written agreement **dated** **19** ,entered into *a* contract with **Owner for**

(Here insert full name, address and description of project)

in accordance **with Drawings** and Specifications prepared *by*

(Here insert full name and address or legal title of Architect)

which contract is by reference made a part hereof, and *is* hereinafter referred to as the Contract.

PERFORMANCE BOND

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the Owner.

Whenever Contractor shall be, and declared by Owner to be in default under the Contract, the Owner having performed Owner's obligations thereunder; the Surety may promptly remedy the default, or shall promptly

1) Complete the Contract in accordance with its terms and conditions, or

2) Obtain a bid or bids for completing the Contract in accordance with its terms and conditions. and upon determination by Surety of the lowest responsible bidder, or, if the Owner elects, upon determination by the Owner and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Owner, and make available as Work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price," as used in this paragraph, shall mean the total amount payable by Owner to Contractor under the Contract and any amendments thereto, less the amount properly paid by Owner to Contractor.

Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the Contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators or successors of the Owner.

Signed and sealed this **day of** **19**

(Witness) (Principal) (Seal)

(Title)

(Witness) (Surety) (Seal)

(Title)

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document ***A377***

Labor and Material Payment Bond

THIS **BOND** *IS ISSUED* SIMULTANEOUSLY WITH PERFORMANCE BOND IN FAVOR OF THE OWNER CONDITIONED ON THE FULL AND FAITHFUL PERFORMANCE OF THE CONTRACT

KNOW ALL MEN BY THESE PRESENTS: that

(Here insert full name and address or legal *title of* Contractor)

as Principal. hereinafter called Principal, and,

(Here insert full name and address or legal title of Surety)

as Surety, hereinafrer **called** Surety, are held and firmly bound unto

(Here insert full name and address or legal title of *Owner)*

as Obligee, hereinafter called Owner, for the use and benefit of claimants as hereinbelow **defined,** in the amount of

(Here insert a sum equal to at least one-half of the contract price) Dollars ($),

for the payment whereof Principal and Surety bind themselves, their **heirs,** executors, administrators, successors and assigns, jointly and severally, **firmly** by these presents.

WHEREAS,

Principal **has** by written agreement dated 19 , entered into a contract with **Owner** for

(Here insert full name, address and description of project)

in accordance with Drawings and Specifications prepared by

(Here insert full name and address or legal title of Architect)

which contract is by reference made a part hereof, and is hereinafter referred to **as the** Contract.

LABOR AND MATERIAL PAYMENT BOND

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that. if Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract. labor and material being construed to include that part of water, gas, power, light. heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.

2. The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

3. No suit or action shall *be* commenced hereunder by any claimant:

a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: the Principal, the Owner, or the Surety above named, within ninety (90) days after such claimant did or performed the last of. the work or iabor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail *or* certified mail, postage prepaid, in an envelope addressed to the Principal, Owner or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located. save that such service need not be made by a public officer.

b) After the expiration of one (1) year following the date on which Principal ceased Work on said Contract, it being understood, however, that if any limitation embodied in thrs bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the Project, or any part thereof, is situated, or in the United States District Court for the district in which the Project, or any part thereof, is situated, and not elsewhere.

4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

Signed and sealed this **day of** ***19***

(Witness) (Principal) (Seal)

(Title)

(Witness) (Surety) (Seal)

(Title)

SECTION 00500

SUPPLEMENTARY CONDITIONS
OF THE CONTRACT FOR CONSTRUCTTON

1. GENERAL

1.1 CHANGE ORDERS

A. Delete Subparagraph 7.2.2 and substitute the following:

7.2.2 The General Contractor will be allowed the following Profit and Overhead on Change Orders: OH&P General Contractor = 10% on own work, 5% on Subcontractors and Sub-subcontractors.

1.2 INSURANCE

A. Refer to General Conditions, Article 11, Insurance and Bonds for general provisions concerning insurance.

B. Amend, General Conditions, Article 11, as follows:

1. Add to Sub-sub-paragraph 11.1.1.7 the following: Liability insurance shall include all major divisions of coverage, and be on a comprehensive basis including:

a. Premises operations (including XCU as applicable).
b. Independent contractors' protective.
c. Products and completed operations.
d. Personal injury liability with employment exclusion deleted.
e. Contractual, including specified provisions for Contractor's obligation under Paragraph 4.18.
f. Owned, non-owned, and hired motor vehicles.
g. Broad form property damage, including completed operations.
h. Umbrella excess liability.

2. Sub-paragraph 11.1.2, add Sub-sub-paragraph 11.1.2.1 as follows: "11.1.2.1: Insurance required by Sub-paragraph 11.1.1 shall be written for not less than following, or greater if required by law:

a. Statutory Workman's Compensation and Employer's Liability.
b. Comprehensive General Liability (including Premises-Operations; Independent Contractors' Protective; Products and Completed Operations' Broad Form Property Damage):
i. Bodily Injury:

$1,000,000 each person
$3,000,000 annual aggregate

ii. Property Damage
$1,000,000 each occurrence
$3,000,000 annual aggregate

iii. Products and Completed Operations shall be maintained for two years after final payment.

iv. Property Damage Liability Insurance shall provide X, C, and U coverage (explosion, collapse, underground utilities) as applicable.

c. Contractual Liability:
i. Property Injury:
$1,000,000 each occurrence

ii. Property Damage:
$1,000,000 each Occurrence
$3,000,000 annual aggregate

d. Personal Injury, with Employment Exclusion deleted:
$1,000,000 annual aggregate

e. Comprehensive Automobile Liability:
i. Bodily Injury:
$1,000,000 each occurrence
$3,000,000 annual aggregate

ii. Property Damage:
$1,000,000 each occurrence

f. Umbrella Excess Liability
i. $1,000,000 over primary insurance
$ 3,000 retention for self-insured hazards, each occurrence

END OF SECTION

SECTION 01010

SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Project consists of additions to the existing Shalom Apartments.

1. Project Location: 180 Auburn Street, Portland, Maine
2. Owner: Shalom Apartments, Inc., P.O. Box 560, Portland, Maine 04112

B. Architect Identification: The Contract Documents, dated mm/dd/yy, were prepared for Project by Archetype, P.A., 48 Union Wharf, Portland, Maine. Contact: John Shields, Architect.

C. Project Coordinator: Bill Floyd is the Owner's Project Coordinator.

D. The Work consists of (10) apartments and associated site improvements.

1. The Work includes but is not limited to:

- Reconstruction of existing private drive; removal of existing paving and subgrade, installation of new paving and subgrade.
- Removal of existing paved drive and parking area. Construction of new paved drive and parking area.
- Construction of (10) single bedroom apartments. Buildings are single story, wood framed, slab on grade construction with wood truss roof framing. Windows are vinyl clad wood type, exterior doors are insulated metal, interior doors are moulded type. Interior finishes include carpet, sheet vinyl, painted gysum board walls and ceilings. Exterior finishes include asphalt shingles, cedar siding, cellular PVC trim boards. The work includes exterior finish work to two existing mechanical room buildings and interior and exterior finish work to one existing apartment shell.
- Gas fired baseboard heat and hot water.
- Connection of plumbing to existing domestic water and sewer services.
- Connection of lighting and power to existing service.

- Landscape improvements including plantings, concrete pavers, and construction of a walking path from Washington Street to Auburn Street. Also included is installation of a temporary chain **link** fence along the walking path to prevent passersby, primarily school children, from entering the work area. The Contractor is to adjust location of the fencing as required by the progress of the work and maintain a firm walking surface providing secure footing.

- Temporary Wood Walkway – the Contractor is to include in his bid 200 linear feet of the wood walkway detailed in Drawing 2/S.1. The purpose of this walkway is to provide safe passage for the residents of the existing units through the work area to the driveway. The Contractor is to adjust the location of the walkway required **by** the progress of the work.

1.3 CONTRACT

A. Project will be constructed under **a** general construction contract.

1.4 USE OF PREMISES

A. General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period. Insert additional paragraphs to specify minor restrictions on Contractor's use of premises or to specify minor limitations because of Owner occupancy.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01045

CUTTING AND PATCHING

1. GENERAL

1.1 REFERENCES

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

B. Divisions 2 through 16.

1.2 DESCRIPTION OF WORK

A. Definition: "Cutting and patching" includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required to restore surfaces to their original condition. This section does not apply to new work that has been installed as part of the Work.

B. Structural Work: Do not cut-and-patch structural work in a manner resulting in a reduction of load-carrying capacity or load/deflection ratio.

C. Operational/Safety Limitations: Do not cut-and-patch operational elements and safety components in a manner resulting in decreased performance, shortened useful life, or increased maintenance.

D. Visual/Quality Limitations: Do not cut-and-patch work exposed to view (exterior and interior) in a manner resulting in noticeable reduction of aesthetic qualities and similar qualities, as judged by the Architect/Engineer.

E. Limitation on Approvals: The Architect/Engineer's approval to proceed with cutting and patching does not waive right to later require removal/replacement of work found to be cut-and-patched in an unsatisfactory manner, as judged by the Architect/Engineer.

F. Materials marked to be removed and reused shall be repaired as necessary to maintain their existing condition. When repair is not sufficient, existing materials shall be disposed of and new materials installed to match existing materials.

G. Refer to other sections of these specifications for specific cutting and patching requirements and limitations applicable to individual units of work.

H. Unless otherwise specified, requirements of this Section apply to Mechanical and Electrical work. Refer to Divisions 15 and 16 for additional requirements and limitations on cutting and patching of mechanical and electrical work.

1.3 QUALITY ASSURANCE

A. Refer to Section 01631, Products and Substitutions, for general provisions covering product selection, substitutions, material storage and installation.

B. Refer to Section 01400, Quality Control Services, for provisions for testing and inspections.

C. Refer to specific Specification Section covering subject in question for quality assurance requirements.

1.4 SUBMITTALS

A. Issue submittals in accordance with Section 01300, Submittals.

B. Refer to specific Specification Section covering subject in question for submittal requirements.

2. PRODUCTS

2.1 GENERAL

A. Use materials for cutting and patching that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal-or-better performance characteristics.

B. Fire-stopping:

1. Seal openings in fire-rated walls and floors to make a tight fit with penetrating items, using appropriate non-combustible filler material. to provide a rating equivalent to wall/floor assemble.

2. Acceptable filler materials include:
   a. Concrete
   b. Cementitious proprietary product: Zonolite Firestop ZF-1
   c. Blanket-type mineral-fiber or ceramic-fiber insulation (glass-fiber insulation is not acceptable)
   d. Fire-resistant sealant: Domtar Fire-Halt, Dow Corning Fire Stop, Hilti CS 240 Firestop, or Nelson CLK or CMP

e. Fire-resistant silicone foam: Dow Coming RTV Foam Penetration Seal System, Hilti CB 120 Adhesive Filling and Sealing Foam, Tremco Fyre-Sil

f. Flexible intumescent strip wrapped around pipe penetrations: Dow Corning Fire Stop Intumescent Wrap, Hilti CS 24720 Intumescent Wrap, Nelson RSW. Tremco TREMstop WS

g. Intumescent fibrous material enclosed in a polyethylene envelope: Nelson PLW, Tremco TREMstop PS

h. Pliable intumescent putty: Nelson FSP Flameseal, Tremco TREMstop WBM

i. Water-based intumescent fire-protective coating for electrical cables: Nelson CTG

3. Neatly patch and seal exposed-to-view openings, using sealants, tooled mortar joints, escutcheons, or flanged collars, as appropriate.

3. EXECUTION

3.1 INSPECTION

A. Before cutting, examine surfaces to be cut and patched and conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.

3.2 TEMPORARY SUPPORT

A. To prevent failure provide temporary support of work to be cut.

3.3 PROTECTION

A. Protect other work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.4 PERFORMANCE

A. Employ skilled workmen to perform cutting and patching work. Except as otherwise indicated or as approved by the Architect/Engineer, proceed with cutting and patching at the earliest feasible time and complete work without delay.

B. Cutting:

1. Cut the work using methods that are least likely to damage work to be retained or adjoining work. Provide dust barriers to prevent dust from entering existing building beyond immediate work area. Where possible, review proposed procedures with the original installer; comply with original installer's recommendations.

2. In general, where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut through concrete and masonry using a cutting machine such as a carborundum saw or core drill to insure a neat hole. Cut holes and slots neatly to size required with minimum disturbance of adjacent work. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces. Temporarily cover openings when not in use.

3. Comply with requirements of applicable sections of Division 2 where cutting and patching requires excavating and backfilling.

4. By-pass utility services such as pipe and conduit, before cutting, where such utility services are shown or required to be removed, relocated or abandoned. Cut-off conduit and pipe in walls or partitions to be removed. After by-pass and cutting, cap, valve or plug and seal tight remaining portion of pipe and conduit to prevent entrance of moisture or other foreign matter.

C. Patching:

1. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.

2. Where feasible, inspect and test patched areas to demonstrate integrity of work.

3. Restore exposed finishes of patched areas and where necessary extend finish restoration into retained adjoining work in a manner which will eliminate evidence of patching and refinishing.

4. Where removal of walls or partitions extends one finished area into another finished area, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. If necessary to achieve uniform color and appearance, remove existing floor and wall coverings and replace with new materials.

5. Where patch occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing patch, after patched area has received prime and base coat.

6. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

3.5 MAINTENANCE OF TRAFFIC, ACCESS, AND UTILITIES

A. Throughout progress of work, do not interfere with use of or means of access and egress for tenants. Do not interfere with adjoining tenants in same building. Do not close or otherwise obstruct sidewalks. streets or means of egress without obtaining permission to do so.

B. Maintain accessibility from street at all times to any fire hydrants within construction area. Ensure that utilities serving adjacent buildings remain in service.

END OF SECTION

SECTION 01300

SUBMITTALS, MEETINGS AND RECORD DOCUMENTS

GENERAL

PRE-CONSTRUCTION MEETING

A. Architect will schedule a pre-construction meeting within 15 days of issuance of Notice to Proceed, to be attended by the owner, Maine State Housing Authority, Construction Lenders Representative, all project managers, Contractor's field superintendent, and representatives of major sub-contractors. At this time, Contractor shall make specified pre-construction submittals including following:

1. Typed list of sub-contractors with addresses and telephone numbers.
2. Certificates of insurance.
3. Approved construction schedule. See General Conditions, Paragraph 3.10.
4. Schedule of values.
5. Building permit and similar start-up authorization or certificates.

B. Pre-construction meeting agenda will include following:

1. Processing application for payment.
2. Processing and distribution of submittals.
3. Maintenance of record documents.
4. Procedure for field changes, change estimates, change orders, etc.
5. Site and building security.
6. Location and maintenance of temporary storage areas, field offices, vehicular parking and access, waste disposal, etc.
7. Safety and first-aid procedures.
8. Date and time for regular monthly coordination and progress meeting (to be coordinated with monthly application for payment).

1.2 CONSTRUCTION SCHEDULE

A. Refer to General Conditions, Paragraph 3.10, for general provisions concerning construction progress schedule. Schedule shall show activities, itemized according to specification Section, and be organized in bar-chart or graph form so as to show both projected and actual progress of work.

B. Arrange schedule to indicate required sequencing of units, and to show time allowances for submittals, inspections, and similar time margins.

C. Show critical submittal dates related to each time bar, or prepare a separate coordinated listing of critical submittal dates.

D. Show phases of work within each time bar for major elements which involve purchase lead-time, fabrication, seasonal treatment, mockups, testing, or similar phases as well as installation.

E. Submit updated schedule monthly, together with application for payment.

1.3 SCHEDULE OF VALUES

A. Refer to General Conditions, Paragraph 9.2 for general provisions concerning schedule of values.

B. For these submittals, use AIA Document G702/703, Application and Certificate for Payment.

C. Use specifications Sections as listed in Table of Contents as basis for format for listing costs.

D. Itemize separately general cost items, such as bonds and allowances.

E. Itemize change orders separately as they are approved.

1.4 MEETINGS AND REPORTING

A. Contractor shall conduct general progress and coordination meetings at least once each month, attended by a representative of each primary entity engaged for performance of work. Record discussions and decisions, and distribute copies to those attending and others affected, including Architect/Engineer.

B. Date and time of at least one regular monthly progress and coordination meeting shall be determined at the pre-construction meeting. Timing of this monthly meeting shall be coordinated with payment requests.

1.5 APPLICATION FOR PAYMENT

A. Refer to General Conditions, Paragraph 9.3, for general provisions concerning applications for payment.

B. Use AIA Form G702/703, fully completed and executed.

C. Submit a minimum of five copies of all except two copies of waiver and required documentation.

1.6 SHOP DRAWINGS, PROJECT DATA, SAMPLES

A. Refer to General Conditions, Product Data and Samples, paragraph 3.12, for general provisions covering this type of submittal.

B. Coordinate the preparation and processing of work-related submittals with the performance of the work. Coordinate each separate submittal with other submittals and related activities that require sequential activity. Coordinate the submittal of different units of interrelated work so that one submittal will not be delayed by the necessity of reviewing a related submittal.

C. Architect/Engineer Review:

1. Allow ten working days for the Architect/Engineer's initial processing of each submittal. Allow one week for reprocessing each submittal. No extension of time will be authorized because of failure to transmit submittals to the Architect/Engineer sufficiently in advance of the work.

2. The Architect/Engineer will stamp each submittal to be returned with a uniform, self-explanatory action stamp, appropriately marked and executed to indicate the status of the submittal.

D. Mark each submittal with a permanent label for identification. Provide project name, date, name of Architect/Engineer, name of Contractor, number and title of appropriate specification section and similar definitive information. Provide a space on the label for Contractors and Architect/Engineer's review markings.

E. Package each submittal appropriately for transmittal and handling. Send each submittal from the Contractor to the Architect/Engineer and other destinations using **AIA** Transmittal Form G810.

F. Provide additional copies of submittals required by governing authorities that are in addition to copies specified for submittal to the Architect/Engineer.

G. Where it is necessary to provide intermediate submittals between the initial and final submittals, provide and process intermediate submittals in the same manner as for initial submittals.

H. Submit as follows:

1. Shop drawings (original drawings prepared by Contractor or sub-contractor illustrating fabrication, layout, erection details, etc.): six prints, or one reproducible transparency and one opaque print, to Architect.

2. Manufacturers' specifications, installation instructions, charts, schedules, catalogs, brochures, etc.: number of copies required by Contractor for distribution, plus one copy for Architect's retention.

3. Samples: one sample to Architect only, unless otherwise specified.

4. In submitting shop drawings and product data to Architect, use separate transmittals for material in different specification Sections, with applicable specification Section clearly numbered.

I. Architect will review submittals within ten working days, measured from date of receipt by Architect until date of mailing. Contractor shall promptly make corrections and resubmit when so directed. Where submittal is marked "Approved as Noted" or similar, assume that all items are approved other than those to which specific exception is taken. Do not delay fabrication, assembly and delivery pending receipt of entirely "Approved" submittal.

J. Distribute approved submittals to job site and record document files, and to suppliers and sub-contractors as required. Samples not designated by Contractor for incorporation into Work shall be kept on file until job completion. Any sample not reclaimed within **30** days after job completion will be considered unclaimed, and will be disposed of as directed by Architect.

1.7 PROJECT RECORD DOCUMENTS

A. Keep on file at job site one complete set of up-to-date Contract Documents, including drawings and specifications, addenda, shop drawings and product data, testing data, change orders, field orders, and other modifications. Documents shall be neatly and securely stored in files or on racks, clearly indexed by trade activity or specification Section, and shall not be used for construction purposes.

B. Legibly mark significant field changes such as following, using colored pencils or felt-tipped pens:

1. Drawings: locations of concealed utilities, field changes of dimension and detail, changes resulting from change order or field order, and details not on original drawings.

2. Specifications: manufacturer and model number of equipment actually installed.

3. Shop drawings and manufacturers' literature: changes made after Architect's review

C. At completion of Work, deliver completed record documents to Architect. Final payment for Project will not be made until Architect reviews and approves these documents.

1.8 SUBSTANTIAL COMPLETION

A. Refer to General Conditions, Article 9, Substantial Completion, for general provision concerning substantial Completion.

B. Following issuance by Architect/Engineer of Certificate of Substantial Completion, Contractor may submit special payment request, provided the following have been completed:

1. Obtain permits, certificates of inspection and other approval and releases by governing authorities, required for Owner's occupancy and use of project.
2. Submit warranties and similar documentation.
3. Submit maintenance manuals and provide instruction of Owner's operational/maintenance personnel.
4. Complete final cleaning of the work.
5. Submit record documents.
6. Submit listing of work to be completed before final acceptance.

