

P R O J E C T M A N U A L

And

S P E C I F I C A T I O N S

for

MAINE MALL MOTORS LEXUS-TOYOTA-SCION

Portland, Maine

Progress Set
April 7, 2004

Maine Mall Motors

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Part II
Division 1

General Requirement

SECTION 01021

ALLOWANCES AND UNIT PRICES

PART 1 – GENERAL

1.1 REQUIREMENTS

- A. The following scheduled Allowances shall be included in the Contract Sum and disbursed in accordance with Paragraph 3.8., CASH ALLOWANCES of the General Conditions as amended by the Supplementary Conditions and as directed by the Architect.

1.2 SCHEDULE OF ALLOWANCES

- | | |
|--------------------------------|-------------|
| A. Utility Co. Connection Fees | \$30,000.00 |
| B. Testing and Inspection | \$20,000.00 |

1.3 UNIT PRICES

- A. Testing Agency will take measurements and compute quantities accordingly. Provide and assist in taking of measurements.
- B. Unit Price Schedule:
1. Geotextile Fabric (\$\$/SY); Division 2, Section 02200, Addendum 02.

PART 2 – PRUDUCTS (Not Applicable).

PART 3 – EXECUTIONS (Not Applicable).

END OF SECTION

SECTION 01030

ALTERNATES

PART 1 - GENERALRELATED DOCUMENTS

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

SUMMARY

This Section specifies administrative and procedural requirements for Alternates

Definition: An Alternate is an amount proposed by Bidders and stated on the Bid Form for certain construction activities defined in the Bidding Requirements that may be added to or deducted from Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents

Coordination: Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Alternate is complete and fully integrated into the project

Notification: Immediately following the award of the Contract, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates.

Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials and methods necessary to achieve the Work described under each Alternate. Include as part of each Alternate, miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.

PART 2 - PRODUCTS (Not Applicable).PART 3 - EXECUTIONSCHEDULE OF ALTERNATES..**Alternate No. 1: Emergency Generator package.****Type: DEDUCT**

Provide a cost savings for deleting the Emergency Generator and all work associated with it back to the transfer switch from the Base Bid. Re: Site and Electrical Drawings and Specifications

Alternate No. 2: Vertical Granite Curb**Type: ADD**

Provide an added cost to substitute Vertical Granite Curb in place of the specified bituminous asphalt curbing at locations indicated. Re: Site Drawings and Specifications.

Alternate No. 3: Flagpole, Flagpole Foundation, Ground Up-light and Adjacent Concrete Pavers
Type: DEDUCT

Provide a cost savings for deleting the flagpole, ground up-light (including underground electrical wiring servicing this fixture) and adjacent concrete pavers from the base bid.

Alternate No. 4: Delayed Start Date (to reduce winter conditions)
Type: DEDUCT

If a start date other than the construction start date indicated would provide a cost savings for the owner, provide the proposed start date and the savings associated with the proposed date.

Alternate No. 5: Freestanding Sign
Type: DEDUCT

Provide a cost savings for deleting the Freestanding Sign, including site work, foundation work, and underground electrical servicing the sign, detailed on Drawing A4.2, Site Sheet 2 and Electrical Drawing E1.1.

Alternate No. 6: Wall and Floor Tile in DECON/Laundry Room
Type: DEDUCT

Provide a cost savings for substituting Sealed Concrete (all floor except shower) and Epoxy Painted MR GWB (all walls except shower) for the floor and wall tile systems specified.

Alternate No. 7: Reduce Plymovent Vehicle Exhaust System from Six to Three Drops
Type: DEDUCT

Provide a cost savings for reducing the scope of the Plymovent Vehicle Exhaust System specified in Section 15750 and indicated on Drawing M1.1 by eliminating the three (3) drops located on the north side of the Apparatus Bays and all associated equipment and ductwork back to within 2 feet of the ducts T riser located below the system exhaust fan. Do not modify the size of the system and, in so doing, provide as system that is capable of being readily expanded, by the owner, to complete the fully designed system in the future.

...END OF SECTION 01030

SECTION 01035

MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections: The following sections contain requirements that relate to this section.
- C. Division 1 Section "Submittals" for requirements for the Contractor's Construction Schedule.
- D. Division 1 Section "Application for Payment" for administrative procedures governing applications for payment.
- E. Division 1 Section "Product Substitutions" for administrative procedures for handling requests for substitutions made after award of the Contract.

1.3 MINOR CHANGES IN THE WORK

- A. Supplemental instructions authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time, will be issued by the Architect on AIA form G710, Architect's Supplemental Instructions.

1.4 CHANGE ORDER PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.
- B. Proposal requests issued by the Architect are for information only. Do not consider them an instruction either to stop work in progress, or to execute the proposed change.
- C. Unless otherwise indicated in the proposal request, within 7 days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost necessary to execute the proposed change.
- D. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
- E. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

- F. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.
- G. Contractor-Initiated Change Order Proposal Requests: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
- H. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
- I. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
- J. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
- K. Comply with requirements in Section "Product Substitutions" if the proposed change in the Work requires the substitution of one product or system for a product or system specified.
- L. Proposal Request Form: Use AIA Document G 709 for Change Order Proposal Requests.

1.5 ALLOWANCES

- A. Allowance Adjustment: Base each Change Order Proposal Request for an allowance cost adjustment solely on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place, with reasonable allowances, where applicable, for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
- B. Include installation costs in the purchase amount only where indicated as part of the allowance.
- C. When requested, prepare explanations and documentation to substantiate the margins claimed.
- D. The Owner reserves the right to establish the actual quantity of work-in-place by independent quantity survey, measure, or count.
- E. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit, within 14 days of receipt of the change order or construction change directive authorizing work to proceed. Claims submitted later than 14 days will be rejected.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Architect may issue a Construction Change Directive on AIA Form G714, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

- B. The Construction Change Directive will contain a complete description of the change in the Work and designate the method to be followed to determine change in the Contract Sum or Contract Time.
- C. If the Contractor fails to proceed as directed in the Construction Change Directive in a timely manner, subsequent requests for additional time may be rejected, and the Contractor is at risk of being found in default of the terms of the Contract.
- D. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
- E. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.7 CHANGE ORDER PROCEDURES

- A. Upon the Owner's approval of a Change Order Proposal Request, the Architect will issue a Change Order for signatures of the Owner and Contractor on AIA Form G701, as provided in the Conditions of the Contract.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01040
PROJECT COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
1. Coordination.
 2. Administrative and supervisory personnel.
 3. General installation provisions.
 4. Cleaning and protection.
- B. Requirements for the Contractor's Construction Schedule are included in Section "Submittals".

1.3 COORDINATION

- A. Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.
- B. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
- C. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
- D. Make adequate provisions to accommodate items scheduled for later installation.
- E. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
- F. Prepare similar memoranda for the Owner and subcontractors where coordination of their Work is required.
- G. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of schedules.

2. Installation and removal of temporary facilities.
 3. Delivery and processing of submittals.
 4. Progress meetings.
 5. Project Close-out activities.
- H. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
- I. Salvage materials and equipment involved in performance of, but not actually incorporated in, the work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.

1.4 SUBMITTALS

- A. Staff Names: Within 15 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.
- B. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated, or as required by applicable codes. Refer questionable mounting height decisions to the Architect for final decision.

3.2 CLEANING AND PROTECTION

- A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
 - 1. Excessive static or dynamic loading.
 - 2. Excessively high or low temperatures.
 - 3. Thermal shock.
 - 4. Excessively high or low humidity.
 - 5. Air contamination or pollution.
 - 6. Water or ice.
 - 7. Solvents or chemicals.
 - 8. Light.
 - 9. Puncture.
 - 10. Abrasion.
 - 11. Heavy traffic.
 - 12. Soiling, staining and corrosion.
 - 13. Combustion.
 - 14. Electrical current.
 - 15. High speed operation,
 - 16. Improper lubrication,
 - 17. Unusual wear or other misuse.
 - 18. Contact between incompatible materials.
 - 19. Destructive testing.
 - 20. Misalignment.
 - 21. Excessive weathering.
 - 22. Unprotected storage.
 - 23. Improper shipping or handling.
 - 24. Theft.
 - 25. Vandalism.

END OF SECTION

SECTION 01095

REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the General Conditions.
- B. Indicated: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.
- C. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Architect," "requested by the Architect," and similar phrases.
- D. Approve: The term "approved," where used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in General and Supplementary Conditions.
- E. Regulation: The term "Regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. Furnish: The term "furnish" is used to mean "supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."
- G. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."
- H. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."
- I. Installer: An "Installer" is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or sub-subcontractor, for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
- J. Trades: Use of titles such as "carpentry" is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

- K. Assignment of Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in the operations to be performed. The specialists must be engaged for those activities, and assignments are requirements over which the Contractor has no choice or option. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.
- L. This requirement shall not be interpreted to conflict with enforcement of building codes and similar regulations governing the Work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.
- M. Project Site is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land upon which the Project is to be built.
- N. Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 16-Division format and MASTERFORMAT numbering system.
- B. Specification Content: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:
 - C. Abbreviated Language: Language used in Specifications and other Contract Documents is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the full context of the Contract Documents so indicates.
 - D. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
 - E. The words "shall be" shall be included by inference wherever a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

- A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference, and include, but are not limited to publications of the following:
 - 1. American Concrete Institute (ACI).
 - 2. American Institute of Steel Construction Inc. (AISC).
 - 3. American National Standards Institute (ANSI).
 - 4. American Society of Civil Engineers (ASCE).

5. American Society of Heating, Refrigerating and Air Conditioning Engineers Inc. (ASHRAE).
 6. American Society of Mechanical Engineers (ASME).
 7. American Society for Testing and Materials (ASTM).
 8. American Welding Society (AWS).
 9. Building Officials and Code Administrators International Inc. (BOCA).
 10. Council of American Building Officials (CABO).
 11. Consumer Product Safety Commission (CSPC).
 12. Factory Mutual (FM).
 13. Maine Department of Environmental Protection (MEDEP).
 14. Maine Office of the State Fire Marshal.
 15. Maine Department of Transportation (MEDOT).
 16. Maine Department of Human Services, Division of Health Engineering, Internal Plumbing Rules.
 17. Maine Human Rights Commission.
 18. Maine Public Utilities Commission (MEPUC).
 19. National Electrical Manufacturers Association (NEMA).
 20. National Fire Protection Association (NFPA).
 21. National Forest Products Association (NFPA).
 22. Underwriters Laboratories Inc. (UL).
 23. Uniform Federal Accessibility Standard (UFAS).
 24. US Dept. of Commerce, National Bureau of Standards (NBS).
 25. US Dept. of Housing and Urban Development, Minimum Property Standards (HUD MPS), 26. Fair Housing Act.
 27. US Dept. of Justice, Americans with Disabilities Act (ADA).
 28. Federal, State and Local codes and regulations.
- B. Publication Dates: Where the date of issue of a referenced standard is not specified, comply with the standard in effect as of date of Contract Documents.
- C. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards establish different or conflicting requirements for minimum quantities or quality levels, assume the greater quantity or higher level of quality, normally the most costly. Refer requirements that are different, but apparently equal, and uncertainties to the Architect for a decision before proceeding.
- D. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.
- E. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.
- F. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain such copies.
- G. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision.

- H. Federal Government Agencies: Names and titles of federal government standard- or Specification-producing agencies are often abbreviated. The acronyms or abbreviations referenced in the Contract Documents indicate the names of standard- or Specification-producing agencies.

1.5 GOVERNING REGULATIONS/AUTHORITIES

- A. The Architect has contacted authorities having jurisdiction where necessary to obtain information necessary for preparation of Contract Documents; that information may or may not be of significance to the Contractor. Contact authorities having jurisdiction directly for information and decisions having a bearing on the Work.

1.6 SUBMITTALS

- A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including;
 - 1. Contractor's construction schedule.
 - 2. Submittal schedule.
 - 3. Shop Drawings.
 - 4. Product Data.
 - 5. Samples.
- B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:
 - 1. Permits.
 - 2. Applications for payment.
 - 3. Performance and payment bonds.
 - 4. Insurance certificates.
 - 5. List of Subcontractors.

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
- B. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
- C. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
- D. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
- E. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals.
- F. If an intermediate submittal is necessary, process the same as the initial submittal.

- G. Allow two weeks for reprocessing each submittal.
- H. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
- I. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
- J. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Submittals received from sources other than the Contractor will be returned without action.
- K. Record on the transmittal relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. CPM-Chart Schedule: Prepare a fully developed, horizontal critical path-type Contractor's construction schedule. Submit within 30 days of the date established for "Commencement of the Work".
- B. Coordinate the Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests and other schedules.
- C. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.5 SUBMITTAL SCHEDULE

- A. After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals.
- B. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule.
- C. Prepare the schedule in chronological order; include submittals required during the first 90 days of construction.
- D. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.6 SHOP DRAWINGS

- A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.
- B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

1. Dimensions.
 2. Identification of products and materials included.
 3. Compliance with specified standards.
 4. Notation of coordination requirements.
 5. Notation of dimensions established by field measurement.
- C. Initial Submittal: Submit 3 blue- or black-line prints for the Architect's review.
- D. Final Submittal: Submit 3 blue- or black-line prints and additional prints as required for maintenance manuals, plus the number of prints needed by the Contractor for distribution. 2 prints will be retained; the remainder returned.
- E. One of the prints returned shall be marked-up and maintained as a "Record Document".
- F. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- G. Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.
- H. Submit coordination Drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

1.6 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element or system of construction. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."
- B. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
1. Manufacturer's printed recommendations.
 2. Compliance with recognized trade association standards.
 3. Compliance with recognized testing agency standards.
 4. Application of testing agency labels and seals.
 5. Notation of dimensions verified by field measurement.
 6. Notation of coordination requirements.
- C. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
- D. Submittals: Submit 2 copies of each required submittal; submit additional copies as required for maintenance manuals. The Architect will retain one, and will return others marked with action taken and corrections or modifications required.
- E. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

- F. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
- G. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.
- H. Do not permit use of unmarked copies of Product Data in connection with construction.

1.7 SAMPLES

- A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.
- B. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Include the following:
 - 1. Generic description of the Sample.
 - 2. Sample source.
 - 3. Product name or name of manufacturer.
 - 4. Compliance with recognized standards.
 - 5. Availability and delivery time.
- C. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
- D. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.
- E. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
- F. Refer to other Sections for Samples to be returned to the Contractor for incorporation in the Work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
- G. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.
- H. Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.
- I. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 2 sets; one will be returned marked with the action taken.

- J. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.
- K. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
- L. Sample sets may be used to obtain final acceptance of the construction associated with each set.
- M. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.
- N. Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.
- O. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.8 ARCHITECT'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.
- B. Compliance with characteristics specified in the Contract Documents is the Contractor's responsibility. Approval by the Architect of a submittal that contains deviations from the Contract Documents does not relieve the Contractor of the responsibility of coordinating the deviation with other aspects of the Work, or the cost of making modifications to other aspects of the work to accommodate the deviation.
- C. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp.
- D. Do not permit submittals marked "Not Approved, Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.
- E. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION

SECTION 01400

QUALITY CONTROL SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for quality control services.
- B. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the Architect.
- C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
- D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
- E. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.
- F. Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
- G. Requirements for the Contractor to provide quality control services required by the Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 RESPONSIBILITIES

- A. Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity; these services include those specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be included in the Contract Sum.
- B. The Contractor shall employ and pay an independent agency, to perform specified quality control services.
- C. The Owner will engage and pay for the services of an independent agency to perform inspections and tests specified as the Owner's responsibility.

- D. Where the Owner has engaged a testing agency or other entity for testing and inspection of a part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless otherwise agreed in writing with the Owner.
- E. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.
- F. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction. The Architect reserves the right to require retesting to be performed by a different testing agency.
- G. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:
- H. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
- I. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
- J. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
- K. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
- L. Security and protection of samples and test equipment at the Project site.
- M. Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Architect and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.
- N. The agency shall notify the Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
- O. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
- P. The agency shall not perform any duties of the Contractor.
- Q. Coordination: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
- R. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.4 SUBMITTALS

- A. The independent testing agency shall submit a certified written report of each inspection, test or similar service, to the Architect, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit a certified written report of each inspection, test or similar service through the Contractor, in duplicate.
- B. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
- C. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making the inspection or test.
 - 6. Designation of the Work and test method.
 - 7. Identification of product and Specification Section.
 - 8. Complete inspection or test data.
 - 9. Test results and interpretations of test results.
 - 10. Ambient conditions at the time of sample-taking and testing.
 - 11. Comments or professional opinion as to whether inspected or tested Work complies with 12. Contract Document requirements.
 - 13. Name and signature of laboratory inspector.
 - 14. Recommendations on retesting.

1.5 QUALITY ASSURANCE

- A. Qualification for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.
- B. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State in which the Project is located.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting and Patching."

- B. Protect construction exposed by or for quality control service activities, and protect repaired construction.
- C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES

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 SUMMARY

- A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.
- B. Temporary utilities required include but are not limited to:
 - 1. Water service and distribution.
 - 2. Temporary electric power and light.
 - 3. Telephone service.
 - 4. Storm and sanitary sewer.
- C. Temporary construction and support facilities required include but are not limited to:
 - 1. Temporary heat.
 - 2. Field offices and storage sheds.
 - 3. Temporary roads.
 - 4. Sanitary facilities, including drinking water.
 - 5. Dewatering facilities and drains.
 - 6. Temporary enclosures.
 - 7. Hoists.
 - 8. Temporary Project identification signs and bulletin boards.
 - 9. Waste disposal services.
 - 10. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities required include but are not limited to:
 - 1. Temporary fire protection.
 - 2. Barricades, warning signs, lights.
 - 3. Environmental protection.

1.3 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
 - 1. Building Code requirements.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police, Fire Department and Rescue Squad regulations.
 - 5. Environmental protection regulations.

- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."
- C. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
- D. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- E. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.4 PROJECT CONDITIONS

- A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of the permanent service.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

2.2 EQUIPMENT

- A. General: Provide new equipment; if acceptable to the Owner, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
- B. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.
- C. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
- D. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect, and will not be accepted as a basis of claims for a Change Order.
- E. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.
- F. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear.
- G. Temporary Lighting: Whenever overhead floor or roof deck has been installed, provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.
- H. Temporary Telephones: Provide temporary telephone service for all personnel engaged in construction activities, throughout the construction period. Install telephone on a separate line for each temporary office and first aid station. Where an office has more than two occupants, install a telephone for each additional occupant or pair of occupants.

3.3 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

- A. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access.
- B. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- C. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment approved by local fire authorities that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.

- D. Field Offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings.
- E. Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site.
- F. Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
- G. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division-2 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations and construction free of water.
- H. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.
- I. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
- J. Temporary Lifts and Hoists: Provide facilities for hoisting materials. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- K. Project Identification and Temporary Signs: Prepare project identification and other signs of the size indicated; install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.
- L. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.
- M. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of State authorities and NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.
- N. Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Cover finished permanent stairs with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Architect.
- B. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."
- C. Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
- D. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.
- E. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.
- F. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.5 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
- C. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
- D. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- E. Termination and Removal: Remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
- F. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.

- G. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
- H. Replace air filters and clean inside of ductwork and housings.
- I. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
- J. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
- B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals."
- C. Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.
- D. Administrative procedures for handling requests for substitutions made after award of the Contract are included under Section "Product Substitutions."

1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms such are self-explanatory and have well recognized meanings in the construction industry.
- B. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- C. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
- D. "Foreign Products", as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside of the United States and its possessions; or produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of nor living within the United States and its possessions.
- E. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
- F. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.4 QUALITY ASSURANCE

- A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.
- B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
- C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.
- D. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.
- E. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - 1. Name of product and manufacturer.
 - 2. Model and serial number.
 - 3. Capacity, speed, ratings, etc. as appropriate.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.
- B. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
- C. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- D. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
- E. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
- F. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
- G. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
- H. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.
- B. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
- C. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- D. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:
- E. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.
- F. Semiproprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.
- G. Where products or manufacturers are specified by name, accompanied by the term "or equal," or "or approved equal" comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
- H. Non-Proprietary Specifications: When the Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
- I. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
- J. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
- K. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
- L. Compliance with Standards, Codes and Regulations: Where the Specifications require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.

- M. Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.
- N. Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.
- O. Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.
- P. Conflicting requirements: Where there are conflicting requirements in the Contract Documents regarding the minimum quantity or level of quality of products, refer to the Architect for interpretation. The Contractor shall assume the greater quantity or higher quality applies, normally the most expensive, unless instructed otherwise by the Architect.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS:

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
- B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION

SECTION 01631
PRODUCT SUBSTITUTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of the Contract.
- B. Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.
- C. Procedural requirements governing the selection of products and product options are included under Section "Materials and Equipment."

1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions." The following are not considered substitutions:
 - C. Substitutions requested by Bidders during the bidding period, and accepted prior to award of Contract, are considered as included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
 - D. Revisions to Contract Documents requested by the Owner or Architect.
 - E. Specified options of products and construction methods included in Contract Documents.
 - F. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS

- A. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.
- B. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - C. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.

- D. Samples, where applicable or requested.
- E. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
- F. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors, that will become necessary to accommodate the proposed substitution.
- G. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
- H. Cost information, including a proposal of the net change, if any in the Contract Sum.
- I. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.
- J. Architect's Action: Within one week of receipt of the request for substitution, the Architect will request additional information or documentation necessary for evaluation of the request. Within 2 weeks of receipt of the request, or one week of receipt of the additional information or documentation, whichever is later, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance will be in the form of a Change Order.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Conditions: The substitution request will be received and considered by the Architect when one or more of the following conditions are satisfied, as determined by the Architect; otherwise requests will be returned without action except to record noncompliance with these requirements.
- B. Extensive revisions to Contract Documents are not required.
- C. Proposed changes are in keeping with the general intent of Contract Documents.
- D. The request is timely, fully documented and properly submitted.
- E. The request is directly related to an "or equal" clause or similar language in the Contract Documents.
- F. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
- G. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

- H. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear, which may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or Contractor, and similar considerations.
- I. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
- j. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
- K. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution will provide the required warranty.
- L. The Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.
- M. Substitutions may cause additional costs and/or time to be incurred by the Contractor or others involved in the Work. The Contractor shall give consideration to any additional costs and/or time needed when making a substitution request. The acceptance of a substitution request shall not relieve the Contractor of bearing the sole the responsibility for any additional cost and/or time needed due to the substitution.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01700

PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
1. Inspection procedures.
 2. Project record document submittal.
 3. Operating and maintenance manual submittal.
 4. Submittal of warranties.
 5. Final cleaning.

1.3 SUBSTANTIAL COMPLETION

- A. Definition:
1. "Substantial Completion" and related inspection procedures shall have meanings as defined in the lease agreement between the Owner and Tenant, in addition to those as specified herein. Should there be a discrepancy between the lease document and this specification, the lease shall take precedence.
 2. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
 - a. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
 - c. Advise Owner of pending insurance change-over requirements.
 - d. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
 - e. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.

- f. Deliver tools, spare parts, extra stock, and similar items.
 - g. Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change-over in security provisions.
 - h. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
 - i. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair, restore or replace marred exposed finishes and equipment.
3. Inspection Procedures: On receipt of a request for inspection, the Architect and Owner will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect and Owner will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
 4. The Architect and Owner will repeat inspection when requested and assured that the Work has been substantially completed.
 5. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
 1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
 3. Submit a certified copy of the Architect and Owner's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect and Owner.
 4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the Work.
 5. Submit consent of surety to final payment.
 6. Submit a final liquidated damages settlement statement.
 7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

8. Submit record as-built drawings and maintenance and operating manuals.
- B. Reinspection Procedure: The Architect and Owner will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect and Owner.
- C. Upon completion of reinspection, the Architect and Owner will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
- D. If necessary, reinspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where it varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 1. Mark record sets with colors to distinguish between variations in separate categories of the Work.
 2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
 3. Note related Change Order numbers where applicable.
 4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.
 1. Upon completion of the Work, submit record Drawings and Specifications to the Owner.
- D. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily

discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

1. Upon completion of mark-up, submit complete set of record Product Data to the Owner.
- E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.
- F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Owner.
- G. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy -duty 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
1. Emergency instructions.
 2. Spare parts list.
 3. Copies of warranties.
 4. Installer's name, address and telephone number.
 5. Wiring diagrams.
 6. Recommended "turn around" cycles.
 7. Inspection procedures.
 8. Shop Drawings and Product Data.
 9. Fixture lamping schedule.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
1. Maintenance manuals.
 2. Record documents.
 3. Spare parts and materials.
 4. Tools.
 5. Lubricants.
 6. Fuels.
 7. Identification systems.

8. Control sequences.
 9. Hazards.
 10. Cleaning.
 11. Warranties and bonds.
 12. Maintenance agreements and similar continuing commitments.
- B. As part of instruction for operating equipment, demonstrate and train Owner's personnel in the following procedures:
1. Start-up.
 2. Shutdown.
 3. Emergency operations.
 4. Noise and vibration adjustments.
 5. Safety procedures.
 6. Economy and efficiency adjustments.
 7. Effective energy utilization.

3.2 FINAL CLEANING

- A. General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- C. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
1. Remove labels that are not permanent labels.
 2. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 3. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces. Clean, strip and wax vinyl composition tile floors.
 4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 5. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- D. Pest Control: Engage an experienced exterminator to make a final inspection, and rid the Project of rodents, insects and other pests.
- E. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

- F. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
- G. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION

Part II

Division 2

Sitework

SECTION 02100

CLEARING AND GRUBBING

PART 1. GENERAL

1.1 Related Work Specified Elsewhere

- a. The general provisions and documents of the Contract, including General and Special Conditions, apply to the work specified in this Section.
- b. Site Earthwork - Section 02200.
- c. Site Improvements - Section 02460.
- d. Landscaping - Section 02500.

PART 2. PRODUCTS

2.1 Materials

- a. Seed for erosion control and temporary seeding - Arrostock rye applied at 2.6#/1,000 square feet.

PART 3. EXECUTION

3.1 Protections

- a. Provide temporary fences, barricades, coverings or other protections to prevent damage to existing improvements, trees or vegetation indicated on the Drawings to remain.
- b. Protect improvements on adjoining properties and on Owner's property.

3.2 Clearing

- a. All areas requiring clearing within the Limit of Work area, shown on the Drawings, shall be done in accordance with applicable laws and ordinances. Clear site of trees, shrubs and other vegetation, except for those indicated to be left standing or transplanted. The Contractor shall be responsible for coordinating selective removal of vegetation with the Landscape Architect.

3.3 Grubbing

- a. In areas where topsoil is to be removed or disturbed, existing grades shall be grubbed free of stumps, stones, rubbish, roots or other extraneous growth or debris.
- b. Dispose of grubblings off Owner's property. Grubbings shall not be buried on site.

SECTION 02200

SITE EARTHWORK

PART 1. GENERAL

1.1 Related Work Specified Elsewhere

- a. The general provisions and documents of the Contract, including General and Special Conditions, apply to the work specified in this Section.
- b. Geotechnical Report – Section 00300
- c. Site Drainage - Section 02400
- d. Site Utilities - Section 02420
- e. Construction Drawings - Refer to architectural plans and specifications for specific requirements regarding the earthwork beneath the building. Where the architectural plans earthwork requirements for the building subgrade pad are more stringent than those stated herein, the architectural plans and specifications shall govern.

1.2 Utility Easements

- a. The Contractor shall contact all utility companies and determine if additional easements will be required to complete the project.

1.3 Standards

- a. Conform to all applicable city, county and state codes for excavation, earthwork and disposal of debris.
- b. Conform to all applicable standards of the various utility companies.

1.4 Inspection

- a. Drawings do not purport to show above ground objects existing on site. Contractor shall visit site and acquaint himself with all observable conditions as they exist before submitting his Bid.

1.5 Grade and Elevations

- a. The Drawings indicate, in general, the alignment and finished grade elevations. The Landscape Architect, however, may make such adjustments in grades and alignment as are found necessary in order to avoid interference or to adapt piping to other special conditions encountered.

- b. The Contractor shall establish the lines and grades in conformity with the Drawings and maintain by means of suitable stakes placed in the field.

1.6 Limit of Work

- a. Take special care to keep all operations within the Limit of Work as shown on the Drawings. The Contractor shall take all necessary precautions to protect existing site elements to remain.

1.7 References

- a. Where M.D.O.T. appears it shall be taken to mean The State of Maine Department of Transportation Specifications, Highways and Bridges - (Latest Revision).

1.8 Reference Standards

- a. The following most current publications form part of this specification to the extent indicated by references thereto and shall be followed for all construction testing:

American Society for Testing and Materials (ASTM):

D 422	Method for Particle Size Analysis of Soils
D 698	Test for Moisture-Density Relations of Soils Using 5.5 lb. (2.5 kg) hammer and 12-inch (304.8mm) Drop (Standard Proctor)
D 1556	Test for Density of Soil in Place by the Sand Cone Method
D 1557	Test for Moisture-Density Relations of Soils Using 10-lb (4.5 Kg) hammer and 18-inch (457 mm) Drop (Modified Proctor)
D 1559	Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
D 2167	Test for Density of Soil in Place by the Rubber Balloon Method
D 2216	Laboratory Determination of Moisture Content of Soil
D 2487	Classification of Soils for Engineering Purposes
D 2922	Tests for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
D 3017	Test for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
D 4318	Test for Plastic Limit, Liquid Limit, & Plasticity Index of Soils
C 25	Chemical Analysis of Limestone, Quicklime and Hydrated Lime
C 110	Physical Testing for Quicklime and Hydrated Lime, Wet Sieve Method
C 618	Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete

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1.9 Tests

- a. Tests for soil density and/or gradations as herein designated shall be taken at the option of the Architect and or Landscape Architect. Costs of testing shall be paid by the Owner.
- b. Soil samples representative of the borrow source and suitable laboratory testing shall be furnished by the Contractor for each material listed in Section 2.1. Test results shall be submitted at least two (2) weeks prior to their proposed use or placement on the site. In the event a proposed material does not meet the specified gradation requirements, the material type shall not be placed on-site until an alternative borrow source is selected and the laboratory test results indicate the material meets the specified gradation requirements.
- c. Compaction tests shall be determined on the basis of laboratory Proctor tests (ASTM D.1557, Modified Proctor).
- d. Field density tests not specified on a comparative basis shall be to the percent density specified in this Section for both earth excavation and earth and granular type fills. Tests shall be in accordance with ASTM D.1556, ASTM D.2167, ASTM D.2922 OR ASTM D.3017.

1.10 Test Borings

- a. Test Borings have been made in the area of the proposed building and parking area and the logs can be reviewed in Section 00300.

1.11 Protection of Existing Structures and Utilities

- a. Barricade open excavations occurring as part of this work and post with warning signs. Backfilling or secured covering of excavations shall be required.
- b. Provide necessary supports, bracing and covering to protect existing and new structures and utilities during all phases of excavation and backfill.
- c. Notify appropriate owners before excavating adjacent to poles, cables, pipes, and other utilities.
- d. Note that location of existing underground utilities on plans is approximate and may be incomplete. Responsibility for exact locations and protection of all utilities rest with the Contractor. The Contractor shall be responsible for confirming invert elevations for existing and proposed sewer installation and connection. Where location of existing underground utilities differs from that shown on plans, notify the Landscape Architect immediately.

- e. Conflicts between existing and new utilities and/or structures to be built under this contract shall be reported to the Landscape Architect or Owner's Representative.

1.12 Erosion and Sedimentation Control

- a. The General Contractor shall perform all work necessary to control erosion. Installation of erosion control structures prior to construction shall be performed in accordance with the Standards of the U.S. Department of Agriculture, Soil Conservation Service, "Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices" by the Cumberland County SWCD, State of Maine, and as shown on the Plans.
- b. Weekly inspections, as well as routine inspections following rain falls, shall be conducted by the Contractor of all temporary and permanent erosion control devices until final acceptance of the project. Necessary repairs shall be made immediately to correct undermining or deterioration. Final acceptance shall include a site inspection to verify the stability of all disturbed areas and slopes. Until final inspection, all erosion and sedimentation control measures shall immediately be cleaned, and repaired by the Contractor after each storm event, as required. Disposal of all temporary erosion control devices shall be the responsibility of the Contractor. Removal of temporary erosion control devices shall not occur until a minimum 75% catch of vegetation occurs or permanent structural measures are in place.

1.13 Removals

- a. The Contractor shall perform all work necessary for clearing and grubbing and/or removal, backfill and disposal of all existing materials noted on the Drawings, as well as temporary structures installed for construction.

PART 2. PRODUCTS

2.1 Materials

- (1) Fill Materials: Backfill and ordinary fill materials shall be as follows:
 - a. Materials from excavation: Excavated material which can be readily spread and compacted, and consists of mineral soil, substantially free of organic materials, loam, wood, rubbish or other perishable substance may be used for common fill. Boulders (rocks over eight (8) inches) shall be removed from excavated material before using for fill.

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- b. Backfill over pipes shall be free of stones over one (1) inch diameter for first one (1) foot over pipes.
- c. Aggregate Base, Crushed - M.D.O.T. 703.06, (a), Type A. (No rocks larger than two inches). - Compacted at 95% ASTM D-1557
- d. Aggregate Subbase Gravel - M.D.O.T. 703.06, (a), Type C, Size of stone no larger than six (6) inches. - Compacted at 95% ASTM D-1557.
- e. Aggregate Subbase Gravel, M.D.O.T. 703.06 (b) Type D (no stone larger than 4 inches – compacted at 95% ASTM D – 1557.
- f. Structural Fill - M.D.O.T. 703.06, (a), Type C. Size of stone no larger than six (6) inches, and further limited to a maximum particle size equal to three (3) inches within twelve (12) inches of slab grade. Compacted at 95% ASTM D-1557
- g. Aggregate for Foundation Backfill: M.D.O.T. 703.6 (a) Type B. Size of stone no larger than four (4) inches.
- h. Gravel Borrow - M.D.O.T. 703.20. Size of stone no larger than six (6) inches. Compacted at 95% ASTM D-1557
- i. Drainage Stone - M.D.O.T. 703.22, Type C. - Vibrated with hand vibrating plate.
- j. Native silty sand (Glacial till) found on-site can be re-used for subgrade preparation provided that the natural moisture content at the time of placement and compaction is at slightly below optimum moisture as determined by MPMDD. On-site soils should not be utilized as backfill against foundations or as slab-on-grade base material.

(2) Bedding Material: Bedding and Backfill Material for Pipes

- a. The refilling of all excavation below the pipe invert and below the crown of the pipes (as indicated by the details) shall be made with crushed stone meeting the following criteria:

<u>Screen Size Square Openings</u>	<u>% by Weight Passing</u>
1- 1/2"	100
1"	90 - 100
1/2"	0 - 15

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- b. Where ordered by the Landscape Architect to stabilize the trench base or for excavation below grade, use 3/4 inch crushed stone.
- c. PVC Pipe and Polyethylene Pipe: Use 1/2 inch to 1 inch crushed stone in the zone twelve (12) inches above and six (6) inches below the pipe.

(3) Sand Blanket

- a. Use (over and under insulation) where insulation is installed over pipe or culvert and at such other places as required in the Contract Documents, or when ordered by the Landscape Architect. Clean sand, free from organic matter, so graded that 90 - 100 percent passes a 1/2 inch sieve and not more than 7 percent passes a No. 200 sieve. (**Exception:** For corrugated polyethylene pipe where crushed stone is required over top of pipe).

(4) Suitable Backfill Material

- a. Structural fill or natural material excavated during the course of construction, excluding debris, pieces of pavement, organic matter, topsoil, all wet or soft muck, peat, or clay, all excavated ledge material, and all rocks over six (6) inches in largest dimension, or any material which will not provide sufficient support or maintain the completed construction in a stable condition, all approved by the Landscape Architect. (**Exception:** may not be used to backfill foundation or under slab).

(5) Geotextile Materials

- a. Acceptable Geotextiles and Geogrids:

- (1) Mirafi 600x
- (2) Phillips 66 Supac 6WS
- (3) Dupont Typar 3401 and 3601
- (4) Trevira S1114 and S1120
- (5) AMOCO 2006
- (6) Tensar SS-1 and SS-2
- (7) Exxon GTF-200 or 350
- (8) Conwed Stratagrid GB-5033
- (9) Miragrid 3xT

- b. Filter/Drainage Geotextiles:

- (1) Mirafi 160N or equal

- c. Silt Fencing Geotextiles:
 - (1) Mirafi 100x or equal

PART 3. EXECUTION

3.1 Classifications

- a. Earth Excavation - Removal and disposal of pavements and other obstructions visible on ground surface, underground structures and utilities indicated to be demolished and removed, any material indicated in the data on subsurface conditions, and other materials encountered that are not classified as rock excavation or unauthorized excavation.
- b. Rock Excavation - Removal and disposal of materials encountered that cannot be excavated without continuous and systematic drilling and blasting or continuous use of a ripper or other special equipment except such materials that are classed as earth excavation.
 - 1. Typical Materials: Boulders 2 cu. yd. or more in volume, solid rock, rock in ledges, and rock-hard cementitious aggregate deposits.
 - 2. Intermittent drilling performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.
- c. Footing and Slab on Grade Excavation
 - 1. Refer to the Geotechnical Report in Section 00300 for specific recommendations.**
 - 2. Foundation subgrade improvements will require the excavation of all existing fill within the influence zone of the footings and replaced with compacted structural fill. Excavation of all fill material within two (2) feet of slab on grade shall be required and filled with compacted structural fill material.
- d. Unauthorized Excavation
 - 1. Removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Architect or Landscape Architect.
 - 2. Under footings or foundation bases, fill unauthorized excavation by filling with Structural Fill and compacting to 95 percent of ASTM D-1557 without altering top elevation.

3.2 Topsoil Removal

- a. Topsoil shall be stripped to its entire depth from area within the Limit Of Work and reusable materials shall be temporarily removed from the site, screened, and returned to the site as needed. Stripped topsoil shall be free from clay, large stones, debris, and peat. Topsoil for reuse on site shall be screened and tested in accordance with Section 02500 - Landscaping.

3.3 General Excavation

- a. Grades, Dimensions - excavate where indicated and as necessary to obtain subgrades as shown on the Drawings and hereinafter specified. All excavation shall include the satisfactory removal of all materials of whatever substance encountered within the indicated limits. Only suitable materials shall be used or stockpiled for later use in backfill preparation. Disturbed subgrade material shall be removed prior to pouring of footings and replaced with either compacted structural fill or thickened footing concrete. All footing subgrades shall be approved by the owner's representative prior to pouring concrete for footings.
- b. The Contractor shall provide temporary drains, ditches and the necessary equipment, as required, to maintain the site of work and adjacent areas in a well drained condition. Keep all excavations free of both ground and surface water at all times. All water pumped or drained from the work shall be disposed of so as not to endanger public health, property or any portion of the work under construction or completed.
- c. The Contractor shall provide shoring, sheeting and bracing as may be required to maintain excavations and trenches secure and safe from collapse and to protect adjacent structures.
- d. Excavation shall not be made below specified subgrades except where rock or unstable material is encountered. If suitable bearing is not found at levels shown on the Drawings, the Architect and or the Landscape Architect shall be notified in writing immediately so that adjustments or changes may be made. Material removed below specified subgrade without the approval of the Landscape Architect shall be replaced and compacted with an approved gravel at the Contractor's expense.
- e. All work shall be carried out in a manner consistent with the regulations of such Federal, State and Local authorities as may have jurisdiction over such activities.

3.4 Summary of Utility Installation

- a. Set all lines, elevations and grades for utility and drainage system work and control system for duration of work, including careful maintenance of bench marks, property corners, monuments or other reference points.
- b. Perform all excavation for underground piping and utility systems to the depths indicated on the Drawings or as otherwise specified. Trenches shall be excavated by open cut.
- c. Maintain in operating condition existing utilities, active utilities and drainage systems encountered in utility installation. Repair any surface or subsurface improvements shown on Drawings.
- d. Verify location, size, elevation and other pertinent data required to make connections to existing utilities and drainage systems as indicated on Drawings. Contractor shall comply with local codes and regulations.
- e. Inspection of stormwater system excavation, utility excavation and backfilling subject to review by utility company, city engineer and third party inspection by project engineer.

3.5 Excavation, Trenching and Backfilling

- a. Perform excavation as indicated for specified depths. During excavation, stockpile materials suitable for backfilling in an orderly manner far enough from bank of trench to avoid overloading, slides or cave-ins.
- b. Remove excavated materials not required or not suitable for backfill or embankments and waste as specified. Any structures discovered during excavation(s) shall be disposed of as specified.
- c. Prevent surface water from flowing into trenches or other excavations by temporary grading or other methods, as required. Remove accumulated water in trenches or other excavations by pumping or other acceptable methods.
- d. Open cut excavation with trenching machine or backhoe. Where machines other than ladder or wheel-type trenching machines are used, do not use clods for backfill. Dispose of unsuitable material and provide other suitable material at no additional cost to Owner.
- e. Excavations for all foundation work shall be backfilled with structural fill meeting specifications set forth herein.

3.6 Trench Excavation

- a. The Contractor shall contact the local utility companies before excavation begins. Dig trench at proper width and depth for laying pipe, conduit or cable. Cut trench banks as nearly vertical as practical and remove stones as necessary to avoid point-bearing. Over-excavate wet or unstable soil, if encountered, from trench bottom as necessary to provide suitable base for continuous and uniform bedding.
- b. All trench excavation side walls greater than five (5) feet in depth shall be sloped, shored, sheeted, braced or otherwise supported by means of the sufficient strength to protect the workmen within them in accordance with the applicable rules and regulations established for construction by the Department of Labor, Occupational Safety and Health Administration (OSHA), and by local ordinances. Lateral travel distance to an exit ladder or steps shall not be greater than 25 feet in trenches four (4) feet or deeper.
- c. Accurately grade trench bottom to provide uniform bearing and support for each section of pipe on bedding material at every point along entire length, except where necessary to excavate for bell holes, proper sealing of pipe joints or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Dig no deeper, longer or wider than needed to make joint connection properly.
- d. Trench width requirements below the top of the pipe shall not be less than 12 inches nor more than 18 inches wider than outside surface of any pipe or conduit that is to be installed to designated elevations and grades. All other trench width requirements for pipe, conduit or cable shall be least practical width that will allow for proper compaction of trench backfill.
- e. Trench depth requirements measured from finished grade or paved surface shall meet the following requirements or applicable codes and ordinances:
 - (1) Water Mains: 66 inches to top of pipe barrel.
 - (2) Sanitary Sewer: Elevations and grades as indicated on Drawings. Note: Pipe with less than five (5) feet of cover in pavement areas or four (4) feet in landscaped areas, provide two (2) inches of rigid insulation as shown on detail.
 - (3) Storm Sewer: Depths, elevations and grades as shown on Drawings. For pipe with less than four (4) feet of cover, provide two (2) inches of rigid insulation per plan and detail.

- (4) Electrical Conduits: 40 inches minimum to top of conduit for primary and 30 inches to top of conduit for secondary or as required by NEC 300-5, NE 710-36 codes, or the local utility company requirements, whichever is deeper.
- (5) TV Conduits: 18 inches minimum to top of conduit or as required by the local utility company, whichever is deeper.
- (6) Telephone Conduits: 18 inches minimum to top of conduit, or as required by the local utility company, whichever is deeper.

3.7 Sheeting and Bracing

- a. Provide sheeting and bracing, when necessary, in trenches and other excavations where protection of workmen is required. Sheeting may be removed after sufficient backfilling to protect against damaging or injurious caving.

3.8 Pipe Bedding

- a. Accurately cut trenches for pipe or conduit that is to be installed to designated elevations and grades to line and grade as specified below bottom of pipe and to width as specified. Place specified depth of bedding material, compact in bottom of trench, and accurately shape to conform to low portion of pipe barrel. After pipe installation, place select bedding material in accordance with details and compact as required.

3.9 Trench Backfilling

- a. Criteria: Trenches shall not be backfilled until required tests are performed and the utility systems comply with and are accepted by applicable governing authorities. Backfill trenches as specified. If improperly backfilled, reopen to depth required to obtain proper compaction. Backfill and compact as specified, to properly correct condition in an acceptable manner.
- b. Backfilling: After pipe or conduit has been installed, bedded, and tested as specified, backfill trench or structure excavation with specified material placed in eight (8) inch maximum loose lifts.

- c. Fill shall not be placed on a surface of frozen material, nor shall snow, ice, frozen earth or debris be incorporated in the fill. Compact to minimum density of 95% of maximum dry density in accordance with ASTM D 698 (or 92% of maximum dry density in accordance with ASTM D1557). For utility trenches located in pavement and sidewalk areas, place backfill in eight (8) inch maximum loose lifts and compaction to 95% of ASTM D.1557 maximum dry density.

3.10 Structural Excavation

- a. Earth shall be excavated to the depth and sections required for installation of all catchbasins, manholes, footings, floor slabs or other appurtenant facilities to the extent indicated on the Plans. Care shall be taken that the foundation areas of structures are not excavated below subgrade or are disturbed so as to lessen their bearing capacity.
- b. All excavations for structures shall be sheeted, braced, sloped, or otherwise protected in the same manner and meeting the safety requirements and conditions specified above under paragraph Section 3.6 (b). Any excess excavated material shall be removed from the site.

3.11 Rock Excavation

- a. Soils investigations indicate that removal of rock will not be required for this project. If however, removal of rock is required, the Contractor shall take the following steps:
 - (1) Uncover and expose material claimed as rock.
 - (2) Notify the Landscape Architect immediately before proceeding with any work in this regard.
 - (3) Obtain written consent and approval from local authorities for the methods to be used before proceeding with blasting or related work.
 - (4) Perform a pre-blast survey of neighboring properties.
 - (5) Handle and employ explosives as stipulated in the Manual of Accident Prevention in Construction of the A.G.C.
- b. Rock excavation shall include boulders over two (2) cubic yards in volume and masses of rock or conglomerate masses requiring systematic drilling and blasting to be removed.

c. Payment

- (1) Payment for rock required to be removed shall be based upon a cubic yard basis. Provide ledge removal inspection for quantity verification of ledge removal by the site contractor.
- (2) Payment for rock trench excavation shall be calculated to depths of six (6) inches below the bottom of pipes, twelve (12) inches below bottoms of footings, and for a width equal to the diameter of the pipe plus eighteen (18) inches beyond each side. Removal cost shall be based upon a unit cost to include rock removal and required trench backfill material.
- (3) Rock excavation removed with open masses but below the required elevation for the mass, as for footing drains, shall not be considered as trench excavation.
- (4) Excavation which does not meet the above requirements for Rock Excavation will be classified as General Earth Excavation.

3.12 Drainage

- a. The Contractor shall provide and maintain ample means and devices (including spare units kept ready for immediate use in case of breakdowns) with which to intercept and/or remove promptly and dispose of properly all water entering excavations. Such excavations shall be kept dry until the structures and appurtenances to be built therein, have been completed to such extent that they will not be damaged.
- b. Dewatering shall be accomplished in a manner that will preserve the undisturbed state of the foundation soils. All water pumped or drained from the work shall be disposed of in a suitable manner without undue interference with other work, other surfaces, or property. Suitable temporary pipes, flumes or channels shall be provided for water that may flow along or across the site of the work.
- c. Temporary underdrains, if used, shall be laid in trenches beneath the grade of the structure. Trenches shall be of suitable dimensions to provide room for the chosen size of underdrain and its surrounding screened gravel.

- d. Temporary underdrains, if used, shall be laid at an approved distance below the bottom of the normal excavation and entirely surrounded by screened gravel. The distance between the bottom of the pipe or structure and the top of the bell of the underdrain pipe shall be at least three (3) inches, unless otherwise permitted. The space between the underdrain and the pipe or structure shall be filled with sand meeting the requirements of ASTM Designation C-33 which shall be rammed if necessary and left with a surface suitable for laying the pipe or building structure. Following their use, underdrains shall be plugged as directed by the Landscape Architect.

3.13 Compaction

- a. Compaction densities specified herein shall be the percentage of the maximum dry density obtainable at optimum moisture content as determined and controlled in accordance with ASTM D.1557. Field density tests shall be made in accordance with ASTM D.1556, D.2167 or D.2922. Each layer of backfill shall be moistened or dried as required, and shall be compacted to the required densities unless otherwise specified in the project specifications.
- c. Fills placed under footings, floor slabs, roads, parking areas and walks shall be compacted to not less than 95 percent of the ASTM D - 1557 maximum dry density.
- c. The subbase material placed under the road gravel base in fill areas shall be compacted to not less than 95 percent of the ASTM D1557 maximum density.
- d. Fills adjacent to building walls from the exterior face of the building and/or retaining walls to a point not less than 10'-0" from the exterior face of the wall shall be compacted to not less than 92 percent of the ASTM D. 698 maximum compaction dry densities as herein before specified.
- e. Bedding material and trench sand under pavement: 95%
- f. Bedding material and trench sand non-pavement areas: 92%
- g. Loam areas: 90%
- h. All other areas: 85%

- i. Methods and equipment proposed for compaction shall be subject to the prior acceptance by the Owner's representative. Compaction generally shall be done with vibrating equipment. Displacement of, or injury to the pipe and structure shall be avoided. Movement of in-place pipe or structures shall be at the Contractor's risk. Any pipe or structure damaged thereby shall be replaced or repaired as directed by the Landscape Architect and at the expense of the Contractor.

3.14 Filling and Subgrade Preparation - Building Area

- a. The recommendations for filling and subgrade preparation for the building area as stated in the Geotechnical Report, prepared by R.W. Gillespie & Associates, dated November 14, 2003 shall govern.

3.15 Filling and Subgrade Preparation - Exclusive of Building Area

- a. The recommendations for filling and subgrade preparation for the building area as stated in the Geotechnical Report, prepared by R.W. Gillespie, dated November 14, 2003, shall govern.
- b. All materials shall be placed and compacted to conform to the lines, elevations and cross-sections indicated on the Drawings. Do not start fills until the area has been inspected and approved by the Landscape Architect or Owner's Representative.
- c. Fill shall not be placed on a surface of frozen material, nor shall snow, ice, frozen earth or debris be incorporated in the fill. All materials shall be approved by the Landscape Architect or Owner's Representative before being placed.
- d. Unless specifically stated otherwise on the Drawings, areas exposed by excavation or stripping and on which subgrade preparations are to be performed, shall be compacted to a minimum of 95% of maximum dry density, in accordance with ASTM D 1557. Subgrades consisting of native sands or silty sands shall be compacted with a 15 ton highway roller. These areas shall then be proof-rolled to detect any areas of insufficient compaction. Proof-rolling shall be accomplished by making a minimum of two (2) complete passes with a fully-loaded tandem-axle dump truck, or approved equivalent, in each of the two perpendicular directions. Areas of failure shall be excavated and recompacted as stated above.

- e. If sufficient suitable fill material is not available from excavations under this Contract, additional fill, suitable for use, shall be brought to the site from other sources. Subgrade fill in pavement areas shall consist of Gravel Borrow (M.D.O.T. 703.20) or Structural Fill (MeDOT 703.06 (a) Type C. Place in maximum 12 inch layers and compact to 92 percent of maximum density in accordance with ASTM D 1557. Each layer shall be free from ruts and shall meet compaction requirements before next layer is placed. Maintain layers with crown or other practical means of drainage.
- f. Stones in fills shall be well distributed. Do not have stones over six (6) inches in diameter within twelve (12) inches of subgrade.

3.16 Finish Grading

- a. Grade all areas where finish grade elevations or contours are indicated on Drawings, other than paved areas and buildings, including excavated areas, filled and transition areas, and landscaped areas. Graded areas shall be uniform and smooth, free from rock, debris, or irregular surface changes. Finished subgrade surface shall not be more than 0.10 feet above or below established finished subgrade elevation, and all ground surfaces shall vary uniformly between indicated elevations. Ditches and swales shall be graded to allow for proper drainage without ponding and in a manner that will minimize erosion potential. For topsoil application, refer to Section 02500-LANDSCAPING.
- b. Correct all settlement and eroded areas within one year after date of completion at no additional expense to Owner. Bring grades to proper elevation. Replant or replace any grass, shrubs, trees or other vegetation disturbed by construction using corrective measures.

3.17 Field Quality Control

- a. If Owner elects to test, an independent testing laboratory selected and paid by the Owner shall be retained to perform construction testing on site. Field density test may be ordered for each foot of depth of backfill at an average of 200 feet along the trench.
- b. If compaction requirements are not complied with at any time during the construction process, remove and recompact deficient areas until proper compaction is obtained at no additional expense to Owner.
- c. The independent testing laboratory shall prepare test reports that indicate test location, elevation data and test results. The Owner, Architect and Contractor shall be provided with copies of reports within 72 hours of time test was performed. In the event that any test performed fails to meet these Specifications, the Owner and Contractor shall be notified immediately by the independent testing laboratory.

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- d. All costs related to retesting due to failures shall be paid for by the Contractor at no additional expense to the Owner. The Owner reserves the right to employ an independent testing laboratory and to direct any testing that is deemed necessary. Contractor shall provide free access to site for testing activities.

3.18 Testing

- a. Field density test may be ordered by the Landscape Architect for each foot of depth of backfill at an average interval of 200 feet along the trench.
- b. The Contractor shall furnish all necessary samples for laboratory tests and shall provide assistance and cooperation during field tests. The Contractor shall plan his operations to allow adequate time for laboratory tests and to permit taking of field density tests during compaction.
- c. Any costs of re-testing required as a result of failure to meet compaction requirements shall be borne by the Contractor.

3.19 Work In Public Streets

- a. Work done in existing Municipal streets shall be done in accordance with local and/or State requirements as applicable.

3.20 Clean-up

- a. The Contractor shall remove all debris, construction equipment, and material from the areas to be loamed and seeded.

SECTION 02400

SITE DRAINAGE

PART 1. GENERAL

1.1 Related Work Specified Elsewhere

- a. The general provisions and documents of the Contract, including General and Special Conditions, apply to the work specified in this Section.
- b. Geotechnical Report - Section 00300
- c. Site Earthwork - Section 02200
- d. Construction Drawings

1.2 Quality Assurance

- a. It is the intention of this Section that the catchbasins, manholes and other structures, including all component parts, have adequate space and strength considered necessary for the intended service. Space requirements and configurations shall be as shown on the Drawings.
- b. Catchbasins and manholes shall be an assembly of precast sections with or without steel reinforcement, with approved jointing. In any approved structures, the complete structure shall be of such material and quality as to withstand loads of eight (8) tons (H-20 loading) without failure, continuously for the life of the structure. Assume a period in excess of 25 years for all structures.

1.3 Submittals

- a. The Contractor shall submit the following information with sets of As-Built Drawings:
 - (1) Shop Drawings of pipe and precast units, catchbasins and manholes.
 - (2) Manufacturer's information of joint sealants, gaskets and waterproofing.
 - (3) Storm drain pipe. Pipe of the same manufacturer shall be used throughout the project.
 - (4) Source and gradation reports for soil materials.

- (5) Manufacturer's information of physical, filtration/hydraulic, and mechanical properties of geotextile fabrics.
- (6) Drainage stone source and gradation analysis report.
- (7) Structural fill source and gradation analysis report.

1.4 Delivery, Storage and Handling

- a. Exercise care when handling pipe to prevent damage to pipe and finish.
- b. Immediately remove damaged materials and replace at no additional cost to the Owner.
- c. Store materials above ground on platforms, skids, or other adequate supports.
- d. Protect geotextiles from ultraviolet light in accordance with manufacturer's requirements.

PART 2. PRODUCTS

2.1 Materials

- a. Catchbasin and Manhole: All structures shall conform to the City of Portland Technical and Design Standards and Guidelines - Latest Edition. Structures shall be precast concrete structures, 4 foot interior diameter, unless otherwise specified, as manufactured by Superior Concrete or approved equal with T & G joints and rubber ring or asphalt filler seals.
 - (1) Bases - Precast sumps conforming to ASTM C478. Holes for pipes cast into the base section shall have a three (3) foot minimum clear distance between the inside bottom of the base section and the pipe invert.
 - (2) Barrels - Precast sections of correct height, conforming to ASTM C478 or solid concrete barrel blocks conforming to ASTM C-139.
 - (3) Cones - Precast, hunched type, conforming to ASTM C478.
 - (4) Pipe to Catchbasin Joints: Only as approved by the Landscape Architect and, in general, will depend on water-tightness upon a rubber boot either cast-in-place or press-wedged in place.

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- (5) Frames and Grates to conform to AASHTO M-105, Class 30, of gray cast iron by Etheridge Foundry. Refer to Drawings for type and size.
 - (6) Each section of the precast structure shall have two holes for the purpose of handling and setting. The holes shall be tapered and shall be plugged with nonshrink mortar or grout in combination with concrete plugs after installation. Note: For storm drain sections that serve as cutoff drains for groundwater, provide 1/4 inch perforations along the top of pipe. Refer to project details and plans.
- b. Storm Drain Pipe: PVC Pipe, Reinforced Concrete Pipe or Corrugated Polyethylene Pipe (refer to Drawings). Furnish as indicated on Drawings and of size shown. Provide couplings and special bends or elbows as shown or required by the work.
- (1) Polyvinyl Chloride (PVC) Pipe: Pipe and fittings shall comply with ASTM D 3034, rated SDR 35. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM D 3034 classification. Pipe joints shall be integrally molded bell ends in accordance with ASTM D 3034, Table 2, with factory supplied elastomeric gaskets and lubricant.
 - (2) Reinforced Concrete Pipe (RCP): Comply with requirements of ASTM C 76, Class III unless another class type is indicated on Drawings, installed with flexible plastic (Bitumen) gaskets at all joints. Gaskets shall comply with AASHTO M-198 75I, Type B, and shall be installed in strict accordance with pipe manufacturer's recommendations.
 - (3) Corrugated Polyethylene Pipe (CPP) Smooth Interior: Conform with AASHTO Designations M 294 and M252. Pipe must be installed in accordance with pipe manufacturers installation Guidelines for Culvert and Other Heavy-Duty Drainage Applications. Acceptable manufacturers: Advanced Drainage Systems, Inc. (ADS) N-12) & Hancore, Inc. (Hi-Q smooth interior).
 - (4) Foundation Drains: Pipe shall be perforated PVC pipe having a SDR of 35 or equivalent. Perforations shall consist of 3/8 inch diameter holes.
- c. Brick: Comply with the ASTM Standard Specifications for Sewer Brick, Designation C32, for Grade SS, hard brick.

- d. Cement: Shall be Type II. Concrete shall have a minimum strength of 3,000 psi at 28 days.
- e. Structural Fill for foundation drain backfill - M.D.O.T. 703.06, (a), Type C.
- f. Drainage Stone: M.D.O.T. 703.22 Type C. 3/8 - inch, pea stone or 3/4-inch crushed stone
- g. Geotextiles: Shall be Mirafi 160 N or equivalent for filtration fabric or equivalent.

PART 3. EXECUTION

3.1 Catchbasins and Manholes

- a. After the excavation has been done and leveled, six (6) inches of bedding material shall be put in the bottom of the excavation, leveled and thoroughly compacted.
- b. Precast concrete sections shall be set so as to be vertical and with section in true alignment, 1/4-inch maximum tolerance to be allowed.
- c. Invert channels of manholes may be formed in 3,000 psi concrete or using brick. When brick is used, use Portland cement, ASTM C 150, Type II. Masonry cements shall not be used. The top shelf shall slope to drain towards the flowing through channel.
- d. The top of the precast reinforced concrete unit shall be set at a grade that will allow a minimum of two (2) courses and a maximum of three (3) courses of brick and mortar before setting the cast-iron frame. Mortar for brick masonry shall be Portland cement, Type II, mixed in the proportion of one part cement to two parts sand, worked to the proper consistency.
- e. The inside and outside of the masonry work of all catchbasins shall be plastered with 1:2 Portland cement mortar. The thickness of the mortar shall be one-half (1/2) inch, and the mortar shall be carefully spread and thoroughly troweled, leaving a smooth, substantially waterproof surface. The mortar shall be extended to completely cover the outside and inside surfaces of all masonry work. To enhance proper curing, completed masonry shall be covered with a polyethylene plastic sheet or other appropriate means for a minimum of 24 hours before backfilling. The inside and outside of each horizontal joint in the precast manholes shall be filled with joint mortar and trowelled smooth.

- f. Backfilling shall be done in a careful manner in 6"-12" lifts and compacted with a vibratory compactor, bringing the fill up evenly on all sides.
- g. If any leaks appear in catchbasins, the Contractor shall uncover the structure and disassemble the sections and reconstruct the catchbasin, or perform other acceptable repairs approved by the Landscape Architect so as to secure a watertight structure. The Contractor shall install the precast units and pipeline connectors in a manner that will result in a watertight joint.
- h. Catchbasins and manholes shall be constructed as the sections of the pipelines between them are completed, and unless this is done, the Landscape Architect shall have the authority to stop trenching and pipe laying until manhole construction is brought up properly. All ground water shall be kept away from any newly placed concrete or freshly laid masonry work until cement has properly set and until a watertight job is obtained.

3.2 Catchbasin and Manhole Frames and Grates

- a. Catchbasin and manhole frames shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface, or as directed.
- b. Frames shall be set concentric with the top of the masonry and in full bed of mortar so that the space between the top of the masonry and the bottom flange of the frame shall be completely filled and made watertight.
- c. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around and on top of the bottom flange. Mortar shall be smoothly finished and have a slight slope to shed water away from the frame.
- d. Manhole covers and catchbasin grates shall be left in place in the frames on completion of the other work at the manholes and catchbasins.

3.3 Drain Pipes

- a. Firmly support the pipe and fittings on bedding material as shown on the Drawings and as specified in the appropriate Sections of these Specifications. Do not permanently support the pipe or fittings on saddles, blocking stones, or any material which does not provide firm and uniform bearing along the outside length of the pipe. Thoroughly compact the material under the pipe to obtain a substantial unyielding bed shaped to fully support the pipe. Excavate suitable holes for the joints so that only the barrel of the pipe receives bearing pressure from the supporting material after placement.
- b. Lay each pipe length so it forms a close joint with the adjoining length and bring the inverts to the required grade, without high spots. Do not drive the pipe down to grade by striking it with a shovel handle, timber, hammer, or any other unyielding object. When each pipe length has been properly set, place and compact enough of the bedding material between the pipe and the sides of the trench to hold the pipe in correct alignment. After filling the sides of the trench, place and lightly tamp bedding material to complete the bedding as shown on the Drawing. Take all necessary precautions to prevent floatation of the pipe in the trench.
- c. Temporary Plugs - When pipe installation work in trenches is not in progress, close the open ends of the pipe with temporary watertight plugs. If water is in the trench when work is resumed, do not remove plugs until all danger of water entering the pipe is eliminated. Do not use the pipelines as conductors for trench drainage during construction.
- d. Jointing - Connect pipe in accordance with the latest manufacturer's instructions and recommendations. Clear each pipe length, coupling and fitting of all debris and dirt before installing. Provide and use coupling pullers for jointing the pipe. Provide gasket feeler gauges for use by the pipe layer for checking the position of the rubber gaskets in the completed joints.
- e. Shove home each length of pipe against the pipe previously laid and hold securely in position. Do not pull or cramp joints. Make all pipe joints as watertight as possible with no visible leakage and no sand, silt, clay, or soil of any description entering the pipeline at the joints. Immediately after making a joint, fill the holes for the joints with bedding material, and compact.
- f. Pipe Cutting - Cut in accordance with manufacturer's recommendations. Cut the pipe with a hand saw, metal-inserted abrasive wheel or pipe cutter with blades (not rollers). Examine all cut ends for possible cracks caused by cutting.

- g. Inspection - Pipe installation shall be subject to inspection by the Landscape Architect for quality, adherence to line and grade, jointing, and proper backfill. Any joint not satisfactory to the Landscape Architect shall be removed and remade to his satisfaction at the Contractor's expense. No pipe shall be backfilled until it has been approved by the Landscape Architect.

3.4 Foundation Drain Pipe

- a. Bed all foundation drains in Drainage Stone, wrapped in Mirafi 160 N geotextile filter fabric or approved equal, as shown on the drawings.
- b. Shape subgrade to drain outlets as shown on the grading and drainage plan.
- c. Install geotextile stabilization fabric between subgrade and pavement subbase gravel, as determined by the geotechnical engineer or Owner's Representative.

3.5 Pipe Insulation

- a. Install two (2) inch thick by four (4) feet wide styrofoam SM insulation as manufactured by Dow Chemical Co., or approved equal, as shown on Detail Drawing.
- b. Install over and along the sides of the pipe when there is less than four (4) feet of cover between the top of pipe and original ground grade.

SECTION 02420

SITE UTILITIES

PART 1. GENERAL

1.1 Related Documents

- a. The general provisions and documents of the Contract, including General and Special Conditions, apply to the work specified in this Section.
- b. Site Earthwork - Section 02200
- c. Site Drainage - Section 02400
- d. Cast-in-Place Concrete - Section 03300
- e. Construction Drawings

1.2 Tests, Permits, Inspections, and Codes

- a. Sewer and water lines shall be tested before use.
- b. Utility installations shall comply with all applicable local and state codes and with requirements of local sewer and water districts.
- c. All utility installations shall be inspected and approved by the Landscape Architect or Owner's authorized representative before being backfilled and also by utility company inspectors and local code enforcement where applicable.
- d. The Contractor shall obtain and pay for any permits required for this portion of the work.

1.3 Submittals

- a. Refer to Section 02400, Paragraph 1.3.
- b. Product Data: Provide data on pipe materials, pipe fittings, valves, meter pit and accessories.
- c. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

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- d. 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.
- e. All materials including pipe, valves, hydrants, etc., shall be subject to approval by the Portland Water District or designated authority.

1.4 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.

1.5 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.

1.6 Damages

- a. If, during the process of this work, utilities in place are damaged, they shall be restored to their proper condition at no added cost to the Owner.

PART 2. PRODUCTS

2.1 Sanitary Sewer System

- a. The Contractor shall contact and coordinate with the City of Portland, Department of Public Works regarding the complete sanitary sewer system.
- b. Polyvinyl Chloride (PVC) Sanitary Sewer
 - (1) Pipe and fittings shall comply with ASTM D 3034, rated SDR 35. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM D 3034 classification.
 - (2) PVC Pipe Joints: PVC shall be supplied with the coupling or coupling integrally molded to the pipe barrel. All joints shall be bell and spigot. Fittings and couplings shall be of the "O" ring push on type as required for non-pressure sewer pipe. "O" rings shall conform to ASTM Designation D 1869 - Latest revision.

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- (3) Fittings for PVC Sewer Pipe: Where fittings such as tee and wyes are required for service taps, "O" ring, PVC fittings shall be used. The material for the PVC fittings shall be compatible to the pipe material in characteristics.

2.2 Water Distribution System

- a. The Contractor shall contact and coordinate with the Portland Water District regarding the complete water system. Refer to the Portland Water District requirements.

2.3 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 02200.
- c. Cover: As specified in Section 02200.

2.4 Accessories

- a. Concrete for Thrust Restraints: Concrete type specified in Section 03300.

PART 3. EXECUTION

3.1 Trenches

- a. Pipe trench excavation and backfill shall be as specified in Section 02200 - Site Earthwork.

3.2 Pipe Jointing and Pipe Laying: Sanitary Sewer

- a. Pipe Jointing - All joints shall be made in a dry trench and in accordance with the manufacturer's recommendations and the best practices for class of pipe laid. The ends of the pipe shall be wiped clean before making the joint.