C. Following completion of the following requirements, final payment request may be submitted:

1. Complete work listed as incomplete at time of substantial completion, or otherwise assure Owner of subsequent completion of individual incomplete items.
2. Settle liens and other claims, or assure Owner of subsequent settlement.
3. Submit proof of payment on fees, taxes and similar obligations.
4. Transfer operational, access, security and similar provisions to Owner; and remove temporary facilities, tools and similar items.
5. Completion of requirements specified in "Project Closeout" section.
6. Obtain consent of surety for final payment.

END OF SECTION

SECTION 01400

QUALITY CONTROL SERVICES

1. GENERAL

1.1 DESCRIPTION

A. Quality control services include inspections and tests performed by independent agencies and governing authorities, as well as by the Contractor.

B. Inspection and testing services are intended to determine compliance of the work with requirements specified.

C. Specific quality control requirements are specified in individual specification sections.

1.2 RESPONSIBILITIES

A. Except where indicated as being the Owner's responsibility, quality control services are the Contractor's responsibility, including those specified to be performed by an independent agency and not by the Contractor.

B. The Contractor shall employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified.

C. The Owner will engage and pay for services of an independent agency to perform the inspections and tests that are specified as Owner's responsibilities.

D. Where results of inspections or tests do not indicate compliance with contract document, retests are the Contractor's responsibility.

E. The Contractor shall cooperate with independent agencies performing inspections or tests. Provide auxiliary services as are reasonable. Auxiliary services include:

1. Provide access to the work.
2. Assist taking samples.
3. Deliver samples to test laboratory.

1.3 COORDINATION

A. The Contractor and independent test agencies shall coordinate the sequence of their activities. Avoid removing and replacing work to accommodate inspections and tests. The Contractor is responsible for scheduling times for inspections and tests.

1.4 QUALIFICATIONS FOR SERVICE AGENCIES

A. Engage inspection and test service agencies which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories.

B. Each agency shall be employed with the approval of the Architect/Engineer.

1.5 SUBMITTALS

A. Notify the Architect/Engineer of the testing schedule.

B. Submit a certified written report of each inspection test or similar service, in duplicate to the Architect/Engineer. Submit additional copies of each report to governing authority, when the authority so directs.

1.6 REPORT DATA

A. Written inspection or test reports shall include:

1. Name of testing agency or test laboratory.
2. Dates and locations of samples, tests or inspections.
3. Names of individuals present.
4. Complete inspection or test data.
5. Test results.
6. Interpretations.
7. Recommendations.

B. Reports shall be provided to the Architect/Engineer in a timely manner.

1.7 REPAIR AND PROTECTION

A. Upon completion of inspection or testing repair damaged work and restore substrates and finishes. Comply with requirements for "Cutting and Patching".

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES

1. GENERAL

1.1 DESCRIPTION OF REQUIREMENTS: Provide temporary services and facilities ready for use when first needed to avoid delay in the work. Maintain, expand and modify as needed. Do not remove until no longer needed, or replaced by authorized use of permanent facilities.

1.2 USE CHARGES: Usage charges for temporary services or facilities are not chargeable to the Owner or Architect/Engineer.

1.3 REGULATIONS: Comply with requirements of local laws and regulations governing construction and local industry standards, in the installation and maintenance of temporary services and facilities.

1.4 STANDARDS: Comply with the requirements of NFPA Code 241, "Building Construction and Demolition Operations", the ANSI-A 10 Series standards for "Safety Requirements for Construction and Demolition", and the NECA National Joint Guideline NJG-6 "Temporary Job Utilities and Services".

1.5 INSPECTIONS: Inspect and test each service before placing temporary utilities in use. Arrange for inspections and tests by governing authorities, and obtain certifications and permits for use.

1.6 SUBMITTALS: Submit copies of reports and permits required or necessary for installation and operation, including reports of tests, inspections and meter readings performed on temporary utilities, and permits and easements necessary for installation, use and operation.

1.7 MATERIALS AND EQUIPMENT

A. Provide materials and equipment that are suitable for the intended use.

B. Provide new materials and equipment for temporary services and facilities; if acceptable to the Architect/Engineer, used materials and equipment that are undamaged may be used.

1.8 INSTALLATION

A. Use qualified tradesmen for installation.

B. Locate temporary services and facilities where they will serve the project adequately and result in minimum interference with the work.

1.9 TEMPORARY UTILITY INSTALLATION

A. Engage, or make arrangements if necessary with, the local utility company to make connections to existing service.

B. Arrange with the companies and existing users for an acceptable time when service can be interrupted to make connections.

C. Establish a service implementation and termination schedule. As early as possible change to use of permanent service, to enable removal of the temporary utility and eliminate possible interference with completion of the work.

D. Provide adequate capacity at each stage of construction. Prior to availability at the site, provide, trucked-in services for start up of construction operations.

E. Obtain and pay for easements required to bring temporary utilities to the site, where the Owner's easement cannot be utilized for that purpose.

1.10 ELECTRIC POWER SERVICE

A. Provide weathertight, grounded temporary electrical service-entrance and distribution system, with ground-fault circuit interrupters and ground-fault interrupter features of proper types, sizes, electrical ratings and characteristics to fulfill project requirements.

B. Comply with applicable requirements of NEMA, NECA and UL standards and governing regulations.

C. Install temporary lighting of adequate illumination levels to perform the work specified.

D. Comply with NEC pertaining to installation of temporary wiring service and grounding. Provide meters, transformers, and overcurrent protective devices at main distribution panel for power and light circuitry. Provide disconnects for equipment circuits.

1.11 POWER DISTRIBUTION SYSTEM

A. Provide circuits of proper sizes, characteristics, and ratings for each use indicated.

B. Install wiring overhead, and risers vertically where least exposed to damage.

C. Provide rigid steel conduit to protect wiring on grade, floors, decks or other areas exposed to possible damage.

D. Provide 20 amp, 4-gang receptacle outlets, equipped with ground-fault circuit interrupters, reset button and pilot light, spaced that a 100 foot extension cord can reach

each area of work. Use only grounded extension cords; use "hard- service" cords where exposed to abrasion and traffic.

E. Provide warning signs at power outlets that are other than 110/120 volt. Provide outlets of proper NEMA configuration to prevent insertion of 110/120 volt plugs into higher voltage outlets.

1.12 TEMPORARY LIGHTING

A. Provide general service incandescent lamps of wattage required for adequate illumination.

B. Protect lamps with guard cages or tempered glass enclosures, where exposed to breakage.

C. Provide exterior type fixtures where exposed to weather or moisture.

D. Provide one 200-watt incandescent lamp per 1000 square feet of floor area for general construction lighting, one 100-watt incandescent lamp every 50 feet in corridors, and one lamp per story, located to illuminate each landing and flight in stairways.

E. Install temporary lighting to fulfill security and protection requirements, without having to operate the entire temporary lighting system.

1.13TEMPORARY TELEPHONES

A. Provide project manager's and supervisor's cell phone number to architect.

1.14 TEMPORARY **HEAT**

A. Provide temporary heat where needed for performance of work, for curing or drying of recently installed work or for protection of work in place from adverse effects of low temperatures or high humidity.

B. Provide UL or FM tested and labeled heating units known to be safe and without adverse effect upon work in place or being installed. Coordinate with ventilation requirements to produce the ambient condition.

C. Maintain a minimum temperature of 45 deg. F (7 deg. C) in permanently enclosed portions of the building and areas where finished work has been installed.

D. Except where use of the permanent heating system is available and authorized, provide properly vented self-contained LP gas or fuel oil heaters with individual space thermostatic control for temporary heat. Do not use open burning or salamander type heating units.

1.15 FIELD OFFICES

A. Provide (1) lockable field office.

B. Provide (1) lockable, weathertight storage trailer.

1.16 SANITARY FACILITIES

A. Sanitary facilities include temporary toilets.

B. Comply with governing regulations including safety and health codes for the type, number, location, operation and maintenance of fixtures and facilities.

C. Supply toilet tissue, paper towels, paper cups and similar disposable materials as appropriate for each facility. Provide covered waste containers for used material

D. Install single occupant self-contained toilet units of the chemical, aerated recirculation or combustion type, properly vented and fully enclosed with glass fiber reinforced polyester shell. Use of pit-type privies will not be permitted.

E. Provide separate toilet facilities for male and female construction personnel.

F Provide drinking water fountains where and when piped potable water, approved by local authorities, is reasonably accessible from permanent or temporary lines. Otherwise, provide containerized tap-dispenser bottled-water type drinking water units.

1.17 FIRST AID SUPPLIES: Comply with governing regulations and recognized recommendations within the construction industry.

1.18 DEWATERING FACILITIES AND DRAINS

A. For temporary drainage and dewatering facilities and operations not directly associated with performance of work included under other sections, comply with dewatering requirements of applicable Division-2 sections. Where feasible, utilize the same facilities.

B. Maintain the site, excavations and construction free of water.

C. Dispose of rainwater in a lawful manner which will not result in flooding and project or adjoining property, nor endanger either permanent work or temporary facilities.

1.19 TEMPORARY ENCLOSURE

A. Provide temporary enclosure of materials, equipment, work in progress and completed portions of the Work to provide protection from exposure, foul weather, other construction operations, and similar activities.

B. Provide enclosures where temporary heat is needed and the permanent building enclosure is not completed, and there is no other provision for containment of heat. Coordinate with ventilating and material drying or curing requirements to avoid dangerous conditions.

C. Provide temporary enclosures by installing waterproof, fire- resistant, UL labeled tarpaulins with a flame-spread rating of 15 or less, using a minimum of wood framing. Use translucent nylon reinforced laminated polyethylene tarpaulins to admit the maximum amount of daylight. Individual openings of 25 square feet or less may be closed with plywood or similar materials.

D. Close openings through the floor or roof decks and other horizontal surfaces with substantial load-bearing wood-framed or similar construction.

1.20 COLLECTION AND DISPOSAL OF WASTES

A. Establish a system for daily collection and disposal of waste materials. Do not hold collected materials longer than 7 days.

B. Handle waste materials that are hazardous, dangerous, or unsanitary separately from other waste by containerizing.

C. Burying or burning of waste materials on the site or washing waste material down sewers will not be permitted.

1.21 MISCELLANEOUS SERVICES AND FACILITIES

A. Design, construct, and maintain miscellaneous services and facilities as needed to accommodate performance of the work, including temporary stairs, ramps, ladders, staging, shoring, scaffolding, temporary partitions, waste chutes and similar items.

1.22 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Provide a neat and uniform appearance in security and protection facilities acceptable to the Architect/Engineer and the Owner.

B. Maintain site in a safe, lawful and publicly acceptable manner.

C. Take necessary measures to prevent erosion.

D. Except for utilization of permanent fire protection facilities, as soon as available, do not change over to use of permanent facilities until substantial completion.

1.23 TEMPORARY FIRE PROTECTION

A. Until fire protection needs may be fulfilled by permanent facilities, install and maintain temporary fire protection of the types needed to protect against losses.

B. Comply with recommendations of NFPA Standard 10.

C. Locate fire extinguishers where most effective; provide not less than one on each floor at or near each stairwell.

D. Provide type "A" fire extinguishers for temporary offices and spaces where there is minimal danger of electrical or flammable liquid fires, and type "ABC" dry chemical extinguishers elsewhere.

E. Store combustible materials in containers in fire-safe locations.

F. Review fire prevention and protection needs with local fire department officials and establish procedures to be followed in the event of fire. Instruct personnel in procedures and post warnings and information.

G. Maintain unobstructed access to fire extinguishers, temporary fire protection facilities, stairways and other access routes.

H. Prohibit smoking in hazardous areas.

I. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of ignition.

J. At temporary water outlets provide hoses of sufficient length to reach construction areas. Hang hoses with a warning sign, indicating that hoses are for fire protection purposes and are not to be removed.

K. At the earliest feasible date complete installation of the permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel at the site on how to use facilities which may not be self-explanatory.

1.24 BARRICADES, WARNING SIGNS AND LIGHTS

A. Comply with recognized standards and code requirements for erection of substantial. barricades where needed to prevent accidents.

B. Paint with appropriate colors and warning signs to inform personnel at the site and the public, of the hazard being protected against.

C. Provide lighting where needed, including flashing red lights where appropriate.

1.25 SECURITY ENCLOSURE AND LOCKUP: Where materials and equipment must be temporarily stored, and are of substantial value or attractive for possible theft, provide a secure lockup.

1.26 ENVIRONMENTAL PROTECTION

A. Conduct construction activities, and by methods that comply with environmental regulations, minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result from the performance of work at the site.

B. Avoid the use of tools and equipment which produce harmful noise.

C. Restrict the use of noise making tools and equipment to hours of use that will minimize complaints.

1.27 OPERATION, TERMINATION AND REMOVAL

A. Limit availability of temporary services and facilities to essential and intended uses to minimize waste and abuse. Do not permit temporary installations to be abused or endangered.

B. Operate and maintain temporary services and facilities in good operating condition and in a safe and efficient manner until removal is authorized. Do not overload services or facilities. Protect from damage by freezing temperatures and similar elements.

C. Do not allow unsanitary conditions, public nuisances or hazardous conditions to develop or persist on the site.

D. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24- hour basis where required to achieve indicated results and avoid the possibility of damage to the Work or to temporary facilities.

E. Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation.

F. Remove each temporary service and facility promptly when need has ended, or when replaced by use of a permanent facility, but no later than substantial completion. Complete, or, if necessary, restore permanent work delayed because of interference with

the temporary service or facility. Repair damaged work, clean exposed surfaces and replace work which cannot be repaired.

G. At substantial completion, clean and renovate permanent services and facilities that have been used to provide temporary services and facilities during the construction period.

1.28 PROJECT IDENTIFICATION AND TEMPORARY SIGNS

A. Prepare a 4'x8' project identification sign as per Architect's requirements. Use 3/4" exterior plywood, and exterior grade acrylic latex-base enamel. Install at location indicated by Architect.

B. Support on suitable posts or framing of treated wood or steel. Maintain in a manner which will properly inform the public and persons seeking entrance to the project.

C. Do not permit installation of unauthorized signs that are visible outside the site.

END OF SECTION

SECTION 01631

PRODUCTS AND SUBSTITUTIONS

1. GENERAL

1.1 PROCEDURAL REQUIREMENTS

A. Source Limitations:

1. To the fullest extent possible, provide products of the same generic kind, from a single source, for each unit of work. Where it is not possible to do so, match separate procurements as closely as possible.

2. To the extent that the product selection process is under the Contractor's control, provide products that are compatible with previously selected products.

3. Where standard products are available that comply with specified requirements, provide those standard products that have been used successfully before in similar applications, and that are recommended by the manufacturers for the applications indicated.

1.2 PRODUCT SELECTION LIMITATIONS

A. Product Selections: Comply with the following requirements in the selection of products, materials and equipment:

1. Single Product Name: Where only a single product or manufacturer is named, provide the product, unless it is not available, is incompatible with existing work. or does not comply with specified requirements or governing regulations.

2. Two or More Products Named: Where two or more products or manufacturers are named, the selection is at the Contractor's option, provided the product selected complies with specified requirements.

3. "Or Approved Equal" Provisions": Where products or manufacturers are specified by name accompanied by the term "or approved equal", provide either the product named, or comply with the requirements for gaining approval of "substitutions" for the use of an unnamed product.

4. Compliance with Standards: Where the specifications require only compliance with an imposed standard, code or regulation, the Contractor has the option of selecting any product that complies with specified requirements provided no product names are indicated.

5. Performance Requirements: Where the specifications require compliance with indicated performance requirements, the Contractor has the option of selecting any product that complies with the specific performance requirements, provided no product names are indicated.

6. Visual Requirements: Where the specifications indicate that a product is to be selected from the manufacturer's standard options, without naming the manufacturer, the Architect/Engineer has the option of making the selection, after the Contractor has determined or selected the manufacturer.

B. Nameplates: Except as otherwise indicated for required labels and operating data, do not permanently attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view either in occupied spaces or on the exterior of the completed project.

1.3 SUBSTITUTIONS

A. Conditions: The Contractor's requests for substitutions will be considered when they are reasonable, timely, fully documented, and when they qualify under one or more of the following circumstances.

1. The proposed substitution is related to an "or approved equal" or similar provision in the contract documents.

2. The required product cannot be supplied in time for compliance with Contract Time requirements.

3. The required product is not acceptable to governing authorities.

4. The required product cannot be properly coordinated with other materials in the work, or cannot be warranted or insured as specified.

5. The proposed substitution will offer a substantial advantage to the Owner after deducting offsetting disadvantages including delays, additional compensation to the Architect/Engineer for redesign, evaluation and other necessary services, and similar considerations.

B. Submittals: Include the following information, as appropriate, in each request for substitution:

1. Provide complete product documentation, including product data and samples, where appropriate.

2. Provide detailed performance comparisons and evaluation, including testing laboratory reports where applicable.

3. Provide coordination information indicating the effect of the substitution on other work and the time schedule.

4. Provide cost information for the proposed change order.

5. Provide the Contractor's general certification of the recommended substitution.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Receive, store and handle products, materials and equipment in a manner which will prevent loss, deterioration and damage.

B. Schedule deliveries so as to minimize long-term storage at the project site.

END OF SECTION

SECTION 01700

PROJECT CLOSEOUT

1. GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. Provisions of this section apply to the procedural requirements for the actual closeout of the **Work,** not to administrative matters such as final payment or the change over of insurance.

B. Closeout requirements relate to both substantial and final completion of the Work; they also apply to individual portions of completed work as well as the total Work.

C. Specific requirements contained in other sections have precedence over the general requirements contained in this section.

1.2 PROCEDURES AT SUBSTANTIAL COMPLETION

A. Prerequisites: Comply with General Conditions and complete the following before requesting Architect's/Engineer's inspection of the Work, or a designated portion of the Work, for certification of substantial completion.

1. Submit executed warranties, workmanship bonds, maintenance agreements, inspection certificates and similar required documentation for specific units of work, enabling owner's unrestricted occupancy and use.

2. Submit record documentation, maintenance manuals, tools, spare parts, keys and similar operational items.

3. Complete instruction of Owner's operating personnel, and start-up of systems.

4. Complete final cleaning, and remove temporary facilities and tools.

B. Inspection Procedures:

1. Upon receipt of Contractor's request, Architect/Engineer will either proceed with inspection or advise Contractor of prerequisites not fulfilled.

2. Following initial inspection, Architect/Engineer will either prepare certificate of substantial completion, or advise Contractor of work which must be performed prior to issuance of the certificate of substantial completion.

3. The Architect/Engineer will repeat the inspection when requested and assure that the Work has been substantially completed.

4. Results of the completed inspection will form the initial "punch-list" for final acceptance.

1.3 PROCEDURES AT FINAL ACCEPTANCE

A. Reinspection Procedure:

1. The Architect/Engineer will reinspect the Work upon receipt of the Contractor's notice that, except for those items whose completion has been delayed due to circumstances that are acceptable to the Architect/Engineer, the Work has been completed, including punch-list items from earlier inspections.

2. Upon completion of reinspection, the Architect/Engineer will either recommend final acceptance and final payment, or will advise the Contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary, this procedure will be repeated.

1.4 RECORD DOCUMENTATION

A. Record Drawings:

1. Maintain a complete set of either blue- or black-line prints of the contract drawings and shop drawing for record mark-up purposes throughout the Contract Time.

2. Mark-up these drawings during the course of the work to show both changes and the actual installation, in sufficient detail to form a complete record for the Owner's purposes. Give particular attention to work which will be concealed and difficult to measure and record at a later date, and work which may require servicing or replacement during the life of the project.

3. Require the entities marking prints to sign and date each mark-up.

4. Bind prints into manageable sets, with durable paper covers, appropriately labeled.

B. Maintenance Manuals:

1. Provide 3-ring vinyl-covered binders containing required maintenance manuals, properly identified and indexed.

2. Include operating and maintenance instructions extended to cover emergencies, spare parts, warranties, inspection procedures, diagrams, safety, security, and similar appropriate data for each system or equipment item.

1.5 GENERAL CLOSEOUT REQUIREMENTS

A. Operator Instructions: Require each Installer of systems requiring continued operation and maintenance by owner's operating personnel, to provide on-location instruction to Owner's personnel, sufficient *to* ensure safe, secure, efficient, non-failing utilization and operation of systems. Provide instructions for the following categories of work:

1. Mechanical/electrical/electronic systems (not limited to work of Divisions 15 and 16).
2. Live plant materials and lawns.
3. Roofing, flashing, joint sealers.
4. Floor finishes.

B. Final Cleaning: At the time of project close out, clean or reclean the Work to the condition expected from a normal, commercial building cleaning and maintenance program. Complete the following cleaning operations before requesting the Architect/Engineer's inspection for certification of substantial completions.