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- b. Pipe Laying - The pipe shall be accurately laid to the line and grades to the satisfaction of the Landscape Architect or the Owner's authorized representative. Sewer pipe shall be placed on six (6) inches of specified crushed material. The line and grade may be adjusted by the Landscape Architect or his authorized representative or a City Engineering Department representative from that shown on the Drawings to meet field conditions and no extra compensation shall be claimed therefore. Whenever the nature of the material excavated is such as to render it unsuitable for bedding, the Contractor shall furnish suitable material as otherwise provided in these Specifications.
- c. The interior of each length of pipe shall be swabbed and wiped clean before laying the next length. No length of pipe shall be laid until the previous length has had specified material placed and tamped around it to secure it firmly in place to prevent any disturbance. Bell ends shall be laid uphill. Whenever the work is stopped temporarily for any reason whatever, the end of the pipe shall be carefully protected against dirt, water or other extraneous material.
- d. The pipe shall be cut as necessary. Sufficient short lengths of pipe shall be furnished so that pipe shall not be more than four (4) feet in length at points of connection with other piping.
- e. Inspection - Pipe installation shall be subject to inspection by the Landscape Architect or his authorized representative for quality, adherence to line and grade, jointing and proper backfill. Any joint not satisfactory to the Inspector shall be removed and remade to his satisfaction at the Contractor's expense. No pipe shall be backfilled until it has been approved. All work must conform to the City of Portland standards for the sanitary installation.
- f. Safety regulation of the State of Maine and the Federal Government, as applicable, shall be followed in regards to work in trenches and trench excavations.

3.3 Manhole Connection

- a. Neatly cut off main flush with inside of existing manhole where they enter structure walls, and point up irregularities and rough edges with nonshrinking with nonshrinking grout. Shape inverts for smooth flow across structure floor as shown on Drawings. Use concrete and mortar to obtain proper grade and contour and finish surface with fine textured wood float.

3.4 Water Distribution System

- a. Work shall be in accordance with applicable AWWA, 10 State Standards, and Portland Water District Standards.

3.5 Lines and Grades

- a. All mains, valves, and curb stops locations shall be verified by the project engineer.

3.6 Excavation

- a. Excavation for trenches for the placing of water mains, valves, and fittings must be of sufficient width to permit the work to be done in the manner and to the depths specified or as shown on the plans. The trench shall be dug to the required level, and the bottom shaped by hand to conform to the shape of the pipe or appurtenances being installed.

3.7 Pipe Laying

- a. All pipe shall be laid to line as indicated on the Drawings. Pipes shall be laid with a minimum of 5 1/2 feet of cover over the pipe. This depth of cover shall be measured from finished grade. Pipe, fittings and valves shall be carefully handled to avoid damage.
- b. Suitable equipment shall be provided by the Contractor for handling the pipe. Any damage to the pipe in handling or laying shall be at the Contractor's expense. Poured concrete thrust blocks shall be provided for all fittings shown on the Drawings and in accordance with the manufacturer's recommendations.
- c. The Contractor shall install a warning tape in the water main trench that is detectable with an inductive type metal detector. The tape shall be blue and have printing that warns of a water line below. The tape shall be Allen Detectatape, as manufactured by Allen Systems, Inc., of Wheaton, Illinois or approved equal and have a 3" width.
- d. Depth of installation shall be one to two feet below grade. The tape shall be detectable with an inductive type metal detector. Splicing of the tape shall be accomplished with manufacturer furnished metal clips. Where required by the Project Engineer, No. 9 gauge copper wire shall be clipped to the tape and brought to the ground surface or attached to other metal risers.
- e. Unless special anchoring devices are indicated by the Project Engineer, all fittings shall be provided with concrete thrust blocks pured against the fitting and undisturbed earth to insure against disjoints from the pipe when placed under pressure. Concrete for thrust blocks shall be so placed that the pipe and joints will be accessible for repair. Concrete shall consist of one part Portland cement, 2 1/2 parts of fine aggregate, and 3 1/2 parts of course aggregate with just enough water to produce a workable consistency.

3.8 Vertical Separation From Sanitary Sewer

- a. Whenever water mains must cross sewer, lay at such an elevation that the top of the sewer is at least 18 inches below the bottom of the water main. When the elevation of the sewer cannot be buried to meet the above requirements, center one full length of water main over the sewer so that both joints will be as far from the sewer as possible.

3.9 Inspection

- a. The manufacturer shall certify to the Owner that all pipe and fittings furnished under this contract conform to these Specifications.
- b. Acceptability of pipe shall be determined by results of strength tests and by inspection at point of delivery to determine whether pipe conforms to Specifications in design and freedom from defects. Rejection on results of field inspection may be made on account of any of the following:
 - (1) Variations in any dimensions exceeding permissible variations.
 - (2) Visible cracks, holes, foreign inclusions or other injurious defects.
 - (3) Any pipe or fittings showing a crack and any fitting or pipe which has received a severe blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from work.
 - (4) Variation of more than 1/16 inch per linear foot in alignment of pipe intended to be straight.
 - (5) Insecure attachment of spurs or branches.

3.10 Backfilling

- a. Backfilling shall be done with approved materials free from roots, frozen pieces, rubbish, large clods or stones. Backfill materials shall be placed in trenches evenly and carefully around and over the pipe in layers. Each layer shall be thoroughly and properly compacted.

3.11 Testing

- a. Whenever practical, before the trench has been backfilled or the joints covered, the pipe shall be tested for leaks. The test may also be made with one foot of backfill placed on the pipe, or the pipe may be completely backfilled. All leaks above the allowable maximum shall be repaired, however regardless of when tests are made. The Contractor shall provide all necessary equipment including but not limited to an appropriate pump, water container, pressure gauge, valve, hydrant connection and corporation stop connection, and he shall perform all work required in connection with the test.
- b. Each section tested shall be slowly filled with water, care being taken to expel all air from the mains and service lines, if installed. If necessary, the pipes shall be tapped at high points to vent the air. All foreign material shall then be flushed from the main. If possible, a flushing velocity of fps shall be run through the mains until clean.
- c. The portion to be tested shall be placed under constant 150 percent of working pressure or 100 psi whichever is greater as designated by the project engineer, all leaks shall be repaired, additional tests instituted and continue the process until all major leakages are eliminated. The test pressure shall be at the minimum pressure at highest point in the water line. Further, line test pressure shall not exceed 15% of the pressure rating at the lowest point.
- d. Allowable maximum leakage shall be determined, as follows $L = (ND / P) / 7400$, where L = allowable leakage in gallons per hour, N is the total length tested divided by the standard length of pipe, D is the nominal diameter of the pipe in inches and P is the test pressure specified above.
- e. A complete approved pressure test of a minimum of two hour duration will be accomplished prior to disinfection. Obtaining water at the site for testing shall be the Contractor's responsibility.

3.12 Disinfection of Water Mains and Fittings

- a. Disinfection of water mains and appurtenances shall be in accordance with the AWWA Standard C651-86, however, the tablet method is not allowed. Chlorinated water shall be directed along and through all lines and appurtenances to be disinfected until a minimum of fifty ppm of chlorine is detected at representative points throughout the line.

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- b. At the end of the 24-hour contact period, a minimum chlorine residual of 5 ppm free chlorine must be detected before disinfection will be considered successful. If unsuccessful, the lines must be re-chlorinated. Otherwise, the line shall be flushed out with clean water until a maximum of 0.4 ppm chlorine residual is detected. All valves and hydrants shall be operated several times during the twenty-four hour contact period. The disinfection water shall be wasted in an environmentally safe manner subject to the approval of the project engineer.
- c. After disinfection, bacteriological samples will be collected and forwarded by the Contractor to a certified lab, such as the State Health Department, for analysis. If positive results are obtained, the system shall be repeated until negative results are obtained.
- d. The method of disinfection and the chlorinating materials used shall be subject to the approval engineer.

3.13 Electric, Telephone and Cable

- a. The Contractor shall coordinate and install underground utilities with Central Maine Power, Verizon, and Time Warner Cable.
- b. The Contractor shall layout and do all excavating and backfilling of trenches for electric, telephone, and cable services, including foundations for light poles and transformers.
- c. Contractor shall confirm all utility company requirements prior to installation, i.e., conduits.

3.14 Gas

- a. The Contractor shall be responsible for the coordination of gas service to the building with Northern Utilities.

3.15 Interference

- a. The Contractor shall be responsible for maintaining proper clearance between adjacent pipes and between pipes and structures. If an interference situation arises, any proposed new routing shall be approved by the Landscape Architect.

3.16 Clean-up

- a. Upon completion of the installation of the sanitary sewers, appurtenant structures, water distribution system and any other work incidental thereto, the Contractor shall remove from the project all equipment, surplus construction materials and debris of any type resulting from the work and shall leave the area in as good or better condition as prior to construction.

SECTION 02460

SITE IMPROVEMENTS

PART 1. GENERAL

1.1 Related Work Specified Elsewhere

- a. The general provisions and documents of the Contract, including General and Special Conditions, apply to the work specified in this Section.
- b. Site Earthwork - Section 02200.
- c. Construction Drawings.

PART 2. PRODUCTS

2.1 Concrete Pavement

- a. All concrete shall meet the requirements as specified in Section 03300 of these Specifications.

2.2 Concrete Pavers

- a. Paving stone for handicap curb ramp, entry plaza and display areas shall be 4"x8" nominal. All 4"x 8" pavers shall be 2-3/8" thick, with average minimum compressive strength of 8,000 psi with no individual unit under 7,200 psi, and absorption rate of 5 percent, with no unit greater than 7 percent (ASTM C 140) when tested in accordance with ASTM 936-82. Paver for the handicap ramps shall be Holland Stone with a Score, color "Granite Gray". Pavers for entry plaza and display areas shall be "Cumberland Blend" and New England Blend. All pavers as manufactured by Duracon Paving Systems, Genest Concrete - Wilson Street, P.O. Box 151, Sanford, Maine 04073 or approved equal.

2.3 Concrete Paver Joint Sealant

- a. Sureland SB-1370 joint stabilizing sealer as manufactured by Sureband East, Inc.

2.4 Drip Strip

- a. Material for perimeter drip strip shall be Mirafi 160-N geotextile drainage fabric and 3/4 inch washed stone.

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2.5 Wood Fence

- a. Contractor shall furnish wood fence in quantities as shown on the Drawings and as specified herein.
- b. Fence shall be eight (8) feet in height, white cedar fence, model "Board & Cap", as manufactured by Ron Forest & Sons Fence Co., Scarborough, Maine. All Cedar shall be Grade #1.
- c. Posts shall be 5"x 5" x 12' long, Grade #1 cedar "Philly" style, as manufactured by Ron Forest & Sons Fence Co., Scarborough, Maine.

2.6 Dumpster Enclosure

- a. Contractor shall furnish dumpster pad, fence and gate as shown and detailed on the Drawings and as specified herein. All fasteners shall be heavy duty and hot dipped galvanized.

2.7 Signage

- a. Provide traffic control signs complying with U.S. Department of Transportation, Federal Highway Administrations Manual "Uniform Traffic Control Devices"; local codes, and as specified. See Drawings for type, location and quantity of sign required.

To be painted with reflective baked - enamel finish with following colors:

- (1) "HANDICAPPED PARKING ONLY" Sign: 12" x 18" white legend on blue background. ("Van Accessible" where required)
- (2) "STOP" signs shall be 24" x 24" octagon, reflectorized copy and boarder.

2.8 Stone Headwall

- a. Stone used to build stone headwall shall be hard, durable stone. Landscape Architect shall approve samples of stone to be used prior to delivery to site for installation.

2.9 Concrete Bases and Footings

- a. Furnish and install all concrete work in accordance with the following standards: ACI 301 Formwork, ASTM C150 Normal Type I Portland Cement, grey color, ASTM C33 fine and coarse aggregates, ASTM C94 concrete mix, comprehensive strength of 4000 PSI at 28 days. Deformed welded wire fabric ANSI/ASTM A497, rebar; ASTM A613 grade 60.

2.10 Pavement Markings

- a. The paint shall be a non-bleeding, quick drying, alkyd petroleum base paint suitable for traffic-bearing surfaces and shall meet FS TTP-85E and mixed in accordance with manufacturer's instructions before application.

PART 3. EXECUTION

3.1 Concrete Pavement

- a. After placement of the gravel base, the surface shall be brought to a smooth, uniform surface by grading and rolling the crushed aggregate base and re-rolled until the surface is true and even.
- b. Slabs shall be placed alternately in lengths not to exceed 30 feet, or as directed and shall be separated by an expansion joint of preformed expansion joint filler and sealant 1/3 inch in thickness. The thickness of the slab shall be as shown on the Plans. The sidewalk surface shall be scored 1-3/8 inch deep into block units as shown on the Plans. When a concrete sidewalk is constructed adjacent to a building, fixed or other structures, a 1/2 inch thick preformed joint filler and sealant shall be used between the slab and the structure. Both expansion and control joints are to occur only within score joints.
- c. Broom Finish - Broom finish by drawing a stiff-bristled pushbroom with a long handle over a troweled surface. Concrete walks shall receive a medium broom finish. Direction of brooming shall be perpendicular to major direction of pedestrian movement or as directed by the Landscape Architect.
- d. Concrete pavement shall be saw cut (not tooled) after brooming to insure a well-defined and smooth border.
- e. Finished concrete shall be properly cured using a waterproof material, such as Sisal Kraft orange label lapped 6 inch taped. The concrete shall be properly moistened before covering it, and shall be kept tight. Curing shall be a minimum of seven (7) days.

3.2 Concrete Pavers

- a. Base shall be fine graded and compacted to 4-1/2 inches below desired finished grade. The concrete sand setting bed shall be screened loose to a thickness of 1-1/2 inches. After sand has been screened, it shall not be disturbed or pre-compacted.
- b. Pavers shall be laid in a running bond pattern or as indicated on the Drawings, hand tight with care taken to maintain straight and true lines as shown on the Drawings. All necessary cutting shall be accomplished with a masonry saw.

- c. Compaction: After pavers are installed and the cutting has been completed, the stones shall be compacted into the loose sand with a plate type vibrating compactor, two (2) passes on all areas. Sand shall then be swept into the joints and vibrated with a plate type compactor until joints are full. Joints shall be filled all the way to the bottom of the chamfer on the pavers. Excess sand shall be swept off and removed from the site.
- d. Surface tolerance: Upon completion of a section of pavers, the surface of the pavers shall be checked with a ten (10) foot straight edge. Variation exceeding 1/8 inch between adjacent stones shall be corrected by relaying.
- e. Thoroughly clean all exposed surfaces with a solution of detergent and water, using still-fiber brushed.

3.3 Paver Sealant

- a. Pavers and joints shall be sealed with approved sealer, per manufacturer's requirements.

3.4 Drip-Strip

- a. The Contractor shall excavate to limits shown on the Drawings. Compact subgrade to provide a firm even base. Place 3/4" washed stone in six (6) inch layers and compact to achieve depth required on the Drawings.

3.5 Wood Fence

- a. Contractor shall place and install fence in locations as shown on the Drawings. Fence posts shall be installed and set into compacted subgrade and backfilled with gravel.
- b. Fence panels shall be attached to posts as recommended by manufacturer.

3.6 Dumpster Enclosure

- a. Contractor shall construct and install dumpster enclosure gates in location and as detailed on the Drawings and as specified herein.

3.7 Signage

- a. Contractor shall install signs in locations and as detailed on the Drawings. Set posts vertical and plumb. Mount sign in accordance with manufacturer's instructions.

3.8 Stone Headwall

- a. Contractor shall construct headwall in location and as detailed on the Drawings.

3.9 Concrete Pads, Bases and Footings

- a. Contractor shall supply and install concrete pads, bases and footings in quantities and locations as shown on the Drawings and specified herein.

3.10 Pavement Markings

- a. Immediately before applying the pavement marking paint to the pavement, the surface shall be dry and entirely free from dirt, grease, oil or other foreign matter which would reduce the bond between the paint and the pavement. The surface shall be thoroughly cleaned by sweeping and blowing, if required, to remove all dust, dirt and loose materials. Areas which cannot be satisfactorily cleaned by sweeping and blowing shall be scrubbed with water, as directed, after which the surface shall be allowed to dry prior to painting.
- b. Apply two (2) coats of paint at manufacturer's recommended rate without the addition of thinner with a maximum of 125 square feet per gallon. Apply with mechanical equipment to produce uniform straight edges. At sidewalk curbs and crosswalks, use a straightedge to ensure a uniform, clean, and straight stripe.

SECTION 02470

BITUMINOUS CONCRETE PAVING

PART 1. GENERAL

1.1. Related Work Specified Elsewhere

- a. The general provisions and documents of the Contract, including General and Special Conditions, apply to the work specified in this Section.
- b. Site Earthwork - Section 02200.
- c. Construction Drawings.

1.2 References

- a. State of Maine Department of Transportation Standard Specifications Highways and Bridges, latest revision, hereafter designated as MDOT Specifications.

1.3 Material Certificates

- a. Submit materials certificate to onsite independent testing laboratory which is signed by material producer and Contractor, certifying that materials comply with, or exceed, the requirements herein.

PART 2. PRODUCTS

2.1 Materials

- a. Bituminous Concrete (roadway and parking) - An approved hot plant mix conforming to MDOT Standard Specifications (latest revision). Use Grading B mix for binder and C mix for surface.

PART 3. EXECUTION

3.1 Bituminous Concrete Paving

- a. The Contractor shall be responsible that gravel is in proper condition to pave before starting work.
- b. Proof roll prepared base material surface to check for areas requiring additional compaction and areas requiring removal and recompaction.

- c. Do not begin paving work until deficient base material areas have been corrected and are ready to receive paving.
- d. Pavement mix for roads and parking areas shall be as herein specified and shall consist of the following courses after compaction:

	<u>Binder</u> <u>Course</u>	<u>Wearing</u> <u>Course</u>
Standard Duty Pavement:	2"	1"

- e. The spreading of bituminous concrete shall be done wherever practicable by an approved mechanical spreader. Place mixture while it is still hot (+250 D.F.). Rolling shall be done as soon as practicable after spreading and in no case after the mixture is cooled. The exposed finished surface shall present a true, smooth plane, free from roller marks, conspicuous joining lines, patches, voids or other imperfections. Where brown spots or other serious imperfections occur they shall be cut down to the base course and replaced by new pavement rather than by attempting to patch the surface. Feathered edge patches will not be permitted.
- f. Apply successive lifts of asphaltic concrete in transverse directions with the surface course placed in the direction of surface-water flow. Place in typical strips not less than 10' - 0" wide.
- g. Make joints between old and new pavements or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density and smoothness as other sections of asphalt concrete course. Joints at existing street paving and new paving shall be saw cut. Clean contact surfaces and apply tack coat.
- h. Mix placed by hand shall be placed on a steel dump board or wheelbarrow from the truck and then shoveled into place.

3.2 Rolling and Compaction

- a. The mixture, after being spread, shall be thoroughly compacted by rolling as soon as it will bear the weight of the rollers without undue displacement. Mixture shall be compacted to a minimum of 92% theoretical maximum density. The number, weight and types of rollers and sequences of rolling operations shall be such that the required density and surface are consistently attained while the mixture is in workable condition.

- b. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
- c. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.
- d. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.
- e. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.
- f. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut out such areas and fill with fresh, hot asphalt concrete. Compact by rolling to maximum surface density and smoothness.
- g. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.
- h. Do not permit maneuvering of excavating equipment, lifts or other vehicles with tight turning or tracking capabilities on finished surface. Damaged areas shall be restored by Contractor at no additional expense to Owner.

3.3 Field Quality Control

- a. Grade Control: Establish and maintain required lines and elevations.
- b. Thickness: In-place compacted thickness shall not be less than thickness specified on the Drawings. Areas of deficient paving thickness shall receive a tack coat and a minimum one (1) inch overlay; or shall be removed and replaced to the proper thickness, at the discretion of the Owner; until specified thickness of the course is met or exceeded at no additional expense to the Owner.

- c. Surface Smoothness: Testing shall be performed on the finished surface of each asphalt concrete course for smoothness, using 10' - 0" straightedge applied parallel with, and at right angles to centerline of paved area.

The results of these tests shall be made available to the Owner upon request. Surfaces will not be acceptable if exceeding following tolerances for smoothness:

Base Course Surface:	1/4"
Wearing Course Surface:	3/16"

- d. Check surface areas at intervals necessary to eliminate ponding areas. Remove and replace unacceptable paving as directed by Owner.
- e. Compaction: Field density tests for in-place materials shall be performed by examination of field cores in accordance with one of the following standards:
 - (1) Bulk specific gravity of paraffin-coated specimens: ASTM D-1188.
 - (2) Bulk specific gravity using saturated surface-dry specimens: ASTM D-2726.
- f. Rate of testing shall be one (1) core per 20,000 square feet of pavement, with a minimum of three (3) cores from heavy-duty areas and three (3) cores from standard-duty areas. Cores shall be cut from areas representative of the project.
- g. Areas of insufficient compaction shall be delineated, removed and replaced in compliance with the specifications at no expense to the Owner. Areas damaged by construction equipment shall be repaired to satisfaction of Owner at no expense to Owner.

SECTION 02480

CURBING

PART 1. GENERAL

1.1 Related Work Specified Elsewhere

- a. The general provisions and documents of the Contract, including General and Special Conditions, apply to the work specified in this Section.
- b. Site Earthwork - Section 02200
- c. Construction Drawings

1.2 References

- a. Where M.D.O.T. appears it shall be taken to mean The State of Maine Department of Transportation Specifications, Highways and Bridges - Latest Revision.

PART 2. PRODUCTS

2.1 Materials

- a. Vertical Granite Curb: Vertical granite curb shall conform to M.D.O.T. specifications for TYPE I. Curb shall be acceptable granite from approved quarries.
- b. Sloped Granite Curb: Sloped granite curb shall conform to M.D.O.T. specifications for Type V.
- c. Tip-Down and Transition Granite Curb: Miscellaneous granite curb sections shall conform to M.D.O.T. Specifications 712.04 (b).
- d. All granite curb shall conform to the following standards:
 - (1) All granite curb shall be basically light gray in color, free from seams and other structural imperfection or flaws which would impair its structural integrity, and of a smooth splitting appearance. Natural color variation characteristic of the deposit from which the curbing is obtained will be permitted.

- (2) The exposed face shall be smooth quarry split to an approximately true plane having no projections or depressions which will cause over one (1) inch to show between a two (2) foot straight-edge and the face when the straight-edge is placed as closely as possible on any part of the face.
- (3) If projections on the face are more than that specified they shall be dressed off. The top and bottom lines of the face shall be pitched off to a straight line and shall not show over one (1) inch between stone and straight-edge when straight-edge is placed along the entire length of the top and bottom lines and when viewed from a direction at right angles to the plane of the face, and for the top line only not over (1) inch when viewed from a direction in the plane of the face. The ends shall be square to the length at the face and so cut that when placed end to end as closely as possible, no space shall show in the joint at the face of over 3/8 inch, except that where the edging is to be used on a curve having a radius of ten (10) feet or less, the ends of the stones shall be so cut as to provide a finished joint at the face section of not more than 1/2 inch. The arras formed by the intersection of the plane of the face with the plane of the end joint shall not vary from the plane of the face more than 1/4 inch. Drill holes not more than 3-1/2 inches in length and 1/2 inch in depth will be permitted. The sides shall not be broken under the square more than four (4) inches and the side adjacent to the grass shall not project over one (1) inch.

(4) Dimension Tolerance:

Minimum Length	2 feet
Maximum Length	8 feet
Thickness	4 inches
Width of Face	12 inches

- (5) Acceptable Manufacturer:
John Swenson Granite Co. or approved equal.

- e. Bituminous Concrete Curb (Cape Cod Curb): An approved hot plant mix conforming to curb mix specifications.

PART 3. EXECUTION

3.1 Granite Curb

- a. Contractor shall install, backfill and protect all granite curb in accordance with M.D.O.T. Subsection 609.03 and as detailed on the Drawings. Provide approved granite tip-down curbs at all curb end sections and handicapped ramps. Provide approved granite transition curb where curb type and or material changes occur.

3.2 Bituminous Concrete Cape Cod Curb

- a. Place curb by machine in locations and as detailed on the Drawings. Use bituminous pad beneath curb at all locations.

3.3 Protection

- a. The Contractor shall provide temporary barriers to protect newly formed bituminous curbing from damage during construction. All damaged curbing shall be repaired or replaced as necessary without additional expense to owner and inspected and approved by the Owner's Representative.
- b. The Contractor shall be responsible to protect and repair as necessary all vertical, sloped granite or concrete curbing disturbed during construction and no expense to owner. Provide temporary barriers at all radius locations where truck entry would impact curbing.

SECTION 02500

LANDSCAPING

PART 1. GENERAL

1.1 Related Work Specified Elsewhere

- a. The general provisions and documents of the Contract, including General and Special Conditions, apply to the work specified in this Section.
- b. Site Improvements - Section 02870
- c. Construction Drawings

1.2 Scope

- a. Work under this Section shall include all labor, materials, services, equipment and accessories necessary to furnish and install trees, shrubs, and turf in accordance with the specifications and applicable Drawings.

1.3 Certification of Acceptability

- a. Inspection of the work covered by this Section to determine completion of the work involved will be made at the conclusion of the Maintenance Period upon written notice requesting such inspection submitted by the Landscape Contractor at least ten (10) days prior to the anticipated date. The condition of turf and plantings will be noted and determination made by the Landscape Architect whether maintenance shall continue.

1.4 Standards

- a. Provide plants which are true to name. Tag one of each bundle or Lot with the name and size of plants and shall conform to ANSI Z260.1 - Nursery Stock, latest edition, of the American Association of Nurserymen, Inc.
- b. Workmanship: Perform work in accordance with the best standards of practice for Landscape work and under the continual supervision of a competent foreman capable of interpreting the Drawings and Specifications.

- c. Submit documentation to Landscape Architect of Record within twenty-five (25) days after award of contract stating that plant material is available. Any and all substitutions due to unavailability must be requested in writing prior to confirmation of ordering.
- d. Plants shall be subject to review and approval of Landscape Architect of Record at place of growth or upon delivery for conformity to specifications. Such approval shall not impair the right of review and rejections during progress of the work. Submit written request for review of plant material at place of growth to Landscape Architect of Record. Written request shall state the place of growth and quantity of plants to be reviewed. Landscape Architect of Record reserves the right to refuse review at this time if, in his judgement, sufficient quantity of plants is not available for review. Review shall be for character and form.

1.5 Guarantee

- e. Turf and plantings shall be guaranteed for one (1) full year after certification of acceptability by the Landscape Architect and shall be alive and in satisfactory growth at the end of the guarantee period, except for damage resulting from causes beyond the responsibility of the Contractor. The Contractor shall provide the Owner with a written guarantee upon certification of acceptability. For plant material in question at the end of the guarantee, the Landscape Architect, Owner and Contractor shall determine a reasonable extension of the guarantee period.

1.6 Tests and Certifications

- a. Tests specified in this Section shall be paid for by the Contractor. **Certifications required must be submitted to the Landscape Architect or Owner's Representative for approval before use of materials on the site.**
- b. **The Contractor shall be required to take representative soil samples of the topsoil** to be provided from several locations (on-site) in the area(s) under consideration for testing. Imported topsoil shall also require test results prior to placement. Tests shall be made by a State Commercial Soil Testing Laboratory using methods approved by the Association of Official Agricultural Chemist or the State Agricultural Experiment Station, or by the University of Maine at Orono. Testing shall include chemical balance (pH) **as well as organic content.** The required pH level shall be between 6.6-7.3% and the organic content shall be between 6.5-8%.

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- c. The Contractor shall provide testing data for composted soil amendment if required to supplement the required minimum organic content.

PART 2. PRODUCTS

2.1 Materials

- a. Topsoil - The Contractor shall furnish and place topsoil to give the specified depths. The Contractor shall furnish and place 18 inches of loam in all shrub beds, and 6 inches under all turf areas. Topsoil mix shall be placed in all tree and shrub pits as shown on the Drawings. Natural loam topsoil shall be of uniform quality, free from hard clods, still clay, hard pan sods, stones over ¾ inches and undesirable inorganic materials. The Owner and/or Landscape Architect reserves the right to reject on or after delivery any materials which do not, in his or her opinion, meet these Specifications.
- b. Additives
 - (1) Humus - Ground or shredded peat that has been stockpiled at least one year prior to use, or commercial bagged peat.
 - (2) Manure - Well-rotted unleached stable manure with no more than 25% straw, shavings, or sawdust content. A mixture of one (1) cubic yard of peat humus or peat moss and 100 lbs. of commercial dehydrated-bagged manure such as Bovung or Spurigon may be used.
 - (3) Mulch for Plants - Well-rotted (**black**) shredded pine bark as approved by the Landscape Architect.
 - (4) Lime - Commercial ground lime with no less than 85% total carbonates, 50% passing a 100 mesh sieve and 90% passing a 200 mesh sieve as approved by the Landscape Architect. Coarser material will be accepted provided that specific rates of application increased proportionately.
 - (5) Compost soil amendment – Acceptable compost for “compost manufactured topsoil” shall conform to EPA Chapter 40 CFR 503 (pathogen, metals and vector attraction reduction) as well as applicable state regulations.
- c. Commercial Fertilizer
 - (1) Seeding - 19-26-5 dust free homogenous granular material such as Scotts Pro-Turf Starter Fertilizer or an approved equal (application rate as recommended by manufacturer).

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- (2) Sodding - 10-6-4 with 50% nitrogen derived from ureaform, such as Agway Turfwood Special Premium or an approved equal (application rate as recommended by manufacturer).
 - (3) Superphosphate - 0-20-0 in unopened bags with manufacturer analysis printed on the bag.
- d. Plant Materials - Furnish plants shown and specified on the Drawings and listed in the plant materials list. Discrepancies between the number of plants shown on the Drawings and the number listed in the plant list shall not be grounds for additional remuneration for the Contractor. Plants shall be nursery grown, typical of their species or variety and have a normal habit of growth. Any plant with broken, damaged, or badly bruised branches, trunks, or root balls shall be rejected.
- (1) Sizes: Plants larger than specified in the plant list may be used if approved by the Landscape Architect but use of such plants shall not increase the contract price. If the use of the larger plants is approved, the spread of roots or ball of earth shall be increased in proportion to the size of the plants.
 - (2) Substitutions: In the event that trees, shrubs or other plant material specified in the plant list are impossible or unreasonably difficult to obtain, the Contractor shall immediately notify the Landscape Architect to discuss appropriate substitutions. No substitutions of plant material may be made without the approval of the Landscape Architect.
- e. Grass Seed
- (1) Grass Seed mixtures shall be fresh, clean, new crop seed. Seed may be mixed by an approved method on the site, or may be mixed by the dealer. If the seed is mixed on the site, each variety shall be delivered in the original containers which shall bear the dealer's guaranteed statement of the composition of the mixture and the percentage of purity of each variety. The Dealer's Guarantee Statement shall be delivered to the Landscape Architect.

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(2) Grass seed mixture shall be of the following types of seed:

- Lawn Areas:

Park Mix by Allen, Sterling & Lothrop or approved equal

35% Kentucky Bluegrass 85/80
20% Creeping Red Fescue
15% Chewings Fescue
15% Perennial Ryegrass
15% Ryegrass

- f. Sod - Sod shall be well-established turf of even thickness consisting of a Bluegrass blend, 90% Bluegrass and 10% Fescue. Sod shall be as provided by Winding Brook Sod Farm, Lyman, Maine or approved equal.

PART 3. EXECUTION

3.1 Pre-Plant Wee Control

- a. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide, as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least fifteen days to allow systemic kill or as directed by advisor.
- b. Maintain site weed free until final acceptance by Owner utilizing mechanical, manual and/or chemical treatment.

3.2 Planting of Trees and Shrubs

- a. Plants must be located by the Contractor and approved by the Landscape Architect before pits are dug. The Contractor shall notify the Landscape Architect at least 48 hours prior to scheduling installation of plant material. Locations as shown on the Drawings may be varied due to existing conditions.
- b. Preparation of Soil - Manure, peat humus and superphosphate additives shall be incorporated into topsoil by placing the additives over topsoil piles and turning piles at least 3 times or until thoroughly mixed. (Refer to planting detail)

3.3 Staking and Guying

- a. Trees shall be staked at the time of planting as shown on the typical section of Tree Planting Detail.

3.4 Pruning and Mulching

- a. Remove all dead wood and/or suckers and all broken or badly bruised branches. All pruning shall conform to standards established by the National Arborist Association.
- b. Immediately after planting operations are completed, cover all tree and shrub pits with three (3) inch layer of specified mulch. The limit of this mulch for trees shall be the area of the pit and for shrubs in beds, the entire area of the shrub bed.

3.5 Watering

- a. The Contractor shall be responsible for thoroughly watering all plant material upon installation.
- b. Watering shall be monitored on a daily basis when temperatures exceed 70 degrees. The depth of moisture in all tree and shrub plantings shall be adequate to prevent wilting.
- c. Watering (as required) of plant material shall continue for the duration of the maintenance period until certification of acceptability.

3.6 Loaming and Seeding

- a. Conduct planting operations under favorable weather conditions. Areas not required to be developed otherwise shall be seeded to turf.
- b. Compost Manufactured Topsoil – The soil (source material) shall be free of lumps, plants, weeds, roots and other debris over 2 inches in any dimension and free of stones over inch in any dimension. The organic compost shall be uniformly incorporated into the loam source by rolling and tumbling, by a front-end loader or by processing in a mixing plant. The material shall be mixed sufficiently to produce a homogenous soil, free of lumps and clods. In addition to the requirements for the compost amendment, the Contractor shall provide documentation that the recommended rate of fertilizer, per the testing analysis, has been applied to lawn areas prior to seeding.
- c. Prior to placing loam, scarify subgrade areas; remove all rocks over two (2) inches and debris; and set grade stakes as necessary. Place topsoil evenly over all areas to be loamed to a minimum thickness of six (6) inches. Hand rake to remove clods, lumps, brush, roots, and stones over 3/4 inch in diameter. Hand roll to show depressions and uneven grades. Regrade as necessary to obtain smooth, even grades. Surplus topsoil shall become the property of the Contractor and shall be removed off the site.

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- d. Apply additives (lime, fertilizer, compost etc.) as per the recommendation of the testing lab. Apply additives and harrow into top two (2) inches of the seedbed.
- e. Sow seed specified by use of a mechanical spreader at the rates specified. Rake lightly in; roll with 200 lb. roller and water with a fine spray.
- f. Following compaction, apply a one- (1) inch layer of straw to hasten germination.
- g. Full even growth in all areas must be guaranteed. The maintenance period shall continue after seeding and until the lawns are certified acceptable by the Landscape Architect.
- h. Repair damage resulting from erosion, gullies, washouts or other similar causes if such damage occurs before certification of acceptability of turf and planting by the Landscape Architect.
- i. Sod - After all grading has been completed, the soil shall be irrigated within 12-24 hours before laying the sod. Sod shall not be laid on soil that is dry and powdery.
- j. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and tightly against each other. Lateral joints shall be staggered to promote a uniform growth and strength. Care shall be exercised to insure that the sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which cause air drying of the roots.
- k. The Contractor shall water sod immediately after installation to prevent drying during progress of the work. It shall then be thoroughly irrigated to a depth sufficient that the underside of the new sod pad and soil immediately below the sod is thoroughly wet.
- l. Rolling of the sod shall be required to properly join sod to the bed after the sod is installed and twenty-four (24) to forty-eight (48) hours after initial watering. The Contractor shall roll the required area with a roller which weights seventy-five (75) to one hundred (100) pounds per square foot of roller width. The completed sod surface shall be true to finish grades as shown on plans and even and firm at all points.

m. Watering

- (1) First and Second Week - The Contractor shall provide all labor and arrange for all watering necessary for establishment of the turf. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first and second week and in sufficient quantities to maintain moist soil to a depth of at least four (4) inches. Watering should be done during the heat of the day to help prevent wilting.
- (2) Watering shall continue to be the responsibility of the Contractor until such time as the Owner or project Landscape Architect has certified acceptance of lawn areas.

Maintenance

- a. General - Maintenance shall begin immediately after each portion of seed and each plant is planted and shall continue in accordance with the following:
 - (1) Lawns: The Contractor shall be responsible for establishing a uniform stand of the specified seed and until a Certification of Acceptability is received. No bare spots shall be allowed. After the seed has started, all areas and parts of areas that fail to show a uniform stand of grass, for any reason whatsoever, shall be seeded or sodded repeatedly until all areas are covered with a satisfactory growth of grass. The Contractor shall be responsible for the first two (2) mowings.
 - (2) New Plantings: Protect and maintain new planting until the end of the lawn maintenance period, or, if installed after the lawn maintenance period, until installation of planting is certified acceptable by the Landscape Architect. Maintenance shall include watering, spraying and dusting for insect and fungal control, mulching, tightening and repairing guys, replacement of sick or dead plants, resetting plants to proper grades or upright position, and restoration of planting saucer, and all other care needed for proper growth and maintenance of the plants. Planting completed after the lawn preparation shall provide proper protection to lawn areas. Any damage resulting from planting operations shall be promptly repaired.
 - (3) Spraying and Dusting: During the maintenance and guarantee periods, the Contractor shall do all seasonal spraying and/or dusting of trees and shrubs as required.

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- (4) Protection: Planting areas and plants shall be protected against trespassing and damage of any kind. If any plants become damaged or injuries occur, they shall be treated or replaced as directed.
- (5) Damage: Damage resulting from erosion, gullies, washouts, or other causes shall be repaired by filling with topsoil, tamping, re-fertilizing, and sodding by the Contractor at his own expense if such damage occurs prior to certification of acceptability of turf and plantings by the Landscape Architect.
- (6) Responsibility: The Contractor's responsibility for maintenance shall cease at the time of certification of acceptability by the Landscape Architect. During the guarantee period, the Contractor shall be held responsible for making replacements, but no maintenance shall be required, other than spraying and dusting.

3.7 Replacement

- a. At the end of the guarantee period, inspection will be made by the Landscape Architect upon written notice requesting such inspection submitted by the Contractor at least ten (10) days before the anticipated date. Any plant required under this Contract that is dead or not in satisfactory condition, as determined by the Landscape Architect, shall be removed from the site. These, and any other plants missing due to the negligence of the Contractor, shall be replaced with plants of the same type and size as originally specified. Replanting shall be done as soon as conditions permit, but during the normal planting season. Plant items in accordance with these specifications.

3.8 Clean-up

- a. The Landscape Contractor shall remove all debris, construction equipment, excess fill, rocks, and other excess material caused by his work, from the site upon completion of his portion of the work.

Part II
Division 3
Concrete

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 Specification sections apply to work of this section.
- B. Examine all other sections of the Specifications for requirements that 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. Work included: Provide labor, materials, and equipment necessary to complete the work of this Section and, without limiting the generality thereof, furnish and include the following:
 - 1. The extent of cast-in-place concrete work is shown on drawings and includes (but not by way of limitation) formwork, reinforcing, cast-in-place concrete, accessories, and casting in of items specified under other Sections of the Specifications or furnished by Owner that are required to be built-in with the concrete.
 - 2. Equipment support pads indicated on mechanical drawings to be installed by the Building Contractor.

1.03 RELATED WORK

- A. Metal Fabrications: Section 05500
- B. Embedded Items - Section 05500
- C. Anchor Bolts, Expansion & Adhesive Anchors: Section 05120
- D. Joint Sealants: Section 07900
- E. Cellular Concrete: Section 03310

1.04 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the latest editions of the following, except where more stringent requirements are shown or specified:
 - ACI 211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete."
 - ACI 212.3R "Chemical Admixtures for Concrete."
 - ACI 301 "Specifications for Structural Concrete for Buildings."
 - ACI 302.1R "Guide for Concrete Floor and Slab Construction."
 - ACI 304R "Guide for Measuring, Mixing, Transporting and Placing Concrete."
 - ACI 304.2R "Placing Concrete by Pumping Methods."

ACI 306 R	"Cold Weather Concreting."
ACI 308	"Standard Practice for Curing Concrete."
ACI 309R	"Guide for Consolidation of Concrete."
ACI 315	"ACI Detailing Manual."
ACI 318	"Building Code Requirements for Reinforced Concrete."
ACI 347R	"Guide to Formwork for Concrete."
Concrete Reinforcing Steel Institute, "Placing Reinforcing Bars," 1992.	

- B. Materials and installed work may require testing and re-testing, as directed by the Architect, at any time during progress of work. Allow free access to material stockpiles and facilities. Tests not specifically indicated to be done at Owner's expense, including re-testing of rejected materials and installed work, shall be done at Contractor's expense.
- C. Concrete Pre-Installation Conference: Conduct conference at project site.
1. At least 35 days prior to the start of the concrete construction schedule, the contractor shall conduct a meeting to review proposed mix designs and discuss the required methods and procedures to achieve the required concrete quality.
 2. The Contractor shall send a pre-concrete conference agenda to all attendees 14 days prior to the scheduled date indicating review requirements.
 3. Representatives of each entity directly concerned with cast-in-place concrete shall attend conference, including to but not limited to, the following:
 - a. Contractor's superintendent and project manager
 - b. Laboratory responsible for field quality control.
 - c. Ready-Mix concrete producer.
 - d. Concrete subcontractors.
 - e. Engineer.
 - f. Owner's representative.

1.05 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review and acceptance. Proceeding with the associated portions of the work with out approved shop drawings shall be at the contractor's risk.
- B. General Contractor shall submit to the engineer within 30 days after they have received the Owner's Notice to Proceed a Submittal Schedule.
- C. All submittals shall be reviewed and returned to the Architect within 10 working days.
- D. Incomplete submittals will not be reviewed.
- E. Submittals not review by the General Contractor prior to submission the Engineer will not be reviewed.
- F. Engineer will review submittals twice as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional services.
- G. Shop Drawings: 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. Include supplemental reinforcing and bar supports necessary to support reinforcing steel at proper location within forms or slabs.

1. Shop Drawing review: Review of shop drawings will be made for the size and arrangement of reinforcement. Conformance of the Shop Drawings to the Contract Drawings remains the responsibility of the General Contractor or Construction Manager. Engineer's review in no way relieves the General Contractor or Construction Manager of this responsibility.
 2. Shop Drawings will not be reviewed as partial submittals. A complete submittal shall include all items listed in this section.
- H. Product Data: Submit producer's or manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
1. Reinforcement certified mill reports covering chemical and physical properties and yield strengths.
 2. Fiber reinforcement.
 3. Patching Products
 4. Non-Shrink Grout.
 5. Curing Compounds.
 6. Admixtures.
- I. Mix Designs: Submit all required laboratory test reports and materials for each mix design listed in Section 2.05 in accordance with one of the following methods for proportioning as defined in chapter 5, ACI 318:
1. Proportioning on the basis of field experience and/or trial mixtures.
 2. Proportioning by water-cement ratio. This method cannot be used without special permission from the Engineer.
- J. Samples: Submit samples of materials as specified and as otherwise requested by the Architect and or Engineer, including names, sources and descriptions.
- K. Curing procedure: Submit curing procedures prior to starting placement. Curing procedure shall conform to ACI 308R-01 "Guide to Curing Concrete".
- L. Meeting minutes from Concrete Pre-Installation Conference. Submit for record.

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

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

2.02 REINFORCING MATERIALS:

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Fiber Reinforcing: ASTM C 1116, Type III virgin polypropylene fibers as manufactured by FIBERMESH or approved alternate.
 - 1. The Fiber size (length) required shall be based on the largest size of the coarse aggregate in the concrete mix and determined by the manufacturer. Manufacturer shall submit written confirmation as to size of fibers, which will be used, based on concrete mix specified.
- C. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI recommendation, unless otherwise specified. Wood, brick and other devices are not acceptable.

2.03 CONCRETE MATERIALS:

- A. Portland Cement: ASTM C 150, Type I or Type II, unless otherwise approved use one brand of cement throughout project, unless otherwise acceptable to Architect.
- B. Normal Weight Aggregates: ASTM C 33. Provide from a single source for exposed concrete. Do not use aggregates containing soluble salts or other substances such as iron sulfides, pyrite, marcasite, or ochre, which can cause stains on exposed concrete surfaces.
- C. Light Weight Aggregates: ASTM C 330.
- D. Water: Potable.
- E. Air-Entraining Admixture: ASTM C 260.
- F. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C 494, Type F or Type G containing not more than 1% chloride ions.
 - 1. Fiber reinforcing shall be added and distributed prior to incorporation of Super Plasticizer.
- G. Normal range water reducing admixture: ASTM C 494 Type A containing no calcium chloride.
- H. Accelerating Admixture: ASTM C 494, Type C or E.
- I. Calcium Chloride not permitted.

2.04 RELATED MATERIALS:

- A. Moisture Barrier: Provide moisture barrier cover over prepared base material where indicated. Use only materials, which are resistant to decay when tested in accordance with ASTM E 154, as follows:
 - 1. Polyethylene sheet not less than 15 mils thick.

- B. Non-Shrink Cement-based Grout: Provide grout consisting of premeasured, prepackaged materials supplied by the manufacturer requiring only the addition of water. Manufacturer's instructions must be printed on the outside of each bag.
1. Non-shrink: No shrinkage (0.0%) and a maximum 4.0% expansion when tested in accordance with ASTM C-827. No shrinkage (0.0%) and a maximum of 0.2% expansion in the hardened state when tested in accordance with CRD-C-621.
 2. Compressive strength: A minimum 28-day compressive strength of 5000 psi when tested in accordance with ASTM C-109.
 3. Setting time: A minimum initial set time of 60 minutes when tested in accordance with ASTM C-191.
 4. Composition: Shall not contain metallic particles or expansive cement.
- C. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M182, Class 2.
- D. Moisture-Retaining Cover: One of the following, complying with ANSI/ASTM C 171.
1. Waterproof paper.
 2. Polyethylene film.
 3. Polyethylene-coated burlap.
- E. Liquid Membrane-Forming Curing Compound: Liquid type membrane forming curing compound complying with ASTM C 309, Type I, Class A unless other type acceptable to Architect. Curing compound shall not impair bonding of any material to be applied directly to the concrete. Demonstrate the non-impairment prior to use.
- F. Preformed Expansion Joint Formers:
1. Bituminous Fiber Type, ASTM D 1751.
 2. Felt Void, Poly-Styrene Cap with removable top as manufactured by SUPERIOR.
- G. Slab Joint Filler: Multi-component polyurethane sealant (self-leveling type).

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 Engineer 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 Engineer.
- B. Submit written reports to Engineer of each proposed mix for each class of concrete. Do not begin concrete production until mixes have been reviewed by Engineer.
- C. Proportion design mixes to provide concrete with the following properties:
1. Footings and Foundation Walls:
 - a. Strength: 4000 psi @28 days, 3/4" aggr.
 - b. W/C Ratio: 0.50 maximum
 - c. Entrained Air: 7% maximum, 5% minimum
 - d. Slump: 4" maximum
 2. Exterior Slabs on Grade:
 - a. Strength: 4500 psi @28 days, 1" aggr.
 - b. W/C Ratio: 0.45 maximum

- c. Entrained Air: 7% maximum, 5% minimum
 - d. Slump: 4" maximum"
 3. Interior Slabs on Grade:
 - a. Strength: 3000 psi @28 days, 1" aggr.
 - b. W/C Ratio: 0.55 maximum
 - c. Entrapped air only, (No entrainment)
 - d. Slump: 4" maximum"
 4. Interior Elevated Slabs:
 - a. Strength: 3000 psi @28 days, 3/4" aggr.
 - b. W/C Ratio: 0.55
 - c. Entrapped air only (No entrainment)
 - d. Slump: 4" maximum
 5. Add air entraining admixture at manufacturers prescribed rate to result in concrete at point of placement having the above noted air contents.
 6. Additional slump may be achieved by addition of mid-range or high-range water reducing admixture. Maximum slump after addition of add mixtures shall be 8 inches.
- 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.

2.06 CONCRETE MIXING:

- A. Job-Site Mixing: Will not be permitted.
- B. Ready-Mix Concrete: Must comply with the requirements of ASTM C 94. Provide batch ticket for each batch discharged and used in work, indicating project name, mix type, mix time and quantity.

PART 3 EXECUTION

3.01 FORMS:

- A. Unless otherwise specified in the Contract Documents, construct formwork so concrete surfaces conform to the tolerance limits of ACI 117. The class of surface for offset between adjacent pieces of formwork facing material shall be Class A for surfaces permanently exposed to view and Class C for surfaces that will be permanently concealed, unless otherwise specified.
- B. Design and engineering of formwork shall be the responsibility of the Contractor. When required by the Contract Documents, design calculations for formwork and formwork drawings shall be sealed by a Professional Engineer licensed in the state where the work will be done.
- C. Design formwork, shores, reshores, and backshores to carry all loads transmitted to them and to comply with the requirements of the applicable building code. Design

formwork to withstand the pressure resulting from placement and vibration of concrete and to maintain specified tolerances.

- D. 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.

3.02 PLACING REINFORCEMENT:

- A. Place, support, and fasten reinforcement as shown on the project drawings. Do not exceed the placing tolerances specified in ACI 117 before concrete is placed. Placing tolerances shall not exceed cover requirements except as specified in ACI 117.
- B. 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-318. 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.
 5. Install welded wire fabric in flat sheets in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

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 & Engineer. Submit plan indicating proposed location of construction joints for review prior to beginning work.
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 unless noted otherwise on Contract Drawings.
 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 wall 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 Engineer. Verify that reinforcing, ducts, anchors, seats, plates and other items to be cast into concrete are placed and securely held. Notify Engineer 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.
- C. 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.
- D. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305.
 - 1. Do not use retarding admixtures without the written acceptance of the Architect and Engineer.

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.
 - 1. 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 unformed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.09 MONOLITHIC SLAB FINISHES:

- A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds, and as otherwise indicated.
 - 1. After placing slabs, plane surface to a tolerance not exceeding 1/2 in. in 10 ft. when tested with a 10-ft. straightedge. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms or rakes.
- B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, and as otherwise indicated.
 - 1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to a minimum flatness F-Number F20, minimum levelness F-Number, F17. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
- C. 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 minimum flatness F-Number Ff 30, minimum levelness F-Number, Fl 25. Grind smooth any surface defects, which would telegraph through applied floor covering system.
- D. 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 brooming 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 308 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.
- 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 walls only as follows:
 - a. Curing compounds shall not be used on slabs unless approved by the Architect and Engineer.
 - b. Apply specified curing and sealing compound to concrete 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. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener or with a covering material bonded to concrete such as concrete, waterproofing, damp-proofing, membrane roofing, flooring, painting, and other coatings and finish materials, unless otherwise acceptable to Architect.

- 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 potential 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 latency, 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.
 2. 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 Owner 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 C231 "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 Engineer's judgment, 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 Engineer 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 Engineer. 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.

END OF SECTION 03300

Part II

Division 4

Masonry
(Not Applicable)

Part II
Division 5

Metals

SECTION 05120

STRUCTURAL STEEL

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 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. Extent of structural steel work is shown on drawings, including schedules, notes and details to show size and location of members, typical connections, and type of steel required.
- B. Structural steel is that work defined in AISC "Code of Standard Practice" and as otherwise shown on drawings.
- C. Related Work specified elsewhere
 1. Section 05200 – Steel Joists
 2. Section 05210 – Composite Steel Joists
 3. Section 05300 – Metal Deck
 4. Section 05500 - Metal Fabrications

1.03 QUALITY ASSURANCE:

- A. Codes and Standards: Comply with provisions of the following, except as otherwise indicated:
 1. AISC "Code of Standard Practice for Steel Buildings and Bridges-March 7, 2000".
 2. AISC "Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design", June 1, 1989 including "Commentary" and Supplements issued thereto.
 3. AISC "*Specifications for Structural Joints using ASTM A 325 or A 490 Bolts*" approved by the Research Council on Structural Connections of the Engineering Foundation.
 4. AISC "*Seismic Provisions for Steel Buildings*", April 15, 1997.

5. AWS D1.1 - 2004 "Structural Welding Code" - Steel.
 6. AWS D1.3 - 2004 "Structural Welding Code" - Sheet Steel.
 7. ASTM A 6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use."
- B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS D1.1 "Standard Qualification Procedure."
1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.
 2. If re-certification of welders is required, retesting will be the Contractor's responsibility.
- C. Fabricator Qualifications: Fabricator must be a member of the American Institute of Steel Construction (AISC), be certified in Category I of the AISC Quality Certification Program, or be a member of the Structural Steel Fabricators of New England (SSFNE). Provide certification of at least one of the above.

1.04 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review and acceptance. Submittals shall be prepared and submitted in accordance with section 01340.
- B. General Contractor shall submit a Submittal Schedule to the engineer within 30 days after they have received the Owner's Notice to Proceed.
- C. All submittals shall be reviewed and returned to the Architect within 10 working days.
- D. Incomplete submittals will not be reviewed.
- E. Submittals not review by the General Contractor prior to submission the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in sections 01340 and 01000 have been complied with.
- F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles.
- G. Product Data: Submit producer's or manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
 1. Structural steel certified mill reports for each grade of steel covering chemical and physical properties and yield strengths.
 2. High-strength bolts (each type), including nuts and washers.
 3. Structural steel primer paint.

4. Structural steel top coat paint. (Refer to Section 09900.)
5. Welder certifications

H. Shop Drawings:

1. Shop Drawing Review: Electronic files of structural drawings **will not** be provided to the contractor for preparation of shop drawings.
 - a. Review of the shop drawings will be made for the size and arrangement of the members and strength of the connections. Conformance of the Shop Drawings to the Contract Drawings remains the responsibility of the General Contractor. Engineer's review in no way relieves the General Contractor of this responsibility. Submit one print and one reproducible. Print will be reviewed and a reproducible will be returned to Contractor for printing and distribution. Multiple copies will not be marked by Engineer and returned.
 - b. Shop drawings: Shop drawings will not be reviewed as partial submittals. A complete submittal shall be provided and shall include; erection and piece drawings indicating all members, braced frames, moment frames and connections, and design calculations. **Incomplete submittals will not be reviewed.**
2. Alternate Connection Design: Connections for all beam, braced frame, and moment connections not tabulated in the AISC "Manual of Steel Construction" (ASD or LRFD) have been designed and detailed in the drawings. Alternate connection design shall be allowed only with prior approval of the Structural Engineer. If such approval is granted, all redesigned connections shall be designed by the fabricator's engineer, registered in the State of Maine. Calculations for redesigned connections shall signed and sealed.
3. Test Reports: Submit copies of reports of tests conducted on shop and field bolted and welded connections. Include data on type(s) of test conducted and test results.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. Deliver materials to site at such intervals to insure uninterrupted progress of work.
- B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not delay work.
- C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.
- D. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Steel materials shall be stored in a manner to avoid ponding of precipitation on members. Repair or replace damaged materials or structures as directed.

PART 2 PRODUCTS

2.01 MATERIALS:

- A. Structural Steel Shapes, Plates and Bars: ASTM A 36 minimum, higher strength steel is acceptable.
- B. Structural Steel Hot Rolled Shapes: ASTM A 992 Grade 50 (ASTM A572 Grade 50 with special requirements per AISC Technical Bulletin #3, dated March 1997)
- C. Steel Tube: ASTM A 500, Grade B, $F_y = 46$ ksi.
- D. Steel Pipe: ASTM A 53, Grade B.
- E. Anchor Bolts: ASTM A 307, headed type unless otherwise indicated.
- F. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular low-carbon steel bolts and nuts. Provide hexagonal heads and nuts for all connections.
- G. High-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:
 - 1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A325 or ASTM A490. Refer to drawings for diameter.
 - 2. Direct tension indicator washers or bolts may be used at Contractor's option.
- H. Steel Shear Studs: Headed type manufactured from steel conforming to ASTM A108 Grade C1015 by KSM or Nelson. Refer to Drawings for diameter and length.
- I. Electrodes for Welding: E70XX and comply with AWS Codes with proper rod to produce optimum weld joint considering material, weld position and size of joint. All filler metal used for complete penetration groove welds shall have a minimum Charpy V Notch value of 20 ft-lbs. at 40 degrees F for enclosed and heated structures and 20 ft-lbs. at 0 degrees F for all other structures.
- J. Steel Coatings for Exterior Embedded Steel: Exterior steel which is embedded in concrete or mortar, steel below grade, or as otherwise indicated on the drawings, shall be painted with TNEMEC FIBRETAR No 250 Coal Tar Epoxy. Paint embedded areas only. Do not paint surfaces which are to be welded until welding is complete.
- K. Steel Coatings for Exterior Exposed shall be hot-dipped galvanized per ASTM A525, G-60 minimum coating.
- L. Non Shrink Cement-Based Grout: See Section 03300
- M. Galvanizing: ASTM A 525, Hot-Dipped, G-60 coating.
- N. Drilled Anchors: Expansion and adhesive by HILTI or POWERS/RAWL as indicated on the drawings.

2.02 FABRICATION:

- A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings.
 - 1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
 - 2. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs and other defects.
- B. Connections: Weld or bolt shop connections, as indicated.
 - 1. Bolt field connections, except where welded connections or other connections are indicated.
 - 2. Provide high-strength threaded fasteners for principal bolted connections, except where unfinished bolts are indicated.
- C. High-Strength Bolted Connection: Install high-strength threaded fasteners in accordance with AISC "Specification for Structural Joints using ASTM A 325 or A 490 Bolts". Unless otherwise indicated, all bolted connections are to be tightened to the snug tight condition as defined by AISC.
- D. Welded Construction: Comply with AWS Codes for procedures, appearance and quality of welds, and methods used in correcting welding work.
- E. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings.
- F. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.
- G. Camber, if any, is indicated on the drawings. Camber indicated is the required camber at time of erection. Contractor shall survey camber prior to placing metal deck.

2.03 SHOP PAINTING

- A. Coordinate painting specification with the Architect, and with Division 9 of the specifications. Requirements of Division 9 may supersede this portion of the specification.
- B. General: Shop priming of all structural steel is generally not required in areas which are enclosed and heated. Shop priming and top coat are required only for steel permanently exposed to weather or view, or as otherwise indicated on the drawings.
- C. Steel which is to receive spray-on fireproofing shall not to be primed or painted, unless specified by the Architect.

- D. Structural Steel Primer Paint: Steel permanently exposed to view, or as indicated on the drawings, shall be primed using fabricator's rust inhibitive primer. Coordinate with Architect the extent of steel to be primed. Primer shall be compatible with paint specified in Division 9. Steel exposed to weather shall be primed with zinc rich primer, Tnemec 90-97, red or gray. Primer shall be compatible with top coat.
- E. Structural Steel Top Coat: Top coat for interior steel exposed to view shall be as specified in Division 9, and shall be applied in the field. Coordinate with Architect the extent of steel to be coated. Steel exposed to weather shall be top coated with Tnemec Series 73 Endura Shield. Color(s) shall be selected by Architect.
- F. Surface Preparation: After inspection and before shipping, clean steel work to be painted. Remove loose mill scale, splatter, slag or flux deposits. Clean steel in accordance with Steel Structures Painting Council (SSPC) SP-6.
- G. Painting: Immediately after surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions. Apply primer at a rate to provide dry film thickness specified by the manufacturer. Use painting methods which result in full coverage of joints, corners, edges and exposed surfaces. Following proper cure times and temperatures, apply top coat (where applicable) in accordance with manufacturer's instructions, at a rate to provide dry film thickness specified by manufacturer.

PART 3 EXECUTION

3.01 ERECTION:

- A. General: Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
- B. Surveys: Check elevations of concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Architect. Do not proceed with erection until corrections have been made, or until compensating adjustments to structural steel work have been approved by Engineer of Record. Additional surveys required to verify corrective work shall be performed at the contractor's expense.
- C. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.
- D. Anchor Bolts: Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work.
 - 1. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
- E. Setting Plates and Base Plates:

1. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations. Refer to division 3 of these specifications for anchor bolt installation requirements in concrete.
 2. Clean concrete bearing surfaces of bond-reducing materials. Clean bottom surface of setting and bearing plates.
 3. Set loose and attached base plates for structural members on wedges or other adjusting devices.
 4. 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.
- F. Concrete slabs that are part of composite floor framing systems shall achieve 28-day design strength prior to the application of any superimposed loads such as curtain walls, masonry veneer, and stairs.
- G. When installing expansion bolts or adhesive anchors, the contractor shall take measures to avoid drilling or cutting any existing reinforcement or damaging adjacent concrete. Holes shall be blown clean and/or cleaned per manufacturer's recommendations prior to the installation of anchors.
- H. Field Assembly:
1. Set structural frames accurately to lines and elevations indicated.
 2. Align and adjust various members forming part of complete frame or structure before permanently fastening.
 3. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly.
 4. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 5. Level and plumb individual members of structure within specified AISC tolerance.
 6. Splice members only where indicated and accepted on shop drawings.
 7. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.
 8. Composite shear studs shall be installed using stud welding process with an appropriately sized ferrule. Fillet welding of shear studs is not permitted. Ferrules shall be removed and discarded.
- I. Erection bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surface.

- J. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members which are not under stress, as accepted by the Engineer of Record. Finish gas-cut sections equal to a sheared appearance when permitted.
- K. Paint Damage: Touch up shop applied paint whenever damaged or bare. Clean surface and touch up with shop primer noted and top coat, if required.
- L. Welders shall have current evidence of passing the appropriate AWS Qualifications test available in the field.
- M. Welding electrodes, welding process, minimum preheat and interpass temperatures shall be in accordance with AISC and AWS specifications. Any structural steel damaged in welding shall be replaced.
- N. Field Welded Moment Connections: Backing materials for field welded moment connections shall be removed, backgouge the weld root, and apply a reinforcing fillet weld.

3.02 QUALITY CONTROL:

- A. General: Contractor is responsible for maintaining quality control in the field and for providing a structure that is in strict compliance with the contract documents.
 - 1. Required inspection and testing services are intended to assist the Contractor in complying with the Contract Documents. These specified services, however, do not relieve the Contractor of his responsibility for compliance, nor are they intended to limit the Contractor's quality control efforts in the field.
- B. Testing: Owner shall engage an independent testing agency to inspect all high-strength bolted and welded connections, to perform tests and prepare reports of their findings. All connections must pass these inspections prior to the installation of subsequent work which they support.
 - 1. Testing agency shall conduct tests and state in each report which specific connections were examined or tested, whether the connections comply with requirements, and specifically state any deviations there from.
 - 2. Contractor shall provide access for testing agency to places where structural steel work is being fabricated, produced or erected so that required inspection and testing can be accomplished. Testing agency may inspect structural steel at plant before shipment. The Engineer, however, reserves the right, at any time before final acceptance, to reject material not complying with specified requirements.
- C. Inspection Requirements:
 - 1. Bolted Connections: Inspect all bolted connections in accordance with procedures outlined in the AISC "Specification for Structural Joints using ASTM A325 or A490 Bolts.
 - 2. Snug Tight Bolted Connections:

- a. The inspector shall monitor the installation of bolts to determine that all plies of connected material have been drawn together and that the selected procedure is used to tighten all bolts.
 - b. If the inspector does not monitor the installation of bolts, he shall visually inspect the connection to determine that all plies of connected material have been drawn together and conduct tests on a sampling connection bolts to determine if they have been tightened to the snug tight condition. The test sample shall consist of 10% of the bolts in the connection, but not less than two bolts, selected at random. If more than 10% of the tested bolts fail the initial inspection, the engineer reserves the right to increase the number of bolts tested.
3. Slip Critical Bolted Connections:
- a. The inspector shall monitor the calibration of torquing equipment and the installation of bolts to determine that all plies of connected material have been drawn together and that the selected procedure is used to tighten all bolts.
 - b. If the inspector does not monitor the calibration or installation procedures, he shall test all bolts in the affected connection using a manual torque wrench to assure that the required pretension has been reached.
4. Field Welded Connections: inspect and test during fabrication of structural steel assemblies, and during erection of structural steel all welded connections in accordance with procedures outline in AWS D1.1. Record types and location of defects found in work. Record work required and performed to correct deficiencies.
- a. Certify welders and conduct inspections and tests as required. Submit welder certifications to Engineer of Record. Perform visual inspection of all welds.
 - b. Welds deemed questionable by visual inspection, all partial and full penetration welds, and any other welds indicated on the drawings to receive non-destructive testing shall be tested by one of the following:
 - c. Radiographic Inspection: ASTM E 94 and ASTM E 142; minimum quality level "2-2T".
 - d. Ultrasonic Inspection: ASTM E 164.
 - e. All welds deemed unacceptable shall be repaired and retested at the Contractor's expense.
- D. Composite Shear Studs/Deformed Bar Anchors:
1. Visually inspect weld fillets. A fillet less than 360 degrees is cause for further testing by bending to 15 degrees per item 2 below. Strike all studs with a sledge hammer with moderates force. If a stud or studs breaks free, further testing shall be performed per item 3.

2. One stud in 100 shall be tested by bending to 15 degrees from vertical, and one stud in 200 shall be tested by bending to 30 degrees from vertical. Single bent studs may be left bent. Failure of stud weld during bend testing is cause for further testing per item 3.
 3. When failure occurs during bend testing, additional bend testing shall be performed on 10 studs to either side of failed stud. Bend studs to 30 degrees from vertical. If failure occurs during additional testing, continue testing in series of 10 studs beyond failed stud until no failure occurs.
 4. Straighten all studs that were bent in multiple stud testing. Replace all studs that fail.
 5. Inspector shall verify that all ferrules are removed and that composite metal deck is free of debris prior to concrete placement.
- E. Nonconforming Work: Contractor shall be responsible for correcting deficiencies in structural steel work which inspections laboratory test reports have indicated to be not in compliance with requirements. Additional tests shall be performed, at the Contractor's expense, as may be necessary to show compliance of corrected work. Any costs associated with the Engineer's review and disposition of faulty works shall be borne by the Contractor.

END OF SECTION

SECTION 05200

STEEL JOIST

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

- A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 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. Extent of steel joists is shown on drawings, including basic layout and type of joists required at new mezzanine framing.
- B. Related Work specified Elsewhere
 - 1. Section 05120 - Structural Steel
 - 2. Section 05300 - Metal Decking
 - 3. Section 05500 - Metal Fabrications

1.03 QUALITY ASSURANCE:

- A. Codes and Standards:
 - 1. Steel Joist Institute (SJI) Standard Specifications, Load Tables and Weight Tables for:
 - a. K-Series Open Web Steel Joists as designated on the Contract Drawings
 - b. LH Series Open Web Long Span Steel Joists.
 - 2. AWS D1.1 - 2004 "Structural Welding Code" – Steel
 - 3. AWS D1.3 - 2004 "Structural Welding Code" - Sheet Steel
- B. Qualification for Welding Work: Qualify welding processes and welding operators in accordance with AWS D1.1 "Standard Qualification Procedure".

1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.
2. If recertification of welders is required, retesting will be the Contractor's responsibility.

1.04 SUBMITTALS:

- A. Unless otherwise specified, submittals required in this section shall be submitted for review and acceptance. Submittals shall be prepared and submitted in accordance
- B. General Contractor shall submit a Submittal Schedule to the Engineer within 30 days after they have received the Owner's Notice to Proceed.
- C. All submittals shall be reviewed and returned to the Architect within 10 working days.
- D. Incomplete submittals will not be reviewed.
- E. Submittals not review by the General Contractor prior to submission the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in sections 01340 and 01000 have been complied with.
- F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles
- G. Product Data: Submit manufacturer's specifications and installation instructions for each type of joist and accessories. Include manufacturer's certification that joists comply with SJI Specifications.
- H. Shop Drawings: Submit detailed drawings showing layout of joist units, special connections, jointing and accessories. Include mark, number, type, location and spacing of joists and bridging.
- I. Design Calculations: Submit design calculations for all steel joists stamped by a Registered Professional Engineer licensed to practice in the State of Maine.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. Deliver, store and handle steel joists as recommended in SJI "Specifications". Handle and store joists in a manner to avoid deforming members and to avoid excessive stresses.

PART 2 PRODUCTS

2.01 MATERIALS:

- A. Steel: Comply with SJI "Specifications".

- B. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular hexagon type, low carbon steel.
- C. Steel Primer Paint: Manufacturer's standard white or grey. Contractor to verify compatibility with final coat to be applied in field. Refer to Division 9 Specifications for additional information.