1. Remove non-permanent protection and labels.
2. Polish glass.
3. Clean exposed finishes.
4. Touch-up minor finish damage.
5. Clean or replace mechanical systems filters.
6. Remove debris.
7. Broom-clean unoccupied spaces.
8. Sanitize plumbing and food service facilities.
9. Clean light fixtures and replace burned-out lamps.
10. Sweep and wash paved areas.
11. Police yards and grounds

END OF SECTION

SECTION 02230

SITE CLEARING AND GRUBBING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of surface debris

B. Clear site of plant life and grass.

C. Removal of trees, shrubs, and other plants.

D. Remove root system of trees, brush and shrubs.

E. Removal of paving, curbs, and existing gravel.

F. Removal of culverts, catch basins, manholes and other drainage features.

G. Removal of fences, posts, bollards, poles, signs, gates and other minor structures.

H. Removal and stockpiling of topsoil

1.02 RELATED SECTIONS

A. Section 02250 - Dewatering

B. Section 02315 - Common Excavation, Embankment and Compaction

C. Section 02320 - Slope Protection and Erosion Control.

1.03 DEFINITIONS

A. Loam
   1. Friable clay loam surface soil found in depth of not less than 4 inches.
   2. Satisfactory topsoil is free of subsoil, clay lumps, stones, and other objects over 2 inch in diameter, and without weeds, roots and other objectionable material.

1.04 REGULATORY REQUIREMENTS

A. Obtain required permits from authorities.

B. Notify affected utility companies before starting work and comply with their requirements.

C. Do not close or obstruct roadways without permits

D. Conform to applicable code for disposal of debris.

E. Conform to applicable regulatory procedures when hazardous or contaminated materials are discovered.

1.05 PROJECT CONDITIONS

A. Conform to applicable regulations relating to environmental requirements, disposal of debris, and use of herbicides.

B. Coordinate clearing work with utility companies.

C. Protect existing utilities from damage

D. Protect trees, plants, and other features designated to remain as final landscaping.

E. Provide protection necessary to prevent damage to existing improvements, trees, or vegetation indicated.

F. Provide traffic control as required, in accordance with the U.S. Department of Transporation "Manual of Uniform Traffic Control Devices" and Maine Department of Transportation (MDOT) requirements.

G. Conduct site clearing operations to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction as well as the representative(s) of Shalom House. Streets and roadways shall be thoroughly cleaned and/or swept on a daily basis or more frequently as required by the governing authority

H. Promptly repair damage to adjacent facilities caused by the clearing and grubbing operations, at no cost to the Owner.

I. Protect bench marks, survey control points, and existing structures from damage or displacement.

PART 2 PRODUCTS

2.01 MATERIALS

A. Herbicide: Use an approved chemical registered in the State of Maine for stump or basal bark treatment.

B. Snow Fence: Beacon Plus Orange Construction Fence by Geotenax Corporation, 4800 Monument Street, Baltimore, Maryland, 21205 or approved equal. Snow or Construction Fence shall be supported with 1" steel posts spaced at a maximum of 8'-0" on center.

PART 3 EXECUTION

3.01 PREPARATION

A. Locate and identify utilities to remain.

B. Verify that existing plants designated to be relocated are tagged or identified.

C Identify a waste area for placing removed material.

D. Install Silt Fence and other Erosion and Sedimentation Control Plan (Sheet SD-2) recommendations.

3.02 PROTECTION

A. Protect utilities to remain from damage

B. Protect existing trees and other vegetation indicated or directed by the Owner to remain in place, against unncessary cutting, breaking, or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within the drip line, excess foot or vehicular traffic, or parking of vehicles within dripline.

C. Pollution Controls: Use water sprinkling to limit to the lowest practical level the amount of dust and dirt rising and scattering in the air. Do not use water when it may create hazardous conditions, ice, flooding or pollution

D. Clean adjacent structures and improvements of dust, dirt and debris caused by clearing and grubbing or earthwork operations. Return adjacent areas *to* condition existing prior to the start of the work.

E. Install chain link fence as necessary to segregate work areas from the Sholom House population.

3.03 CLEARING

A. Clear areas required for access to site and execution of Work.

B. Remove trees, shrubs, and stumps within marked areas and as directed by Owner.

C. Remove roots to a depth of 18 inches.

D. Clear undergrowth and deadwood, including blown down or uprooted trees, without disturbing subsoil.

E. Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction.

F. Stumps not required to be removed: Cut flush with ground elevation.

G. Retain root systems intact in areas where erosion is likely.

H. Tree wound paint:
1. Apply to all cut surfaces of trees to remain and to all surgically repaired areas damaged by construction.
2. Apply material recommended by the tree wound paint manufacturer for trees which are not readily affected by the standard applications.

3.04 REMOVAL

A. Remove paving, curbs, poles, posts, signs, fences, gates, culvert and minor structures to facilitate construction. Where required by these Drawings, or directed by Owner, preserve

those curbs, poles, posts, signs, fences, gates, culverts, minor structures, and other features called for to be reset. Reset removed objects immediately upon completion of backfilling, unless otherwise directed by Owner.

B. Remove portions of existing pavement; as indicated. Neatly saw cut edges at right angle *to* surface with a paving saw or compressed air cutter satisfactory to Owner.

C. Excavate and remove underground storage tanks, retaining straps, associated plumbing piping, and foundation pad.

D. Remove debris from site.

3.05 GRUBBING

A. Limits of grubbing: Coincide with limits of clearing

B. Use only hand methods for grubbing inside drip line of trees indicated to be left standing.

C. Remove all stumps, roots over 2 inches in diameter, and matted roots within limit of grubbing *to* depths of organics or maximum depths shown below:
1. Walks - 18 inches.
2. Roads - 24 inches.
3. Parking Areas - 24 inches.
4. Lawn Areas - 12 inches.

3.06 TOPSOIL REMOVAL

A. Remove vegetation from areas before stripping.

B. Strip topsoil to whatever depths encountered, avoidings its intermingling with the underlying subsoil or other objectionable material.

C. Prevent topsoil from mixing with underlying subsoil or other objectionable material.

D. Stockpiling:
1. Stockpile in areas on site as directed by Owner.
2. Locate out of natural drainageways.
3. Construct to freely drain surface water to a height not to exceed 8 feet with side slopes of 1.5:1 to 2:1.
4. Erect silt fence surrounding stockpile immediately following formation.
5. Cover if required to prevent wind-blown dust.
6. Apply temporary seeding if piles remain for a period of greater than ten days.

3.07 DISPOSAL

A. Burning of Materials: Burning will not be permitted.

B. Removal: Remove material, debris, rock and extracted plant life from site daily as it accumulates and legally dispose of.

C. Dumping: Dispose of material in an approved off site legally operated disposal area.

D. Chipping: Reduce to dimensions of less than 2 inches by use of an approved chipping machine and save for *use* on trail *system* or dispose of at an approved off site, legally operated disposal area or

E. Trucks removing demolition debris from the site shall be covered or shall be of a closed body design to prevent the accidental throwing upon any way of tacks, nails, wire, scrap metal, glass, crockery, or other substances injurious to the feet of persons or animals or to tires or wheels of vehicles.

3.08 RESTORATION

A. Restore any improvements damaged by or removed by this work *to* original condition, as acceptable to Owners or other parties or authorities having jurisdiction including but not limited to fences, curbs, signs, trees, shrubs, vegetation, poles, and posts.

B. Repair or replace trees and vegetation damaged by construction operations, in a manner acceptable to Owner.

C. Retain qualified tree surgeon to repair specimen tree damage.

D. Replace trees damaged beyond repair.

END OF SECTION

SECTION 02250

DEWATERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish, operate and maintain dewatering equipment for control, collection, and disposal of ground and surface water entering trenches and excavations.

1.02 RELATED SECTIONS

A. Section 02315- Common Excavation, Embankment and Compaction.

B. Section 02317- Trenching.

C. Section 02320 - Slope Protection and Erosion Control

1.03 DESIGN REQUIREMENTS

A. Design dewatering facilities including drains, piping and pumping.

1.04 SUBMITTALS

A. Prior to start of excavation and trenching, submit dewatering design and methods to Owner for review.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Provide pumps, drains, piping and other facilities necessary to keep excavations and trenches free of water including spare units available for immediate use in the event of equipment failure

PART 3 EXECUTION

3.01 PROTECTION

A. Protect watercourses, sewer systems and adjacent properties from siltation by use of sediment ponds or other measures acceptable to Owner.

B. Keep excavations clear of groundwater, surface water, seepage, sewage and stormwater.

3.02 INSTALLATION

A. Install, construct and maintain equipment and facilities required for work of this section

B. Dispose of water removed from Work in a suitable manner which will not interfere with other work, cause erosion, damage pavements, other surfaces or property and is acceptable to Owner:

C. Remove dewatering equipment and facilities when no longer required

D. Backfill excavations in accordance with 02315

E. Repair damage resulting from dewatering operations.

END OF SECTION

D. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 1990 (Reapproved 1996).

E. ASTM D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 1991.

F. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 1994.

G. ASTM D 2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System); 1998.

H. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 1996.

I. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 1996.

J. ASTM D 4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 1998.

1.04 DEFINITIONS

A. Common excavation: Excavated material meeting the description of MDOT Specification Section 203.01, except common excavation shall include the removal and disposal of boulders, solid mortared stone masonry, and concrete masonry when each is less than 2 cubic yards in volume.

B. Rock Excavation

1. Rock excavation includes removal and disposal of solid rock, boulders over 1 cu. yd., ledge rock, rock-hard cementitious deposits and other materials or obstructions which cannot be dislodged and excavated with modern, heavy-duty, track-mounted excavating equipment defined as follows:

   a. For trenches less than 10' in width or pits in excess of 30' in either length or width: Caterpillar Model 215 or equivalent hydraulic excavator.

   b. For open excavation (all excavations other than above): Caterpillar Model No. 973 or 977K or equivalent loader.

2. If encountered, rock excavation will be paid for in accordance with contract conditions relative to changes in work. Rock payment lines are limited to the following:

   a. Two feet outside of concrete work for which forms are required, except footings.

   b. One foot outside perimeter of footings.

   c. In pipe trenches, 6" below invert elevation of pipe and 2 ft. wider than inside diameter of pipe, but not less than 3 ft. minimum trench width.

   d. Neat outside dimensions of concrete work where no forms are required.

   e. Under slabs on grade, 6" below bottom of concrete slab.

C. Unauthorized excavation (removal of materials beyond indicated subgrade elevations) may be filled with compacted structural fill.

1.05 SUBMITTALS

A. Samples: 10 lb sample of each type of fill; submit in air-tight containers to testing laboratory.

B. Materials Sources: Submit name of imported materials source.

C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

D. Compaction Density Test Reports.

1.06 PROJECT CONDITIONS

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

B. Protect plants, lawns, and other features to remain.

C. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

D. Protect above or below grade utilities which are to remain.

E. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.

F. Notify Owner of unexpected subsurface conditions and discontinue work in affected area until notification to resume work.

G. Protect excavations and soil adjacent to and beneath foundations from frost.

H. Grade excavation top perimeter to prevent surface water runoff into excavations.

I. Protect excavations by shoring, bracing, sheet piling, underpinning or other methods required to prevent cave-in or loose soil from falling into excavation.

J. Maintenance of existing flows:
1. Keep existing sewers and drains in operation.
2. If existing sewers and drains are disturbed, provide for maintenance of such flows until work is completed.
3. Do not allow raw sewage to flow on ground surface or stand in excavation.

K. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.

L. When fill materials need to be stored on site, locate stockpiles where indicated.
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 MATERIALS

A. Subsoil: Reused, meeting the requirements of Common Borrow

B. Common Borrow: MDOT 703.18; Earth, suitable for embankment construction, free from frozen material, perishable rubbish, peat and other unsuitable material, with sufficient moisture content to provide the required compaction and stable embankment, moisture content shall not exceed 4 percent above optimum. Determine optimum moisture content in accordance with AASHTO T 180, Method C or D.

C. Granular Borrow: MDOT 703.19; Sand or gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of that portion passing a 3 inch sieve shall meet the following requirements:
   1. No. 40 sieve: 0 to 70 percent passing by weight.
   2. No. 200 sieve: 0 to 20 percent passing by weight.

D. Granular borrow shall contain no particles or fragments with a maximum dimension in excess of one-half of the compacted thickness of the layer being placed.

E. Gravel Borrow: MDOT 703.20; Uniformly graded granular material having no rocks with a maximum dimension of over 6 inches. The gradation of that portion passing a 3 inch sieve shall contain not more than 70 percent passing by weight a 1/4 inch mesh sieve and not more than 10 percent passing by weight a No. 200 mesh sieve.

F. Aggregate Base: Crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of that part that passes a 3 inch sieve shall meet the gradation requirements of MDOT Specification Section 703.06, Type **A** aggregate, with the following limits:
   1. 1/2 inch sieve: 45 to 70 percent passing by weight
   2. 1/4 inch sieve: 30 to 55 percent passing by weight
   3. No. 40 sieve: 0 to 20 percent passing by weight
   4. No. 200 sieve: 0 to 5 percent passing by weight

5. Type **A** aggregate shall not contain particles of rock which will not pass the 2 inch square mesh sieve.

G. Aggregate Subbase: Sand or gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of that part that passes a 3 inch sieve shall meet the gradation requirements of MDOT Specification Section 703.06, Type D aggregate, with the following limits:
1. 1/4 inch sieve: 25 to 70 percent passing by weight
2. No. 40 sieve: 0 to 30 percent passing by weight
3. No. 200 sieve: 0 to 7 percent passing by weight
4. Type D aggregate shall not contain particles of rock which will not pass the 6 inch square mesh sieve.

H. Select Fill: Screened or crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of that part that passes a 4 inch sieve shall meet the following requirements:
1. 4 inch sieve: 100 percent passing by weight
2. 3 inch sieve: 90 to 100 percent passing by weight
3. 1/4 inch sieve: 25 to 90 percent passing by weight
4. No. 40 sieve: 0 to 30 percent passing by weight
5. No. 200 sieve: 0 to 5 percent passing by weight

I. Structural Fill: Granular soils with good drainage characteristics free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of that part that passes a 4-inch sieve shall meet the following requirements:
1. 6 inch sieve: 100 percent passing by weight.
2. No. 40 sieve: 0 to 70 percent passing by weight.
3. No. 200 sieve: 0 to 20 percent passing by weight.

2.02 ACCESSORIES

A. Water for sprinkling: Fresh and free from oil, acid, and injurious alkali or vegetable matter.

B. Calcium chloride: ASTM D98 commercial grade except as waived by Owner.

2.03 SOURCE QUALITY CONTROL

A. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.

B. If tests indicate materials do not meet specified requirements, change material and retest.

C. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

B. Examine the areas and conditions under which excavating and filling is to be performed and notify Owner in writing of conditions detrimental to proper and timely completion of work

C. Correct unsatisfactory conditions in a manner acceptable to Owner prior to proceeding with work

D. Maintain in operating condition existing utilities, active utilities and drainage systems encountered in utility installation. Repair any surface or subsurface improvements shown on Drawings.

E. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.

F. Verify structural ability of unsupported walls to support imposed loads by the fill.

3.02 INSPECTION

A. Verify stockpiled fill to be reused is approved.

B. Verify areas to be backfilled are free of debris, snow, ice or water, and surfaces are not frozen.

3.03 PREPARATION

A. When necessary, compact subgrade surfaces to density requirements for embankment, aggregate base and aggregate subbase materials.

B. Contact Dig Safe Maine at least three (3) but not more than thirty (30) days prior to commencement of excavation to verity horizontal and vertical location of all utilities. Contractor shall be responsible for compliance with the requirements of 23 MSRA 3360-A.

C. Identify known underground utilities. Stake and flag locations.

D. Identify and flag surface and aerial utilities

E. Notify utility companies of work to be done.

F. Locate, identify, and protect utilities that remain and protect from damage.

G. Scarify subgrade surface to a depth of 6 inches to identify soft spots.

H. Cut out soft areas of subgrade not capable of compaction in place. Backfill with granular borrow or crushed stone.

I. The building pad shall be constructed in such a manner as to provide positive drainage of surface water off the pad and to protect the pad surface and subgrade. Temporary ditches shall be constructed to carry any surface runoff away from the pad area, as directed by the Owner. At the start of building construction, the pad shall be prepared for foundations and temporary ditches properly backfilled.

J. Surface preparation shall be performed in accordance with the soils report and the requirements of the Geotechnical Engineer.

K. Soil fill placed adjacent to foundations (interior and exterior) within 8 inches of floor slabs and as backfill around exterior foundations (including features such as bollards and light pole bases) shall be select fill and shall be placed in lift thickness such that the desired density is achieved throughout the lift thickness 3 to 5 passes of the compaction equipment.

L. Soil fill placed within the proposed building area, below select fill, shall be structural fill. Where structural fill is below footing grade, the zone of 95 percent compaction (maximum dry density as determined by ASTM D-1557) shall extend laterally beyond the foundation at least 1 foot for each foot of depth below foundation grade.

3.04 EXCAVATING

A. Underpin adjacent structures which may be damaged by excavating work.

B. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. Excavate materials encountered when establishing required subgrade elevations in accordance with MDOT Specification Section 203.04 and 203.05.

D. Remove lumped subsoil, boulders, solid mortared stone masonry, concrete masonry and rock up to 2 cubic yards, measured by volume.

E. Conform to elevations, contours, dimensions, line and grade shown on the Drawings.

F. When excavation through roots is necessary, perform work by hand and cut roots with a sharp axe.

G. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored. All excavations shall be consistent with OSHA regulations.

H. Do not excavate wet subsoil.

I. Remove all existing fill soils from beneath foundations.

J. Do not interfere with 45 degree bearing splay of foundations.

K. Correct areas that are over-excavated and load-bearing surfaces that are disturbed at no cost to Owner.

L. Grade top perimeter of excavation to prevent surface water from draining into excavation.

M. Remove excavated materia1 that is unsuitable for re-use from site.

N. Surplus Material:
1. Make arrangements to provide suitable disposal areas off-site
2. Deposit and grade material to the satisfaction of the owner of the property on which the material is deposited.
3. Obtain any necessary permits for disposal.
4. Provide suitable watertight vehicles to haul soft or wet materials over streets or pavements to prevent deposits on same.
5. Keep crosswalks, streets, and pavements clean and free of debris.
6. Clean up materials dropped from vehicles as often as directed by Owner.

3.05 FILLING AND SUBGRADE PREPARATION

A. Subgrades shall be proof-rolled using a vibratory roller-compactor weighing at least 15 kips. Any areas that continue to yield after 3 to 5 passes of the compaction equipment shall be over-excavated and replaced with clean granular fill.

B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

C. Place and compact fill materials in continuous layers not exceeding 12 inches loose depth upon compacted material.

D. Fill to contours and elevations indicated using unfrozen materials.

E. Fill up to subgrade elevations unless otherwise indicated.

F. Employ a placement method that does not disturb or damage other work.

G. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

H. Maintain optimum moisture content of fill materials to attain required compaction density.

I. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

J. Correct areas that are over-excavated.
   1. Load-bearing foundation surfaces: Use select fill, flush to required elevation, compacted to 95 percent of maximum dry density.
   2. Other areas: Use common borrow, flush to required subgrade elevation, compacted to minimum 95 percent of maximum dry density.

K. Compaction Density Unless Otherwise Specified or Indicated:
   1. Under paving, slabs-on-grade, and similar construction: 95 percent of maximum dry density.
   2. At other locations: 90 percent of maximum dry density.

L. Leave stockpile areas completely free of excess fill materials.

M. Reshape and re-compact fills subjected to vehicular traffic.

N. Frost:
   1. Do not excavate to full indicated depth when freezing temperatures may be expected unless fill material or structures can be constructed immediately after the excavation has been completed. Protect the excavation from frost if placing of fill or structure is delayed.
   2. Fill shall not be placed over frozen soil. Soil that is frozen shall be removed prior to placement of compacted fill. Remove all frozen uncompacted soil prior to placing additional fill for compaction.

O. Native soils can undergo substantial strength loss when subjected to construction traffic and excavation activities, particularly during periods of precipitation and shallow groundwater levels. Care must be exercised to minimize disturbance of the bearing soils. Should the subgrade become yielding or difficult to work, disturbed areas shall be excavated and backfilled with select fill or crushed stone. Select fill shall be placed in lifts and compacted to at least 95 percent of its maximum dry density as determined by ASTM-1557.

3.06 CONSTRUCTION OF AGGREGATE BASE AND SUBBASE COURSE

A. Place and compact aggregate base and subbase course materials in continuous layers

not exceeding 8 inches loose depth upon compacted material.

B. Employ a placement method so not to disturb or damage structures and utilities.

C. Spread materials well mixed having no pockets of either fine or coarse material.

D. Do not segregate large or fine particles.

E. Compact by mechanical means to obtain 95 percent of maximum dry density as determined in accordance with ASTM Test Designation D1557. Base course material shall be compacted with a minimum of two coverages with self propelled vibratory compaction equipment.