2.02 FABRICATION:

- A. General: Fabricate steel joists in accordance with SJI "Specification".
- B. Holes in Chord Members: Provide holes in chord members where shown for securing other work to steel joists, including bolted bridging; however, deduct area of holes from the area of chord when calculating strength of member.
- C. Holes in Web: Provide holes in joist and joist girder webs to allow through passage of HVAC, sprinklers, etc. As the Mechanical package is to be Design-Build, it is the Contractor's responsibility to coordinate web pass throughs for mechanical equipment.
- D. Extended Ends: Provide extended ends on joists where shown, complying with manufacturer's standards and requirements of applicable SJI "Specifications and Load Tables".
- E. Bridging:
 - 1. Provide horizontal or diagonal type bridging for "open web" joists, complying with SJI "Specifications" and as shown on plans.
 - 2. Provide bridging anchors for ends of bridging lines terminating at walls or beams.
- F. End Anchorage: Provide end anchorages to secure joists to adjacent construction, complying with SJI "Specifications", unless otherwise indicated.
- G. Shop Painting:
 - 1. Remove loose scale, heavy rust and other foreign materials from fabricated joists and accessories before application of shop paint.
 - 2. Apply one shop coat of primer paint to steel joists and accessories by spray, dipping, or other method to provide a continuous dry paint film of 2.0 to 3.5 dry mils thickness.

PART 3 EXECUTION

3.01 ERECTION:

- A. General: Place and secure steel joists in accordance with SJI "Specifications", final shop drawings, and as herein specified.
- B. Placing Joists:

1. Do not start placement of steel joists until supporting work is in place and secured.
 2. Place joists on supporting work, adjust and align in accurate location and spacing before permanently fastening.
 3. Provide temporary bridging, connections and anchors to ensure lateral stability during construction.
- C. Bridging: Install bridging simultaneously with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.
- D. Fastening:
1. Field weld joists to supporting steel framework in accordance with SJI "Specifications" for type of joists used. Coordinate welding sequence and procedure with placing of joists.
 2. Bolt joists to supporting steel framework in accordance with SJI "Specifications" for type of joists used.
 - a. Provide unfinished threaded fasteners for bolted connections, unless otherwise indicated.
- E. Touch-up painting: Clean field welds, bolted connections, and abraded areas, and apply same type of paint as used in shop.

END OF SECTION

SECTION 05210

COMPOSITE STEEL JOISTS

PART 1 GENERAL

1.01 SUMMARY

This section is based on the following proprietary system to establish structural performance, strength characteristics and quality standards. Equivalent products of other manufacturers may be considered as judged solely by the Engineer and/or Architect:

Vulcraft Composite Steel Joists

1.02 RELATED DOCUMENTS:

- A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 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.

1.03 DESCRIPTION OF WORK:

- A. Extent of steel joists is shown on drawings, including basic layout and type of joists required at new mezzanine framing.
- B. Related Work specified Elsewhere
 - 1. Section 05120 - Structural Steel
 - 2. Section 05200 – Steel Joists
 - 3. Section 05300 - Metal Decking
 - 4. Section 05500 - Metal Fabrications

1.04 QUALITY ASSURANCE:

- A. Codes and Standards:

Steel Joist Institute (SJI) Standard Specifications.

AISC "Floor Vibration due to Human Activity – Steel Design Guide Series 11"

AISC "Code of Standard Practice for Steel Buildings and Bridges-March 7, 2000".

AISC "Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design", June 1, 1989 including "Commentary" and Supplements issued thereto.

AISC "*Specifications for Structural Joints using ASTM A 325 or A 490 Bolts*" approved by the Research Council on Structural Connections of the Engineering Foundation.

AISC "Code of Standard Practice for Steel Buildings and Bridges-March 7, 2000".

AWS D1.1 - 2004 "Structural Welding Code" – Steel

AWS D1.3 - 2004 "Structural Welding Code" - Sheet Steel

- B. Qualification for Welding Work: Qualify welding processes and welding operators in accordance with AWS D1.1 "Standard Qualification Procedure".
1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.
 2. If recertification of welders is required, retesting will be the Contractor's responsibility.

1.05 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Design, Engineer, Fabricate, and Erect composite steel joist to withstand specified design loads within limits and under conditions required.
1. Design Loads: As specified on Contract Documents.
 2. Deflections: Include the effects of camber in deflection calculations. Live load deflection meeting the following (unless otherwise specified):
 - a. Live Load Deflection: Vertical deflection less than or equal to 1/360 of the span.
 - b. Total Load Deflection: Vertical deflection less than or equal to 1/240 of the span.
 3. Vibration: Steel joists are to be designed to account for vibration effect due to human excitation. Vibration limit: $a_0/g = 0.5\%$.

1.06 SUBMITTALS:

- A. Unless otherwise specified, submittals required in this section shall be submitted for review and acceptance. Submittals shall be prepared and submitted in accordance
- B. General Contractor shall submit a Submittal Schedule to the Engineer within 30 days after they have received the Owner's Notice to Proceed.
- C. All submittals shall be reviewed and returned to the Architect within 10 working days.
- D. Incomplete submittals will not be reviewed.

- E. Submittals not review by the General Contractor prior to submission the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in sections 01340 and 01000 have been complied with.
- F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles
- G. Product Data: Submit manufacturer's specifications and installation instructions for each type of joist and accessories. Include manufacturer's certification that joists comply with SJI Specifications.
- H. Design Calculations: Composite Steel Joist Design: Submit design calculations prepared and stamped by a Professional Engineer registered in the State of Maine for the composite steel joists indicated on the Drawings. Calculations shall detail all design loads, material stresses and serviceability requirements including deflection and vibration. Provide camber calculations for the pre-composite deflection.
- I. Shop drawings: Shop drawings will not be reviewed as partial submittals. A complete submittal shall be provided and shall include; erection and piece drawings indicating all members, composite steel stud information and design calculations. **Incomplete submittals will not be reviewed. Composite member design must be included with submittal.**

1.07 DELIVERY, STORAGE AND HANDLING:

- A. Deliver, store and handle steel joists as recommended in SJI "Specifications". Handle and store joists in a manner to avoid deforming members and to avoid excessive stresses.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS: Available Manufacturers: Subject to compliance with requirements, manufacturer of composite steel joist which may be incorporated in the work, shall included, but are not limited to, Vulcraft Composite Steel Joists. Other manufacturers may be permitted if evidence of experience in composite steel joist construction is available. Submit evidence of experience to Architect and Engineer for review.

2.02 MATERIALS:

- A. Steel: Comply with SJI "Specifications".
- B. Steel Shear Studs: Headed type manufactured from steel conforming to ASTM A108 Grade C1015 by KSM or Nelson. Diameter and length are to be provided by composite steel joist supplier's Engineer.
- C. Electrodes for Welding: E70XX and comply with AWS Codes with proper rod to produce optimum weld joint considering material, weld position and size of joint.

- D. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular hexagon type, low carbon steel.
- E. Steel Primer Paint: Manufacturer's standard white or grey. Contractor to verify compatibility with final coat to be applied in field. Refer to Division 9 Specifications for additional information.

2.03 FABRICATION:

- A. General: Fabricate steel joists in accordance with SJI "Specification".
- B. Holes in Chord Members: Provide holes in chord members where shown for securing other work to steel joists, including bolted bridging; however, deduct area of holes from the area of chord when calculating strength of member.
- C. Holes in Web: Provide holes in joist and joist girder webs to allow through passage of HVAC, sprinklers, etc. As the Mechanical package is to be Design-Build, it is the Contractor's responsibility to coordinate web pass throughs for mechanical equipment.
- D. Extended Ends: Provide extended ends on joists where shown, complying with manufacturer's standards and requirements of applicable SJI "Specifications and Load Tables".
- E. Bridging:
 - 1. Provide horizontal or diagonal type bridging for "open web" joists, complying with SJI "Specifications" and as shown on plans.
 - 2. Provide bridging anchors for ends of bridging lines terminating at walls or beams.
- F. End Anchorage: Provide end anchorages to secure joists to adjacent construction, complying with SJI "Specifications", unless otherwise indicated.
- G. Shop Painting:
 - 1. Remove loose scale, heavy rust and other foreign materials from fabricated joists and accessories before application of shop paint.
 - 2. Apply one shop coat of primer paint to steel joists and accessories by spray, dipping, or other method to provide a continuous dry paint film of 2.0 to 3.5 dry mils thickness. DO NOT PRIME TOP SURFACE OF TOP CHORD OF COMPOSITE JOIST.

PART 3 EXECUTION

3.01 ERECTION:

- A. General: Place and secure steel joists in accordance with SJI "Specifications", final shop drawings, and as herein specified.
- B. Placing Joists:

1. Do not start placement of steel joists until supporting work is in place and secured.
 2. Place joists on supporting work, adjust and align in accurate location and spacing before permanently fastening.
 3. Provide temporary bridging, connections and anchors to ensure lateral stability during construction.
- C. Bridging: Install bridging simultaneously with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.
- D. Fastening:
1. Field weld joists to supporting steel framework in accordance with SJI "Specifications" for type of joists used. Coordinate welding sequence and procedure with placing of joists.
 2. Bolt joists to supporting steel framework in accordance with SJI "Specifications" for type of joists used.
 - a. Provide unfinished threaded fasteners for bolted connections, unless otherwise indicated.
- E. Installation of Composite Shear Studs: Composite shear studs shall be installed, size quantity and spacing, per the Composite Steel Joist Manufacturer. Note that position of shear stud in metal deck flutes is critical to the strength of the member. Review the documentation carefully prior to installation.
- F. Touch-up painting: Clean field welds, bolted connections, and abraded areas, and apply same type of paint as used in shop.

3.02 QUALITY CONTROL:

- A. General: Contractor is responsible for maintaining quality control in the field and for providing a structure that is in strict compliance with the contract documents.
1. Required inspection and testing services are intended to assist the Contractor in complying with the Contract Documents. These specified services, however, do not relieve the Contractor of his responsibility for compliance, nor are they intended to limit the Contractor's quality control efforts in the field.
- B. Testing: Owner shall engage an independent testing agency to inspect all high-strength bolted and welded connections, to perform tests and prepare reports of their findings. All connections must pass these inspections prior to the installation of subsequent work which they support.
1. Testing agency shall conduct tests and state in each report which specific connections were examined or tested, whether the connections comply with requirements, and specifically state any deviations there from.

2. Contractor shall provide access for testing agency to places where structural steel work is being fabricated, produced or erected so that required inspection and testing can be accomplished. Testing agency may inspect structural steel at plant before shipment. The Engineer, however, reserves the right, at any time before final acceptance, to reject material not complying with specified requirements.

C. Inspection Requirements:

1. Bolted Connections: Inspect all bolted connections in accordance with procedures outlined in the AISC "Specification for Structural Joints using ASTM A325 or A490 Bolts.
2. Snug Tight Bolted Connections:
 - a. The inspector shall monitor the installation of bolts to determine that all plies of connected material have been drawn together and that the selected procedure is used to tighten all bolts.
 - b. If the inspector does not monitor the installation of bolts, he shall visually inspect the connection to determine that all plies of connected material have been drawn together and conduct tests on a sampling connection bolts to determine if they have been tightened to the snug tight condition. The test sample shall consist of 10% of the bolts in the connection, but not less than two bolts, selected at random. If more than 10% of the tested bolts fail the initial inspection, the engineer reserves the right to increase the number of bolts tested.
3. Slip Critical Bolted Connections:
 - a. The inspector shall monitor the calibration of torquing equipment and the installation of bolts to determine that all plies of connected material have been drawn together and that the selected procedure is used to tighten all bolts.
 - b. If the inspector does not monitor the calibration or installation procedures, he shall test all bolts in the affected connection using a manual torque wrench to assure that the required pretension has been reached.
4. Field Welded Connections: inspect and test during fabrication of structural steel assemblies, and during erection of structural steel all welded connections in accordance with procedures outline in AWS D1.1. Record types and location of defects found in work. Record work required and performed to correct deficiencies.
 - a. Certify welders and conduct inspections and tests as required. Submit welder certifications to Engineer of Record. Perform visual inspection of all welds.
 - b. Welds deemed questionable by visual inspection, all partial and full penetration welds, and any other welds indicated on the drawings to receive non-destructive testing shall be tested by one of the following:

- c. Radiographic Inspection: ASTM E 94 and ASTM E 142; minimum quality level "2-2T".
 - d. Ultrasonic Inspection: ASTM E 164.
 - e. All welds deemed unacceptable shall be repaired and retested at the Contractor's expense.
- D. Composite Shear Studs:
- 1. Visually inspect weld fillets. A fillet less than 360 degrees is cause for further testing by bending to 15 degrees per item 2 below. Strike all studs with a sledge hammer with moderates force. If a stud or studs breaks free, further testing shall be performed per item 3.
 - 2. One stud in 100 shall be tested by bending to 15 degrees from vertical, and one stud in 200 shall be tested by bending to 30 degrees from vertical. Single bent studs may be left bent. Failure of stud weld during bend testing is cause for further testing per item 3.
 - 3. When failure occurs during bend testing, additional bend testing shall be performed on 10 studs to either side of failed stud. Bend studs to 30 degrees from vertical. If failure occurs during additional testing, continue testing in series of 10 studs beyond failed stud until no failure occurs.
 - 4. Straighten all studs that were bent in multiple stud testing. Replace all studs that fail.
 - 5. Inspector shall verify that all ferrules are removed and that composite metal deck is free of debris prior to concrete placement.
- E. Nonconforming Work: Contractor shall be responsible for correcting deficiencies in structural steel work which inspections laboratory test reports have indicated to be not in compliance with requirements. Additional tests shall be performed, at the Contractor's expense, as may be necessary to show compliance of corrected work. Any costs associated with the Engineer's review and disposition of faulty works shall be borne by the Contractor.

END OF SECTION

SECTION 05300

METAL DECKING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 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. Extent of metal floor and roof deck is shown on the drawings and includes composite floor deck, roof deck, cell closures, end plates, pour stops with vertical leg return lip, metal lath column closures, composite finish strips, welding washers, accessories and sump plates or pans.
- B. Related work specified elsewhere:
 1. Section 05120 - Structural Steel
 2. Section 05200 – Steel Joists
 3. Section 05210 – Composite Steel Joists
 4. Section 05500 - Metal Fabrications

1.03 QUALITY STANDARDS

- A. Codes and Standards: Comply with provisions of the following codes and standards, except where more stringent requirements are indicated or specified:
 1. AISI "Specification for the Design of Cold Formed Steel Structural Members".
 2. AWS D1.1 "Structural Welding Code" - Steel
 3. AWS D1.3 "Structural Welding Code" - Sheet Steel
 4. Steel Deck Institute (SDI) "Design Manual for Floor Decks and Roof Decks".
- B. Qualification of field welding: Qualify welding process and welding operators in accordance with AWS D1.1 "Standard Qualification Procedure."

- C. Inspection: Welded Deck is subject to inspection and testing. Expense of removing and replacing portions of decking for testing purposes will be borne by the owner if welds are found to be unsatisfactory. Work found to be defective will be removed and replaced at the Contractor's expense.
 - 1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.
 - 2. If re-certification of welders is required, re-testing will be the Contractor's responsibility.

1.04 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review and acceptance. Submittals shall be prepared and submitted in accordance with section 01340.
- B. General Contractor shall submit a Submittal Schedule to the engineer within 30 days after they have received the Owner's Notice to Proceed.
- C. All submittals shall be reviewed and returned to the Architect within 10 working days.
- D. Incomplete submittals will not be reviewed.
- E. Submittals not review by the General Contractor prior to submission the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in sections 01340 and 01000 have been complied with.
- F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles.
- G. Product Data: Submit manufacturer's specifications and installation instructions for each type of decking and accessories. Include manufacturer's certification as may be required to show compliance with these specifications.
- H. Shop Drawings: Submit one sepia and two legible prints of all shop drawings. Submit detailed drawings showing layout and types of deck panels, galvanizing, shop paint, anchorage details, and conditions requiring closure panels, supplementary framing, sump pans, cant strips, cut openings, special jointing, and all other accessories. Use of structural Contract Documents as erection or detail drawings will not be permitted. Electronic versions of structural drawings will not be provided.

PART 2 PRODUCTS

2.01 GENERAL:

- A. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

1. United States Deck
 2. Wheeling Corrugating Co.
 3. United Steel Deck
 4. Vulcraft
- B. Materials:
1. Steel for Galvanized Metal Deck Units and accessories: ASTM A653-94 structural quality with a minimum yield strength of 33 ksi or ASTM A611 with a minimum yield strength of 33 ksi.
 2. Miscellaneous Steel Shapes: ASTM A36 minimum.
 3. Sheet metal Accessories: ASTM A526, commercial quality, galvanized.
- C. Galvanizing: Conform to ASTM 924-94 with minimum coating class of G60 (Z180) as defined in ASTM A653-94.
- D. Paint: Manufacturer's baked on, rust inhibitive paint, for application to metal surfaces which have been chemically cleaned and phosphate chemical treated.
- E. Flexible closure Strips: Manufacturer standard vulcanized, closed-cell, synthetic rubber.

2.02 FABRICATION:

- A. General: Form deck units in lengths to span 3 or more supports, unless otherwise noted on the drawings, with flush, telescoped or nested 2" laps at ends and interlocking or nested side laps, unless otherwise indicated. For roof deck units, provide deck configurations complying with SDI "Roof Deck Specifications," of metal thickness, depth and width as shown.
- B. Metal Cover Plates: Fabricate metal cover plates for end-abutting floor deck units of not less than same thickness as decking. Form to match contour of deck units and approximately 6" wide.
- C. Metal Closure Strips: Fabricate metal closure strips, cell closures, "Z" closures, column closures, pour stops, girder fillers and openings between decking and other construction, of not less than 0.045" min. (18 gage) sheet steel or as indicated on the drawings. Form to provide tight fitting closures at open ends of cells or flutes and sides of decking.
- D. Roof Sump Pans: Fabricate from a single piece of 0.071" min. (14 gage) galvanized sheet steel with level bottoms and sloping sides to direct water flow to the drains, unless otherwise shown. Provide sump pans of adequate size to receive roof drains and with bearing flanges not less than 3" wide. Recess pans not less than 1 1/2" below roof deck surface, unless otherwise shown or required by deck configuration. Holes for drains will be cut in the field.

PART 3 EXECUTION**3.01 INSTALLATION:**

- A. Install deck units and accessories in accordance with manufacturer's recommendations and final shop drawings, and as specified herein.
- B. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before permanently fastened. Do not stretch or contact side lap interlocks.
- C. Place deck units in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.
- D. Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.
- E. Coordinate and cooperate with the structural steel erector in locating decking bundles to prevent overloading of structural members.
- F. Do not use decking units for storage or working platforms until permanently installed.

3.02 FASTENING:

- A. General: Fasten metal deck to supporting steel members as indicated on the Design Drawings: Each deck is to be fastened with a minimum of 5/8" diameter puddle welds spaced in a 36/7 pattern. Secure deck to each supporting member in ribs where sidelaps occur. Deck units shall bear over the ends of supports by a minimum of 1.5".
 - 1. End Closures: Tack weld or use #12 hex head machine screws at 4'-0" o.c. for fastening end closures.
- B. Sidelaps: Fasten sidelaps of adjacent roof deck units between supports at not less than 5 sidelap connections per span. Use #10 tek screws or welded sidelap connections. Use 3/8"x1 1/4" arc seam welds for acoustical deck.
- C. Welding: Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Uplift loading: Floor deck units are not required to resist uplift loads. Decking units used at the roof level shall be designed for a net uplift of 7 psf.
- E. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking.
- F. Reinforcement at openings: Provide additional metal reinforcement and closures pieces as required for strength, continuity of decking and support of other work shown.
 - 1. Deck penetrations affecting no more than (1) deck rib need not be reinforced.

2. For deck penetration affecting more than (1) deck rib, but less than 13", reinforce the opening with a 0.057" thick plate spanning between unaffected ribs.
 3. Reinforce deck penetrations larger than 13" with the structural frame described in the Design Drawings.
- G. Joint Covers: Provide metal joint covers at abutting ends and changes in direction of floor deck units.
- H. Roof Sump Pans: Place over openings provided in roof decking and weld to top decking surface. Space welds not more than 12" on center with at least 1 weld in each corner. Cut opening in roof sump bottom to accommodate drain size indicated.
- I. Closure Strips: Provide metal closure strips at open uncovered ends and edges of roof decking, and in voids between decking and other construction. Weld into position to provide a complete decking installation.
- J. Touch-Up Painting:
1. Painted Deck: After decking installation, wire brush, clean and paint scarred areas, welds and rust spots on top and bottom surfaces of decking units and supporting steel members.
 - a. Touch up painted surfaces with same type paint used on adjacent surfaces.
 - b. In areas where shop-painted surfaces are to be exposed, apply touch-up paint to blend into adjacent surfaces.

END OF SECTION

Part II
Division 6

Wood and Plastics

SECTION 06100
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. Types of work in this section include rough carpentry for:
1. Wood grounds, nailers and blocking.
 2. Wood furring.
 3. Sheathing.
- B. Finish carpentry is specified in another section within Division 6.

1.3 DEFINITIONS:

- A. Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated.

1.4 PRODUCT HANDLING:

- A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.

1.5 PROJECT CONDITIONS:

- A. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow attachment of other work.

PART 2 - PRODUCTS

2.1 LUMBER, GENERAL:

- A. Lumber Standards: Manufacture lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- B. Inspection Agencies: Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:

1. APA - American Plywood Association.
2. NELMA - New England Lumber Manufacturer's Association.
3. NLGA - National Lumber Grades Authority (Canadian).
4. SPIB - Southern Pine Inspection Bureau.
5. WCLIB - West Coast Lumber Inspection Bureau
6. WWPA - Western Wood Products Association

- C. Grade Stamps: Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
- D. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
- E. Provide dressed lumber, S4S, unless otherwise indicated.
- F. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.

2.2 DIMENSION LUMBER:

- A. For light framing (2" to 4" thick, 2" to 6" wide) provide the following grade and species:
 1. Standard grade, Spruce-Pine-Fir graded under NLGA rules.

2.3 BOARDS:

- A. Concealed Boards: Where boards will be concealed by other work, provide lumber of 19 percent maximum moisture content (S-DRY) and of following species and grade:
 1. Any species graded construction boards.

2.4 MISCELLANEOUS LUMBER:

- A. Provide wood for support or attachment of other work including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping and similar members. Provide lumber of sizes indicated, worked into shapes shown, and as follows:
 1. Moisture content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
 2. Grade: Standard Grade light framing size lumber of any species or board size lumber as required. No. 3 Common or Standard grade boards per WCLIB or WWPA rules or No. 3 boards per SPIB rules.

2.5 CONSTRUCTION PANELS:

- A. Construction Panel Standards: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood panels and, for products not manufactured under PS 1 provisions, with American Plywood Association (APA) "Performance Standard and Policies for Structural-Use Panels", Form No. E445.

- B. Trademark: Factory-mark each construction panel with APA trademark evidencing compliance with grade requirements.
- C. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant treated or painted plywood panels with grade designation, APA A-C INT with exterior glue, in thickness indicated, or, if not otherwise indicated, not less than 15/32".

2.6 MISCELLANEOUS MATERIALS:

- A. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices.
 - 1. Where rough carpentry work is exposed to weather, in ground contact, in area of high relative humidity, or in contact with roofing materials, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A153).

2.7 WOOD TREATMENT BY PRESSURE PROCESS:

- A. Preservative Treatment: Where lumber or plywood is indicated as "PT" or "Treated," or is specified herein to be treated, comply with applicable requirements of AWPB Standards C2 (Lumber) and C9 (Plywood) and of AWPB Standards listed below. Mark each treated item with the AWPB Quality Mark Requirements.
- B. Pressure-treat above-ground items with water-borne preservatives to comply with AWPB LP-2. After treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent. Treat indicated items and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping and similar concealed members in contact with masonry or concrete.
- C. Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment and to comply with AWPB M4.
 - 1. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.
- D. Fire-Retardant Treatment: Where fire-retardant treated wood ("FRTW") is indicated, pressure impregnate lumber and plywood with fire-retardant chemicals to comply with AWPB C20 and C27, respectively, for treatment type indicated below; identify "FRTW" lumber with appropriate classification marking of Underwriters Laboratories, Inc., U.S. Testing, Timber Products Inspection or other testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Interior Type A: Use where "FRTW" wood is indicated for interior applications.
 - 2. Exterior Type: Use where "FRTW" wood is indicated for exterior, exposed applications.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL:

- A. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
- B. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.
- C. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes.
- D. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

3.2 WOOD GROUNDS, NAILERS, BLOCKING AND SLEEPERS:

- A. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
- B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
- C. Provide permanent grounds of dressed, preservative treated, key-beveled lumber not less than 1-1/2" wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

3.3 WOOD FURRING:

- A. Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finished work.
- B. Firestop furred spaces on walls at each floor level and at ceiling line, with wood blocking or noncombustible materials, accurately fitted to close furred spaces.

3.4 WOOD FRAMING, GENERAL:

- A. Provide framing members of sizes and on spacings shown, and frame openings as shown, or if not shown, comply with recommendations of "Manual for House Framing" of National Forest Products Association (NFoPA). Do not splice structural members between supports.
- B. Anchor and nail as shown, and to comply with "Recommended Nailing Schedule" of "Manual for House Framing" and "National Design Specifications for Wood Construction" published by NFoPA.

3.5 INSTALLATION OF CONSTRUCTION PANELS:

- A. General: Comply with applicable recommendations contained in Form No. E 30F, "APA Design/Construction Guide - Residential & Commercial," for types of construction panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Plywood Backing Panels: Screw to supports.

END OF SECTION

SECTION 06200
FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

- A. Definition: Finish carpentry includes carpentry work which is exposed to view, is non-structural, and which is not specified as part of other sections.
- B. Types of finish carpentry work in this section include:
 - 1. Interior running and standing trim.
 - 2. Interior panels.
 - 3. Interior window sills.
- C. Rough carpentry is specified in another Division-6 section.

1.3 QUALITY ASSURANCE:

- A. Factory-mark each piece of lumber and plywood with type, grade, mill and grading agency identification; except omit marking from surfaces to receive transparent finish, and submit mill certificate that material has been inspected and graded in accordance with requirements if it cannot be marked on a concealed surface.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Protect finish carpentry materials during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Do not deliver finish carpentry materials, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified.

1.5 JOB CONDITIONS:

- A. Conditioning: Installer shall advise Contractor of temperature and humidity requirements for finish carpentry installation areas. Do not install finish carpentry until required temperature and relative humidity conditions have been stabilized and will be maintained in installation areas.

PART 2 - PRODUCTS

2.1 WOOD PRODUCT QUALITY STANDARDS:

- A. Softwood Lumber Standards: Comply with PS 20 and with applicable grading rules of the respective grading and inspecting agency for the species and product indicated.
- B. Plywood Standard: Comply with PS 1/ANSI A199.1.
- C. Hardwood Lumber Standard: Comply with National Hardwood Lumber Association (NHLA) rules.
- D. Woodworking Standard: Where indicated for a specific product comply with specified provision of the following:
 - 1. Architectural Woodwork Institute (AWI) "Quality Standards".

2.2 MATERIALS:

- A. Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sizes as required by PS 20 or to actual sizes and pattern as shown, unless otherwise indicated.
- B. Moisture Content of Lumber: Provide kiln-dried (KD) lumber having a moisture content from time of manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.
- C. Lumber for Transparent Finish (Stained or Clear): Use pieces made of solid lumber stock.

2.3 Interior Finish Carpentry:

- A. Standing and Running Trim for Transparent Finish: Plain sawn premium White Maple manufactured to sizes and patterns (profile) shown from selected First Grade lumber (NHLA); complying with Custom grade requirements of AWI.
- B. WM/Series Wood Molding Patterns: For stock molding patterns graded under Wood Molding and Millwork Producers Industry WM 4, provide the following grade based on finish indicated and fabricated from any Western softwood species graded and inspected by WWPA:
 - 1. Moldings for Painted Finish: P-Grade.
- C. Standing and Running Trim for Painted Finish:
 - 1. Grade for Standard Sizes and Patterns: "C Select" or "Choice" for Eastern White Pine.
- D. Window Sills: 3/4" plywood, plain sawn premium White Maple veneer, with edge band.
- E. Panels: 3/4" plywood, plain sawn premium White Maple veneer, book matched.

2.4 Miscellaneous Materials:

- A. Fasteners and Anchorages: Provide nails, screws and other anchoring devices of the type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.
 - 1. Where finish carpentry is exposed on exterior or in areas of high relative humidity, provide fasteners and anchorages with a hot-dipped zinc coating (ASTM A 153).

PART 3 - EXECUTION

3.1 PREPARATION:

- A. Condition wood materials to average prevailing humidity conditions in installation areas prior to installing.
- B. Backprime Lumber for painted finish exposed on the exterior or to moisture and high relative humidities on the interior. Backprime finish carpentry items scheduled for transparent finish with one coat of spar varnish. Comply with requirements of Division 9 section on painting.

3.2 INSTALLATION:

- A. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small, or which are of defective manufacture with respect to surfaces, sizes or patterns.
- B. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level; and with 1/16" maximum offset in flush adjoining surfaces; 1/8" maximum offsets in revealed adjoining surfaces.
- C. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- D. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, to produce tight fitting joints with full surface contact. Use scarf joints for end-to-end joints.
 - 1. Apply primer to seal cut ends of backprimed lumber.
- E. Anchor finish carpentry work to anchorage devices or blocking built-in or directly attached to substrates with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished fasteners are required, use fine finishing nails for exposed nailing, countersunk and filled flush with finished surface.

3.3 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION:

- A. Repair damaged and defective finish carpentry work wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.

- B. Clean finish carpentry work on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas. Refer to Division-9 sections for final finishing of installed finish carpentry work.
- C. Protection: Installer of finish carpentry work shall advise Contractor of final protection and maintained conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION

SECTION 06402

ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Wood cabinets (casework).
 - 2. Cabinet tops (countertops).
 - 3. Interior miscellaneous ornamental items.
 - 4. Adjustable Wood Shelving & Brackets
- B. Related Sections: The following sections contain requirements that relate to this section:
- C. Division 6 Section "Rough Carpentry" for furring, blocking, and other carpentry work that is not exposed to view.
- D. Division 6 Section "Finish Carpentry" for carpentry exposed to view that is not specified in this section.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Firm experienced in successfully producing architectural woodwork similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the Work.
- B. Single-Source Responsibility: Arrange for production by a single firm of architectural woodwork.
- C. Installer Qualifications: Arrange for installation of architectural woodwork by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this project.
- D. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI) except as otherwise indicated.

- E. Hardware Coordination: Coordinate cabinet shop drawings and fabrication with hardware requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- B. Do not deliver woodwork until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions."

1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Obtain and comply with Woodwork Manufacturer's and Installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized so that woodwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.
- B. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before manufacturing woodwork; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide materials that comply with requirements of the AWI woodworking standard for each type of woodwork and quality grade indicated and, where the following products are part of woodwork, with requirements of the referenced product standards, that apply to product characteristics indicated:
 - 1. High Pressure Laminate: NEMA LD 3.
 - 2. Particleboard: ANSI A208.1, 45pcf density
 - 3. Softwood Plywood: PS 1, AA grade.
- B. Formaldehyde Emission Levels: Comply with formaldehyde emission requirements of each voluntary standard referenced below:
 - 1. Particleboard: NPA 8.
 - 2. Hardwood Plywood: HPMA FE.

2.2 FABRICATION, GENERAL

- A. Wood Moisture Content: Comply with requirements of referenced quality standard for moisture content of lumber in relation to relative humidity conditions existing during time of fabrication and in installation areas.

- B. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Corners of cabinets and edges of solid wood (lumber) members less than 1 inch in nominal thickness: 1/16 inch.
- C. Complete fabrication, including assembly, finishing, and hardware application, before shipment to project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- D. Factory-cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges of cutouts with a water-resistant coating.

2.3 LAMINATE CLAD CABINETS

- A. Quality Standard: Comply with AWI Section 400 and its Division 400B "Laminate Clad Cabinets."
 - 1. Grade: Custom.
- B. AWI Type of Cabinet Construction: Flush overlay.
- C. Case Body: All joints glued.
 - 1. Top, Bottom and Fixed Horizontals: Lock jointed, dadoed or rabbeted into ends/dividers and screwed or doweled at approximately 2 1/2" oc.
 - 2. Back: Dadoed or rabbeted into top, sides and bottom.
 - 3. Fixed Small Compartment Dividers: Dadoed.
- D. Drawers with Sub Front: All joints glued.
 - 1. All corners: Dovetailed or doweled; or front corners dovetailed and back corners lock jointed.
 - 2. Bottom: Dadoed into all four sides.
 - 3. Front: Screwed into subfront.
 - 4. Top Edges: Box-rounded.
- E. Laminate Cladding: High pressure decorative laminate complying with the following requirements:
 - 1. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 2. Provide selections made by Architect from laminate manufacturer's full range of standard colors and finishes.
- F. Laminate Grade for Exposed Surfaces: Provide laminate cladding complying with the following requirements for type of surface and grade.

1. Horizontal Surfaces Other Than Tops: GP-50 (0.050-inch nominal thickness).
2. Vertical Surfaces: GP-50 (0.050-inch nominal thickness).
3. Edges: GP-50 (0.050-inch nominal thickness).

G. Provide backer sheet on each plastic laminated item:

1. Semi exposed: Grade C120 (0.020 inch nominal thickness).
2. Concealed: Grade BK20 (0.020 inch nominal thickness).

2.4 WOOD CABINETS

A. Quality Standard: Comply with AWI Section 400 and its Division 400A "Wood Cabinets."

1. Grade: Custom.

B. AWI Type of Cabinet Construction: Reveal overlay.

C. Case Body: All joints glued.

1. Top, Bottom and Fixed Horizontals: Lock jointed, dadoed or rabbeted into ends/dividers and screwed or doweled at approximately 2 1/2" oc.
2. Back: Dadoed or rabbeted into top, sides and bottom.
3. Fixed Small Compartment Dividers: Dadoed.

D. Drawers with Sub Front: All joints glued.

1. All corners: Dovetailed or doweled; or front corners dovetailed and back corners lock jointed.
2. Bottom: Dadoed into all four sides.
3. Front: Screwed into subfront.
4. Top Edges: Box-rounded.

E. Stiles and Rails: 2-1/2" wide x 3/4" thick, premium White Maple.

F. Door Panels: Raised panels, premium White Maple.

2.5 CABINET HARDWARE AND ACCESSORY MATERIALS

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets.

B. Cabinet Hardware Schedule: Refer to schedule at end of this section for cabinet hardware required for architectural cabinets.