F. Maintain surface, compaction and stability until pavement course has been placed.

G. Conform to elevations, contours, dimensions, line and grade shown on the Drawings.

3.07 DUST CONTROL

A. Upon request of Owner, implement the following dust control measures:
   1. Apply water and calcium chloride as directed by Owner.
   2. Spread calcium chloride uniformly over designated area.
   3. Apply water with equipment having a tank with pressure pump and nozzle equipped spray bar acceptable to Owner.

3.08 TOLERANCES

A. Top surface of base and subbase course: Plus or minus 318 inch.

3.09 FIELD QUALITY CONTROL

A. Provide for visual inspection of load-bearing excavated surfaces before placement of foundations.

B. Perform compaction density testing on compacted fill in accordance with ASTM D 1556, ASTM D2 167, or ASTM D2922. Contractor shall be responsible for conducting and paying for all necessary compaction density testing.

C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 1557 ("modified Proctor").

D. If tests indicate work does not meet specified requirements, remove work, replace and retest.

E. Frequency of Tests:

1. Building subgrade areas, including 10'-0" outside exterior building lines: In cut areas, not less than one compaction test for every 2,500 square feet In fill areas, same rate of testing for each lift.
2. Areas of construction exclusive of building subgrade: In cut areas, not less than one compaction test for every 10,000 square feet. In fill areas, same rate of testing for each lift.

3.10 PROTECTION

A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

C. Protect newly graded areas from traffic and erosion and keep free of trash and debris.

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

END OF SECTION

SECTION 02317

TRENCHING

PART1 GENERAL

1.01 SECTION INCLUDES

A. Excavating trenches for utilities.

B. Excavating for manholes, catch basins and other structures.

C. Compacted bedding and compacted backfilling over utilities to subgrade elevations

D. Compacted base and compacted backfilling for manholes, catch basins and other structures to subgrade elevations.

E. Compaction requirements.

F. Dust control.

1.02 RELATED SECTIONS

A. Section 02250 - Dewatering.

B. Section 02315 - Common Excavation, Embankment and Compaction.

C. Section 02510 - Water Distribution.

D. Section 02535 - Sanitary Sewer Piping.

E. Section 02635 - Storm Drainage Piping.

1.03 REFERENCES

A. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 1997.

B. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 1996a.

C. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2000a.

D. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2000.

E. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2000.

F. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 1994.

G. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2000.

H. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 1996.

I. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 1996.

J. ASTM D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2000.

1.04 DEFINITIONS

A. Finish Grade Elevations: Indicated on drawings.

B. Subgrade Elevations: Indicated on drawings.

1.05 SUBMITTALS

A. Samples: 10 lb sample of each type of fill; submit in air-tight containers to testing laboratory.

B. Materials Sources: Submit name of imported materials source.

C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

D. Compaction Density Test Reports.

1.06 PROJECT CONDITIONS

A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where designated.
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

C. Verify that survey bench marks and intended elevations for the Work are as indicated.

D. Protect plants, lawns, and other features to remain.

E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

F. Protect excavations by shoring, bracing, sheet piling, underpinning or other methods required to prevent cave-in or loose soil from falling into excavation.

G. Protect above or below grade utilities which are to remain.

H. Repair damage.

I. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.

J. Protect excavations and soil adjacent to and beneath foundations from frost.

K. Grade excavation top perimeter to prevent surface water runoff into excavations.

L. Maintenance of existing flows:
   1. Keep existing sewers and drains in operation.
   2. If existing sewers and drains are disturbed, provide for maintenance of such flows until work is completed.
   3. Do not allow raw sewage to flow on ground surface or stand in excavation.

PART 2 PRODUCTS

2.01 PIPE BEDDING

A. Bedding for ductile iron pipe or concrete pipe shall be a granular material meeting the requirements of AASHTO Specification M145 49 as revised, Classification **A-3** or better.

B. Bedding for pvc conduit or direct bury cable: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter.

1. Graded in accordance with the following limits:
   a. 3/8 Inch sieve: 85 to 100 percent passing by weight
   b. No. 200 sieve: 0 to 5 percent passing by weight.

C. Bedding for all other pipe materials shall be 3/4 inch crushed stone. Aggregate for crushed stone shall be hard durable crushed stone free from friable materials, lumps or balls of clay, shale or other deleterious substances.
   1. Graded in accordance with the following limit
      a. 1" sieve: 100 percent passing by weight
      b. 3/4 Inch sieve: 90 to 100 percent passing by weight
      c. 1/2 Inch sieve: 45 to 80 percent passing by weight
      d. 3/8 Inch sieve: 20 to 55 percent passing by weight
      e. 1/4 Inch sieve: 5 to 20 percent passing by weight
      f. No. 4 sieve: 0 to 10 percent passing by weight
      g. No. 8 sieve: 0 to 5 percent passing by weight
      h. No. 200 sieve: 1.5 percent maximum passing by weight

D. Heavy gravel: Bank run, uniformly graded, free of soil, subsoil, clay, shale, frozen material or foreign matter, stones larger than 8 inches, 20% maximum passing a #200 sieve. Gradation to provide a firm stable base upon compaction by normal vibratory or compressed air compaction equipment to satisfaction of Owner.

2.02 TRENCH BACKFILL

A. Special backfill shall be a granular material meeting the requirements of AASHTO Specification M145 49 as revised, Classification **A-3** or better.

B. Select backfill shall be a granular material meeting the requirements of AASHTO Specification M145 49 as revised, Classification A-3 or better.

C. Excavated material shall be granular in nature, free of gravel larger than 6 inch size, organic matter, roots, frozen material, debris and other objectionable material, and that can be compacted by vibratory means to obtain 92% of the optimum density.

2.03 ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, non-woven, Mirafi 600x.

B. Water for sprinkling: Fresh and free from oil, acid and injurious alkali or vegetable matter.

C. Calcium Chloride: ASTM D98 commercial grade except as waived by the Owner.

2.04 SOURCE QUALITY CONTROL

A. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify required lines. levels. contours, and datum locations.

B. Examine the areas and conditions under which excavating and filling is to be performed and notify Owner in writing of conditions detrimental to proper and timely completion of work.

C. Correct unsatisfactory conditions in a manner acceptable to Owner prior to proceeding with work.

D. Maintain in operating condition existing utilities, active utilities and drainage systems encountered in utility installation. Repair any surface or subsurface improvements shown on Drawings.

E. Locate, identify, and protect utilities that remain and protect from damage.

F. Notify utility company to remove and relocate utilities.

3.02 INSPECTION

A. Verify areas to be backfilled are free of debris, snow, ice or water, and surfaces are not frozen.

3.03 PREPARATION

A. When necessary, compact subgrade surfaces to density requirements for embankment, aggregate base and aggregate subbase materials.

B. Identify known underground utilities. Stake and flag locations.

C. Identify and flag surface and aerial utilities.

D. Notify utility companies of work to be done.

E. Cut out soft areas of subgrade not capable of compaction in place. Backfill with heavy

gravel and compact to density equal to requirements for subsequent backfill material.

F. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

G. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

3.04 GENERAL REQUIREMENTS

A. Refer to Section 023 15 Common Excavation, Embankment and Compaction.

B. Provide trenching and backfilling for water service, sewerage pipes, conduits and structures. Water and sewerage lines separation shall be minimum 10 feet horizontally and 18 inches vertically. Lay all piping in open trench. Maintain access to fire hydrants by fire-fighting equipment.

C. Excavate trenches of sufficient width for proper installation of the work. When the depth of backfill over sewer pipe exceeds 10 feet, keep the trench below the level of the top of the pipe as narrow as practical.

D. Sheet and brace trenches and remove water as necessary to fully protect workmen and adjacent facilities, in keeping with local regulations or, in the absence thereof, with the provisions of the "Manual of Accident Prevention in Construction," of the Associated General Contractors of America. Inc. Under no circumstances lay pipe or install appurtenances in water. Keep the trench free from water until pipe joint material has hardened. Sheeting left in place shall be cut off not less than 2 feet below finished grade. Sheeting shall not be removed until the trench is substantially backfilled.

E. It shall be noted that excavation under this contract shall be unclassified.

F. Grade the bottom of the trenches evenly to insure uniform bearing for full length of all pipes. Excavate all rock, cemented gravel, old masonry, or other hard material to at least 6 inches below the pipe at all points. Refill such space and all other cuts below grade with sand or fine gravel firmly compacted.

G. Should soil conditions necessitate special supports for piping and/or appurtenances, including the removal of unsuitable material and refilling with gravel or other material, such work shall be performed as necessary.

H. Backfill trenches only after piping has been inspected, tested and the locations of pipe and appurtenances have been recorded. Backfill by hand around pipe and for a depth of 1 foot above the pipe. Use earth without rock fragments or large stones and tamps, as specified, in layers not exceeding 6 inches in thickness, taking care not to disturb the pipe or injure the pipe coating. Compact the remainder of the backfill as specified with

a rammer of suitable weight, or with an approved mechanical tamper, provided that under pavements. walks and other surfacing, the backfill shall be tamped as specified. Exclude all cinders, rubbish and scrap metal from trenches in which metal pipes are laid. Special care shall be used to properly tamp backfill under lower half of sewer pipe.

3.05 ELECTRICAL/TELEPHONE

A. Refer to the Handbook of Standard Requirements for Electric Service and Meter Installation for installation requirements for primary electric service, secondary electric service, telephone service and cable services. Pull ropes shall be installed in all conduits.

3.06 TRENCHING

A. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

B. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored. All excavations shall be consistant with OSHA requirements.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Excavate subsoil required for piping and appurtenances.

E. Cut trenches wide enough to enable installation and allow inspection of installed utilities.

F. Hand trim excavations. Remove loose matter.

G. Remove large stones and other hard matter which could damage piping or impede consistent backfilling or compaction.

H. Remove excavated material that is unsuitable for re-use from site.

I. Stockpile excavated material to be re-used in area designated on site. Do not store excavated materials adjacent to excavations where they would surcharge sideslopes.

J. Correct unauthorized excavation with heavy gravel or as directed by Owner at no cost to Owner.

K. Fill over-excavated areas under pipe bearing surfaces with heavy gravel or as directed by Owner.

L. Do not store excavated material adjacent to excavations where they could surcharge

sideslopes.

M. Remove excess excavated material from site.

N. Surplus Material:
1. Make arrangements to provide suitable disposal areas off-site
2. Deposit and grade material to the satisfaction of the owner of the property on which the material is deposited.
3. Obtain any necessary permits for disposal.
4. Provide suitable watertight vehicles to haul soft or wet materials over streets or pavements to prevent deposits on same.
5. Keep crosswalks, streets, and pavements clean and free of debris.
6. Clean up materials dropped from vehicles as often as directed by Owner.

3.07 REPAIRS TO EXISTING PIPES, CONDUIT AND WATER LINES

A. Remove damaged or broken portions of pipe or conduit and replace with a pipe or conduit of the same size and material, unless otherwise directed by Owner, designed to serve same function as existing pipe or conduit.

B. Make connections for repair with flexible couplings to satisfaction of Owner.

C. Maintain inventory of suitable repair materials on site.

D. Make repairs iininediately following discovery of damage.

E. Do not backfill until repairs have been completed to satisfaction of Owner

F. Repairs to water mains and services will be by the water utility. Coordination and payment for repairs shall be the responsibility of the Contractor.

3.08 BACKFILLING

A. Place and compact bedding material to grade of underside of pipe in trench bottom as soon as excavation reaches grade.

B. Compact bedding material to provide firm laying base.

C. After pipe is laid to grade, place bedding material uniformly on each side of pipe up to spring line while carefully compacting bedding material under haunches of pipe.

D. Support pipe and conduit during placement and compaction of bedding fill.

E. Place and compact base material to grade of underside of appurtenant structures in bottom of excavation as soon as excavation reaches grade.

F. Compact base material for appurtenant structures to provide a firm laying base.

G. Place and compact backfill materials in continuous layers not exceeding 8" in areas of paving, slabs-on-grade, and similar construction. Lift thickness not to exceed 16" in lawn or field areas.

H. Backfill to contours and elevations indicated using unfrozen materials.

I. Install geotextile fabric in accordance with manufacturer's recommendations and where shown on Drawings.

J. Employ a placement method that does not disturb or damage other work or existing pipe.

K. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

L. Maintain optimum moisture content of fill materials to attain required compaction density.

M. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

N. Correct areas that are over-excavated.
1. Thrust bearing surfaces: Fill with concrete.
2. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

O. Leave stockpile areas completely free of excess fill materials.

P. Upon completion of backfilling in paved areas, sweep undisturbed pavement.

Q. Upon request of Owner implement the following dust control measures during the interim period between backfilling and capping of the trench:
1. Apply water and calcium chloride as directed by Owner.
2. Spread calcium chloride uniformly over designated areas.
3. Apply water with equipment having a tank with pressure pump and nozzle equipped spray bar acceptable to Owner.

R. Compaction Density Unless Otherwise Specified or Indicated:
1. Under paving, slabs-on-grade, and similar construction: 95 percent of maximum dry density based upon ASTM D-1557.

2. At other locations: 90 percent of maximum dry density.

S. Reshape and re-compact fills subjected to vehicular traffic.

3.09 TOLERANCES

A. Top Surface of General Backfilling: Plus or minus l inch from required elevations.

3.10 FIELD QUALITY CONTROL

A. Perform compaction density testing on compacted fill in accordance with ASTM D1556.

B. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 1557 ("modified Proctor").

C. If tests indicate work does not meet specified requirements, remove work, replace and retest.

D. Frequency of Tests: 1 test for each 200'-0" of trench for the first and every other lift of compacted trench backfill.

3.11 CLEAN-UP

A. Leave unused materials in a neat, compact stockpile

B. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

C. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION

SECTION 02320

SLOPE PROTECTION AND EROSION CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary silt fence

B. Erosion control mesh

C. Hay bales, temporary erosion checks.

D. Stone check dams.

E. Plain riprap - machine placed stones on filter fabric.

1.02 RELATED SECTIONS

A. Section 02230- Site Clearing and Grubbing.

B. Section 02315 - Common Excavation, Embankment and Compaction.

1.03 ENVIRONMENTAL REQUIREMENTS

A. Conform to Maine Department of Environmental Protection publication "Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices".

B. Maintain erosion control installations in a functional condition *at* all times. Inspect after each rainfall and at least daily during prolonged rainfall. Immediately correct deficiencies

C. Conform to the Erosion and Sedimentation Control Plan for this project, Sheet SD-2.

PART 2 PRODUCTS

2.01 MATERIALS

A. Silt Fence: MDOT Section 656.03.

B. Erosion Control Mesh: MDOT Section 717.061 and/or as indicated on Sheet SD-2 for this project.

C. Hay Bales: Baled hay approximately 14" by 18" by 30" securely tied to form a firm bale.D. Plain Riprap: MDOT Section 703.26 and/or as indicated on Sheet SD-2.

E. Stone check dams: Crushed stone as shown on Sheet SD-2 for this.

F. Filter Fabric: Mirafi 600x or Approved Equal.

G. Refer to Sheet SD-2 for all other details related to this section.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work.

B. Beginning of installation means installer accepts existing surface conditions

3.02 INSTALLATION

A. Install silt fences before beginning excavation.

B. Install silt fences in accordance with MDOT 656.08.

C. Install erosion control mesh in accordance with MDOT 613.

D. Install hay bales in accordance with MDOT Section 656

E. Install plain riprap in accordance with MDOT 610 with the exception that plain riprap shall be installed on filter fabric installed per manufacturer's recommendations.

F. Refer to Erosion and Sedimentation Control Plan for this project (SD-2) for all other recommendations and details.

3.03 FIELD QUALITY CONTROL

A. Inspect and repair temporary erosion control measures at least weekly and after any significant storm. A significant storm shall be defined as over 1 inch of precipitation in any consecutive 24 hour period.

3.04 MAINTENANCE

A. Maintain erosion control installations in a functional condition at all times. Inspect after each rainfall and at least daily during prolonged rainfall. Immediately correct deficiencies

B. Make a daily review of the location of erosion control measures in areas where construction activity causes drainage runoff to ensure that erosion control measures are properly located for effectiveness.

C. Where deficiencies exist, install additional erosion control measures as approved or directed by the Owner. No additional payment shall be made for additional erosion control measures which may be required.

3.05 TEMPORARY EROSION CONTROL REMOVAL

A. Remove temporary silt fence and hay bales when no longer needed and dispose of in a proper manner.

B. Remove stone check dams when no longer needed and dispose of in a proper manner. Stone shall be raked out to a maximum depth of one layer to allow future vegetation to grow through the stone.

END OF SECTION

SECTION 02480

LANDSCAPE WORK

1. GENERAL

1.1 REFERENCES

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specifications, apply to work in this section.

B. Excavation, Embankment and Compaction: Section 02315

C. American National Standards Institute (ANSI), Z60.1, "American Standard for Nursery Stock".

D. Official Seed Analysis of North America

E. State of Maine Department of Transportation (MDOT), Standard Specifications, Highways and Bridges.

1.2 DESCRIPTION OF WORK: Extent of Landscape Work is shown on the drawings.

1.3 QUALITY ASSURANCE

A. Refer to Section 01631, Products and Substitutions, for general provisions covering product selection, substitutions, material storage, and installation.

B. Refer to Section 01400, Quality Control Services, for provisions for testing and inspection.

C. Warranty all plants, shrubs, and trees for one year against death and unhealthy condition, except as may result from neglect by Owner or damage by others. Replace at optimum planting time.

D. Warranty lawns through specified lawn maintenance period and until final acceptance.

1.4 SUBMITTALS

A. Issue submittals in accordance with Section 01300, Submittals.

B. Submit planting schedule showing coordination of normal planting times with construction schedule for other (related) work.

SECTION 02480

LANDSCAPE WORK

1. GENERAL

1.1 REFERENCES

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specifications, apply to work in this section.

B. Excavation, Embankment and Compaction: Section 02315

C. American National Standards Institute (ANSI), Z60.1, "American Standard for Nursery Stock".

D. Official Seed Analysis of North America

E. State of Maine Department of Transportation (MDOT), Standard Specifications, Highways and Bridges.

1.2 DESCRIPTION OF WORK: Extent of Landscape Work is shown on the drawings.

1.3 QUALITY ASSURANCE

A. Refer to Section 01631, Products and Substitutions, for general provisions covering product selection, substitutions, material storage, and installation.

B. Refer to Section 01400, Quality Control Services, for provisions for testing and inspection.

C. Warranty all plants, shrubs, and trees for one year against death and unhealthy condition, except as may result from neglect by Owner or damage by others. Replace at optimum planting time.

D. Warranty lawns through specified lawn maintenance period and until final acceptance.

1.4 SUBMITTALS

A. Issue submittals in accordance with Section 01300, Submittals.

B. Submit planting schedule showing coordination of normal planting times with construction schedule for other (related) work.

C. Submit analysis or certification of loam to show conformance with specification requirements.

2. PRODUCTS

2.1 PLANT SIZE AND QUALITY

A. Provide sizes of plants as shown or scheduled, conforming to ANSI Z60.1 "American Standard for Nursery Stock" for shape and quality.

B. Furnish balled and burlapped (B&B) trees and shrubs, except container-grown plants may be furnished if indicated size is below limit established in ANSI 260.1.

C. Deciduous shrubs may be furnished in bare root condition if adequately maintained and protected from drying through transplanting period.

D. Furnish ground cover plants in removable containers or integral peat pots.

2.2 LOAM

A. Loam shall be good quality friable loam free of stones over 2 in., objectionable weed roots or seeds, clay lumps, sticks, trash, or other extraneous material.

B. The loam shall have an organic content greater than 1.5% by weight and shall not contain soluble salt greater than 500 parts per million.

C. Provide loam to supplement that (if any) shown as available for reuse at site. Provide clean, fertile, friable, natural loam obtained from a local, well drained source.

2.3 GRANULAR DRIP BED

A. Stone: Where indicated, provide natural, hard, clean, 3/4" coarse aggregate.

2.4 GRASSSEED

A. **A** blend of predominantly Kentucky Bluegrass seed, with approximately 20% "nurse-grass" seeds, complying with standards of Official Seed Analysis of North America, for *85%* purity, *80%* germination and 1% (max.) weed seed, recommended by producer for full-sun exposure of lawns in geographic location of project.

2.5 FERTILIZER

A. Provide fertilizer, humus and other soil amendments of a type which are known to improve pH condition of soil for particular plant material to be planted.

B. Mix peat humus (FA Q-P-166) with loam in the ratio of 1:3 for use in planting.

3. EXECUTION

3.1 PLANTING TREES

A. Excavate pit to 2 times diameter of tree ball. Backfill around ball with loam, compacted to eliminate voids and air pockets, watering thoroughly as layers are placed. Build 4" high berm of loam beyond edge of excavation. Apply 2" mulch of shredded hemlock, bark chips, peat, or other recognized organic planting mulch.

B. Prune trees to remove damaged branches. Do not prune back terminal leader.

C. Guy and stake tree 2 directions with galvanized wire, through flexible-hose chafing guards, with wooden stake anchors.

3.2 PLANTING SHRUBS

A. Excavate pits or trench to 2 times diameter of balls or containers, or 1'-0" wider than spread of roots, and 3" deeper than required for positioning at proper height. Lightly compact a layer of loam in bottom before placing plants. Backfill around plants with loam, compacted to eliminate voids and air pockets. Water thoroughly as layers are placed. Form grade slightly dished, and bermed at edges of excavation. Apply 2" mulch of hemlock bark chips or other recognized organic planting mulch.

B. Prune shrubs to remove damaged branches only.

3.3 PLANTJNG PERENNIALS

A. Loosen subgrade to depth of 4" in areas where loam has been stripped, and spread loam to depth of 6", except as otherwise indicated.

B. Space plants 2'-0" apart both ways, except as otherwise indicated. Dig holes large enough to allow for spreading of roots. Compact backfill to eliminate voids, and leave grade slightly dished at each plant. Water thoroughly. Apply 2" mulch of shredded hemlock bark chips or other recognized organic planting mulch over entire planting bed, lifting plant foliage above mulch.

C. During periods of hot sun and wind at time of planting, provide protective cover for several days.

3.4 PLANTING LAWNS

A. Loosen subgrade to depth of 4" in areas where loam has been stripped.. Spread additional 6" depth of loam, add specified soil amendments and mix thoroughly into top 4" of loam, till surface to level, fine texture.

B. Grade and roll prepared lawn surface. Water thoroughly but do not create a muddy soil condition.

C. Sow grass seed uniformly in two directions in the quantity recommended by the seed producer, except as otherwise indicated. Rake seed lightly into top 1/8" of lawn surface. Water thoroughly with fine spray.

D. Protect seeded areas against erosion by spreading straw to a uniform loose depth of 1-1/2".

E. All disturbed areas and areas not receiving specific groundcovers shall be loamed and seeded.

3.5 APPLYING FERTILIZER

A. Fertilize loam for planting trees, shrubs and perennial with an organic blend of fertilizer containing not less than 2% nitrogen and applied and mixed at rate of not less than 0.25 lbs. per cu. ft. of soil and humus.

B. Fertilize loam for planting grass with a commercial fertilizer (5-10-10) containing 10% phosphorus, 10% potash and 5% nitrogen in sufficient quantity to supply not less than 40 lbs. of actual nitrogen per 1000 sq. ft. lawn area.

3.6 MISCELLANEOUS LANDSCAPE WORK

A. Drip Strip Wood Edging: Where indicated, install 2x6 preservative pressure treated pine edging units, with 112 inch **x** 36 inch steel stakes at **48**" on center.

B. Granular Drip Bed: Where indicated, provide granular drip bed over compacted subgrade and soil saver fabric.

3.7 LANDSCAPE MAINTENANCE

A. Maintain landscape work for a period of 60 days immediately following complete installation of each major category of work.

B. Include watering, weeding, cultivating, restoration of grade, mowing and trimming grass, pruning trees and shrubs, protection from insects and diseases, fertilizing and similar operations as needed to ensure normal growth and good health for live plant material.

END OF SECTION

SECTION 02510

WATER DISTRIBUTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe and fittings for site water lines including domestic water lines and fire water lines.

B. Valves and Fire hydrants.

1.02 RELATED SECTIONS

A. Section 02250 - Dewatering: Dewatering and Water Control.

B. Section 02317 - Trenching: Bedding and Backfill.

C. Section 03300 - Cast-in-Place: Concrete for thrust restraints.

1.03 REFERENCES

A. AWWA C104/A21.4 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water; American Water Works Association; 1995 (ANSI/AWWA C104/A21.4).

B. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; American Water Works Association; 2000 (ANSI/AWWA C111/A21.11).

C. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast, for Water; American Water Works Association; 1996 (ANSI/AWWA C151/A21.51).

D. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service; American Water Works Association; 2001 (ANSI/AWWA C509).

E. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances; American Water Works Association; 1999 (ANSI/AWWA C600).

F. UL 246 - Hydrants for Fire-Protection Service; Underwriters Laboratories Inc.; 1993.

1.04 SUBMITTALS

A. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories

B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements

C. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with Portland Water District requirements. The Contractor shall comply with the requirements contained within this section and those contained within the

Department's requirements. In the event of conflicting requirements, the more stringent standard shall apply.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Unload materials so as to avoid shock or damage. Handle and store all pipe in such a manner as to avoid deterioration or other injury thereto. Place no pipe within pipe of larger size. Store pipe and fittings on sills above storm drainage level and delivery for laying after trenches are excavated. Valves and hydrants shall be drained and stored to protect them from damage.

PART 2 PRODUCTS

2.01 MATERIALS

A. Ductile Iron Pipe: AWWA C151:
   1. Pipe shall meet requirements of AWWA Standard C-151 (latest revision) and be cement line and seal coated to meet AWWA Standard C-104 (latest revision).
   2. Joints shall meet requirements of AWWA C-111 (latest revision).
   3. Interior seal coated, bituminous paint oil, cut emulsion not acceptable, thickness, minimum of 2 mils **dry** film thickness.
   4. Exterior bituminous coated with minimum of 2 mils dry film thickness
   5. Class 52 wall thickness, **4** inch diameter through 12 inch diameter inclusive.
   6. State nominal laying length and mark shorter lengths near bell.
   7. Mechanical joint pipe to be furnished with gland, gaskets, and Cor-ten bolts and nuts.
   8. Push on joint pipe to be supplied with gasket and gasket lubricants (approx. 5 lb. containers).

B. Ductile Iron Fittings:
   1. Material shall be ASTM A536 latest, grade 70-50-05, in accordance with AWWA C153 (latest revision) for fittings 3" through 24".
   2. Fittings shall be cement lined AWWA C104 (latest revision).
   3. Interior seal coated AWWA C104 with minimum of 4 mils dry film thickness.
   4. Exterior bituminous coated with minimum of 2 mils dry film thickness.
   5. Mechanical joint with accessories furnished: DI glands, gaskets, Cor-Ten T-bolts and nuts.
   6. Class 350 pressure rating in accordance with AWWA C110 - 3" - 24" sizes.
   7. The "compact design" fittings must provide adequate space for the MJ joint and accessories to be installed without special tools (i.e. Lowell wrench can be used).

C. Trace Wire: Magnetic detectable conductor, clear plastic covering, imprinted with "Water Service " in large letters.

D. Valve Boxes
   1. Bottom section shall be slide-type with bell-type base.
   2. Top section shall be slide-type. It may have a top flange, but shall not have a "bead" or bottom flange.
   3. The cover shall be a 2" drop-type cover to fit the 7 1/4" opening of the top section.
   4. The intermediate (mid) section shall be slide-type with a minimum 3" belled bottom.
   5. Material shall be cast iron or ductile free from defects.
   6. Interior and exterior of all components shall be bituminous coated with a minimum of **4** mils dry film thickness.

E. Service Rod Box and Rod

1 Service box shall be 1.0" Schedule 40 steel pipe with top having 1.0" NPT pipe threads for screw on cover or coupling.
2. Service box shall be Erie style with 5'6" slide type riser.
3. Service box cover shall be Quincy type (heavy-duty) cover that screws on E.I above.
4. Service box cover shall be tapped with a 1" rope thread with a solid brass plug with pentagon operating head.
5. Service box foot piece shall be heavy-duty (Ford style or equal) cast iron design.
6. The large heavy-duty foot piece shall have an arch that will fit over 2" inch ball valve curb stops.
7 Service rod shall be 36" in length and have a self-aligning design.
8 Service rod shall be of circular dimension and constructed of 5/8" dia. Min cold rolled steel with an epoxy coating (minimum 4 mil D.F.T.) or 1/2" dia. Min. #304 stainless steel.
9. Service rod shall have a yoke design that is and integral part of the rod.
10. The curb-stop attachment pin shall be a brass cotter pin.
11. The rod "wrench flat" shall have a minimum thickness of 1/4" tapered to 1/16" and a width of 5/8" or 1/2".

F. Hydrants
1. Shall be Clow Eddy or American Darling B62-B.

G. Gate Valves:
1. Shall be USP Metroseal, Waterous Series 500 (AFC), Mueller A-2360, American AVK or Clow F6100 Series.

H. Fire Hydrants
1. Shall be Clow Eddy or American Darling B62-B.
2. Hydrant Extensions: Fabricate in multiples of 6 inches with rod and coupling to increase barrel length.
3. Hose and Streamer Connection: Match sizes with utility company, two hose nozzles, one pumper nozzle.
4. Finish: Primer and two coats of enamel in color required by utility company.

2.02 THRUST BLOCKS

A. Blocks shall be concrete of a mix not leaner than 1:2-1/2:5 cement:sand:stone, and shall have a compressive strength of not less than 3,000 psi at 28 days. Concrete for thrust blocks shall be placed against undisturbed earth.

B. Bedding: As specified in Section 02317

C. Cover: As specified in Section 02317

2.03 ACCESSORIES

A. Concrete for Thrust Restraints: Concrete type specified in Section 03300.

PART 3 EXECUTION

3.01 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.02 TRENCHING

A. See Sections 02315 and 02317 for additional requirements. Refer to details on Sheet SD-3 for trench detail.

B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.03 INSTALLATION - PIPE

A. Service line from existing main shall be furnished and installed to serve the project. The project contract work shall begin at indicated public water supply line and shall include all water lines, valves, fire hydrant and appurtenances as shown on the drawings, except as indicated otherwise.

B. Pipe-Laying - General:
1. The interior of all pipe shall be clean and joint surfaces wiped clean and dry before the pipe is lowered into trench. Lower each pipe, fitting and valve into the trench carefully and lay true to line and without objectionable breaks in grade. The depth *of* cover below finished grade shall be not less than 5'-0" and the standard cover shall be 6'-0".
2. Provide uniform bearing for all pipe in trenches. Do not allow trench water or dirt *to* enter the pipe after laying. Insert a watertight plug in the open end of the piping while laying of pipe is not in progress.
3. Do not lay pipe closer than 10 feet to a sewer. At cross-overs with sewers, no joint in the water line shall be closer than 6 feet from the cross- over point. A minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer shall be maintained when the water main is either above or below the sewer. Provide valves, plugs or caps, as required, where pipe ends are left for future connections.

C. All pipe shall be laid with standard provisions for expansion and contraction and in accordance with manufacturer's recommendations. All pipe with slip type joints shall be restrained at elbows and tees by thrust blocks or rods and clamps.

D. Install suitable fittings at all changes in direction, dead ends and branch connections, provided that double strap saddles, in lieu of tees, may be used for service taps.

E. Before setting each valve, make sure that the interior is clean, and test opening and closing. Set valves and stops with stems plumb and at the exact location shown. Provide brick laid flat, or other similar foot-pieces, under each curb box. Valve and service boxes shall be plumb, with tops at finished grade.

F. Maintain separation of water main from sewer piping in accordance with applicable code

G. Install ductile iron piping and fittings to AWWA C600

H. Route pipe in straight line.

I. Install pipe to allow for expansion and contraction without stressing pipe or joints

J. Slope water pipe and position drains at low points.

3.04 INSTALLATION - VALVES AND HYDRANTS

A. Set valves on solid bearing.

B. Center and plumb valve **box** over valve. Set box cover flush with finished grade.

C. Set hydrants plumb; locate pumper nozzle perpendicular to and facing parking lot.

D. Set hydrants to grade, with nozzles at least 20 inches above ground.

3.05 FIELD QUALITY CONTROL

A. Pressure test water mains in accordance with the requirements of the Portland Water District.

B. Disinfect water mains in accordance with the requirements of the Portland Water District.

C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.06 ATTACHMENTS

A. Portland Water District - Construction Handbook

END OF SECTION

SECTION 02535

SANITARY SEWER PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sanitary sewerage drainage piping, fittings, and accessories.

1.02 RELATED SECTIONS

A. Section 02315 -Common Excavation Embankment and Compaction

B. Section 02317 - Trenching

C. Section 02640 - Manholes and Covers

1.03 REFERENCES

A. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2000.

B. ASTM D 2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 1996a.

C. ASTM D 3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2000.

1.04 SUBMITTALS

A. Product Data: Provide data indicating pipe, pipe accessories

1.05 REGULATORY REQUIREMENTS

A. Perform work in accordance with the Portland Public Works Department

PART 2 PRODUCTS

2.01 SEWER PIPE MATERIALS

A. Plastic Pipe - gravity service: **ASTM** D 3034, Type PSM, Poly(Vinyl Chloride) (PVC) material rated SDR 35; inside nominal diameter of 6 inches, bell and spigot style solvent sealed joint end.

B. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM classification.

C. Pipe joints shall be integrally molded bell ends in accordance with ASTM D-3034 Table 2, with factory supplied elastomeric gaskets and lubricant.

D. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

PART 3 EXECUTION

3.01 TRENCHING

A. See Section 02317 for additional requirements and Sheet SD-3 for additional details

B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.02 INSTALLATION - PIPE

A. Make all required connections to existing sewers. Carry out such work in accordance with local standards. Observe care to prevent debris from entering sewers. Check the invert elevations of existing sewers to which connections are to be made, and if appreciable difference from elevations noted on the drawings, or if they involve any difficulty in obtaining necessary drainage, notify the Engineer immediately so that appropriate corrective action may be taken.

B. Commence at the lowest point in the system and lay the pipe with the bell-end upgrade. Test pipe for soundness and clean interior and joint surfaces before lowering the pipe into the trench. Lay pipe in straight lines and on uniform grades between points where changes in alignment or grade are shown. Bed the pipe barrel uniformly.

C. Comply fully with manufacturer's instructions for sewer pipe jointing, using sealing or lubricating compound as supplied by the manufacturer, and apply proper pressure to seal the spigot in the bell.

D. As soon as the joint material has set, pack fine earth carefully around the joints, and around and over the pipe. Carry this backfill operation to a depth of at least 12 inches above the top of the pipe. Care shall be used in tamping backfill under lower parts of the pipe to give proper support, especially in shallow trenches.

E. Flush all sanitary sewers, including building connections, with water in sufficient volume to obtain free flow through each line. Remove any obstructions and correct any defects discovered.

F. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

G. Install pipe, fittings, and accessories in accordance with ASTM D 2321 and manufacturer's instructions. Seal joints watertight.

H. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch in 10 feet. Minimum slope of pipe to be 1/4" per foot.

3.03 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with the requirements of the servicing utility

B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at *no cost to* Owner.

3.04 PROTECTION

A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

SECTION 02580

PAVEMENT MARKINGS

PART1 GENERAL

1.01 SECTION INCLUDES

A. The extent of pavement marking is shown on the drawings.

B. Work includes, but is not limited to, the following:
   1. Parking stall divider lines.
   2. Wheelchair legends.
   3. "No Parking" legend.
   4. Diagonal striping.

1.02 RELATED SECTIONS

A. Section 02740- Bituminous Concrete Paving.

1.03 REFERENCES

A. State of Maine Department of Transportation Standard Specifications Highways and Bridges, latest revision, hereafter designated as MDOT Specifications.

B. ASTM D 93, D 562, D 711, D 821, D 1210, D 1475, D 1640, D 2243, D 2369, D 2486, D 3723, D 3960, E 70, and G 53.

C. DOT Code of Federal Regulations, Hazardous Materials and Regulations Board, Reference 49CFR, ICC Regulations.

D. Federal Specification TT-P-I15E, Type III (Type I if V.O.C. compliance required). colors 33538 and 37038.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with MDOT Specifications 627

1.05 SUBMITTALS

A. Shop Drawings: Indicate sizes, shapes, patterns, and colors of marking, and manufacturers and types of paints.

1.06 DELIVERY, STORAGE AND HOLDING

A. Deliver all materials to the job site with all labels intact and legible at time of installation.

B. Store materials off ground under cover. Protect from damage or deterioration.

C. Handle materials so as to prevent damage to surface, edges, ends, and factory applied finishes of items. Damaged material shall be rejected and replaced.

1.07 GUARANTEE

A. Contractor shall guarantee entire installation for one (1) year from turnover date

PART 2 PRODUCTS

2.01 MATERIALS

A. Subject to compliance with requirements, provide ready-mixed one component water borne traffic line paint. Materials shall be listed on the Department of General Services Office of Procurement Qualified Products List.

B. Paints shall contain all necessary co-solvents, dispersants. wetting agents, preservatives, and all other additives, so that paint shall retain viscosity. Halogenated solvents and glass beads shall not be permitted.

C. Volatile Organic Compound (VOC) content shall not exceed 250 grams maximum per liter of paint as determined in accordance with ASTM D 3960 test, excluding water and exempt solvents.

D. Yellow shall match Federal 595a Color 33538. Black shall match Federal 595a Color 37038.

E. Traffic paint for parking stripes to be nonvolatile, oil modified alkyd of chlorinated rubber non-bleed, rapid drying material, especially manufactured for zone marking. Color to be white conforming to FS TT-P-115E, Type. See plans for location.

PART 3 EXECUTION

3.01 EXAMINATION

A. Installer shall examine the substrates and conditions under which materials are to be installed, and notify the Owner in writing of conditions detrimental to the completion

of the work. Do not proceed with the work until traffic lines are completed and properly dry.

B. Coordinate provisions for installation with work of other trades.

C. All parking area marking and painting to be protected by appropriate traffic barriers, lighted if necessary, so located as to prohibit parking and traffic until permission for such is given by the Owner.

3.02 INSTALLATION

A. Install pavement marking in accordance with approved shop drawings and applicable codes and standards.

B. Traffic paint shall be installed in two coats. The first coat shall be installed at 1/2 the recommended coverage rate after paving is in place; the second coat shall be installed at full recommended rate 30 days later.

3.03 PAINTING

A. Parking stall, division, and limit lines shall be 4" in width, true and straight. Color: White.

B. "No Parking" legend shall be as detailed on Drawings. Color: White.

C. Wheelchair legends shall be as detailed on Drawings. Color: Blue background with yelllow symbols. Parking stall striping shall be blue at handicapped stalls only.

D. Diagonal striping at handicapped parking. Color: Yellow.

E. Directional signage shall be as detailed on Drawings. Color: White.

3.04 COMPLETION

A. During the progress of the work, the premises shall be kept free of debris and waste resulting from the work in this section. Upon completion, all surplus material and debris shall be removed from the site.

B. At completion of work, touch up minor damage to prefinished surfaces to the satisfaction of the Owner. Replace materials damaged or stained during installation.

END OF SECTION

SECTION 02635

STORM DRAINAGE PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Storm drainage piping, fittings, and accessories

1.02 RELATED SECTIONS

A. Section 02250 - Dewatering.

B. Section 02315 - Common Excavation, Embankment and Compaction

C. Section 02317 - Trenching.

D. Section 02640 - Manholes and Covers

1.03 REFERENCES

A. ASTM C 76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 2000.

B. ASTM C 443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets; 1998.

C. ASTM D 1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 1999.

D. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2000.

E. ASTM D 2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 1996a.

F. ASTM D 3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2000.

1.04 SUBMITTALS

A. Product Data: Provide data indicating pipe, pipe accessories.

B. Project Record Documents:
   1. Record location of pipe runs, connections, catch basins, cleanouts, and invert elevations.
   2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.05 PROJECT CONDITIONS

A. Coordinate the Work with termination of storm sewer connection outside building, trenching, connection *to* foundation drainage system.

PART 2 PRODUCTS

2.01 STORM DRAIN PIPE MATERIALS

A. Reinforced Concrete Pipe: ANSI/ASTM C76, IV, with modified tongue-and-groove compression gasket joints complying with ANSI/ASTM C443.

B. Reinforced Concrete Pipe Joint Device: ASTM C 443 (ASTM C 443M), rubber compression gasket joint.

C. Corrugated Polyethylene Pipe (PE): Pipe complying with AASHTO M294 and MP7, and ASTM D3550. Interior of pipes shall be smooth, and shall have an "n" value of not less than 0.010. Pipes shall be joined with gasketed bell and spigot joints complying with ASSHTO M252 and M294. Gaskets shall comply with ASTM F477 and ASTM D I 149. Provide minimum coverage per manufacturer's sepcifications.
   1. Acceptable Manufacturers of Corrugated Polyethylene Pipe: Hancor "Sure Lok", or Equal.

D. Plastic Pipe: ASTM D 3034, Type PSM, Poly(Vinyl Chloride) (PVC) material; inside nominal diameter of specified inches, bell and spigot style solvent sealed joint end.