C. Hardware Standard: Comply with ANSI/BHMA A156.9 "American National Standard for Cabinet Hardware" for items indicated by reference to BHMA numbers or referenced to this standard.

D. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for BHMA code number indicated.

1. Brushed Aluminum.

E. For concealed hardware provide manufacturer's standard finish that complies with product class requirements of ANSI/BHMA A156.9.

2.6 ARCHITECTURAL CABINET TOPS (COUNTERTOPS)

- A. Quality Standard: Comply with AWI Section 400 and its Division 400C.
- B. Type of Top: High pressure decorative laminate complying with the following:
 - 1. Grade: Custom.
- C. Core: Veneer core, spruce faced plywood or particleboard.
- D. Laminate Cladding for Horizontal Surface: High pressure decorative laminate as follows:
 - 1. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 2. Provide selections made by Architect from manufacturer's full range of standard colors and finishes.
 - 3. Grade: GP-50 (0.050-inch nominal thickness).
- E. Edge Treatment: Same as laminate cladding on horizontal surfaces.

2.7 ADJUSTABLE WOOD SHELVING

- A. Finish: Paint finish.
- B. Description: Make shelves of 3/4" plywood sizes as shown on drawings; band front and back edges with 3/4 solid stock.
- C. Provide shelves on shelf standards and brackets called for on the Drawings, Schulte 48" 7913-3048-11 white wall mounted upright standards and Schulte 14.5" 7913-1114-11 Heavy Duty with dual shelf screws. Provide all mounting hardware for adequate structural support of shelving.
- D. Provide vertical solid wood blocking in metal stud partitions from floor to ceiling at standard locations. Brace wall as required to roof structure to provide adequate stability.
- E. Paint finish as per Paint Specification

2.8 INTERIOR MISCELLANEOUS ORNAMENTAL ITEMS FOR TRANSPARENT FINISH

- A. Quality Standard: Comply with AWI Section 700.
- B. Lumber Species: Match species and cut indicated for other types of transparent finished architectural woodwork located in same areas of building unless otherwise indicated.

2.9 INTERIOR MISCELLANEOUS ORNAMENTAL ITEMS FOR OPAQUE FINISH

- A. Quality Standard: Comply with AWI Section 700.
- B. Lumber Species: Any closed-grain hardwood listed in referenced woodworking standard.

2.10 FASTENERS AND ANCHORS

- A. Screws: Select material, type, size, and finish required for each use. Comply with FS FF-S-111 for applicable requirements.
- B. For metal framing supports, provide screws as recommended by metal framing manufacturer.
- C. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
- D. Anchors: Select material, type, size, and finish required by each substrate for secure anchorage. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts and anchors, as required, to be set into concrete or masonry work for subsequent woodwork anchorage.

2.11 FACTORY FINISHING OF INTERIOR ARCHITECTURAL WOODWORK

- A. Quality Standard: Comply with AWI Section 1500 unless otherwise indicated.
- B. General: The entire finish of interior architectural woodwork is specified in this section, regardless of whether factory applied or applied after installation.
- C. Factory Finishing: To the greatest extent possible, finish architectural woodwork at factory. Defer only final touch-up, cleaning, and polishing until after installation.
- D. General: The primary and prefinishing (if any) of interior architectural woodwork required to be performed at factory is specified in this section. Refer to Division 9 Section "Painting" for final finishing of installed architectural woodwork and for material and application requirements of prime coats for woodwork not specified to receive final finish in this section.
- E. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces and similar preparations for finishing of architectural woodwork, as applicable to each unit of work.
- F. Transparent Finish for Closed-Grain Woods: Comply with requirements indicated below for grade, finish system, staining, effect, and sheen.
 - 1. Grade: Custom.
 - 2. AWI Finish System #5: Catalyzed polyurethane.
 - 3. Staining: Match approved sample for color.
 - 4. Sheen: Dull satin 15-20 deg.

2.12 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Plastic Laminate:
 - a. Formica Corp.
 - b. Nevamar Corp.

- c. Ralph Wilson Plastics Co.
- 2. Plastic Overlay Panel Products:
 - a. Simpson Timber Co.
 - b. Sel-Ply Div./Medford Corp.
- 3. Cabinet Hardware:
 - a. National Lock Co.
 - b. EPCO.
 - c. Grant.
 - d. Knappe & Vogt.
 - e. Ives.
 - f. Stanley.
 - g. Stylemark.
 - h. Webber Knapp.
- 4. Stains and Varnishes:
 - a. Fuller O'Brien /Div. ICI Paints.
 - b. Glidden /Div. ICI Paints.
 - c. Pratt & Lambert.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installing.
- B. Deliver concrete inserts and similar anchoring devices to be built into substrates well in advance of time substrates are to be built.
- C. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

3.2 INSTALLATION

- A. Quality Standard: Install woodwork to comply with AWI Section 1700 for same grade specified in Part 2 of this section for type of woodwork involved.
- B. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 8'-0" for plumb and level (including tops) and with no variations in flushness of adjoining surfaces.
- C. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching

fastener heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated.

- E. Standing and Running Trim and Rails: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns and miter at corners.
- F. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated. Maintain veneer sequence matching (if any) of cabinets with transparent finish.
- G. Tops: Anchor securely to base units and other support systems as indicated.
- H. Complete the finishing work specified in this section to whatever extent not completed at shop or before installation of woodwork.

3.3 ADJUSTMENT AND CLEANING

- A. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.4 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensures that woodwork is being without damage or deterioration at time of Substantial Completion.

3.5 HARDWARE SCHEDULE

- | | | |
|----|-----------------------------|--|
| A. | Cabinet door hinges | Concealed type pivot hinges, Stanley or equal. |
| B. | Door and drawer pulls | Wire type, 4" face dimension, Stanley or equal. |
| C. | Drawer glides | Full extension, 150lb cap. |
| D. | Door latches | Magnetic type. |
| E. | Locks | Heavy duty institutional pin tumbler type, National Lock M2-0106 |
| F. | Wall Standards and Brackets | See Section 06402, 2.7 Adjustable Wood Shelving |

END OF SECTION

SECTION 06650
SOLID POLYMER FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. The extent of solid polymer fabrications is shown on the Drawings and includes:

1. Counter tops.
2. Counter tops with sinks.
3. Vanity tops with bowls.

- B. Related Sections: The following sections contain requirements that relate to this Section:

1. 06100 - Finish carpentry.
2. 06402 - Architectural woodwork.
3. 15000 - Plumbing.

1.3 REFERENCES

- A. Applicable Standards: Standards of the following, as referenced herein:

1. American National Standards Institute (ANSI).
2. American Society for Testing and Materials (ASTM).
3. National Electrical Manufacturers Association (NEMA).
4. Federal Specifications (FS).

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Shop Drawings: Indicate dimensions, component sizes, fabrication details, attachment provisions and coordination requirements with adjacent work.
- C. Samples: Submit minimum 2 inch by 2 inch samples. Indicate full range of color and pattern variation. Approved samples will be retained as a standard for work.
- D. Product Data: Indicate product description, fabrication information and compliance with specified performance requirements.
- E. Maintenance Data: Submit manufacturer's care and maintenance data, including care, repair and cleaning instructions and maintenance video. Provide maintenance kit for all finishes. Include in project close-out documents.

1.5 DELIVERY, STORAGE AND HANDLING:

- A. Deliver no components to project site until areas are ready for installation. Store indoors.
- B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.6 QUALITY ASSURANCE:

- A. Allowable Tolerances:
 - 1. Variation in component size: +1/8 inch.
 - 2. Location of openings: +1/8 inch from indicated location.

1.7 WARRANTY:

- A. Provide manufacturer's warranty against defects in materials, [fabrication and installation], excluding damages caused by physical or chemical abuse or excessive heat. Warranty shall provide for replacement or repair of material and labor for a period of ten years, beginning at Date of Substantial Completion.
- B. Maintain surfaces in accordance with manufacturer's care and maintenance instructions.

PART 2 PRODUCTS

2.1 SOLID POLYMER FABRICATIONS:

- A. Acceptable Products:
 - 1. E. I. du Pont de Nemours & Co., Inc., Corian(r) Surfaces.
 - 2. Avonite, Inc., Avonite Surfaces.
 - 3. Formica Corporation, Surell Surfaces.
 - 4. The Swan Corporation, Swanstone Surfaces.
- B. Material:
 - 1. Cast, filled, acrylic; not coated, laminated or of composite construction, meeting ANSI Z124 1980, Type Six, and FS WW-P-541E/GEN dated August 1, 1980.
 - 2. Material shall have minimum physical and performance properties specified.
 - 3. Superficial damage to a depth of 1/32 inch shall be repairable by sanding or polishing.
- C. Material Thicknesses: 3/4 inch.
- D. Colors: As selected by Architect from manufacturer's standard full range selection.
- E. Edge Treatments: As indicated.
- F. Integral Vanities: Cast solid polymer material, lavatory cast integrally with counter.

Performance Characteristics:

PROPERTY	REQUIREMENT (min/max)	TEST PROCEDURE	
Tensile Strength	5000 psi min	ASTM D638	
Tensile Modulus	1.0 x 10 ⁶ psi min	ASTM D638	
Flexural Strength	7000 psi min	ASTM D790	
Flexural Modulus	1.0 x 10 ⁶	ASTM D790	
Elongation	0.3% min.	ASTM D638	
Strain at Break	0.8% min.	ASTM D638	
Hardness	90-Rockwell "M" scale 52-Barcol Impressor min.	ASTM D758	
Thermal Expansion	3.5 x 10 ⁻⁶ in/in/deg C max 1.95 x 10 ⁻⁶ in/in/deg F max	ASTM D696	
Color Stability	No change, min. 100 hours	NEMA LD3-3.10	
Wear and Cleanability	Passes	ANSI Z124.3	
Abrasion Resistance	No loss of pattern Weight loss (1000 cycles)=0.9 g. max.	NEMA LD3-3.01 ANSI Z124.3	
Boiling water Surface Resistance	No Change	NEMA LD3-3.05	
High Temperature Resistance	No Change	NEMA LD3-3.06	
Conductive Heat Resistance	No Change	NEMA LD3-3.08	
Impact Resistance Notched Izod	0.24 ft.-lbs./in. of notch min.	ASTM D256, Method A	
Gardner Ball drop	9.0 ft-lbs min.	ASTM D3029 NEMA LD3-303	
3/4" sheet	200" min. with 1/2 lb ball, no failure		
Bowls (point impact)	No cracks or chips	ANSI Z124.3 and 124.6	
Stain Resistance	Passes	ANSI Z124.3	
Weatherability	No change, min. 1000 hours	ASTM D1499-84	
Fungi and Bacteria	No Attack	ASTM G21, ASTM G22	
Specific Gravity	1.6 min.		
Water Absorption Weight (% max.)	24 hrs. 0.05 (1/4") max. 0.10 (3/4") max.	Long Term 0.50 (1/4") max. 0.90 (3/4") max.	ASTM D570
Flammability		ASTM E84	

Solid Colors

	1/4"	1/2"	3/4"
Flame spread	25 max	25 max	25 max
Smoke Developed	30 max	30 max	30 max
Class	1	1	1

Particulate Patterns

	1/4"	1/2"	3/4"
Flame spread	25 max	25 max	25 max
Smoke Developed	30 max	30 max	30 max
Class	1	1	1
Pittsburgh Protocol Toxicity (as used by NY state)		solids-80 grams min. particulate patterns-65 grams min.	"LC50" Test

2.2 ACCESSORY PRODUCTS

- A. Joint Adhesive: Manufacturer's standard two-part adhesive kit to create inconspicuous, non-porous joints by chemical bond.
- B. Panel Adhesive: Manufacturer's standard neoprene-based panel adhesive complying with ANSI A136.1-1967, UL listed.
- C. Sealant: Manufacturer's standard mildew-resistant, FDA, UL listed silicone sealant in colors matching components.
- D. Conductive Tape: 3M(r) aluminum foil tape, 4 mils thick, for use with cutouts near heat sources.
- E. Insulating Felt Tape: Manufacturer's standard for use with conductive tape in insulating solid polymer from adjacent heat source.

2.3 FABRICATION:

- A. Factory fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed Instructions and technical bulletins.
- B. Form joints between components using manufacturer's standard joint adhesive; without conspicuous joints. Reinforce with strip of solid polymer material, 2" wide.
- C. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the Drawings.
- D. Rout and finish component edges with clean, sharp returns. Rout cutouts, radii and contours to template. Smooth edges. Repair or reject defective and inaccurate work.
- E. Finish: Provide surfaces with a uniform finish.

1. Matte: Gloss range of 5-20.
- F. Thermoforming: Comply with manufacturer's data.
1. Construct molds of plywood in "male/female" sections. Construct molds matching component shape.
 2. Form pieces to shape prior to seaming and joining.
 3. Cut pieces to finished dimensions. Sand edges. Remove nicks and scratches.
 4. Heat entire component. Material shall be uniform, between 275-325 degrees Fahrenheit during forming.
 5. Prevent blistering, whitening and cracking of solid polymer material during forming. Reject defective material.
- G. Color Inlay: Comply with manufacturer's product data.
1. Rout groove for inlay to straight edge or pattern indicated on the Drawings.
 2. Completely fill groove using bulk acrylic material furnished by polymer manufacturer, without air bubbles or voids. Overflow inlay area.
 3. Sand cured inlay, touch up to uniform appearance.
- H. Material Inlay: Comply with polymer manufacturer's product data. Install material as shown on the Drawings.
- I. Cove Backsplash: Fabricate backsplashes using 3/4 inch solid polymer material. Create 1/2 inch radius cove at intersection of counters and backsplashes.
- J. Counter Tops: 3/4 inch thick solid polymer material adhesively joined with inconspicuous seams, having edge details as detailed on the Drawings; color as selected, complete with specified bowls.
- K. Integral Vanity Tops And Lavatories: 3/4 inch thick solid polymer material vanity top, having edge details as indicated on the Drawings, complete with integral, cast solid polymer material lavatory bowls and backsplash of size shown on the Drawings; color as selected.

PART 3 - EXECUTION

3.1 JOB MOCK-UP

- A. Prior to final approval of shop drawings, erect at project site one full size mock-up of each component required, for Architect's review.
- B. Should mock-up not be approved, re-fabricate and reinstall until approval is secured. Remove rejected units from project site.
- C. Approved mock-ups may remain as part of finished work.

3.2 INSTALLATION

- A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
- B. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Reinforce joints as required.
- C. Provide backsplashes and sidesplashes as indicated on the Drawings. Adhere to tops using manufacturer's standard color matched silicone sealant.
- D. Keep components clean during installation. Remove adhesives, sealants and other stains. Keep clean until Date of Substantial Completion. Replace stained and damaged components.
- E. Make plumbing connections to sinks in accordance with Division 15, Mechanical.
- F. Protect surfaces from damage until Date of Substantial Completion. Repair work or replace damaged work which cannot be repaired to Architect's satisfaction.

END OF SECTION

Part II
Division 7

Thermal and Moisture Protection

SECTION 07120

FLUID-APPLIED WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

- A. Extent of each type of fluid-applied waterproofing work is indicated on drawings.
- B. Types of fluid-applied waterproofing required for project include the following:
 - 1. Urethane based type.

1.3 QUALITY ASSURANCE:

- A. Installer Qualifications: A firm which has specialized in installation of types of waterproofing required for project for not less than 3 years and which is acceptable to manufacturer(s) of primary materials.
- B. Assign work closely associated with waterproofing, including (but not limited to) waterproofing accessories, and flashings used in conjunction with waterproofing, expansion joints in membrane, insulation and protection course on membrane, to installer of waterproofing, for single, undivided responsibility.
- C. Source Quality Control: Obtain primary waterproofing materials of each type required from single manufacturer with not less than 3 years of successful experience in supplying principal materials for fluid-applied waterproofing work. Provide secondary materials only as recommended by manufacturer of primary materials.

1.4 SUBMITTALS:

- A. Product Data: Submit manufacturer's specifications, installation instructions, and general recommendations for each waterproofing material required.

1.5 JOB CONDITIONS:

- A. Substrate: Proceed with work of this section only after substrate construction and penetrating work have been completed.
- B. Weather: Proceed with work of this section only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturer's recommendations.
- C. Ventilation: Provide adequate ventilation to prevent accumulation of hazardous fumes during application of solvent-based components in enclosed spaces, and maintain ventilation until coatings have thoroughly cured.

PART 2 - PRODUCTS

2.1 MATERIALS:

- A. General Compatibility: Provide products which are recommended by manufacturer to be fully compatible with indicated substrates, including modification by additives and similar proven compounding provisions.
- B. Urethane Based Waterproofing: Polyurethane rubber based liquid membrane material, self-bonding to normal substrates, compounded specifically for application method to be used and for slope of substrate. Provide membrane with not less than 92% solids, tested by manufacturer to comply with requirements of ASTM C 836.
 - 1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - a. LM-60V: Gaco Western, Inc.
 - b. One-Kote System; Karnak Corporation.
 - c. Vulkem; Mameco International.
 - d. Perma-Gard; Neogard.
 - e. Hydrocide Liquid Membrane 5000; Sonneborn Div./ChemRex Inc.
 - f. Tremproof 60; Tremco.

2.2 MISCELLANEOUS MATERIALS:

- A. Primer/Filler/Sealer: As recommended by manufacturer of waterproofing.
- B. Flashings, Cant Strips, and Accessories: As recommended by manufacturer of waterproofing.
- C. Protection Course: As recommended by manufacturer of waterproofing.

PART 3 - EXECUTION

3.1 PREPARATION OF SUBSTRATE:

- A. Clean substrate of projections and substances detrimental to work; comply with instructions of prime materials manufacturer.
- B. Install cant strips and similar accessories as shown and as recommended by prime materials manufacturer even though not shown.
- C. Fill voids, seal joints, and apply bond breakers as recommended by prime materials manufacturer, with particular attention at construction joints.
- D. Mask off adjoining surfaces not to receive fluid-applied water-proofing to prevent spillage or overspray of liquid materials outside membrane area.

3.2 INSTALLATION:

- A. General: Comply with manufacturer's instructions, except where more stringent requirements are shown or specified.

- B. Start installation of waterproofing membrane only in presence and with advice of manufacturer's technical representative.
- C. Apply uniform coating of waterproofing to substrate and adjoining surfaces indicated to receive membrane.
- D. Apply coating either by hand or machine spray, complying with recommendations of manufacturer.
- E. Provide 60-mil (average) coating.
- F. Permit membrane to cure under conditions which will not deteriorate waterproofing material. Protect membrane from physical damage.
- G. Protection Course:
 - 1. Install protection course on cured membrane without delay, so that period of membrane exposure will be minimized. Comply with waterproofing manufacturer's recommendations for application.

3.3 PERFORMANCE REQUIREMENTS:

- A. It is required that fluid applied waterproofing membrane be watertight and not deteriorate in excess of limitations published by manufacturer.

END OF SECTION

SECTION 07200

INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

- A. Extent of insulation work is shown on drawings and indicated by provisions of this section.
- B. Applications of insulation specified in this section include the following:
 - 1. Insulation under slabs-on-grade.
 - 2. Foundation wall insulation (supporting backfill).
 - 3. Cavity wall insulation.
 - 4. Safing insulation.
- C. Insulation installed as part of roofing work is specified in Division 7 section "Membrane Roofing."
- D. Sound attenuation blankets installed as part of gypsum drywall assemblies are specified in Division-9 section "Gypsum Drywall."

1.3 QUALITY ASSURANCE:

- A. Fire and Insurance Ratings: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Surface Burning Characteristics: ASTM E 84.
 - 2. Fire Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.
- B. Maximum Allowable Asbestos Content of Inorganic Insulations: Provide insulations composed of mineral fibers or mineral ores which contain less than 0.25% by weight of asbestos of any type or mixture of types occurring naturally as impurities as determined by polarized light microscopy test per Appendix A of 40 CFR 763.

1.4 SUBMITTALS:

- A. Product Data: Submit manufacturer's product literature and installation instructions for each type of insulation and vapor retarder material required.

1.5 DELIVERY, STORAGE, AND HANDLING:

- A. General Protection: Protect insulations from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.
- B. Protection for Plastic Insulation:
 - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 - 2. Protect against ignition at all times.
 - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of work.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

- A. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Manufacturers of Extruded Polystyrene Board Insulation:
 - a. Amoco Foam Products Co.
 - b. The Dow Chemical Company.
 - c. UC Industries.
 - 2. Manufacturers of Glass Fiber Insulation:
 - a. CertainTeed Corp.
 - b. Knauf Fiber Glass GmbH.
 - c. Manville Building Insulation Div./Schuller.
 - d. Owens-Corning Fiberglas Corp.

2.2 INSULATING MATERIALS:

- A. General: Provide insulating materials which comply with requirements indicated for materials, compliance with referenced standards, and other characteristics.
- B. Preformed Units: Sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths and lengths.
- C. Extruded Polystyrene Board Insulation: Rigid, closed cell polystyrene thermal insulation with integral high density skin, formed by expansion in an extrusion process to comply with ASTM 578 for type indicated; with 5-year aged r-values of 5.4 and 5 at 40 and 75oF (4.4 and 23.9oC), respectively; and as follows:
 - 1. Type IV, 1.6 lb./cu ft. min. density, unless otherwise indicated.
 - 2. Surface Burning Characteristics: Maximum flame spread and smoke developed values of 5 and 165, respectively.

- D. Unfaced Mineral Fiber Blanket/Batt Insulation: Thermal insulation produced by combining glass or slag mineral fibers with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing); and as follows:
 - 1. Combustion Characteristics: Passes ASTM E 136 test.
 - 2. Surface Burning Characteristics: Maximum flame spread and smoke developed values of 25 and 50, respectively.

2.3 AUXILIARY INSULATING MATERIALS:

- A. Adhesive for Bonding Insulation: Type recommended by insulation manufacturer, and complying with requirements for fire performance characteristics.
- B. Mechanical Anchors: Type and size indicated or, of not indicated, as recommended by insulation manufacturer for type of application and condition of substrate.
- C. Mastic Sealer: Type recommended by insulation manufacturer for bonding edge joints between units and filling voids in work.
- D. Vapor Barriers: 6 mil polyethylene film.
- E. Vapor Barrier Sealant: 3M 8086 self adhering tape.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION:

- A. Require Installer to examine substrates and conditions under which insulation work is to be performed. Obtain Installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.
- B. Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections which might puncture vapor retarders.

3.2 INSTALLATION, GENERAL:

- A. Comply with manufacturer's instructions for particular conditions of installation in each case. Consult manufacturer's technical representative for specific recommendations before proceeding with work.
- B. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.
- C. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

3.3 INSTALLATION OF PERIMETER AND UNDER-SLAB INSULATION:

- A. On vertical surfaces, set units in adhesive of type recommended by and applied in accordance with manufacturer's instructions.

3.4 INSTALLATION OF LOOSE FIBER INSULATION:

- A. Stuff loose glass fiber insulation into miscellaneous voids and cavity spaces as indicated. Compact to approximately 40% of normal maximum volume (to a density of approximately 2.5 lbs. per cu. ft.)

3.5 INSTALLATION OF VAPOR BARRIERS:

- A. Install vapor barriers over entire surface of insulation. Seal joints with tape.

3.6 PROTECTION:

- A. General: Protect installed insulation and vapor retarders from harmful weather exposures and from possible physical abuses, where possible by nondelayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION

SECTION 07242

EXTERIOR INSULATION AND FINISH DRAINAGE SYSTEM

PART 1 GENERAL

1.1 SUMMARY

- A. This section is based on the following proprietary system to establish performance and appearance characteristics and quality standards. Equivalent products of other manufacturers may be considered as judged solely by Architect:

1. Sto Premier NExT

1.2 SECTION INCLUDES

- A. Materials and installation of Air/Moisture Barrier and EIF System.

1.3 RELATED SECTIONS:

- A. 03300 - 1-14 Cast-In-Place Concrete and Reinforcement
- B. 07530 - 1-5 Elastomeric Sheet Roofing
- C. 07900 - 1-7 Joint Sealers
- D. 08361 - 1-3 Aluminum Sectional Doors
- E. 08362 - 1-3 Insulated Steel Sectional Doors
- F. 08410 - 1-3 Aluminum Entrances and Storefronts
- G. 09250 - 1-8 Gypsum Drywall

1.4 DESIGN REQUIREMENTS

- A. Wind Load

1. Design for maximum allowable system deflection, normal to the plane of the wall, of L/240.
2. Design for wind load in conformance with code requirements.

- B. Moisture Control

1. Prevent the accumulation of water behind the EIF system, either by condensation or leakage through the wall construction, in the design and detailing of the wall assembly.
 - a. Provide flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly, including, above window and door heads, beneath window and door sills, at roof/wall intersections, decks,

abutments of lower walls with higher walls, above projecting features, and at the base of the wall.

- b. Air Leakage Prevention-- provide continuity of air barrier system at foundation, roof, windows, doors and other penetrations through the system with connecting and compatible air barrier components to minimize condensation and leakage caused by air movement.
- c. Vapor Diffusion and Condensation-- perform a dew point analysis of the wall assembly to determine the potential for accumulation of moisture in the wall assembly as a result of water vapor diffusion and condensation. Advise the Architect and Owner of any required adjustments to the insulation thickness and/or other wall assembly components accordingly to minimize the risk of condensation. Avoid the use of vapor retarders on the interior side of the wall in warm, humid climates.

C. Impact Resistance

1. Provide ultra-high impact resistance to a minimum height of 6'-0" (1.8 m) above finished grade at all areas accessible to pedestrian & Vehicle traffic and other areas exposed to abnormal stress or impact. Indicate the areas with impact resistance other than "Standard" on contract drawings.

D. Color Selection

1. Select finish coat with a light reflectance value of 20 or greater.
2. Provide finish coatings and color systems that meets the requirements of the owner's franchise

E. Joints

1. Design minimum 3/4 inch (19 mm) wide expansion joints in the EIFS where they exist in the substrate or supporting construction, where the EIFS adjoins dissimilar construction or materials, at changes in building height, and at floor lines in multi-level wood frame construction.
2. Design minimum 1/2 inch (13 mm) wide sealant joints at all penetrations through the EIFS (windows, doors, etc.).
3. Specify compatible backer rod and sealant that has been evaluated in accordance with ASTM C 1382, "Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish System (EIFS) Joints," and that meets minimum 50% elongation after conditioning.
4. Design joints in accordance with B.1.b so that air barrier continuity is maintained across the joint and drain joints to the exterior.

F. Grade Condition

1. Do not specify EIFS below grade (unless designed for use below grade and permitted by code) or for use on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure.

G. Trim, Projecting Architectural Features and Reveals

1. All trim and projecting architectural features must slope along their top surface. All horizontal reveals must have a minimum 1:2 [27°] slope along their bottom surface. Where trim/feature or bottom surface of reveal projects more than 2 inches (51 mm) from the face of the EIFS wall plane, protect the top surface with waterproof base coat. Avoid the use of trim and features that exceed the maximum allowable thickness of EPS permitted by code unless approved by the code official. Periodic inspections and increased maintenance may be required to maintain surface integrity of EIFS on weather exposed sloped surfaces. Limit projecting features to easily accessible areas and limit total area to facilitate maintenance and minimize maintenance burden.
2. Do not use EIFS on weather exposed projecting ledges, sills, or other projecting features unless supported by framing or other structural support and protected with metal coping or flashing.

H. Fire Protection

1. Do not use foam plastic in excess of 4 inches (100 mm) thick unless approved by the code official.
2. Where a fire-resistance rating is required by code use EIFS over rated assembly
3. Refer to manufacturer's applicable code compliance report for other limitations that may apply.

1.5 SUBMITTALS

- A. Samples: Submit to the Owner/Architect two (2) samples of the EIFS for each finish, texture and color to be used on the project. Samples shall be of sufficient size to accurately represent each color and texture being utilized on the project.
- B. Test Reports: of selected test reports verifying the performance of the EIFS
- C. Product Data: Submit to the Owner/Architect the Manufacturer's product data describing the EIFS products, which will be used on the project..
- D. Manufacturer's specifications, details, installation instructions and product data.
- E. Manufacturer's code compliance report.
- F. Manufacturer's standard warranty for system being used.
- G. Manufacturer's certificate of compliance with EIMA standards.
- H. Applicator's certificate of instruction.
- I. EPS board manufacturer's certificate of compliance with the current edition of EIMA Guideline Specifications for the use of Expanded Polystyrene (EPS) Insulation Board.
- J. Sealant manufacturer's certificate of compliance with ASTM C 1382.
- K. Prepare and submit project-specific details (when required by contract documents).

1.6 QUALITY ASSURANCE

- A. Manufacturer requirements
 - 1. Member in good standing of the EIFS Industry Members Association (EIMA).
 - 2. System manufacturer for a minimum of twenty (20) years.
 - 3. Manufacturer ISO 9001 certified.
 - 4. Manufacturer's wall assembly listed in Gypsum Association Fire Resistance Design Manual.

- B. Contractor requirements
 - 1. Engaged in application of EIFS for a minimum of three (3) years.
 - 2. Knowledgeable in the proper use and handling of Sto materials and listed by Sto as having attended Sto EIFS continuing education.
 - 3. Employ skilled mechanics who are experienced and knowledgeable in EIFS application, and familiar with the requirements of the specified work.
 - 4. Successful completion of minimum of three (3) projects of similar size and complexity to the specified project.
 - 5. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with Sto's published specifications and details and the project plans and specifications.

- C. Insulation board manufacturer requirements
 - 1. Recognized by Sto as capable of producing insulation board to meet system requirements, and hold a valid licensing agreement with Sto.
 - 2. Listed by an approved agency.
 - 3. Label insulation board with information required by Sto, the approved listing agency and the applicable building code.

- D. Mock-up Testing
 - 1. Construct full-scale mock-up of typical EIFS/window wall assembly with specified tools and materials and test air and water infiltration and structural performance in accordance with ASTM E 283, E 331 and E 330, respectively, through independent laboratory.
 - 2. Mock-up shall comply with requirements of project specifications.
 - 3. Where mock-up is tested at job site maintain approved mock-up at site as reference standard. .
 - 4. Provide the Owner/Architect with a mock-up for approval prior to beginning work.
 - 5. The mock-up shall be of suitable size as required to accurately represent each color and texture to be utilized on the project.

- E. Inspections
 - 1. Provide independent third party inspection where required by code or contract documents.
 - 2. Conduct inspections in accordance with code requirements and contract documents.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.
- B. Protect coatings (pail products) from freezing and temperatures in excess of 90°F (32° C). Store away from direct sunlight.
- C. Protect Portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.
- D. Protect all products from weather and direct sunlight.

1.8 COORDINATION/SCHEDULING

- A. The work in this section requires close coordination with related sections and trades
 - 1. Provide site grading such that EIFS terminates above finished grade a minimum of 8 inches (203 mm) or as required by code.
 - 2. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors and other wall penetrations to provide a continuous air barrier.
 - 3. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall and provide sill flashing.
 - 4. Coordinate installation of windows and doors so air barrier components are connected to them to provide a continuous air barrier.
 - 5. Install window and door head flashing immediately after windows and doors are installed.
 - 6. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior.
 - 7. Install copings and sealant immediately after installation of the EIF system and when EIFS coatings are dry.
 - 8. Attach penetrations through EIFS to structural support and provide water tight seal at penetrations.

1.9 WARRANTY

- A. Provide a written fifteen (15) year moisture drainage and limited material warranty from manufacturer against defective material.
- B. Provide separate warranty for workmanship from the applicator

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide EIF System, Air/Moisture Barrier and accessories from single source manufacturer or approved supplier.
- B. The following are acceptable manufacturers:
 - 1. Air/Moisture Barrier and EIF System.
 - a. STO Corp.
 - b. Dryvit Systems, Inc.
 - c. Senergy.
 - 2. Accessories:
 - a. Plastic Components, Inc.

2.2 AIR/MOISTURE BARRIER

- A. Sto Guard—fluid applied air/moisture barrier for exterior wall sheathing.

2.03 ADHESIVE

- A. Sto BTS Plus—one-component, polymer-modified, cement based high build Adhesive.

2.4 INSULATION BOARD

- A. Nominal 1.0 lb/ft³ (16 kg/m³) Expanded Polystyrene (EPS) Insulation Board in compliance with ASTM C 578 Type I requirements, and EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board.

2.5 BASE COAT:

- A. Sto BTS Plus—one-component polymer modified cement based high build base coat with less than 33 percent Portland cement content by weight and capable of achieving minimum 1/16 inch (1.6 mm) thickness in one pass.
- B. Sto Flexyl—two component fiber reinforced acrylic based waterproof base coat mixed with Portland cement on all surfaces that require waterproofing

2.6 REINFORCING MESHES

- A. Standard Mesh
 - 1. Sto Mesh--nominal 4.5 oz./yd² (153 g/m²), symmetrical, interlaced open-weave glass fiber fabric made with minimum 20 percent by weight alkaline resistant coating for compatibility with Sto materials

- B. Ultra-High Impact Mesh a minimum height of 6'-0" [1.8m] above finished grade at all areas accessible to pedestrian and vehicle traffic and other areas exposed to abnormal stress or impact.
 - 1. Sto Armor Mat--nominal 15 oz./yd² (509 g/m²), ultra-high impact, double strand, interwoven, open-weave glass fiber fabric with alkaline resistant coating for compatibility with Sto materials
- 2.7 PRIMER
- A. Sto Primer—acrylic based tinted primer.
- 2.8 FINISH COAT
- A. Finish requirements for Toyota\Scion franchise
 - 1. StoSilco Lit—silicone enhanced textured wall coating with graded marble aggregate.
 - a. Finish Codes:
 - 1) Red: NA 01-0026
 - 2) Medium Gray: NA 01-0027
 - 3) Dark Gray: NA 01-0028
 - 4) White" NA 01-0029
 - B. Finish requirements for Lexus franchise.
 - 1. Sto Decocoat is a ready-mixed, decorative and protective wall and floor coating composed of fine variegated aggregate encased in a pure acrylic binder
 - a. Finish Codes
 - 1) NA 00-0101
- 2.9 JOB MIXED INGREDIENTS
- A. Water--Clean and potable.
- 2.10 ACCESSORIES
- A. Starter Track— Rigid PVC (polyvinyl chloride) plastic track accessories as furnished by Plastic Components, Inc., 9051 NW 97th Terrace, Miami, Florida 33178 (800 327-7077).