2.02 PIPE ACCESSORIES

A. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

PART 3 EXECUTION

3.01 TRENCHING

A. See Section 02317 for additional requirements.

B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.02 INSTALLATION - PIPE

A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

B. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.

C. Install pipe, fittings, and accessories in accordance with ASTM D 2321 and manufacturer's instructions. Seal joints watertight.

D. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch in 10 feet.

3.03 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance requirements of local authorities having juristiction.

3.04 PROTECTION

A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

SECTION 02640

MANHOLES AND COVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Modular precast concrete manhole sections with tongue-and-groove joints with masonry transition to lid frame, covers, anchorage, and accessories.

B. Modular precast catch basins with frames and grates.

C. Modular precast concrete electric handholds and telephone manholes, with tongue-and-groove joints with masonry transition to lid frame, covers, anchorage, and accessories.

D. Precast concrete grease trap

1.02 RELATED SECTIONS

A. Section 02250 - Dewatering

B. Section 02317 - Common Excavation, Embankment, and Compaction

C. Section 02535 - Sanitary Sewer Piping.

D. Section 04810 - Unit Masonry Assemblies: Masonry units.

E. Section 02635 - Storm Drainage Piping.

1.03 REFERENCES

A. ASTM C 478 - Standard Specification for Precast Reinforced Concrete Manhole Sections; 1997

B. ASTM C 478M - Standard Specification for Precast Reinforced Concrete Manhole Sections (Metric); 1997.

1.04 SUBMITTALS

A. Shop Drawings: Indicate manhole locations, elevations, piping sizes and elevations of penetrations.

B. Product Data: Provide manhole covers, component construction, features, configuration, and dimensions.

1.05 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manhole and Catch Basin Sections: Reinforced precast concrete in accordance with ASTM C 478 (ASTM C 478M), with gaskets in accordance with ASTM C 923 (ASTM C 923M).
   1. Use concrete that will attain a 28-day compressive strength of not less than 4,000 psi.
   2. Reinforcing: H-20 loading.
   3. Horizontal Joints:
      a. Tongue and Groove formed of concrete to receive a flexible plastic gasket.
      b. Joints to be watertight.
      c. Cast to allow installation to be vertical and in true alignment.
   4. Provide two tapered lifting holes 180 degrees apart in each section for handling and placing.
   5. Base Section: Cast holes for pipes to provide invert elevations as required by Drawings.
   6. Pipe to Structure Joints:
      a. Flexible sleeves, rubber quality, ASTM C-443 and C361 cast into base.
      b. If pre-manufactured adaptor cannot be installed, use rubber concrete adaptor designed to provide a watertight seal between pipe and structure.

6. Mortar and Grout: As specified in Section 04810, Type S

C. Concrete Masonry Units: ANSI/ASTM C139.

D. Manhole Brick: ANSI/ASTM C32, Grade MS

E. Sewer Brick: ANSI/ASTM C32, Grade SS.

F. Masonry Mortar: ANSI/ASTM C270, Type M

G. Mahole Frames and Covers: Grey cast iron, ANSI/ASTM A 48, Class 30 B.
   1. Comply with requirements of FS RR-F-621 for type and style indicated.
   2. Furnish covers with cast-in legend on roadway face as indicated.

H. Manhole Steps: Grey cast iron, ANSI/ASTM A 48, Class 306, integrally cast into manhole sidewalls, unless otherwise indicated.

I. Catch Basin Frames and Gratings: Grey cast iron, ANSI/ASTM A 48, Class 30 B
   1. Comply with requirements of FS RR-F-621, for type and style required.

J. Other Precast Structures:
   1. Use concrete that will attain a 28-day compressive strength of not less than 4,000 psi
   2. Manufactured in accordance with ASTM C-478.
   3. Reinforcing: H-20 loading.
   4. Horizontal Joints:
      a. Tongue and groove formed of concrete to receive a flexible plastic gasket.
      b. Joints to be watertight.
      c. Cast to allow installation to be vertical and in true alignment
   5. Pipe to Structure Joints:
      a. Flexible sleeves, rubber quality, ASTM C-433 and C-361 cast into base.
      b. If pre-manufactured adaptor cannot be installed, use rubber-concrete adaptor designed to provide a watertight seal between pipe and structure.

2.02 ELECTRIC HANDHOLDS AND TELEPHONE MANHOLES - DIVISION 16

A. Electric handholds shall comply with the requirements of Central Maine Power

B. Telephone manholes shall comply with the requirements of Verizon

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify items provided by other sections of Work are properly sized and located.

B. Verify that built-in items are in proper location, and ready for roughing into Work.

C. Verify excavation for manholes is correct

3.02 PREPARATION

A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

3.03 PRECAST CONCRETE STRUCTURES

A. Precast Concrete Structures: Place precast concrete sections as shown on drawings. Where structures occur in pavement, set tops of frames and covers flush with finish surface. Elsewhere, set tops 3" above finish surface, unless otherwise indicated.
1. Use epoxy bonding compound where manhole steps are mortared into structure walls
2. Provide rubber joint gasket complying with ASTM C443.
3. Place base section level on 12 inch layer of crushed stone.
4. Fix inlet and outlet stubs into sleeves with stainless steel pipe clamp.
5. Place barrel sections, cones or tops of the appropriate combination of heights to meet grades required by Drawings or existing conditions.
6. Seal horizontal joints as recommended by manufacturer.
7. Apply lubricant to inside tongue and rubber gaskets immediately prior to joining sections.
8. Fill lifting holes with non-shrink mortar.
9. Place frame and grate on top or otherwise prevent accidental entry by unauthorized persons until ready for adjustment to grade.
10. Repair damaged coating of frames and covers with coat-tar-pitch varnish.

3.04 MASONRY WORK

A. Laying Brick:
1. Use clean bricks.
2. Lay brick by methods consistent with the trade acceptable to Owner
3. Lay in a full bed of mortar and joint without subsequent grouting, flushing, or filling, and thoroughly bond
4. Bring casting rim to grade with brick and coat outside with mortar; minimum thickness 3/8 inch with troweled waterproof surface.

3.05 ELECTRIC HANDHOLDS AND TELEPHONE MANHOLES

A. Electric handholds shall be installed in accordance with the requirements of Central Maine Power.

B. Telephone manholes shall be installed in accordance with the requirements of Verizon

END OF SECTION

SECTION 02741

BITUMINOUS CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hot bituminous concrete paving.

B. Granite Curb.

C. Surface sealer.

1.02 RELATED SECTIONS

A. Section 02315 - Common Excavation, Embankment and Compaction

B. Section 02317 - Trenching.

1.03 REFERENCES

A. State *of* Maine Department of Transportation Standard Specifications Highways and Bridges, latest revision, hereafter designated as MDOT Specifications.

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with MDOT Section 403.

B. Mixing Plant: Conform to MDOT Section 401

C. Obtain materials from same source throughout.

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable code for paving work on public property.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Weather and seasonal limitations as required by MDOT Section 401.07 shall apply to this Section.

1.07 TESTS

A. Submit proposed mix design of each class of mix for review prior *to* commencement of work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Cement. MDOT Section 702.

B. Hot Bituminous Pavement: MDOT Section 401.02 through 401.06.

C. Mineral Filler: MDOT Section 703.

D Emulsified Bituminous Sealing Compound: MDOT Section 702.12

E Granite Curb: MDOT Section 712.04. City of Portland

F. Joint Mortar: MDOT Section 705.02

A. Tack Coat: Emulsified asphalt for tack coat shall conform to MDOT Section 702

A. Bituminous Curb

A. Pavement Stripping: MDOT Section 708.03, Type N glass beads conforming to AS HTO M 247 Type I.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

C. Beginning of installation means acceptance of substrate.

3.02 PREPARATION AND PLACEMENT

A. Place tack coat on swept surfaces as noted on Drawings

B. Prepare and place plant mix hot bituminous pavement in accordance with MDOT Sections 301 and 401.

3.03 CURBS

A. Granite Curb: Conform to the requirements of MDOT Section 609.06

3.04 SEAL COAT

A Apply seal *coat* to surface course in accordance with MDOT Section 609.06.

3.05 TOLERANCES

A. Flatness: Conform to requirements of MDOT Section 401.20.

B. Compacted Thickness: Conform to requirements of MDOT Section 401.17.

C. Variation from True Elevation: Conform to requirements *of* MDOT Section 403.

3.06 FIELD QUALITY CONTROL

A. Provide field inspection and testing. Take samples and perform tests in accordance with MDOT Specifications.

3.07 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury for 5 days.

END OF SECTION

2.03 STEEL FENCE FRAMING

A. Steel pipe - Type I: ASTM F 1083, standard weight schedule 40; minimum yield strength of 25,000 psi. sizes as indicated. Hot-dipped galvanized with minimum average 1.8 oz/ft² of coated surface area.

B. End and Corner Post 3" od 5.7 lbs/ft (4' at dumpster)

Intermediate Post 3" od 3.65 lbs/ft (9" at dumpster)

2.05 ACCESSORIES

A. Chain link fence accessories: [ASTM F 626] Provide items required to complete fence system. Galvanize each ferrous metal item and finish to match framing.

B. Post caps: Formed steel, cast malleable iron, or aluminum alloy weathertight closure cap for tubular posts. Provide one cap for each post. Cap to have provision for barbed wire when necessary. "C" shaped line post without top rail or barbed wire supporting arms do not require post caps. (Where top rail is used, provide tops to permit passage of top rail.)

C. Top rail and brace rail ends: Pressed steel per **ASTM** F626, for connection of rail and brace to terminal posts.

D. Top rail sleeves: 7" (178 mm) expansion sleeve with spring, allowing for expansion and contraction of top rail.

E. Wire ties: 9 gauge 0.148" (3.76 mm) galvanized steel wire for attachment of fabric to line posts. Double wrap 13 gauge 0.092" for rails and braces. Hog ring ties of 12-1/2 gauge for attachment of fabric to tension wire.

F. Brace and tension (stretcher bar) bands: Pressed steel. At square post provide tension bar clips.

G. Tension (stretcher) bars: One piece lengths equal to 2 inches less than full height of fabric with a minimum cross-section of 3/16" x 3/4" (4.76 mm x 19 mm) or equivalent fiber glass rod. Provide tension (stretcher) bars where chain link fabric meets terminal posts.

H. Tension wire: Galvanized coated steel wire, 7 gauge, 0.177"diameter wire with tensile strength of 75,000 psi

I. Truss rods & tightener: Steel rods with minimum diameter of 5/16". Capable of withstanding a tension of minimum 2,000 lbs.

L. Nuts and bolts are galvanized.

M. Privacy Slats:

Standard –PDS (self-locking using horizontal bottom channel system)

All slats are manufactured from a combination of color pigments, quality high density virgin polyethylene and ultraviolet inhibitors.

1. Color: To be chosen

2. 25 years limited warranty against either color fading or breakage of slats and locking-channel used under normal climactic extremes experienced In North America and Hawaii.

2.06 SETTING MATERIALS

A. Concrete: Minimum 28 day compressive strength of 3,000 psi .

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify areas to receive fencing are completed to final grades and elevations.
B. Ensure property lines and legal boundaries of work are clearly established.

3.02 CHAIN LINK FENCE FRAMING INSTALLATION

A. Install chain link fence in accordance with ASTM F 567 and manufacturer's instructions.

B. Locate terminal post at each fence termination and change in horizontal or vertical direction of 30" or more.

C. Space line posts uniformly at 10' on center.

D. Concrete set [terminal] [and] [gate] posts: Drill holes in firm, undisturbed or compacted soil. Holes shall have diameter **4** times greater than outside dimension of post, and depths approximately 6" deeper than post bottom. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads. Set post bottom 36" below surface when in firm, undisturbed soil. Place concrete around posts in a continuous pour. Trowel finish around post. Slope to direct water away from posts.

E. Drive Anchor line posts: With protective cap, drive post 36" into ground. Slightly below ground level install drive anchor shoe fitting. Install 2 diagonal drive anchors and tighten in the shoe.

F. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.

G. Bracing: Install horizontal pipe brace at mid-height for fences 6' and over, on each side of terminal posts. Firmly attach with fittings. Install diagonal truss rods at these points. Adjust truss rod, ensuring posts remain plumb.

H. Tension wire: Provide tension wire at bottom of fabric [and at top, if top rail is not specified].

Install tension wire before stretching fabric and attach to each post with ties. Secure tension wire to fabric with 12-1/2 gauge hog rings 24" oc.

I. Top rail: Install lengths, 21'. Connect joints with sleeves for rigid connections for expansion/contraction.

K. Bottom Rails: Install bottom rails between posts with fittings and accessories.

3.03 CHAIN LINK FABRIC INSTALLATION

A. Fabric: Install fabric on security side and attach so that fabric remains in tension after pulling force is released. Leave approximately 2" between finish grade and bottom selvage. Attach fabric with wire ties to line posts at 15" on center and to rails, braces, and tension wire at 24" on center.

B. Tension (stretcher) bars: Pull fabric taut; thread tension bar through fabric and attach to terminal posts with bands or clips spaced maximum of 15" on center.

3.04 ACCESSORIES

A. Tie wires: Bend ends of wire to minimize hazard to persons and clothing.

B. Fasteners: Install nuts on side of fence opposite fabric side for added security.

C. Slats: Install slats in accordance with manufacturer's instructions.

3.05 CLEANING

A. Clean up debris and unused material, and remove from the site.

END OF SECTION

SECTION 02890

TRAFFIC SIGNS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Installation of traffic control signs.

1.02 REFERENCES

A. US Department of Transportation, Federal Highway Administration's "Manual on Uniform Traffic Control Devices" (MUTCD), latest edition.

B. Construction Drawings

PART 2 PRODUCTS

2.01 SIGNS - MUTCD CLASSIFICATION IS SHOWN IN PARENTHESES

A. "ACCESSIBLE PARKING SYMBOL" Signs: 12-inches **x** 18-inches, green legend and border, white symbol on blue box, and white background (R7-8)

2.02 POSTS

A. "U" channel galvanized steel posts with galvanized sign-mounting hardware for each sign. Posts shall have a weight of 2-pounds per lineal foot.

PART **3** EXECUTION

3.01 PREPARATION

A. Contractor to field verify all underground utilities prior to sign installation. Primary utilities of concern, of shallow depths, are electric, telephone, fiber optic, cable and gas

B. Cost related to repair of damaged surface and subsurface facilities shall be paid for by the Contractor at no additional expense to the Owner.

3.02 INSTALLATION

A. Set posts vertical and plumb with bottom of sign at 6'-5" above finish grade unless otherwise indicated on the Construction Drawings. Mount signs in accordance with manufacturer's instructions. Minimum Post Embedment shall be 4'-0".

END OF SECTION

A. Codes and Standards: Comply with provisions of the following except where more stringent requirements are shown or specified:

1. ACI 213R-79 "Guide for Structural Lightweight Aggregate Concrete."

2. ACI 211.1-81 "Recommended Practice for Selecting Proportions for Normal Heavyweight and Mass Concrete."

3. ACI 212.2 R-81 "Guide for Use of Admixtures in Concrete."

4. ACI 301-72 (Revised 1981) "Specifications for Structural Concrete for Buildings."

5. ACI 302.1 R-80 "Guide for Concrete Floor and Slab Construction."

6. ACI 304-73 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete."

7. ACI 304-2 R-71 "Placing Concrete by Pumping Methods."

8. ACI 306 R-78 "Cold Weather Concreting."

9. ACI 308-81 "Standard Practice for Curing Concrete."

10. ACI 309-72 "Recommended Practice for Consolidation of Concrete."

11. ACI 315-80 "Details and Detailing of Concrete Reinforcement."

12. ACI 318-89 "Building Code Requirements for Reinforced Concrete."

13. ACI 347-78 "Recommended Practice for Concrete Formwork."

14. Concrete Reinforcing Steel Institute, "Placing Reinforcing Bars," 1976.

15. ACI 211.2-81 "Standard Practice for Selecting Proportions for Structural Lightweight Concrete."

B. Materials and installed work may require testing and retesting, as directed by the Architect. at any time during progress of work. Allow free access to material stockpiles and facilities. Tests not specifically indicated shall be done at Owner's expense. Retesting of rejected materials and installed work, shall be done at Contractor's expense.

1.05 SUBMITTALS:

A. Product Data: Submit manufacturer's product data with application and installation instructions for proprietary materials and items: including reinforcement and forming accessories, polypropylene fiber admixtures, patching compounds, non-shrink grout, water stops, joint systems, curing compounds, and others as requested by Architect.

B. Shop Drawings:

1. Reinforcement: Submit shop drawings for fabrication, bending and placement of concrete reinforcement. Comply with ACI 315, showing bar schedules, stirrup spacing, diagrams of bent bars and arrangement of concrete reinforcement. Include special reinforcement required at openings through concrete structures.

C. Samples: Submit samples of materials as specified and as otherwise requested by Architect, including names, sources and descriptions.

D. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design test if trial batch method is used for proportioning concrete mixes.

E. Strength Tests: Provide required records of strength tests if field experience method is used for proportioning concrete mixes.

PART 2 - PRODUCTS

2.01 FORM MATERIALS:

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

1. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with piece bearing legible inspection trademark.

E. Preformed Expansion Joint Formers:

1. Bituminous Fiber Type, ASTM D 1751.

2. Felt Void, Poly-Styrene Cap with removable top as manufactured by SUPERIOR.

F. Slab Joint Filler:

1. Multi-component polyurethane sealant (self-leveling type.

G. WaterStop: Duroseal Gasket Waterstop & Duroseal paste by AWS (Absolute Waterproofing Systems, Inc.). Install per manufacturers printed instructions.

H. Slab sealer to be "Safe Seal" by Dayton Superior or equal.

2.05 PROPORTIONING AND DESIGN OF MIXES:

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. Use material, including all admixtures, proposed for use on the project. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.

B. Submit written reports to Architect of each proposed mix for each class of concrete at least 14 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.

C. Proportion design mixes to provide concrete with the following properties:

1. Interior Slabs on Grade, Footings, Frost Walls:
   a. Strength: 3500 psi @28 days, 3/4" aggr.
   b. W/C Ratio: 0.46
   c. Entrained Air: 4% $\pm$ 1%
   d. Slump: 3" $\pm$ 1"

2. Exterior Slabs:
   a. Strength: 4000 psi @28 days, 3/4" aggr.
   b. W/C Ratio: 0.46

c. Entrained Air: 6% ± 1%
d. Slump: 3" ± 1"

3. Add air entraining admixture at manufacturers prescribed rate to result in concrete at point of placement having the above noted air contents.
   a. 4% to 8% for maximum 3/4" aggregate.
   b. 3 1/2% to 6 1/2% for maximum 1" aggregate.

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

1. Water may be added at the project only if the maximum specified slump and design mix maximum water/cement ratio is not exceeded.

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

2.06 CONCRETE MIXING:

A. Job-Site Mixing: Will not be permitted.

B. Ready-Mix Concrete: Must comply with the requirements of ASTM C 94, and as herein specified. Provide batch ticket for each batch discharged and used in work, indicating project name, mix type, mix time and quantity.

1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required by Engineer.
2. When the air temperature is between 85 degrees F. and 90 degrees F., reduce the mixing and delivery time from 1 1/2 hours to 75 minutes, and when the air temperature is above 90 degrees F., reduce the mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.01 FORMS:

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

B. Design, construct, erect, maintain, and remove forms for cast-in-place concrete work in compliance with ACI 347.

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

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

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

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

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

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

1. Unless otherwise indicated, provide ties so portion remaining within concrete after removal is 1" inside concrete and will not leave holes larger than 1" diameter in concrete surface.

1. Provision for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings,

recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

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

3.02 PLACING REINFORCEMENT:

A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.

1. Clean reinforcement of loose rust and mill scale, earth, ice. and other materials which reduce or destroy bond with concrete.

2. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.

3. Place reinforcement to obtain specified coverages for concrete protection within tolerances of ACI-3 18. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

4. Fiber Reinforcing shall be introduced directly into the concrete either at the batch plant or job site at the rate of 1.6 pounds (minimum) per cubic yard. If introduced at the batch plant with the aggregate, no extra mixing time is required. If added at the job site, approximately 3 to 5 minutes mixing at agitating speed is required.

3.03 JOINTS:

A. Construction Joints: Locate and install construction joints, which are not shown on drawings, so as not to impair strength and appearance of the structure, as acceptable to Architect.

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

2. Roughened surfaces shall be used between walls and footings unless shown otherwise on the drawings. The footing surface shall be roughened to at least an amplitude of 1/4" for the width of the wall before placing the wall concrete.

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

4. Joints in slabs on grade shall be located and detailed as indicated on the drawings. If saw-cut joints are required or permitted. cutting shall be timed properly with the set of the concrete: Cutting shall be started as soon as the concrete has been hardened sufficiently to prevent aggregate being dislodged by the saw, and shall be completed before shrinkage stresses become sufficient to produce cracking.