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install Air/Moisture Barrier and EIFS in compliance with manufacturer's published instructions.

3.2 PROTECTION

- A. Provide protection of installed materials from water infiltration into or behind them.

- B. Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry.

END OF SECTION

SECTION 07530

ELASTOMERIC SHEET ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Modify Specification Section 07530, item 1.2.A to read: "Elastomeric Sheet Membrane Conventional Roofing System complete with roofing membrane, tapered insulation, expansion joints, flashings and accessories.
 - 1. Provide fully adhered roof system at roofs above Toyota Service Reception [141], Lexus Service Reception [140] and Toyota/Lexus Service Shop [180].
 - 2. Provide mechanically fasted roof system at all other roof locations."

1.3 SYSTEM DESCRIPTION

- A. Elastomeric sheet membrane roof assembly including insulation and accessories to conform to requirements for a UL Class A fire rated assembly, and FM I 90 requirements for wind uplift resistance.
- B. Wind Speed Rating: Provide roof system capable of meeting requirements of BOCA National Building Code for wind speed of the site.

1.4 SUBMITTALS

- A. Product Data: Provide characteristics on membrane materials, flashing materials, insulation, vapor retarders and walkway pads.
- B. Shop Drawings: Provide shop drawings of installation details recommended by membrane manufacturer, and of tapered insulation layout.
- C. Warranty: Provide warranty signed by roof membrane manufacturer and installer.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with UL 790 (Underwriters Laboratories Inc.) Class A Fire Hazard Classification. FM 4470 (Factory Mutual Engineering Corporation) - Roof assembly Classification wind uplift requirement of I-90, FM Construction Bulletin 1-28, Class 1 A Construction.
- B. Owner will engage an independent roofing consultant to monitor and inspect the roofing installation.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install membrane during inclement weather or when air temperature may fall below 40 degrees F, or as required by manufacturer's instructions.

1.7 WARRANTY

- A. Provide fifteen (15) year total system warranty under provisions of Section 01001.

PART 2 - PRODUCTS

2.1 MEMBRANE MATERIALS

- A. Manufacturers:
 - 1. Carlisle Syntec Systems.
 - 2. Celotex Corp.
 - 3. Dunlop Construction Products Co.
 - 4. Firestone Building Products Co.
 - 5. Goodyear Tire and Rubber Co.
 - 6. Schuller Roofing Systems.
- B. Membrane: Reinforced EPDM; 0.060 inch thick.
- C. Seaming Materials: As recommended by membrane manufacturer.

2.2 FASTENING

- A. Insulation Adhesive: Type recommended by insulation manufacturer.
- B. Mechanical Fasteners: Manufacturer's standard type for application intended.

2.3 INSULATION MATERIALS

- A. Manufacturers:
 - 1. As approved by roof membrane manufacturer.
- B. Insulation: ASTM C 1289-95 Type II, polyisocyanurate closed cell foam core with manufacturer's standard facing; thicknesses as indicated, square edges, R value of 6.3 per inch thickness.
- C. Separation Sheet: As recommended by roofing membrane manufacturer for application intended.
- D. Insulation Adhesive: As recommended by insulation manufacturer.

2.4 ACCESSORIES

- A. Flexible Flashings: Same materials as membrane; black color; manufactured by roofing membrane manufacturer.
- B. Prefabricated Control or Expansion Joint Flashing: Sheet EPDM with foam filler, and metal edge flashings.
- C. Fiber Cant Strips: Asphalt impregnated wood fiberboard.
- D. Roofing Fasteners: Galvanized or non-ferrous type as recommended by membrane manufacturer.
- E. Sealants: As recommended by membrane manufacturer.
- F. Walkway Pads: As recommended by membrane manufacturer
- G. Fascia System: Two part prefinished fascia system as indicated with extruded aluminum anchors and snap on cover, 24 ga. steel with Kynar finish, as recommended by membrane manufacturer.

PART 3 - EXECUTION

3.1 COORDINATION

- A. Prior to beginning roofing work, conduct preconstruction conference with all affected trades and roof membrane manufacturer's representative.
- B. At a minimum, discuss procedures for removal of existing roofing, temporary protection of building and installation of new roofing system.
- C. Document conference and distribute copies to all parties, including Owner and Architect.

3.2 REMOVALS

- A. Remove complete existing roofing system, including ballast, membrane, insulation, fascias, flashings and accessories.
- B. Provide temporary protection from water infiltration to building during roofing operations.

3.3 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work; deck is clean and smooth, free of snow or ice; properly sloped to drains.
- B. Verify roof openings, curbs, and protrusions through roof are solidly set; wood cant strips and reglets are in place.

3.4 PREPARATION

- A. Fill concrete surface honeycomb and variations with latex filler.

3.5 INSULATION APPLICATION

- A. Embed into insulation adhesive on deck in accordance with insulation manufacturer's instructions.
- B. Lay second and any succeeding layers of insulation with joints staggered from previous layer.
- C. Minimum Total Insulation Thickness: As required to achieve an insulation R value of 34
- D. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

3.6 MEMBRANE APPLICATION

- A. Apply membrane in strict accordance with manufacturer's instructions.
- B. Roll out membrane. Work out air bubbles, wrinkles, and fishmouths. Adhere fully to substrate.
- C. Overlap edges and ends and solvent seal watertight.
- D. Seal membrane to adjoining surfaces.
- E. Shingle joints on sloped substrate in direction of drainage. Apply joint sealant.
- F. Continue membrane up vertical surfaces minimum 8 inches unless otherwise noted. Reinforce membrane with multiple thickness of membrane material over joints.
- G. Seal items penetrating membrane with counterflashing membrane material. Install membrane flashings. Seal watertight to membrane.
- H. Place walkway units at locations noted.

3.7 FLASHINGS AND ACCESSORIES

- A. Apply flexible flashings to seal membrane to vertical elements.
- B. Install prefabricated roofing expansion control joints to isolate roof into areas as indicated in accordance with manufacturer's instructions.
- C. Coordinate installation of roof drains sumps and related flashings.
- D. Seal flashings and flanges of items penetrating membrane.
- E. Install fascias in accordance with manufacturer's instructions.
- F. Replace existing roof drain domes with cast aluminum domes.

3.8 INSPECTION

- A. Upon completion of roofing work, conduct inspection of roof installation with manufacturer's representative and Owner's roofing consultant. Correct any deficiencies noted and have roof reinspected.

END OF SECTION

SECTION 07700

ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

- A. Extent and locations of roof accessories is indicated on the drawings and by provisions of this section.
- B. Types of units specified in this section include the following:
 - 1. Prefabricated Curbs.
- C. Refer to roofing system sections of these specifications for roofing accessories to be built into roofing system (not work of this section).

1.3 SUBMITTALS:

- A. Product Data; Roof Accessories: Submit manufacturer's technical product data, rough-in diagrams, details, installation instructions and general product recommendations.
- B. Coordination Drawings: Submit coordination drawings for items interfacing with or supporting mechanical or electrical equipment, ductwork, piping, or conduit. Indicate dimensions and locations of items provided under this section, together with relationships and methods of attachment to adjacent construction and to mechanical/electrical items.

1.4 QUALITY ASSURANCE:

- A. Standards: Comply with SMACNA "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap- flashing to coordinate with type of roofing indicated. Comply with "NRCA Roofing and Waterproofing Manual" details for installation of units.

PART 2- PRODUCTS

2.1 GENERAL PRODUCT REQUIREMENTS:

- A. Provide manufacturers' standard units, modified as necessary to comply with requirements. Shop fabricate each unit to greatest extent possible.

2.2 MATERIALS, GENERAL:

- A. Zinc-Coated Steel: Commercial quality with 0.20 percent copper, ASTM A 525, G90 hot-dip galvanized, mill phosphatized.

- B. Aluminum Sheet: ASTM B 209, alloy 3003, temper as required for forming and performance; AA-C22A41 clear anodized finish, except mill finish prepared for painting where indicated for field painting.
- C. Extruded Aluminum: Manufacturer's standard extrusions of sizes and general profiles indicated, alloy 6063-T52; 0.078" minimum thickness for primary framing and curb member legs, 0.062" for secondary legs; AA-C22A41 clear anodized finish on exposed members, except as otherwise indicated.
- D. Insulation: Manufacturer's standard rigid or semi-rigid board of glass fiber of thicknesses indicated.
- E. Wood Nailers: Softwood lumber, pressure treated with water-borne preservatives for above-ground use, complying with AWPB LP-2; not less than 1-1/2" thick.
- F. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
 - 1. Where removal of exterior exposed fasteners affords access to building, provide nonremovable fastener heads.
- G. Gaskets: Tubular or fingered design of neoprene or polyvinyl chloride, or block design of sponge neoprene.
- H. Bituminous Coating: FS TT-C-494A or SSPC-Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coating.
- I. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
- J. Elastomeric Sealant: Generic type recommended by unit manufacturer, which is compatible with joint surfaces; comply with FS TT-S-00227E, TT-S-00230C, or TT-S-001543A.

2.4 PREFABRICATED CURBS/EQUIPMENT SUPPORTS:

- A. Comply with loading and strength requirements as indicated where units support other work. Coordinate dimensions with rough-in sheets or shop drawings of equipment to be supported. Fabricate of structural quality sheet steel (ASTM A 570, Grade as required) which has been prepared for painting and factory-primed and painted with 2-mil thickness of baked-on synthetic enamel, after fabrication.
- B. Fabricate with welded or sealed mechanical corner joints. Provide complete with cant strips and base profile coordinated with roof insulation thickness. Provide preservative-treated wood nailers at tops of curbs, coordinate with thickness of insulation and roof flashing as indicated, tapered as necessary to compensate for roof deck slopes of 1/4" per ft. and less.
- C. Except as otherwise indicated or required for strength, fabricate units of minimum 14-gage (0.0747") metal, and to minimum height of 12".
- D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering prefabricated curbs/equipment supports which may be incorporated in the work include, but are not limited to, the following:

1. Custom Curb, Inc.; Chattanooga, TN
2. The Pate Company; Broadview, IL
3. ThyCurb Div./ThyBar Corp.; Addison, IL

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. General: Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units, and vapor barriers, roof insulation, roofing and flashing; as required to ensure that each element of the work performs properly, and that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.
- B. Except as otherwise indicated install roof accessory items in accordance with construction details of "NRCA Roofing and Waterproofing Manual".
- C. Isolation: Where metal surfaces of units are to be installed in contact with noncompatible metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation.
- D. Flange Seals: Except as otherwise indicated, set flanges of accessory units in a thick bed of roofing cement, to form a seal.
- E. Cap Flashing: Where cap flashing is required as component of accessory, install to provide adequate waterproof overlap with roofing or roof flashing (as counter-flashing). Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.
- F. Operational Units: Test operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

3.2 CLEANING AND PROTECTION:

- A. Clean exposed metal and plastic surfaces in accordance with manufacturer's instructions. Touch up damaged metal coatings.

END OF SECTION

SECTION 07812

APPLIED FIREPROOFING

1 PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract including General and Supplementary Conditions and Division 1 specification sections, apply to work of this section.

1.2 SECTION INCLUDES

- A. Cementitious field-applied fireproofing.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM E 605 — Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material Applied to Structural Members.
 - 2. ASTM E 736 — Cohesion/Adhesion of Sprayed Fire-Resistive Material Applied to Structural Members.
 - 3. ASTM E 859 — Air Erosion of Sprayed Fire-Resistive Material Applied to Structural Members.
 - 4. ASTM E 761 — Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members.
 - 5. ASTM E 759 — Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members.
 - 6. ASTM E 760 — Effect of Impact on Bonding of Sprayed Fire Resistive Material Applied to Structural Members.
 - 7. ASTM E 937 — Corrosion of Steel by Sprayed Fire Resistive Material Applied to Structural Members.
 - 8. ASTM G 21 — Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
 - 9. ASTM E 119 — Standard Methods of Fire Tests of Building Construction and Materials.
 - 10. ASTM E 84 — Surface Burning Characteristics.
 - 11. ASTM E 1354 — Cone Calorimeter.
- B. Bureau of Building Inspection: City of San Francisco.
 - 1. Abrasion Resistance Test Method.
 - 2. Impact Penetration Test Method.
- C. Underwriters Laboratories Inc. (UL) Fire Resistance Directory (Latest Edition).
- D. Uniform Building Code (UBC).
 - 1. UBC Standard No. 7-6 Thickness, Density Determination and Cohesion/Adhesion for Spray-Applied Fireproofing.
 - 2. UBC Standard No. 7-7 Methods for Calculating Fire Resistance of Steel, Concrete and Wood Construction.
- E. Uniform Mechanical Code (UMC) Standard 6-1.

1.4 DEFINITIONS

- A. Cementitious Mixture as identified by Underwriters Laboratories Inc. in the latest edition of the UL Fire Resistance Directory under category CHPX, Spray-Applied Fire Resistive Material.

1.5 SUBMITTALS

- A. Manufacturer's Data: Submit manufacturer's instructions for proper application of cementitious fireproofing.
- B. Fire Testing: Submit evidence that the cementitious fireproofing has been subjected to full-scale ASTM E 119 fire testing at Underwriters Laboratories Inc. by the manufacturer.
- C. Thickness Schedule: Provide schedule indicating material to be used, building elements to be protected with spray-applied fireproofing, hourly rating and material thickness provided and appropriate references. Apply to underside of second floor framing. Ref. drawings for units.
- D. Test Data: Independent laboratory test results for fireproofing shall be submitted for the following performance criteria:
 - 1. Bond Strength per ASTM E 736.
 - 2. Compressive Strength per ASTM E 761.
 - 3. Deflection per ASTM E 759.
 - 4. Bond Impact per ASTM E 760.
 - 5. Air Erosion per ASTM E 859.
 - 6. Corrosion Resistance per ASTM E 937.
 - 7. High Speed Air Erosion per UMC Standard 6-1 and ASTM E 859.
 - 8. Surface Burning Characteristics per ASTM E 84.
 - 9. Combustibility per ASTM E 1354 Cone Calorimeter.
 - 10. Mold Resistance per ASTM G 21 and UMC Standard 6-1.
 - 11. Abrasion Resistance (Test Method developed by City of San Francisco, Bureau of Building Inspection).
 - 12. Impact Penetration (Test Method developed by City of San Francisco, Bureau of Building Inspection).

1.6 QUALITY ASSURANCE

- A. Fireproofing work shall be performed by a firm acceptable to the cementitious fireproofing material manufacturer.
- B. Products, execution, and fireproofing thicknesses shall conform to the applicable code requirements for the required fire resistance ratings.
- C. Contractor, fireproofing subcontractor and independent testing laboratory shall attend a pre-installation conference to review the substrates for acceptability, method of application, applied thicknesses, inspection procedures, and other issues.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Material shall be delivered in original unopened packages, fully identified as to the manufacturer, brand or other identifying data and bearing the proper Underwriters

Laboratories Inc. labels for Surface Burning Characteristic and Fire Resistance Classification.

- B. Material shall be stored off the ground, under cover, and in a dry location until ready for use. All bags that have been exposed to water before use shall be found unsuitable and discarded. Stock of material is to be rotated and used prior to its expiration date.

1.8 PROJECT/SITE CONDITIONS

- A. A minimum air and substrate temperature of 4.4°C (40°F) shall be present before application of spray-applied fireproofing. A minimum air and substrate temperature of 4.4°C (40°F) must be maintained during and for 24 hours after application of spray-applied fireproofing. Provide enclosures with heat to maintain temperature.
- B. Provide ventilation in poorly ventilated areas to achieve a minimum total air exchange rate of 4 times per hour until the material is substantially dry.

1.9 SEQUENCING AND SCHEDULING

- A. Sequence and coordinate application of cementitious fireproofing with work in other sections which would interfere with efficient fireproofing application.

2 PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Fireproofing shall be cementitious mixture as manufactured by Grace Construction Products of W. R. Grace & Co.-Conn., or its processing distributors.
- B. Substitutions may be accepted as determined solely by the Architect upon review of submittal information.

2.2 MATERIALS

- A. Materials shall be MONOKOTE® Type MK-6s factory blended cementitious fireproofing.
- B. Physical Performance Characteristics: Fireproofing material shall meet the following physical performance standards:
 1. Dry Density: The field density shall be measured in accordance with ASTM Standard E 605. Minimum average density shall be that listed in the UL Fire Resistance Directory for each rating indicated, ICBO Evaluation Report as required by the authority having jurisdiction, or minimum average 305 kg/m³ (19 pcf), whichever is greater.
 2. Deflection: Material shall not crack or delaminate from the surface to which it is applied when tested in accordance with ASTM E 759.
 3. Bond Impact: Material subject to impact tests in accordance with ASTM E 760 shall not crack or delaminate from the surface to which it is applied.
 4. Bond Strength: Fireproofing, when tested in accordance with ASTM E 736, shall have a minimum average bond strength of 9.6 kPa (200 psf) and a minimum individual bond strength of 7.2 kPa (150 psf).

5. Air Erosion: Maximum allowable total weight loss of the fireproofing material shall be .05 g/m² (.005 g/ft²) when tested in accordance with ASTM E 859. Sample surface shall be "as applied" (not pre-purged) and the total reported weight loss shall be the total weight loss over a 24 hour period from the beginning of the test.
 6. High Speed Air Erosion: Materials to be used in plenums or ducts shall exhibit no continued erosion after 4 hours at an air speed of 12.7 m/s (47 km/h) when tested in accordance with the UMC Standard 6-1 and ASTM E 859.
 7. Compressive Strength: The fireproofing shall not deform more than 10% when subjected to compressive forces of 57 kPa (1200 psf) when tested in accordance with ASTM E 761.
 8. Corrosion Resistance: Fireproofing applied to steel shall be tested in accordance with ASTM E 937 and shall not promote corrosion of steel.
 9. Abrasion Resistance: No more than 15 cm³ shall be abraded or removed from the fireproofing substrate when tested in accordance with the test methods developed by the City of San Francisco, Bureau of Building Inspection.
 10. Impact Penetration: The fireproofing material shall not show a loss of more than 6 cm³ when subjected to impact penetration tests in accordance with the test methods developed by the City of San Francisco, Bureau of Building Inspection.
 11. Surface Burning Characteristics: Material shall exhibit the following surface burning characteristics when tested in accordance with ASTM E 84:
 - a. Flame Spread 0
 - b. Smoke Development 0
 12. Resistance to Mold: The fireproofing material shall be formulated at the time of manufacturing with a mold inhibitor. Fireproofing material shall be tested in accordance with ASTM G-21 and shall show resistance to mold growth for a period of 21 days for general use and 60 days for materials to be installed in plenums.
 13. Combustibility: Material shall have a maximum total heat release of 20 MJ/m² and a maximum 125 kW/m² peak rate of heat release 600 seconds after insertion when tested in accordance with ASTM E 1354 at a radiant heat flux of 75 kW/m² with the use of electric spark ignition. The sample shall be tested in the horizontal orientation.
- C. Fire Resistance Classification: The spray-applied fireproofing material shall have been tested and reported by Underwriters Laboratories Inc. in accordance with the procedures of ASTM E 119 and shall be listed in the Underwriters Laboratories Fire Resistance Directory.
- D. Mixing water shall be clean, fresh, and suitable consumption and free from such amounts of mineral or organic substances as would affect the set of the fireproofing material. Provide water with sufficient pressure and volume to meet the fireproofing application schedule.

2.3 ACCESSORIES

- A. Provide accessories to comply with manufacturer's recommendations and to meet fire resistance design and code requirements. Such accessories include, but are not limited to, any required or optional items such as SPATTERKOTE® Type SK-3; bonding agents; mechanical attachments; application aids such metal lath, scrim, or netting; and MONOKOTE ACCELERATOR.

2.4 SOURCE QUALITY CONTROL

- A. Submit evidence that the cementitious fireproofing has been tested per ASTM E 119 by Underwriters Laboratories Inc. Include evidence that the fire testing was sponsored by the manufacturer and that the material tested was produced at the manufacturer's facility under

the supervision of Underwriters Laboratories Inc. personnel. Letters documenting classification status are not acceptable evidence of compliance with this section.

3 PART 3 EXECUTION

3.1 EXAMINATION

- A. All surfaces to receive spray-applied fireproofing shall be provided free of oil, grease, paints/primers, loose mill scale, dirt, or other foreign substances which may impair proper adhesion of the fireproofing to the substrate. Where necessary, cleaning or other corrections of surfaces to receive fireproofing shall be the responsibility of the supplier of the incompatible substrate.
- B. Application of the fireproofing shall not begin until the contractor, applicator and fireproofing testing laboratory (inspector) have examined surfaces to receive fireproofing and determined that the surfaces are acceptable to receive the fireproofing material.

3.2 PREPARATION

- A. Prior to application of the fireproofing material, a bonding agent, approved by the fireproofing material manufacturer, shall be applied to all concrete substrates to receive fireproofing.
- B. Other trades shall install clips, hangers, support sleeves and other attachments required to penetrate the fireproofing, prior to application of the fireproofing material.
- C. Other trades shall not install ducts, piping, equipment or other suspended items until the fireproofing is complete.
- D. Complete placing of concrete on floor and roof decking prior to application of the fireproofing to the underside of steel deck and supporting beams and joists.
- E. On roof decks without a concrete cover, complete all roofing applications and roof mounted equipment installation prior to application of the fireproofing to the underside of roof decking and supporting beams and joists. Prohibit all roof traffic upon commencement of the fireproofing and until the fireproofing material is dry.
- F. Protection of permanently exposed walls or floors, or special surfaces:
(Please indicate special protection requirements by location in a finish schedule on the plans or herein. Eliminate subparagraph F if not applicable).

3.3 APPLICATION

- A. Equipment and application procedures shall conform to the material manufacturer's application instructions.
- B. Post appropriate cautionary "Slippery When Wet" signs in all areas in contact with wet fireproofing material. Erect appropriate barriers to prevent entry by non-fireproofing workers into the fireproofing spray and mixing areas and other areas exposed to wet fireproofing material.
- C. Apply a discontinuous textured spray of W. R. Grace & Co.-Conn. SPATTERKOTE SK-3 in accordance with manufacturer's instructions to all cellular steel floor units with flat plate on

the bottom and to roof deck assemblies as required to meet the fire resistance ratings, before application of the MONOKOTE fireproofing to these surfaces.

3.4 FIELD QUALITY CONTROL

- A. The architect will select, and the owner will pay an independent testing laboratory to randomly sample and verify the thickness and density of the fireproofing in accordance with provisions of ASTM E 605, or the "Inspection Procedure for Field-applied Sprayed Fire Protection Materials" as published by the Association of Wall and Ceiling Contractors International (AWCI), or the Uniform Building Code Standard No. 7-6. Where density samples are of irregular shape, a displacement method approved by Underwriters Laboratories Inc. shall be used to determine in place fireproofing density.
- B. The architect will select, and the owner will pay an independent testing laboratory to randomly sample and verify the bond strength of the fireproofing in accordance with provisions of ASTM E 736.
- C. The results of the above tests shall be made available to all parties at the completion of pre-designated areas which shall have been determined during the pre-job conference.

3.5 CLEANING

- A. A. After the completion of fireproofing work, application equipment shall be removed.
- B. B. Except as detailed in Section 3.02F, floors shall be left in a scraped condition.

3.6 PATCHING

- A. A. All patching and repairing of spray-applied fireproofing, due to damage by other trades, shall be performed with same materials under this section, and paid for by the trade(s) responsible for the damage.

3.7 FIRE RATING SCHEDULE

	<u>Element</u>	<u>Hour</u>
A.	Columns	One
B.	Floor Decks	Zero
C.	Floor Supports	One
D.	Roof Decks	Zero
E.	Roof Supports	Zero

(X) Restrained or () Unrestrained

END OF SECTION

SECTION 07840

FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Firestopping materials and accessories.

1.3 SYSTEM DESCRIPTION

- A. Firestopping Materials: Complete systems of materials tested under [ASTM E119] [ASTM E814] [UL 263] [UL 1479] to achieve a fire rating as noted on Drawings.
- B. Surface Burning: [ASTM E84] [UL 723] with a flame spread / smoke developed rating of 0/0
- C. Firestop all interruptions to fire rated assemblies, materials and components.

1.4 SUBMITTALS

- A. Product Data: Provide data on product characteristics, performance and limitation criteria.
- B. Manufacturer's Certificate: Certify that [products] meet or exceed [specified requirements.]
- C. Schedule: Provide a schedule of openings and penetrations requiring firestopping and firesafing. Correlate with products submitted, fire ratings, and testing agency test results.

PART 2 - PRODUCTS

2.1 FIRESTOPPING MATERIALS

- A. Manufacturers:
 - 1. Isolatek International (Cafco Products).
 - 2. Specified Technologies Inc.
 - 3. 3M Fire Protection Products.
 - 4. United States Gypsum Co.
- B. Firestopping Material: [Mineral fiber stuffing insulation].
 - 1. USG Thermafiber Safing Insulation.
 - a. Density: 4.0 lb/cu ft.

- C. Firestopping Material: [[Single] [] component [mortar] compound.]]
 - 1. Cafco TPS Mortar.
 - 2. SpecSeal Fire Rated Mortar SSM
 - 3. USG Firecode Compound.

- D. Firestopping Material: [[Single] [] component [elastomeric] [] compound.] []
 - 1. Cafco TPS Type C.
 - 2. SpecSeal Latex Sealant LC150
 - 3. 3M Fire Barrier CP 25WB+ Caulk.
 - 4. USG Smoke-Seal Compound.

2.2. ACCESSORIES

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces.
- B. Dam Material: Permanent:
 - 1. As required by manufacturer to meet system listing.
- C. Installation Accessories: Clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Verify openings are ready to receive the work of this section.
- B. Clean substrate surfaces of matter which may effect bond of firestopping material.
- C. [Install backing materials to arrest liquid material leakage.]

3.2 APPLICATION

- A. Apply [primer and] materials in accordance with manufacturer's instructions.
- B. Apply firestopping material [in sufficient thickness to achieve rating], in manner consistent with tested and listed assemblies.
- C. Install material at openings and edge of floor slabs requiring firestopping.
- D. Install material at walls or partition openings which contain penetrating sleeves, piping, duct work, conduit and other items, requiring firestopping.
- E. Protect installed firestopping from damage during construction operations.

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

- A. The extent of each form and type of joint sealer is indicated on drawings and by provisions of this section.
- B. The applications for joint sealers as work of this section include the following:
 - 1. Exterior wall joints.
 - 2. Joints at the intersection of counters and walls.
 - 3. Interior sound-sealed and air-sealed joints.
 - 4. Joints at the perimeter plumbing fixtures.
 - 5. Joints at the perimeter of windows and doors.
 - 6. Flooring joints.
 - 7. Joints at penetrations of fire rated assemblies and draftstopping, by piping, wiring and other services and equipment.

1.3 SYSTEM PERFORMANCES:

- A. Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

1.4 SUBMITTALS:

- A. Product Data from manufacturers for each joint sealer product required, including instructions for joint preparation and joint sealer application.
- B. Samples for Selection Purposes: Manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view.

1.5 QUALITY ASSURANCE:

- A. Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from a single manufacturer for each different product required.

1.6 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials to project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multicomponent materials.
- B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS:

- A. Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturers.
 - 2. When joint substrates are wet due to rain, frost, condensation or other causes.
- B. Joint Width Conditions: Do not proceed with installation of joint sealers when joint widths are less than allowed by joint sealer manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealers until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL:

- A. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.
- B. Colors: Provide color of exposed joint sealers indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

2.2 ELASTOMERIC JOINT SEALANTS:

- A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class, and Uses.
- B. One-Part Non-Acid-Curing Silicone Sealant: Type S; Grade NS; Class 25; uses NT, M, G, A and, as applicable to joint substrates indicated, O; for general exterior use at non porous surfaces where painting is not required.
- C. One-Part Mildew-Resistant Silicone Sealant: Type S; Grade NS; Class 25; Uses NT, G, A and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide for sealing interior joints with nonporous substrates around ceramic tile, showers, sinks and plumbing fixtures.
- D. One-Part Non Sag Urethane Sealant for Use NT: Type S; Grade NS; Class 25; Uses NH, M, A and as applicable to joint substrates indicated, O; for general exterior use at non porous surfaces where painting is not required.
- E. Multi-Part Non Sag Urethane Sealant for Use T: Type M; Grade NS; Class 25 ; Uses T, M, A and, as applicable to joint substrates indicated, O.
- F. Products: Subject to compliance with requirements, provide one of the following:
 - 1. One-Part Non-Acid-Curing Silicone Sealant:

- a. "Baysilone 440"; Mobay.
- b. "Chem-Calk 1200"; Bostik.
- c. "Dow Corning 790"; Dow Corning Corp.
- d. "Omniseal"; Sonneborn Building Products/Div. ChemRex Inc.
- e. "Rhodorsil 5C"; Rhone-Poulenc.
- f. "Silpruf"; GE Silicones/Div. General Electric Co.
- g. "Spectrum 1"; Tremco, Inc.

2. One-Part Mildew Resistant Silicone Sealant:

- a. "Dow Corning 786"; Dow Corning Corp.
- b. "Sanitary 1700"; GE Silicones/Div. General Electric Co.
- c. "Rhodorsil 6B White"; Rhone-Poulenc.

3. One-Part Non Sag Urethane Sealant:

- a. "Chem-Calk 900", Bostik.
- b. "Dynatrol I", Pecora Corp.
- c. "Dymonic", Tremco Inc.
- d. "Sonolastic NP 1", Sonneborn Building Products/Div. ChemRex Inc.

4. Two-Part, Pourable, Urethane Sealant:

- a. "Pourthane"; WR Meadows, Inc.
- b. "NR-200"; Pecora Corp.
- c. "Sonolastic SL2"; Sonneborn Building Products/Div. ChemRex Inc.
- d. "THC 900"; Tremco, Inc.

2.3 LATEX JOINT SEALANTS:

- A. Acrylic-Emulsion Sealant: Manufacturer's standard, one part, nonsag, mildew-resistant, acrylic-emulsion sealant complying with ASTM C 834, formulated to be paintable and recommended for exposed applications on interior.

1. Products: Subject to compliance with requirements, provide one of the following:
- a. "AC-20"; Pecora Corp.
 - b. "Chem-Calk 600"; Bostik.
 - c. "Sonolac"; Sonneborn Building Products/Div. ChemRex Inc.
 - d. "Tremco Acrylic Latex 834"; Tremco, Inc.

2.4 MISCELLANEOUS JOINT SEALANTS:

- A. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.
- B. Butyl-Polyisobutylene Sealant: Manufacturer's standard, solvent- release-curing, butyl-polyisobutylene sealant complying with AAMA 809.2, recommended for concealed joints.
- C. Butyl-Polyisobutylene Tape Sealant: Manufacturer's standard, solvent- free, butyl-polyisobutylene tape sealant with a solids content of 100%; complying with AAMA 804.1; formulated to be nonstaining, paintable, and non-migrating in contact with nonporous surfaces; packaged on rolls with a release paper on one side; with or without reinforcement thread to prevent stretch.

- D. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
1. Acoustical Sealants for Concealed Joints:
 - a. "PTI 808"; Protective Treatments, Inc.
 - b. "Tremco Acoustical Sealant"; Tremco Inc.
 - c. "Sheetrock Acoustical Sealant"; United States Gypsum Co.
 - d. "3C 909A"; Continental Brands.
 2. Butyl-Polyisobutylene Sealant:
 - a. "BC 158"; Pecora.
 - b. "Chem-Calk 300"; Bostik.
 - c. "PTI 404"; Protective Treatments, Inc.
 3. Butyl-Polyisobutylene Tape Sealant:
 - a. "Extru-Seal Tape"; Pecora Corp.
 - b. "PTI 606"; Protective Treatments, Inc.
 - c. "Tremco 440 Tape"; Tremco Inc.

2.5 FIRE-RESISTANT JOINT SEALERS:

- A. General: Provide manufacturer's standard sealant and accessory materials with fire-resistance rating indicated which are identical to those of assemblies whose fire endurance has been determined by testing per ASTM E 814 by Underwriters Laboratory, Inc. or other testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Foamed-In-Place Fire-Stopping Sealant: Two-part, foamed-in-place, silicone sealant formulated for use as part of a through-penetration fire-stop system for filling openings around cables, conduit, pipes and similar penetrations through walls and floors.
- C. One-Part Fire-Stopping Sealant: One part elastomeric sealant formulated for use as part of a through-penetration fire-stop system for sealing openings around cables, conduit, pipes and similar penetrations through walls and floors.
- D. Products: Subject to compliance with requirements, provide one of the following:
1. Foamed-in-Place Fire-Stopping Sealant:
 - a. "Dow Corning Fire Stop Foam"; Dow Corning Corp.
 - b. "Pensil 200 Foam", Specified Technologies, Inc.
 - c. "3M Fire Barrier 2001 Silicone RTV Foam"; 3M Fire Protection Products.
 2. One-Part Fire-Stopping Sealant:
 - a. "Cafco TPS Caulk"; Isolatek International.
 - b. "Firecode Compound"; United States Gypsum Co.
 - c. "FireMaster Putty"; 3M Fire Protection Products.
 - d. "FS 601"; Hilti Corp.
 - e. "Fyre Putty"; The Carborundum Co.
 - f. "Fyre-Sil"; Tremco Inc.
 - g. "Dow Corning Fire Stop Sealant"; Dow Corning Corp.
 - h. "Nelson CLK"; Nelson Firestop Products/Div. General Signal.

- i. "Pensil 100 Sealant", "SpecSeal Sealant"; Specified Technologies, Inc.
- j. "3M Fire Barrier Caulk CP-25WB+"; 3M Fire Protection Products.