3.04 INSTALLATION OF EMBEDDED ITEMS:

A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings. diagrams, instructions and directions provided by suppliers of items to be attached thereto. Notify other trades to permit installation of their work.

B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface.

3.05 INSTALLATION OF GROUT

A. Place grout for base plates in accordance with manufacturer's recommendations

B. Grout below setting plates as soon as practicable to facilitate erection of steel and prior to removal of temporary bracing and guys. If leveling bolts or shims are used for erection grout shall be installed prior to addition of any column load.

C. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials and allow to cure. For proprietary grout materials, comply with manufacturer's instructions.

3.06 PREPARATION OF FORM SURFACES:

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

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

3.07 CONCRETE PLACEMENT:

A. Preplacement Review: Footing bottoms, reinforcement and all work shall be subject to review by the Architect. Verify that reinforcing, ducts, anchors, seats, plates and other items to be cast into concrete are placed and securely held. Notify Architect 48 hours prior to scheduled placement and obtain approval or waiver of review prior to placement. Moisten wood forms immediately before placing concrete where form coatings are not used. Be sure that all debris and other foreign matter is removed from forms.

B. General: Comply with ACI 304, and as herein specified.

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

2. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients and in a manner which will assure that the required quality of the concrete is maintained.

3. Conveying equipment shall be approved and shall be of a size and design such that detectable setting of concrete shall not occur before adjacent concrete is placed. Conveying equipment shall be cleaned at the end of each operation or work day. Conveying equipment and operations shall conform to the following additional requirements:

a. Belt conveyors shall be horizontal or at a slope which will not cause excessive segregation or loss of ingredients. Concrete shall be protected against undue drying or rise in temperature. An arrangement shall be used at the discharge end to prevent apparent segregation. Mortar shall not be allowed to adhere to the return length of the belt. Long runs shall be discharged into a hopper or through a baffle.

b. Chutes shall be metal or metal-lined and shall have a slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long, and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.

c. Pumping or pneumatic conveying equipment shall be of suitable kind with adequate pumping capacity. Pneumatic placement shall be controlled so that segregation is not apparent in the discharged concrete.

d. The loss of slump in pumping or pneumatic conveying equipment shall not exceed 2 inches. Concrete shall not be conveyed through pipe made of aluminum alloy. Standby equipment shall be provided on the site.

e. Tined rakes are prohibited as a means of conveying fiber reinforced concrete.

4. Do not use reinforcement as bases for runways for concrete conveying equipment or other construction loads.

C. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than **18** inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

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

2. Use vibrators designed to operate with vibratory equipment submerged in concrete, maintaining a speed of not less than 8000 impulses per minute and of sufficient amplitude to consolidate the concrete effectively. Do not use

vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine, generally at points 18 inches maximum apart. Place vibrators to rapidly penetrate placed layer and at least 6 inches into the preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion maintain the duration of vibration for the time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix, generally from 5 to 15 seconds. **A** spare vibrator shall be kept on the job site during all concrete placing operation.

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

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

2. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations. Do not sprinkle water on plastic surface.

3. Maintain reinforcing in proper position during concrete placement operations.

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

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

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

3. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators.

4. All temporary heat, form insulation, insulated blankets, coverings, hay or other equipment and materials necessary to protect the concrete work from physical damage caused by frost, freezing action, or low temperature shall be provided prior to start of placing operations.

5. When the air temperature has fallen to or is expected to fall below 40 deg.F, provide adequate means to maintain the temperature in the area where concrete is being placed between 50 and 70 deg.F.

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

Cool ingredients before mixing *to* maintain concrete temperature at time of placement below 90 deg.F. Mixing water may be chilled, or chopped ice may be used to control the concrete temperature provided the water equivalent of the ice is calculated to the total amount of mixing water.

Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that the steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

Wet forms thoroughly before placing concrete.

Do not use retarding admixtures without the written acceptance of the Architect.

3.08 FINISH OF FORMED SURFACES:

A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction. unless otherwise indicated. This concrete surface shall have texture imparted by form facing material, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4 in. in height rubbed down or chipped off.

B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, damp-proofing, painting or other similar system. This as-cast concrete surface shall be obtained with selected form facing material, arranged orderly and symmetrically with a

minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

C. Grout Cleaned Finish: Provide grout cleaned finish to scheduled concrete surfaces which have received smooth form finish treatment. Combine one part Portland cement to 1-1/2 parts fine sand by volume and mix with water to consistency of thick paint. Proprietary additives may be used at Contractor's option. Blend standard Portland cement and white Portland cement, amounts determined by trial patches. so that final color of dry grout will closely match adjacent surfaces.

Thoroughly wet concrete surfaces and apply grout to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

D. Related Unformed Surfaces: At tops of walls and grade beams, horizontal offset surfaces occurring adjacent to formed surfaces, strike-off, smooth and finish with a texture matching adjacent uniformed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.09 MONOLITHIC SLAB FINISHES:

A. Trowel Finish: Apply trowel finish to monolithic slab surfaces indicated, including slab surfaces to be covered with carpet, resilient flooring, 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 a surface plane tolerance not exceeding 1/4 in. in 10 ft. when tested with a 10-ft. straightedge. Grind smooth any surface defects which would telegraph through applied floor covering system.

B. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated.

1. Immediately after trowel finishing, slightly roughen concrete surface by broorning with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.10 CONCRETE CURING AND PROTECTION:

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with the requirements of ACI 306 as herein specified.

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

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

   a. Curing shall be continued for at least 7 days in the case of all concrete except high-early-strength concrete for which the period shall be at least 3 days. Alternatively, if tests are made of cylinders kept adjacent to the structure and cured by the same methods, moisture retention measures may be terminated when the average compressive strength has reached 70 percent of the specified strength, f'c. If one of the curing procedures below is used initially, it may be replaced by one of the other procedures any time after the concrete is 1 day old provided the concrete is not permitted to become surface dry during the transition.

3. When the mean daily temperature is less than 40 deg.F, the temperature of the concrete shall be maintained between 50 and 70 deg.F for the required curing period.

   a. When necessary, arrangements for heating, covering, insulation, or housing the concrete work shall be adequate to maintain the required temperature without injury due to concentration of heat. Combustion heaters shall not be used during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide.
   b. Keep protections in place and intact at least 24 hours after artificial heat is discontinued. Avoid rapid dry-out of concrete due to overheating and avoid thermal shock due to sudden cooling or heating.

   c. Changes in temperature of the air immediately adjacent to the concrete during and immediately following the curing period shall be kept as uniform as possible and shall not exceed 5 deg.F in any 1 hour or 50 deg.F in any 24 hour period.

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

1. Provide moisture curing by following methods:

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

b. Continuous water-fog spray.

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

2. Provide moisture-cover curing as follows:

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

3. Provide curing compound to slabs as follows:

a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete [within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

c. Separating compound may be used as a curing medium if applied in accordance with manufacturer's specifications.

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

D. Protection From Mechanical Injury: During the curing period, the concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock. and excessive vibration. All finished concrete surfaces shall be protected

from damage by construction equipment, materials, or methods, by application of curing procedures, and by rain or running water. Self-supporting structures shall not be loaded in such a way as to overstress the concrete.

3.11 REMOVAL OF FORMS:

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

B. Formwork supporting weight of concrete, such as beam soffits, joints, slabs and other structural elements, may not be removed in less than 14 days and until concrete has attained design minimum compressive strength at 28 days. Determine potentia1 compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.

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

3.12 REUSE OF FORMS:

A. Clean and repair surfaces of forms to be reused in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.

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

3.13 MISCELLANEOUS CONCRETE ITEMS:

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

3.14 CONCRETE SURFACE REPAIRS:

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to the Architect.

1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

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

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

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

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

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

4. Repair defective areas. except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding

compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in the same manner as adjacent concrete.

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

6. Use epoxy-based mortar for structural repairs, where directed by the Architect.

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

3.15 QUALITY CONTROL. TESTING DURING CONSTRUCTION:

A. The Contractor shall employ a testing laboratory to inspect, sample and test the materials and the production of concrete and to submit test reports. Concrete testing shall be performed by technicians certified by the Maine Concrete Technician Certification Board.

B. Concrete shall be sampled and tested for quality control during placement of concrete shall include the following, unless otherwise directed by Architect.

C. Sampling Fresh Concrete: ASTM C 172.

1. Slump: ASTM C 143: one test for each concrete load at point of discharge and one test for each set of compressive strength test specimens. **A** slump test must be run prior to the incorporation of the CFP fibers per recommendations of ACI 544.

2. Air Content: ASTM C 231 "Pressure method for normal weight concrete." One for each set of compressive strength test specimens.

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

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

   a. Fiber reinforced concrete test specimens shall be vibrated externally per recommendations ACI 544.

5. Compressive Strength Tests: ASTM C 39; one set for each 100 cu. yds. or fraction thereof, of each concrete class placed in any one day or for each 5,000 sq. ft. of surface area placed; 1 specimen tested at 7 days, 2 specimens tested at 28 days, and 1 specimen retained in reserve for later testing if required.

   a. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 used.

   b. When total quantity of a given class of concrete is less than 50 cu. yds., strength test may be waived, if in the Architect's judgement, adequate evidence of satisfactory strength is provided.

   c. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

   d. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.

   e. Test results will be reported in writing to Architect and Contractor on the day after tests are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type

and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials compressive breaking strength, and type of break for both 7-day tests and 28-day tests.

D. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods, as directed. Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.

3.16 ENGINEER'S REVIEW

A. The Engineer of Record will conduct periodic reviews of the construction for compliance with the provisions of the Design Documents during the construction period.

B. The General Contractor shall employ a licensed professional engineer to analyze and design modifications and repairs for construction not in conformance with the provisions of the Contract Documents. These modifications and repair details shall be stamped by an engineer licensed to practice in the State of Maine and submitted with calculations for approval by the Engineer of Record. Modifications shall not be made without express written approval.

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

1. GENERAL

1.1 GENERAL PROVISIONS

A. SCOPE: Drawings and general provisions of Contract, including General Conditions and Division 1 specifications, apply to work in this section. Performance shall meet the requirements of these Specifications.

1.2 DESCFUPTION OF WORK

A. The work covered by this section **of** Specifications consists of the following:

1. All rough carpentry work **as** required by Drawings and **as** specified under this section to include: framing, blocking, sheathing, miscellaneous siding and exterior trim, vents, access panels, certain site improvements and temporary structures, and other misc. items specified elsewhere and shown on Drawings.

2. Installation of metal **and** other items furnished by other trades, if specifically noted in these specifications and cutting/patching for other trades as necessary **for** proper execution of their work.

2. PRODUCTS:

2.1 ALL LUMBER shall be as shown on Drawings or called for in this section. Lumber shall be live stock, thoroughly seasoned, and well manufactured. Materials shall be free from warp that cannot be corrected by bridging or nailing.

2.2 FRAMING LUMBER: "**S**" dried Eastern Spruce, NELMA #2 grade or better. Lumber shall be stamped "**S**" dry with moisture content not to exceed 19%, dressed four sides sound and free from significant warps, checks, splits, and knots. Dressed sizes shall comply with American Lumber Standards and sizes shown **on** Drawings are nominal unless shown as actual by inch (") notations.

2.3 PRESSURE TREATED LUMBER where used in contact with concrete, water, or earth shall meet AWPA C-2 for acceptable water-borne preservative process (no creosote or Pentachlorophenal). Timber shall be Southern Yellow Pine treated with CCA to 0.4 # c.f., in contact with concrete **(0.6** where buried), in accordance with **AWPA** C-18.

2.4 SHEATHING: All sheathing shall **bear** A.P.A. stamp.

2.5 WALL SHEATHING: APA Rated sheathing **24/16,** 1/2" minimum thickness.

2.6 ROOF **SHEATHING:** APA Rated sheathing to be; Exterior 19/32, APA rated sheathing **48/24** for 24" o.c. with **H** clips

2.7 TRIM **FLASHING:** Aluminum "Z" **flashing 24** gauge with ¼" lower lip.

2.8 ROOF TRUSSES: See Section 06190 Timber Trusses.

2.9 **NAILS: As** noted in these Specifications and on Drawings.

2.10 SCREWS, BOLTS AND OTHER FASTENERS: **as** shown on Drawings **and** of length adequate to support loads where shown; where not shown, consult Architect.

2.1 1 **SILL** SEALER: See Section 07200 - Insulation.

3. EXECUTION:

3.1 GENERAL: The Contractor shall carefully lay out and erect all structural members of rough carpentry, framing, sheathing, blocking, bridging **and** other items of work **as** necessary to install the finished work as shown on Drawings and as noted in Specifications. *All* members shall be properly braced, plumbed and leveled. A sufficient number of nails, as shown on Drawings and nailing schedule, screws and bolts shall be used to insure the rigidity of the construction.

3.2 FRAMING:

A. *All* framing shall be installed closely fitted, accurately set in place to the required lines and levels, and shall be of the dimensions shown on Drawings. Do not impair structural members by improper cutting or drilling. Contractor must follow truss manufacturer limitation of cutouts. Columns shall be continuous without splices from base to girder and shall be joined by nailing alternate sides with 2-16d nails 12" o.c.

B. Joints of girders shall be centered over supports. Framing joists into side of wood **beams** or girders shall be done with steel joist hangers or connectors **as** shown on Drawings.

3.3 **BLOCKING:**

A. (2x6, 2x8 or wider) shall be provided **as** necessary for the application of plumbing and fixtures **as** defined in Section 15400, toilet accessories, grab bars, kitchen cabinets, and other wall mounted accessories, electrical and communications equipment. Provide either blocking for or center stud in closet back walls for closet rod/shelf bracket.

B. Provide solid blocking at panel joints of horizontally laid plywood in all external walls.

3.4 WALL SHEATHING:

A. Applied horizontally. Blocking required at horizontal joint leave 1/8" - 1/4" space at panel side joints and end joints, unless otherwise recommended by manufacturer. Nail 1/2" sheathing with 8d common nails at 4" o.c. at edges, 16" o.c. at intermediate supports, 3/8" minimum crown, 1" minimum penetration in studs at 4" o.c. at edges and 8" o.c. at intermediate supports. Unless otherwise noted on the Drawings.

Installation of oriented strand board must meet manufacturers recommendations for cut edge treatment, protection and all other aspects of this product.

3.5 ROOF SHEATHING: Shall be installed continuous over two or more spans with long dimension across supports. End joints shall be over supports and staggered in adjacent courses. Leave 1/4" space at panel edge joints and 1/8" space at panel end joints; unless otherwise recommended by manufacturer. Nail: 8d common at 6" o.c. at panel edges, 16" o.c. at intermediate supports. H" clips required at joints perpendicular to framing midway between every support.

3.6 DOOR **FRAMES:** Shall be securely anchored to the supporting construction. Install solid wood blocking at all hinges and door latch locations. Framing shall be so door can be hung true and plumb (See Section 08200 Doors). Window framing shall be as shown on Drawings, true and plumb.

END OF SECTION

SECTION 06190

PREFABRICATED TIMBER TRUSSES

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. RELATED DOCUMENTS: Drawings and general provisions of the contract, including General and Supplementary Conditions and Division I Specification sections apply to work of this section.

B. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 DESCRIPTION OF WORK:

A. Definition: Prefabricated wood trusses include planar structural units consisting of metal plate connected members which are fabricated from dimension lumber and which have been cut and assembled prior to delivery to the job site.

B. Types of fabricated wood trusses are indicated on the drawings.

C. **DESIGN LOADS**

- **Top Chord Dead Load – 15# / sq. ft.**
- **Bottom Chord Live Load – 5# / sq. ft.**
- **Balanced Snow Load – 42# / sq. ft.**
- **Unbalanced snow and wind load per BOCA 1999**

1.03 RELATED WORK SPECIFIED ELSEWHERE:

A. Section 06100 - Rough Carpentry

1.04 QUALITY ASSURANCE:

A. TPI Standards: Comply with applicable requirements and recommendations of the following Truss Plate Institute (TPI) publications:

1. "Design Specification for Metal Plate Connected Wood Trusses."

2. Commentary and Recommendations for Handling and Erecting Wood Trusses."

section modulus, assembled allowable stress, stress diagrams and calculations and similar information needed for analysis and to ensure that trusses comply with requirements.

3. Engineer Stamp: Provide shop drawings which have been signed and stamped by a structural engineer licensed to practice in the State of Maine.

4. TPI Approval: All drawing submittals must bear a TPI stamp.

5. Submittal: Submit (1) blue line print and (1) reproducible transparency (Sepia) of each shop drawing.

1.06 DELIVERY, STORAGE, HANDLING

A. Handle and store trusses with care, and in accordance with manufacturer's instructions and TPI recommendations to avoid damage from bending, overturning or other cause for which truss is not designed to resist or endure.

B. Time delivery and erection of trusses to avoid extended on-site storage and to avoid delaying work of other trades whose work must follow erection of trusses.

PART 2 - PRODUCTS

2.01 LUMBER

A. General: Factory mark each plate of lumber with type, grade, mill and grading agency.

B. Sizes: Nominal sizes are indicated except as shown by detail dimensions. Provide actual sizes as required by PS 20 for dressed lumber, S4S, unless otherwise indicated.

C. Moisture Content: Provide seasoned lumber with a maximum moisture content of 19% at time of dressing.

D. Lumber Grade: Lumber members will be graded in accordance with the following grading agency requirements:

1. Eastern Woods: NELMA or NHPMA

2. Western Woods: WWPA

3. Southern Pine: SPIB

2.02 METAL CONNECTOR PLATES, FASTENERS AND ANCHORAGES

A. Connector Plate Material: Use metal not less than "0.036" thick, coated thickness, (Contractor's option if more than one metal indicated).

1. Galvanized Sheet Steel: ASTM **A** 446, Grade A, Coating G60.

2. Electrolytic Zinc Coated Steel Sheet: ASTM **A** 591, Coating Class C, with minimum structural quality equivalent to ASTM A 446, Grade A.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering metal connector plates which may be incorporated in the work, but are not limited to, the following:

a. Gang Nail Systems, Inc.
b. Hydro-Air Engineering, Inc.
c. Inter-Lock Steel Co., Inc.
d. Link-Wood Construction Systems
e. Robbins Manufacturing Co.
f. Tee-Lok Corp.
g. Truss Connectors of America
h. Truswall Systems Corp.

2.03 FIRE RETARDANT TREATMENT:

A. Not applicable.

2.04 FABRICATION:

A. Cut truss members to accurate lengths, angles and sizes to produce close fitting joints with wood-to-wood bearing in assembled units.

B. Fabricate metal connector plates to size, configuration, thickness and anchorage details required for types of joint designs indicated.

C. Assemble truss members in design configuration indicated using jigs or other means to ensure uniformity and accuracy of assembly with close fitting joints. Position members to produce design camber indicated.

D. Connect truss members by means of metal connector plates accurately located and securely fastened to wood members by means indicated or approved.

PART 3 - EXECUTION

3.01 GENERAL

A: Erect and brace trusses to comply with the recommendations of the Manufacturer and the TPI publications referenced above.

B. Erect trusses with plane of truss webs vertical (plumb) and parallel to each other, located accurately at design spacings indicated.

C. Hoist units in place by means of lifting equipment suited to sizes and types of trusses required, applied at designated lift points as recommended by fabricator, exercising care not to damage truss members or joints by out-of-plane bending or other causes.

C. Provide temporary bracing as required to maintain trusses plumb, parallel and in location indicated, until permanent bracing is installed.

D. Anchor trusses securely at all bearing points to comply with methods and details indicated.

E. Install permanent bracing and related components to enable trusses to maintain design spacing, withstand live and dead loads including lateral loads, and to comply with other indicated requirements.

F. Do not cut or remove truss members.

3.02 ENGINEER'S REVIEW

A. The Engineer of Record will conduct periodic reviews of the construction for compliance with the provisions of the Specifications and Drawings during the construction period.

B. The General Contractor shall employ a licensed professional engineer to analyze and design modifications and repairs for construction not in conformance with the provisions of the Contract Documents. These modifications and repair details shall be stamped by an engineer licensed to practice in the State of Maine and submitted with calculations for approval by the Engineer of Record. Modifications shall not be made without express written approval.

END OF SECTION

SECTION 06200

FINISH CARPENTRY

1. GENERAL

1.1 GENERAL PROVISIONS: Drawings and general provisions of Contract, including General Conditions and Division 1 specifications, apply to work in this section.

1.2 DESCRIPTION OF WORK:

A. The extent of work shall be as shown on Drawings and called for in these Specifications. Performance shall meet the requirements of these Specifications. The work covered by this section of Specifications consists of the following:

1. **All** finished carpentry work and millwork as required by Drawings and as specified under this section.
2. Installation of metal and other items furnished by other trades, if specifically noted in these Specifications.

2. PRODUCTS

2.1 EXTERIOR TRIM: Eave, window, door, cornerboard, column and other exterior trim shall be Perma-Trim cellular PVC trim boards by Edge Building Products – color white. (See Section 2.3 Nails below.)

2.2 PORCH RAILING: PVC resin railing system: Oxford Ever-new vinyl railing by CertainTeed.

2.3 BOARD LUMBER shall comply with the American Lumber Standards Simplified Practice Recommendation No. 16. Grade of board lumber shall be suitable for its intended use. Finish lumber is to be painted and shall be dressed free of tool marks and other objectionable defects. All exposed lumber to be architectural quality grade: Custom.

2.4 NAILS: 6d for 1/2" finish stock and 4d finish for thinner wood. Use 8d generally for nailing 3/4" wood trim to framing. **All** nails used with cellular PVC trim shall **be** stainless steel finish nails.

2.5 SCREWS, BOLTS & OTHER FASTENERS: as shown on Drawings with penetration into framing or blocking adequate to support loads shown. Where not shown, consult Architect.

2.6 CLOSET SHELVING: Pre-manufactured plastic coated wire shelving with integral clothes hanger. Closet Maid or equal. Five (5) shelves finish linen closet, one shelf typical closet.

2.7 UNIT NUMBERS: 2" solid brass double digit numbers, style to be selected **by** Architect for exterior apartment entry,

2.8 INTERIOR TRIM: All interior trim to be equal to No.1 poplar. Finger joints are allowed only where trim is to be painted. **BIN all knots.**

3. EXECUTION

3.1 ALL ITEMS OF MILLWORK shall be carefully erected, leveled and plumbed with tight-fitting joints and square corners, carefully cut and secured. Exposed nails shall be set adequately for putty. Moulds and faces shall be free from hammer or other tool marks, clean-cut and true pattern. All work shall be thoroughly cleaned and sanded to receive the finish. Sharp corners of small members of finished woodwork shall be slightly rounded. All trim baseboards, etc. fastened to walls shall be secured to wall framing members and nails set. Care shall be taken to avoid splitting ends of trim boards.

3.2 INTERIOR TRIM: Install trim with finishing nails and glue where required to assure permanent, tight joints, according to Drawing details.

END OF SECTION

SECTION 07200

INSULATION AND VAPOR BARRIERS

1. GENERAL:

1.1 GENERAL PROVISIONS: Drawings and general provisions of Contract. including General Conditions and Division 1 specifications, apply to work in this section.

1.2 DESCRIPTION OF WORK: The extent of work shall be as shown on Drawings and called for in these Specifications. Performance shall meet the requirements of the Specifications. The work covered by this section of Specifications consists of the following:

1. Installation of rigid insulation on inside foundation wall and sill sealer, where shown on Drawings.
2. Installation of rigid insulation, fiberglass batts, blown insulation, and sound insulation in exterior walls, interior walls, ceilings and floors where shown on Drawings.
3. Vapor barriers to be installed as shown.

2. PRODUCTS:

2.1 SLAB AND FOUNDATION WALL INSULATION: sizes as shown on Drawings. Type Sm Styrofoam insulation by Dow Chemical, or approved equal.

2.2 BATT INSULATION TYPE: 6" (or as shown) Fiberglass by Owens-Corning- Fiberglass, or equal.

2.3 BLOWN INSULATION TYPE: Fiberglass Blowing Insulation by Certainteed or equal.

2.4 EAVE BAFFLE AIR GUIDE: Owens – Corning "Raft – R – Mate" or equal.

2.5 MOISTURE PROTECTION: 6 mil. clear polyethylene film in exterior walls and attic ceilings as manufactured by Dow Chemical, or equal.

2.6 SILL SEALER: "Dow" ¼" x 5-1/2" fiberglass sill sealer.

2.7 SHEATHING PAPER: Tyvek – Commercial Wrap.

3. EXECUTION:

3.1 RIGID INSULATION on foundations walls must extend to a minimum 24" below grade.

3.2 FIBERGLASS INSULATION

A. Attic: Install all fiberglass batt insulation tight to framing members.

B. When Fiberglass Ceiling Insulation is installed, batts are to be fluffed out to full nominal depth and tucked as close to the exterior wall line of the building as feasible. Care shall be taken to maintain minimum of 1½ " by bay width space at the top of the insulation where it meets the exterior wall to insure proper ventilation of the attic space from the perimeter soffit vent system.

C. Polystyrene baffle vents shall be installed according to manufacturer's recommendations at all eaves to provide a stop for fiberglass insulation and the proper conduction of air to ventilation attic insulation. Air guides are to be installed at rafters to insure adequate air flow past insulation.

D. Fiberglass Blown Over Batts shall be done to provide consistent depth indicated on Drawings and according to manufacturer's instructions. Total R-factor to be 38.

E. Fiberglass batts in exterior walls between floors shall be fluffed to full nominal depth and shall be stuffed in around window unit frame to fill gap between frame and rough opening studs. Secure wall batts at top of cavity with wire or nails into side of studs. Provide foam insulation in ¼" or less gaps between frame and R.O. Insure that insulation is tight and full

3.3 MOISTURE PROTECTION: A continuous 6-mil. vapor barrier shall be installed on all exterior walls stapled to hold fiberglass batts in place, as part of the work of this section. Vapor barrier on walls shall be 8' wide to minimize horizontal joints. All joints in vapor barrier shall be taped, and all vapor barrier free edges shall be taped to substrate. Minimum lap at joints to be 8" including lap at wall/ceiling (cap 8" each surface).

END OF SECTION

SECTION 07300

ROOFING AND FLASHING

1. GENERAL

1.1 GENERAL PROVISIONS: Drawings and general provisions of Contract, including General Conditions and Division 1 specifications, apply to work in this section.

1.2 DESCRIPTION OF WORK:

A. The extent of work shall be as shown on Drawings and called for in these Specifications. Performance shall meet the requirements of these Specifications. The work covered by this section of Specifications consists of the following:

1. Complete installation of roofing as shown on Drawings or noted in these Specifications.
2. Installation of all flashings as needed to make the roof watertight.
3. Installation of flashings in connection with work of other trades and flashings furnished by others in connection with roof work.
4. Installation of rain diverters, drip edges and fascias.
5. Furnish and install ridge vents.

1.3 SUBMITTALS: Contractor to submit manufacturer's information on shingles and vents.

2. PRODUCTS;

2.1 ASPHALT SHINGLES:

A. Shall be Class C of the Underwriters' Laboratories, Inc., and shall meet ASTM D-225 Type III, ASTM D3161 and UL Standard #997 for compliance with wind resistance.

B. Shingles shall be IKO Aristocrat asphalt with 25 year warranty or equal. Color to be chosen by Architect.

2.2 ROOF FLASHINGS; shall be .014 mil aluminum.

2.3 DOOR, WINDOW & WALL FLASHING – "Vycor plus" self-adhering flashing by W.R. Grace or equal.

2.4 DRIPEDGES: shall be 8"preformed galvanized aluminum on fascia, 5" on rake min. 0.032".

2.5 RIDGE VENT: shall be Filtervent by Air Vent Inc., Peoria, Hts., Ill. **(1-800-AIR**VENT) or equal. Open ridge venting to be Ridge Filter Shingle Vent (series SHFV 103), venting at roof/wall junctures to be Flash Filtervent (series FFV 131 or FFV 161)

2.6 ROOFING FELTS: shall be 15# Asphalt Impregnated.

2.7 EAVE AND EDGE UNDERLAYMENT: Ice Shield: Bituthane ice and water shield shingle underlayment by W.R. Grace. 36" wide roll x 40 mil thick rubberized asphalt membrane or equal. Contractor to be aware that the ice and water shield is to be applied for the first 6' at all eaves and over entire roof at pitches below *5:*12.

3. EXECUTION:

3.1 ALL ROOFING MATERIALS to be installed in accordance with manufacturer's recommendations. In no case shall any roofing materials be installed over snow, ice, frost or any other wet materials.

3.2 ROOFING FELT: Install felt as required over dry roof, fully secured and laid flat with no bubbles, humbles etc. Felt shall not be exposed to weather for more than 24 hours before shingles are installed.

3.3 ASPHALT SHINGLE ROOFING: Install asphalt shingles to provide at least double thickness at all points. Use eleven or twelve-gauge wire nails long enough to penetrate the sheathing. Number, spacing and pattern of nails shall be described in the attached Asphalt Roofing Manufacturer's Association Technical Bulletin.

3.4 INSTALL FLASHINGS:

A. At roof surface intersections and at intersections of roof surface with other parts of the building.

B. Install roof-to-wall flashings at all intersections leaving 1" exposed above roof plane as shown on Drawings.

C. Install sheet metal flashing in "step" fashion; one step at each shingle course.

D. Flashing to run up wall behind finish a minimum of 6", and run under shingles a minimum of 6", flashing overlap minimum 4".

E. Flash pipes projecting through roof with one-piece sheet metal or preformed synthetic rubber boot made for this purpose.

F. Install fascias, drip edges and ridge vents shown on Drawings or noted in these Specifications.

G. Install Chimney Flashing as required.

3.5 RIDGE VENTS to be installed at ridge according to manufacturer's recommendations, run continuously to 12" from each end. Insure that free air space allows ventilation flow through bay spaces & out ridge vent. Provide air baffles to insure this air flow.

3.8 NOTE: All roofing, flashing and related work to be in accordance with "Asphalt Roofing Manufacturer's Association" application procedures. Handbook/guide shall be obtained by roofing installer.

END OF SECTION

technical bulletin

Asphalt Roofing Manufacturers Association

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Nail Application of Asphalt Shingles for New and Re-cover Roofing

The Asphalt Roofing Manufacturers Association (ARMA) recommends that properly driven and attached roofing nails be utilized as the fastening system for asphalt shingles. The following, if rigidly adhered to, will help optimize the performance of asphalt shingles.

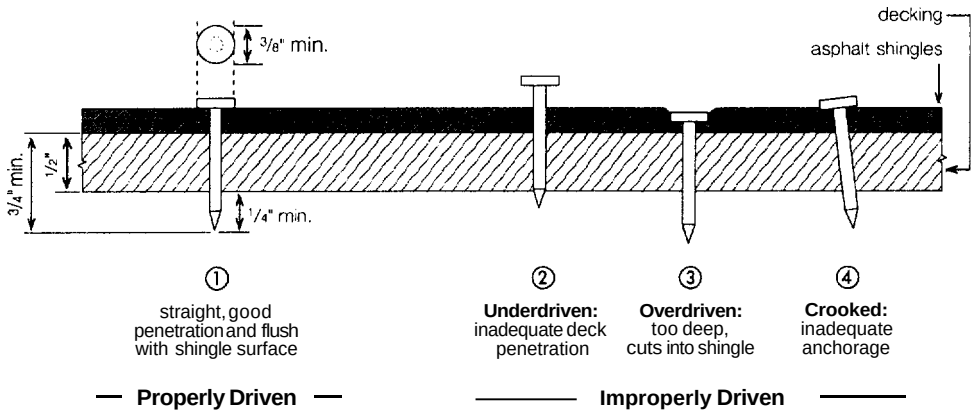
- All nails must be corrosion resistant.
- All nails are to be driven by hand or with pneumatic nailers.
- Failure to use a properly adjusted pneumatic air system, or to place nails accurately, can lead to sealing failure, raised tabs, buckling, leaks, and blowoffs.
- Roofing nails should have a minimum nominal shank diameter of 12 gauge, 0.105" with a minimum head diameter of ⅜"; the shank must have sufficient length to penetrate ¾" into the wood deck lumber, or completely through the plywood decking.
- For each shingle, a minimum of four (4) nails must be applied. For other applications (i.e., in regions with high winds and/or other unusual weather conditions) the use of six (6) nails per shingle should be considered.
- Nails should be located as follows:
  - √ 5⅝" up from the butt edge with 5" exposure shingles – or midway between the 5" exposure and the tab sealant line. Do not nail in or above the sealant.
  - √ 6⅛" up from the butt edge with 5⅝" exposure metric shingles – or midway between the 5⅝" exposure and the tab sealant line. Do not nail in or above the sealant..
  - √ No nail head is to be closer than 1" from the edge of a shingle.
  - √ 1" in from each edge and over each cutout for three-tab shingles.
  - √ 1" and 12" in from each edge for two-tab and no-cutout shingles with nominal length of 36". Laminated shingles require that each nail penetrate through the double-ply or laminated area just above the top of the "dragon teeth." Nail placement is usually identified by a line or set of lines.
  - √ 1" and 13" in from each edge for two-tab and no-cutout metric length shingles; nails must penetrate the double-ply area of a laminated shingle as mentioned above.
- Nails are to be applied so that the entire head bears tightly against the shingle, without cutting into the shingle surface.

Also, see Figure 1 on back page.

Note: These recommendations were prepared by and have the approval of the Asphalt Roofing Manufacturers Association for informational purposes only. They are not intended to revoke or change the requirements or specifications of the individual roofing material manufacturers or local, state and federal building officials that have jurisdiction in your area. Any question, or inquiry, as to the requirements, or specifications of a manufacturer, should be directed to the roofing manufacturer concerned.

(continued on back)

Figure 1: Application of Nails



SECTION 07317

WOOD SHINGLES

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. Cedar shingle siding.

B. Related Sections include the following:

1. Division 6 Section "Rough Carpentry".
2. Division 7 Section "Roofing and Flashing".
3. Division 7 Section "Joint Sealants".
4. Division 9 Section "Painting".

1.3 SUBMITTALS

A. Product Data: For each type of product specified. Include manufacturers' product specifications, standard details, dimensions, and general recommendations, as applicable to materials and installation.

B. Samples: Of the following:

1. Shingles.

C. Research/Evaluation Reports: Evidence of shingle and shake manufacturer's and grading agency's compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.

1.4 QUALITY ASSURANCE

A. Grading Agency Qualifications: An independent testing and inspecting agency recognized by authorities having jurisdiction as qualified to label shingles or shakes for compliance with referenced wood shingle and shake grading rules.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's unopened bundles or containers with labels intact.

B. Handle and store materials at Project site to prevent water damage, staining, or other physical damage. Comply with manufacturer's written instructions for Project site storage, handling, and protection.

1.6 PROJECT CONDITIONS

A. Weather Limitations: Proceed with work only when existing and forecasted weather conditions permit work to be installed according to manufacturer's written instructions and warranty requirements, and when substrate is completely dry.

1.7 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.

1. Furnish shingles equal to 2 percent of amount installed, but not less than 1 square, identical to those installed in unbroken bundles.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

1. Cedar Shingles: Clear white cedar, 16" long.

2.2 UNDERLAYMENT

A. Underlayment: Tyvek Commercial Wrap.

2.3 FASTENERS

A. Nails: 316 stainless-steel nails of sufficient length to penetrate through or at least 3/4 inch into sheathing. Copper, bright steel, or blue-steeled nails are unacceptable.

1. Shingle Nails: Provide shingle-type nails at wood shingles.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for substrates, installation tolerances, and other conditions affecting performance of Work specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application. Cover knotholes or other minor voids in substrate with sheet metal flashing secured with non-corrosive roofing nails.

B. Coordinate installation with flashing and other adjoining work to ensure proper sequencing.

3.3 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions and the following:
1. CSSB's "Design and Application Manual for Exterior and Interior Walls."

2. Weather Exposure: 5 inches for 16-inch long shingles.

3.4 WOOD SHINGLE WALL INSTALLATION

A. Felt Underlayment: Apply felt underlayment horizontally over entire surface to receive wood shingles, lapping ends and succeeding courses a minimum of 2 inches. Fasten felt with a sufficient number of galvanized roofing nails to hold underlayment in place until shingles are applied.

B. Install wood shingles, beginning at lower end, with a double-layer starter course, projecting shingles 1-1/2 inches beyond lower fascia. Attach each shingle with 2 fasteners spaced 3/4 to 1 inch from edge of shingle and 1-1/2 to 2 inches above butt line of subsequent course. Stagger edge joints a minimum of 1-1/2 inches in succeeding courses. Prevent alignment of vertical joints in every third course. Install shingles to weather exposure specified. Drive fasteners tight to top surface of shingles without crushing wood.

1. Weather Exposure: 5 inches for 16-inch long shingles.
2. Spacing of Adjacent Shingles: 1/8 to 1/4 inch apart.
3. Interior Corners: Butted against wood stop.
4. Exterior Corners: Butted against corner boards.

C. Flashing: Install metal flashing as indicated and as specified.

3.5 ADJUSTING

A. Replace damaged materials specified in this Section with new materials that meet requirements.

END OF SECTION

SECTION 07900

JOINT SEALERS

1. GENERAL:

1.1 REFERENCES:
A. Drawings and general provisions of Contract, including General Conditions and Division 1 specifications, apply to work in this section.
B. Section 01045 Cutting and Patching, SPECIFICALLY Section 2.1B Fire stopping & section 07860 fire stopping & smoke seals.

1.2 DESCRIPTION OF WORK: The extent of work shall be as shown on Drawings and called for in these Specifications. Performance shall meet requirements of these Specifications.

2. PRODUCTS

2.1 CAULKING MATERIAL

A. Tremco Dymonic; one part polyurethane on exterior walls for caulking joints where siding butts trim and at all junctions as necessary to obtain complete watertight construction and caulking gap between bottom of wall and sheathing foundation wall face.
B. Tremco Latex **839** for general interior caulking.

3. EXECUTION:

3.1 ALL POTENTIAL INFILTRATION cracks & joints to be caulked. Caulking shall be done only by workmen who are thoroughly experienced in this work. Exterior caulking shall be applied around all trim boards-corners, windows, doors, vents, utilities, at top of foundation, and any other infiltration "crack".

3.2 NOTE: Apply caulking under corner boards and window, door trim as trim applied. Apply caulking under flange as window is installed.

3.3 INTERIOR CAULKING shall be applied to seal all penetrations through top plates of interior walls, (due to electrical or plumbing), and at tubs, showers, counter tops, bottom of party walls GWB, and other as shown on Drawings.

3.4 IN GENERAL, caulking to be done prior to (in conjunction with) siding installation. See Drawings for any additional applications. Joints and spaces to be caulked shall be dry and free from dust. Finished caulking "bead" shall be neat and smooth, free of gaps and sags and run continuously. Complete all caulking work and allow to stand for the manufacturer's recommended time period before painting. Prime if required before finish coat of paint is applied.

3.5 NOTE: Vents penetrating siding shall be adequately "Wood Backed" for plumpness and tight seal, and caulked prior to installation.

END OF SECTION

SECTION 08200

DOORS AND FINISH HARDWARE

A. GENERAL:

SCOPE: The extent of work shall be as shown on Drawings and called for in these Specifications. Performance shall meet the requirements of these Specifications. The work covered by this section of Specifications consists of the following:

1. Furnishing and installing all door frames as called for in the Construction Documents.
2. Furnishing and installing all doors as called for in the Construction Documents.
3. Furnishing and installing all hardware as called for in the Construction Documents; including locksets, closers, holders, knockers, etc.

NOTE: Tlie Contractor shall submit drawings on every item specified in this section. There shall be no substitutions without a specific written explanation from the subcontractor that the specific item is equal with the item specified by the Architect. **NO SUBSTITUTIONS WILL BE ACCEPTED FOR THE SPECIFIED LOCKSETS.** All substitutions shall be approved by the Architect and the Owner.

B. PRODUCTS - DOORS

All doors and frames shall be of the material, type and finish as called for on Drawings or in these Specifications. All dimensions shall be as shown by Door Schedule on Drawings. Door identified by manufacturer's name and type of brand name may be substituted for others of equal quality only with tlie approval of the Architect. Doors delivered for installation shall be carefully stored to prevent damage or warping.

Apartment Interior swing, bi-fold and by-pass doors, shall be 1-3/8" Atherton #550 moulded smooth panel doors by Door Craft Inc. and distributed by Brosco or equal. Units shall be prehung and primed.

Apartment & Storage Room Exterior swing doors shall be preassembled entry door panels, wood frame components, operable hardware, weather stripping, anchorages, attachments, and shims. Doors shall be Avanti Entry Door units, part of the Image™ Series, as manufactured by Peachtree Doors and Windows, Inc., Gainesville, Georgia.

Mechanical Room Interior swing door shall be (1) hour rated hollow metal door with (1) hour rated hollow metal frame.

C. EXECUTION

Install doors after completion of all other work which would raise the moisture content of wood doors or damage door surfaces. Fit, hang and trim as required by the opening so the doors will close and not bind. Solid blocking at hinges and latch required. Provide even clearance of 1/8" at sides and top, 1/4" over thresholds, and 3/4" over floors. See also Section 06100 & 06200 Rough and Finish Carpentry.

Install doorstops for all swing doors.