2.6 JOINT SEALANT BACKING:

- A. General: Provide sealant backings of material and type which are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Plastic Foam Joint-Fillers: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Either flexible, open cell polyurethane foam or non-gassing, closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back (3rd) surface of joint. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS:

- A. Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from joint sealer-substrate tests.
- B. Cleaners for Nonporous Surfaces: Provide non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.
- C. Accessory materials for Fire-Stopping Sealants: Provide forming, joint-fillers, packing and other accessory materials required for installation of fire-stopping sealants as applicable to installation conditions indicated.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Require Installer to inspect joints indicated to receive joint sealers for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Obtain Installer's written report listing any conditions detrimental to performance of joint sealer work. Do not allow joint sealer work to proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION:

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers.
- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on prior experience. Apply primer to comply with joint sealer

manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking type where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALERS:

- A. General: Comply with joint sealer manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Elastomeric Sealant Installation Standard: Comply with recommendations of ASTM C 962 for use of joint sealants as applicable to materials, applications and conditions indicated.
- C. Latex Sealant Installation Standard: Comply with requirements of ASTM C 790 for use of latex sealants.
- D. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications and conditions indicated.
- E. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
 - 1. Install joint-fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint-fillers.
 - b. Do not stretch, twist, puncture or tear joint-fillers.
 - 2. Install bond breaker tape between sealants and joint-fillers, compression seals or back of joints where required to prevent third-side adhesion of sealant to back of joint.
- F. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.
- G. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform concave beads, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
- H. Installation of Fire-Stopping Sealant: Install sealant, including forming, packing and other accessory materials to fill openings around mechanical and electrical services penetrating floors and walls to provide fire-stops with fire resistance ratings indicated for floor or wall assembly in which penetration occurs.

3.4 CLEANING:

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

3.5 PROTECTION:

- A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

END OF SECTION

Part II
Division 8

Doors and Windows

SECTION 08110

STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

- A. Extent of standard steel doors and frames is indicated and scheduled on drawings.
- B. Finish hardware is specified elsewhere in Division-8.

1.3 QUALITY ASSURANCE:

- A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications: Standard Steel Doors and Frames" (SDI-100) and as herein specified.
- B. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 "Standard for Fire Doors and Windows", and have been tested, listed, and labeled in accordance with ASTM E 152 "Standard Methods of Fire Tests of Door Assemblies" by a nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.
- C. Temperature Rise Rating: At stairwell enclosures, provide doors which have Temperature Rise Rating of 450 deg F (232 deg C) maximum in 30 minutes of fire exposure.

1.4 SUBMITTALS:

- A. Product Data: Submit manufacturer's technical product data substantiating that products comply with requirements.
- B. Shop Drawings: Submit for fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
- C. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.
- D. Samples: Submit full range of color samples for factory finished doors and frames to Architect for selection.

1.5 DELIVERY, STORAGE AND HANDLING:

- A. Deliver hollow metal work cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.

- B. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4" high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4" spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

- A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames by one of the following:
 - 1. Steel Doors and Frames:
 - a. Amweld Building Products Inc.
 - b. Benchmark/Div. General Products Co. Inc.
 - c. Ceco Door Products/Div. United Dominion Co.
 - d. Curries Co./Div. Essex Industries, Inc.
 - e. Fenestra Corp.
 - f. SW Fleming Ltd.
 - g. The Kewanee Corp.
 - h. Pioneer Industries/Div. CORE Industries, Inc.
 - i. Republic Builders Products.
 - j. Steelcraft.
 - k. Trussbilt, Inc.

2.2 MATERIALS:

- A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 569 and ASTM A 568.
- B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.
- C. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, with ASTM A 525, G60 zinc coating, mill phosphatized.
- D. Supports and Anchors: Fabricate of not less than 18 gage galvanized sheet steel.
- E. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, complying with ASTM A 153, Class C or D as applicable.
- F. Shop Applied Paint:
 - 1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints.

2.3 FABRICATION, GENERAL:

- A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at project site. Comply with SDI-100 requirements as follows:
 - 1. Interior Doors: SDI-100, Grade II, heavy -duty, Model 1, minimum 18-gage faces.
 - 2. Exterior Doors: SDI-100, Grade III, extra heavy -duty, Model 2, minimum 16-gage faces.
- B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel.
- C. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel (at fabricator's option).
- D. Fabricate doors, panels, and frames at exterior or wet locations from galvanized sheet steel. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16-gage inverted steel channels.
- E. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.
- F. Thermal-rated (Insulating) Assemblies:
 - 1. At exterior locations and elsewhere as shown or scheduled, provide doors which have been fabricated as thermal insulating door and frame assemblies and tested in accordance with ASTM C 236. Provide doors with a U value of 0.1 or better.
- G. Finish Hardware Preparation: Prepare doors and frames to receive mortised and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 series specifications for door and frame preparation for hardware.
 - 1. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site.
 - 2. Locate finish hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware", published by Door and Hardware Institute, and in accordance with the requirements of the Americans with Disability Act.
- H. Shop Painting:
 - 1. Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces.
 - 2. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.
 - 3. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

2.4 STANDARD STEEL DOORS:

- A. Provide metal doors of types and styles indicated on drawings or schedules.
- B. Door Lights:
 - 1. Provide manufacturer's standard hollow metal light frames with glazing as indicated. Provide fire rated construction in accordance with NFIPA 80 at fire rated openings.
- C. Door Louvers:
 - 1. Provide sightproof stationary louvers for interior doors where indicated, constructed of inverted V-shaped or Y-shaped blades formed of 24-gage cold-rolled steel set into 20-gage steel frame.

2.5 STANDARD STEEL FRAMES:

- A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated.
 - 1. Fabricate interior frames of minimum 16-gage cold-rolled furniture steel.
 - 2. Fabricate exterior frames of minimum 14-gage cold-rolled furniture steel.
 - 3. Fabricate frames with mitered corners, welded construction for exterior applications and at masonry walls, and knocked-down for field assembly at interior drywall partition applications.
- B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-swing frames and 2 silencers on heads of double-swing frames.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. General: Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.
- B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions For Steel Frames", unless otherwise indicated.
 - 1. Except for frames located at in-place concrete or masonry and at drywall installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
 - 2. In masonry construction, locate 3 wall anchors per jamb at hinge and strike levels.
 - 3. Install fire-rated frames in accordance with NFIPA Std. No. 80.

4. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In open steel stud partitions, place studs in wall anchor notches and wire tie. In closed steel stud partitions, attach wall anchors to studs with tapping screws.
- C. Door Installation:
1. Fit hollow metal doors accurately in frames, within clearances specified in SDI-100.
 2. Place fire-rated doors with clearances as specified in NFPA Standard No. 80.
- 3.2 ADJUST AND CLEAN:
- A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
 - B. Protection Removal: Immediately prior to final inspection, remove protective wrappings from prefinished doors.
 - C. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and incomplete and proper operating conditions.

END OF SECTION

SECTION 08332
COUNTER FIRE DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions, and Division 1 General Requirements, apply to the work of this Section

1.2 SUMMARY

- A. The work of this Section includes rolling counter fire doors.
- B. Related Sections: Other specification sections which directly relate to the work of this Section include, but are not limited to, the following:

1.3 SUBMITTALS

- A. Product Data: Submit manufacturers product data and installation instructions for each type of rolling counter fire door. Include both published data and any specific data prepared for this project.
- B. Shop Drawings: Submit shop drawing for approval prior to fabrication. Include detailed plans, elevations, details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent materials.
- C. Provide color samples when requested to do so.

1.4. QUALITY ASSURANCE

- A. Manufacturer: Rolling counter fire doors shall be manufactured by a firm with a minimum of five years experience in the fabrication and installation of rolling counter fire doors. Manufacturers proposed for use, which are not named in these specifications, shall submit evidence of ability to meet performance and fabrication requirements specified, and include a list of five projects of similar design and complexity completed within the past five years.
- B. Installer: Installation of rolling counter fire doors shall be performed by the authorized representative of the manufacturer.
- C. Single-Source Responsibility: Provide doors, guides, motors, and related primary components from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- D. Pre-Installation Conference: Schedule and convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and products in labeled protective packages. Store and handle in strict compliance with manufacturers instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Provide rolling counter fire doors by Overhead Door Corporation, Pennsylvania Division; Telephone 800- 929-2553 or 717-248-0131; Fax 800-929-1274.
- B. Or equal.

2.2 COUNTER FIRE DOORS

- A. Trade Reference: 640 Series Counter Fire Doors by Overhead Door Corporation.
- B. Label: Rolling fire doors shall bear the (UL and FM 3-Hour Class A Label for masonry fire walls.) (ULand FM 1-1/2 Hour Class B Label for non-masonry fire walls.)
- C. Curtain: Interlocking slats, Type F-128 fabricated of 22 gauge galvanized steel. Endlocks shall be attached to each end of alternate slats to maintain curtain alignment and prevent lateral movement.
- D. Finish: Slats and hood shall be galvanized steel in accordance with ASTM A 525 and receive rust-inhibitive, roll coating process, including bonderizing, 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester (powder coated) top coat. Non-galvanized exposed ferrous surfaces shall receive one coat of rust- inhibitive primer.
- E. Color: Gray polyester top coat.
- F. Bottom Bar: Single primed steel angle bottom bar (with 1/4 foam astragal.) (Tubular locking bottom bar.)
- G. Guides: Roll-formed painted steel shapes and brush smoke seals.
 - 1. Fastening Guides to Masonry Fire Walls: UL listed expansion anchors, or by through-bolts on soft brick or hollow block walls, or by bolts on steel jambs.
 - 2. Fastening Guides to Non-Masonry Fire Walls: Comply with the manufacturers listing.
- H. Brackets: Painted steel to support counterbalance, curtain and hood.I. Counterbalance: Helical torsion spring type. Counterbalance shall be housed in a steel tube or pipe barrel.
- J. Hood: Galvanized painted steel. Hood shall be equipped with thermally controlled, internal flame baffle. Hood support provided for wall openings over 136 wide. Exterior brush smoke seal.
- K. Manual Operation: Manual push up operation.

- L. Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - 1. Sensing Edge Protection: Electric sensing edge.
 - 2. Operator Controls: Push-button and key operated control stations with open, close, and stop buttons for surface mounting, for interior location.
- M. Automatic Closure: Provide automatic closure thermally controlled by means of 165 degree fusible links. Operating mechanism shall be disengaged during automatic closing. Automatic closing rate shall be controlled by a governor.
 - 1. Time Delay Release Device: UL 864 rated; Fire Sentinel. (Provide UL/FM fail safe release device, Model A or B.) (Provide UL/FM fail safe release device with internal battery, Model B2.) (Provide UL/FM fail safe release device with internal battery to close fire door on alarm by electric operation with commercial power; Model C.)
 - 2. Provide automatic closing on alarm by electric operator with uninterruptible power supply for operator.
- N. Locking: Interior bottom bar slide bolt.
- O. Wall Mounting Condition: Face-of-wall mounting.
- P. 1-1/2 hour fire-rated countertop with fire-resistant core with decorative laminate finishes. Finished and color to be selected by architect.
- Q. Coordinate control wiring with electrical contractor to provide complete system operation.
- R. Coordinate final locations of the controls with owner.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Take field dimension and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Strictly comply with manufacturers installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.
- B. Install rolling counter fire doors in compliance with requirements of NFPA 80. Test fire-release system and reset components after testing.
- C. Instruct Owners personnel in proper operating procedures and maintenance schedule.

3.3 ADJUSTING AND CLEANING

- A. Test rolling counter fire doors for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Touch-up damaged coatings and finishes and repair minor damage. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer of material or product being cleaned.

END OF SECTION

SECTION 08333
ROLLING FIRE DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions, and Division 1 General Requirements, apply to the work of this Section.

1.2 SUMMARY

- A. The work of this Section includes rolling doors.
- B. Related Sections: Other specification sections which directly relate to the work of this Section include, but are not limited to, the following:

1.3 SUBMITTALS

- A. Product Data: Submit manufacturers product data and installation instructions for each type of rolling fire door. Include both published data and any specific data prepared for this project.
- B. Shop Drawings: Submit shop drawing for approval prior to fabrication. Include detailed plans, elevations, details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent materials.

1.4. QUALITY ASSURANCE

- A. Manufacturer: Rolling fire doors shall be manufactured by a firm with a minimum of five years experience in the fabrication and installation of rolling doors. Manufacturers proposed for use, which are not named in these specifications, shall submit evidence of ability to meet performance and fabrication requirements specified, and include a list of five projects of similar design and complexity completed within the past five years.
- B. Installer: Installation of rolling fire doors shall be performed by the authorized representative of the manufacturer.
- C. Single-Source Responsibility: Provide doors, guides, motors, and related primary components from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- D. Pre-Installation Conference: Schedule and convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and products in labeled protective packages. Store and handle in strict compliance with manufacturers instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Provide rolling fire doors by Overhead Door Corporation, Dallas, Texas; Telephone 800-887-3667 or 972-233-6611; Fax 972-233-0367.
- B. Or equal.

2.2 ROLLING DOORS

- A. Trade Reference: Series 630 Fire Doors by Overhead Door Corporation.
- B. Label: Provide fire doors certified with the following listing.
 - 1. Rolling fire doors up to 144 sq. ft. and 12 in width or height shall bear the (UL and FM 3-Hour Class A Label.) (ULC 3-Hour Label.) (UL and FM 1-1/2 Hour Class B Label for non-masonry fire walls.)
 - 2. Rolling fire doors over 144 sq. ft. shall receive the UL Oversize Fire Door Label.
 - 3. Rolling fire doors over 144 sq. ft. and not exceeding 18 in height or width shall receive the Factory Mutual Label for Oversize Fire Doors.
- C. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
 - 1. Curved profile type C-275 for doors thru 140 wide by 120 high, fabricated of 22 gauge galvanized steel. (20 gauge galvanized steel.) (22 gauge stainless steel.)
 - 2. Curved profile type C-275 for doors over 140 thru 200 wide, fabricated of 20 gauge galvanized steel. (18 gauge galvanized steel.) (20 gauge stainless steel.)
 - 3. Curved profile type C-275 for doors over 200 thru 240 wide, fabricated of 18 gauge galvanized steel. (16 gauge galvanized steel.)
- D. Glazing: Not Required.
- E. Finish:
 - 1. Galvanized Steel: Slats and hood shall be galvanized steel in accordance with ASTM A 525 and receive rust-inhibitive, roll coating process, including bonderizing, 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester (powder coated) top coat. Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
- F. Color: Gray polyester top coat.
- G. Bottom Bar: Two galvanized structural steel angles 1-1/2 by 1-1/2 by 1/8 minimum.
- H. Guides: Roll-formed steel shapes attached to continuous steel wall angle for doors thru 120 wide. Three structural steel angles with minimum thickness of 3/16 for doors over 12 wide. Guides for between jamb doors shall be structural angles.

1. Fastening Guides to Masonry Fire Walls: UL listed expansion anchors, or by through-bolts on soft brick or hollow block walls, or by bolts on steel jambs, or welded in accordance with manufacturers listing.
 2. Fastening Guides to Non-Masonry Fire Walls: Comply with the manufacturers listing.
- I. Brackets: Steel plate to support counterbalance, curtain and hood.
- J. Counterbalance: Helical torsion spring type. Counterbalance shall be housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 per foot of span. Counterbalance shall be adjustable by means of an adjusting tension wheel.
- K. Hood: 24 gauge galvanized primed steel minimum for wall openings thru 19 wide. 22 gauge galvanized primed steel for wall openings over 19 wide. Hood shall be equipped with thermally controlled, internal, galvanized steel flame baffle as required. Provide one intermediate support bracket for wall openings over 136 wide and two support brackets for wall openings over 190 wide.
- L. Manual Operation: Manual push up
- M. Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
1. Sensing Edge Protection: Electric sensing edge.
 2. Operator Controls: Push-button Key operated control stations with open, close, and stop buttons for surface mounting, for interior location.
- N. Automatic Closure: Provide automatic closure thermally controlled by means of 165 degree fusible links. Operating mechanism shall be disengaged during automatic closing. Automatic closing rate shall be controlled by a governor.
1. Time Delay Release Device: UL 864 rated; Fire Sentinel. (Provide UL/FM fail safe release device, Model A or B.) (Provide UL/FM fail safe release device with internal battery, Model B2.) (Provide UL/FM fail safe release device with internal battery to close fire door on alarm by electric operation with commercial power; Model C.)
 2. Provide automatic closing on alarm by electric operator with uninterruptible power supply for operator.
- O. Locking: Interior bottom bar slide bolt
- P. Wall Mounting Condition: Face-of-wall mounting.
- Q. Coordinate control wiring with electrical contractor to provide complete system operation.
- R. Coordinate final locations of the controls with owner.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Take field dimension and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Strictly comply with manufacturers installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.
- B. Install rolling fire doors in compliance with requirements of NFPA 80. Test fire-release system and reset components after testing.
- C. Instruct Owners personnel in proper operating procedures and maintenance schedule.

3.3 ADJUSTING AND CLEANING

- A. Test rolling fire doors for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Touch-up damaged coatings and finishes and repair minor damage. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer of material or product being cleaned.

END OF SECTION

SECTION 08361

ALUMINUM SECTIONAL DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions, and Division 1 General Requirements, apply to the work of this Section.

1.2 SUMMARY

- A. The work of this Section includes upward-acting sectional doors.
- B. Related Sections: Other specification sections which directly relate to the work of this Section include, but are not limited to, the following:
 - 1. Section 05500 - Miscellaneous Metal; metal framing and supports.
 - 2. Section 09900 - Painting; field painting.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each type of sectional door. Include both published data and any specific data prepared for this project.
- B. Shop Drawings: Submit shop drawing for approval prior to fabrication. Include detailed plans, elevations, details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent materials.

1.4. QUALITY ASSURANCE

- A. Manufacturer: Sectional doors shall be manufactured by a firm with a minimum of five years experience in the fabrication and installation of sectional doors. Manufacturers proposed for use, which are not named in these specifications, shall submit evidence of ability to meet performance and fabrication requirements specified, and include a list of five projects of similar design and complexity completed within the past five years.
- B. Installer: Installation of sectional doors shall be performed by the authorized representative of the manufacturer.
- C. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- D. Pre-Installation Conference: Schedule and convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and products in labeled protective packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Provide sectional doors by Overhead Door Corporation, Dallas, Texas; Telephone 800-887-3667 or 214-233-6611; Fax 214-233-0367.
- B. Or equal.

2.2 ALUMINUM SECTIONAL DOORS

- A. Trade Reference: 520 Series Aluminum Doors by Overhead Door Corporation. Sectional Doors 520 Series Specifications Overhead Door Corporation PO Box 809046 Dallas, Texas 75380 · 1-800-887-3667
- B. Sectional Door Assembly: Stile and rail assembly secured with 1/4" diameter through rods. Units shall have the following characteristics:
 - 1. Panel Thickness: 1-3/4"
 - 2. Aluminum Panels: 0.050" thick, alloy 6063-T6.
 - 3. Springs; High Cycle package.
 - 4. Glazing: 1/8" double strength glass.
- C. Finish and Color:
 - 1. Anodized Finish: Bronze anodized finish.
- D. Windload Design: ANSI/NAGDM 102 standards and as required by code.
- E. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- F. Lock: Interior galvanized single unit.
- G. Weatherstripping: Flexible PVC on bottom section. Jamb seals. Header seal.
- H. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
- I. Manual Operation: Manual pull rope.
- J. Electric Motor Operation: Provide UL listed electric operator, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.

1. Entrapment Protection: Photoelectric sensors.
2. Operation Controls: Multiple push-button operated control stations with open, close, and stop buttons for surface mounting, for multiple interior locations as indicated on drawings.
3. Special Operation: (Pull-rope release automatic opening device, vehicle detector operation, photocell operation.)
4. Coordinate control wiring with electrical contractor to provide complete system operations.
5. Coordinate final location of the controls with owner

PART 3 - EXECUTION

3.1 PREPARATION

- A. Take field dimension and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Strictly comply with manufacturer's installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.
- B. Instruct Owner's personnel in proper operating procedures and maintenance schedule.

3.3 ADJUSTING AND CLEANING

- A. Test sectional doors for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Touch-up damaged coatings and finishes and repair minor damage. Clean exposed surfaces using nonabrasive materials and methods recommended by manufacturer of material or product being cleaned.

END OF SECTION

SECTION 08362

INSULATED STEEL SECTIONAL DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions, and Division 1 General Requirements, apply to the work of this Section.

1.2 SUMMARY

- A. The work of this Section includes upward-acting sectional doors.
- B. Related Sections: Other specification sections which directly relate to the work of this Section include, but are not limited to, the following:
 - 1. Section 05500 - Miscellaneous Metal; metal framing and supports.
 - 2. Section 09900 - Painting; field painting.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each type of sectional door. Include both published data and any specific data prepared for this project.
- B. Shop Drawings: Submit shop drawing for approval prior to fabrication. Include detailed plans, elevations, details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent materials.

1.4. QUALITY ASSURANCE

- A. Manufacturer: Sectional doors shall be manufactured by a firm with a minimum of five experience in the fabrication and installation of sectional doors. Manufacturers proposed for use, which are not named in these specifications, shall submit evidence of ability to meet performance and fabrication requirements specified, and include a list of five projects of similar design and complexity completed within the past five years.
- B. Installer: Installation of sectional doors shall be performed by the authorized representative of the manufacturer.
- C. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- D. Pre-Installation Conference: Schedule and convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and products in labeled protective packages. Store and handle in strict compliance with manufacturers instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Provide sectional doors by Overhead Door Corporation, Dallas, Texas; Telephone 800-887-3667 or 972-233-6611; Fax 972-233-0367.
- B. Or equal.

2.2 INSULATED STEEL SECTIONAL DOORS

- A. Trade Reference: 592 Series Thermacore Insulated Steel Doors by Overhead Door Corporation.
- B. Sectional Door Assembly: Metal/foam/metal sandwich panel construction, with EPDM thermal break and ship-lap design with rounded water channels. Units shall have the following characteristics:
 - 1. Panel Thickness: 2" (51 mm)
 - 2. Exterior Surface: Ribbed, textured.
 - 3. Exterior Steel: 0.016, hot-dipped galvanized.
 - 4. End Stiles: 16 gauge with thermal break.
 - 5. Springs; High Cycles package.
 - 6. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - 7. Thermal Values: R-value of 17.50; U-value of 0.057.
 - 8. Air Infiltration: 0.08 cfm at 15 mph; 0.13 cfm at 25 mph.
 - 9. Pass-Door: Not required.
 - 10. High-Usage Package: Required.
 - 11. Partial Glazing of Steel Panels: Insulated double strength glass.
- C. Finish and Color: Two coat baked-on polyester with white exterior and interior color.
- D. Windload Design: ANSI/NAGDM 102 standards and as required by code.
- E. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- F. Lock: Interior mounted slide lock on both sides of jamb

- G. Weatherstripping: EPDM rubber seals fitted inside joints between sections. EPDM rubber bulb-type strip at bottom. Header seal and jamb weatherstripping.
- H. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
- I. Manual Operation: Manual pull rope.
- J. Electric Motor Operation: Provide UL listed electric operator, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - 1. Entrapment Protection: Photoelectric sensors.
 - 2. Operation Controls: Push-button operated control stations with open, close, and stop buttons for surface mounting, for interior location.
 - 3. Special Operation: Vehicle detector operation, photocell operation.
 - 4. Coordinate control wiring with electrical contractor to provide complete system operation
 - 5. Coordinate final locations of the controls with owner.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Take field dimension and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Strictly comply with manufacturers installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.
- B. Instruct Owners personnel in proper operating procedures and maintenance schedule.

3.3 ADJUSTING AND CLEANING

- A. Test sectional doors for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Touch-up damaged coatings and finishes and repair minor damage. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer of material or product being cleaned.

END OF SECTION

SECTION 08410

ALUMINUM ENTRANCES AND STOREFRONTS

1 PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Aluminum doors, frames and glazed lights.
- B. Glass and infill panels.
- C. Door hardware.

1.3 SYSTEM DESCRIPTION

- A. Tubular aluminum sections with supplementary internal support framing, factory fabricated, factory finished, vision glass, glass infill, related flashings, anchorage and attachment devices.
- B. System Assembly: Site assembled.
- C. System Design: Provide for expansion and contraction within system components caused by temperature cycling. Design and size members to withstand dead loads caused by pressure and suction of wind.
- D. Air Infiltration: Limit air leakage through assembly to 0.06 cfm/min/sq ft of wall area, measured at a reference differential pressure across assembly of 6.24 psf as measured in accordance with ASTM E283.
- E. Water Leakage: None when measured in accordance with ASTM E331.
- F. System Internal Drainage: Drain water entering the framing system to exterior.

1.4 SUBMITTALS

- A. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware and internal drainage details
- B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with AAMA SFM-1 and AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

1.6 WARRANTY

- A. Section 01001 - Basic Requirements: Provide a ten year warranty for coverage of insulated glass units.

2 PART 2 PRODUCTS

2.1 MATERIALS

- A. Manufacturers:
 - 1. Amarlite/Arco Metals Co.
 - 2. Kawneer Co.
 - 3. Tubelite Div./Indal Inc.
 - 4. United States Aluminum Corp.
 - 5. Vistawall Architectural Products.
 - 6. EFCO Corp.
- B. Steel Sections: ASTM A36/A36M, Structural shapes to suit mullion sections; galvanized.
- C. Fasteners: Stainless steel.
- D. Sealant and Backing Materials: As specified in Section 07900

2.2 FABRICATED COMPONENTS

- A. Frames: 2 x 4.5 inch profile thermally broken, flush glazing stops. Frames for interior glazing need not to be thermally broken.
- B. Doors: 1-3/4 inches thick, 6 inch wide top rail, 6 inch wide vertical stiles, 8 inch wide bottom rail; square glazing stops. Wide style doors.
- C. Flashings: .040 inch thick aluminum finish to match mullion sections where exposed

2.3 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing Materials: As specified in Section 08800 to the following type description:
 - 1. Glass in Exterior Lights: 1" tempered front set clear insulating glass.
 - 2. Glass in Interior Lights: 1/4" tempered center set clear float glass.
 - 3. Glass in Doors and Adjacent Lights: 1" tempered clear insulating glass.

2.4 HARDWARE

- A. Weather Stripping: nylon pile, continuous, replaceable.
- B. Sill Sweep Strips: resilient seal type, of neoprene compound.

- C. Threshold: Extruded aluminum, thermally broken, one piece per door opening, ribbed surface, sloped to exterior, maximum of ½" height for accessibility.
- D. Pivots: Offset type.
- E. Push/Pull: Tubular aluminum style.
- F. Exit Device, Cylinder Lock, and Closer: As specified in Section 08705.

2.5 FABRICATION

- A. Fabricate doors and frames allowing for minimum clearances and shim spacing around perimeter of assembly.
- B. Accurately and rigidly fit and secure joints and corners, flush, hairline, and weatherproof.
- C. Arrange fasteners, attachments, and jointing to ensure concealment from view.
- D. Prepare components with internal reinforcement for door hardware and door operator hinge hardware.

2.6 FINISHES

- A. Exterior Aluminum Surfaces: Color: Dark bronze anodized.
- B. Interior Aluminum Surfaces: Color: Dark bronze anodized.
- C. Concealed Steel Items: Galvanize to G90.
- D. Apply bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

3 PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.2 INSTALLATION

- A. Install doors, frames, glazing, hardware and flashings in accordance with manufacturer's instructions, AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Use anchorage devices to securely attach frame assembly to structure.
- C. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- D. Coordinate attachment and seal of air and vapor barrier materials. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

- E. Install hardware using templates provided. Refer to Section 08705 for installation requirements.
- F. Install glass in accordance with Section 08800, using exterior dry method of glazing.
- G. Install perimeter type sealant, backing materials, and installation requirements in accordance with Section 07900

3.3 ERECTION TOLERANCES

- A. Variation from Plane: 1/8 inch per foot maximum or 1/4 inch per 30 feet; whichever is less.

END OF SECTION

SECTION 08460

AUTOMATIC SLIDE DOORS AND OPERATORS

1 PART 1 GENERAL

1.1 DESCRIPTION

- A. This section covers the furnishing and installation of a complete automatic sliding door system. It includes operator, track, doors, glass and glazing and activating devices all as for installation as shown and specified.

1.2 RELATED WORK COVERED BY OTHER APPLICABLE SECTIONS OF SPECIFICATIONS SHALL INCLUDE.

- A. Preparation of opening
- B. Electrical supply and connections (120VAC, 15 amp Dedicated Circuit)

1.3 QUALITY ASSURANCE

- A. ANSI 156.10 STANDARD: Provide automatic entrance doors complying with applicable requirements of power operated pedestrian door standard where applicable to door type.
- B. UL325: Provide powered door operators complying with UL325, electrical door, drapery, gate, louver and window operators and systems.
- C. Manufacturer's Qualifications: Provide units produced by a firm with not less than 5 years successful experience in fabrication of automatic doors of the type required for this project.
- D. Installer's Qualifications: Engage an installer who is an authorized representative of the automatic door manufacturer and who is certified by the American Association of Automatic Door manufacturers (AADAM), for the installation and maintenance of the type of units required for this project. Engage a firm that maintains service available within a 20 mile radius of the project.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturers product data and standard details for automatic entrance doors, including fabrication, finishing hardware, operators, accessories and other components of the work. Include rough in diagrams, wiring diagrams, parts list and maintenance instructions.
- B. Templates and Diagrams: Furnish templates, diagrams and other data to fabricators and installers of related work, as needed for coordination of automatic entrance installation.
- C. Shop Drawings: Submit shop drawings for the fabrication and installation of automatic entrance doors and associated components of the work. Indicate anchors, joint system, expansion provisions, hardware and other components not included in manufacturers standard data.

1.5 WARRANTY

- A. Units to be warranted against defect in material and workmanship for a period of one year from the date of installation.

2 PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Automatic sliding doors shall be of the type and size as indicated on the plans. specifications based on units manufactured by Horton Automatics, Belt Drive series 2001, surface applied package P-SX-SX-Pfor atmospheric clean room application. Alternate manufacturers must be submitted to architect for approval 10 days prior to bid date.

2.2 EQUIPMENT

A. Door Unit:

1. The door unit shall include operator, header & track, sliding doors and jambs. All structural aluminum header section shall be 6063T-5 anodized aluminum no less than 3/16" thick and shall be capable of self support up to a length of 14' on standard door size and glazing. The header shall be 6" deep by 8" high, track shall be 5/8" wide, and rollers shall be Delrin covered high quality roller ballbearing wheels 1-3/4" in diameter.
2. Concealed guides shall stabilize bottom of door. Anti derailing means shall be a separate adjustable roller.

B. Aluminum Door Unit:

1. All structural aluminum sections shall be 6063T-5 alloy not less than 1/8" thickness with safety radius corners on all vertical rails. Door panel construction shall be by means of tongue-and-groove key fitted gussets that have two tempered bolts in each corner section to assure against racking failure.
2. An adjustable astragal with double neoprene weather-strip shall be provided on all strike rails. Joining vertical panel rails shall have complementing vinyl weather-stripping, while horizontal rails shall be weather-stripped with vinyl type fabric. All vertical rails shall have safety radius corners, horizontal rails shall include beveled glass stops.
3. All exposed aluminum surfaces shall be 204R1 clear anodized finish.

C. Operator:

1. Horton Automatic series 2001 all electromechanical operator utilizing a 1/4 hp, DC permanent magnet motor with gear transmission and belt drive, shall be header mounted and concealed with a securely attached hinged cover. The belt shall be steel stranded polyurethane & nylon, 1" wide. The operator shall have a time delay adjustable from 1 to 28 seconds. The opening speed, closing speed, back check and latch check shall be fully and independently adjustable. Braking or checking shall be an integral function of the operator for deceleration of the moving panels. For protection in case of electrical power failure, operator shall

revert to free manual operation of the door. A power on / off switch shall be located on the inside of the header and shall serve a second function as "hold open" for door when in off position.

2. The operators microprocessor control shall include programming on open/close check speed and time delay. The switch shall set the door opening into permanent memory and shall not be effected by temporary loss of power. A revolution counter shall be used to memorize and continuously recheck the door's position.

D. Control Switch:

1. Shall be 24VAC, class II circuit. Each sliding door unit shall include two C1185 photoelectric beams mounted in the vertical rails of the sidelites at heights of 24" and 48". Each shall parallel door opening and serve as a door hold open when interrupted. Also include a header mounted presence sensor to monitor the threshold area as a second means of detection.
2. Actuation for sliding doors to include 2 press wall switches at each opening. Press wall switch to read "Press To Open".

E. Electrical:

1. The general contractor or electrical contractor shall furnish and install all wiring to operator. Provide 120VAC, 60 cycle, 1 phase, 15 amp service to each operator on a separate circuit breaker routed to the header.
2. All control and internal wiring for door operation by door supplier.

F. Glass and Glazing:

1. The automatic door supplier shall include as part of this section, 1/4" tempered glazing for doors and sidelites.

3 PART 3 EXECUTION

3.1 INSPECTION

- A. Installer must examine the areas and conditions under which automatic doors are to be installed and notify the contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until all unsatisfactory conditions have been corrected in a manner acceptable to the installer and in accordance with approved shop drawings

3.2 INSTALLATION

- A. Must comply with manufacturers specifications and recommendations and be installed by an AADAM certified technician.
- B. Set track and operator plumb, level and true to line, without warp or rack of doors. Anchor securely in place. Isolate aluminum and other corrodible materials from sources of electrolytic action at points of contact.

- C. Install complete door system in accordance with manufacturers instructions, including drive mechanism, controls, and control switches.

3.3 ADJUST AND CLEAN

- A. Adjust operator and controls for optimum condition and safety. Lubricate operating equipment.
- B. Clean surfaces promptly after installation, exercising care to avoid damage of the protective coating.
- C. Advise contractor of protective treatment and other precautions required through the remainder of the construction period, to ensure the doors will be without damage or deterioration at the time of acceptance.

END OF SECTION

SECTION 08710

FINISH HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

- A. Definition: "Finish Hardware" includes items known commercially as finish hardware which are required for swing, sliding and folding doors.
- B. Extent of finish hardware required is indicated on drawings and in schedules.
- C. Types of finish hardware required include the following:
 - 1. Hinges.
 - 2. Lock cylinders and keys.
 - 3. Lock and latch sets.
 - 4. Bolts.
 - 5. Exit devices.
 - 6. Bifold door hardware.
 - 7. Closers.
 - 8. Miscellaneous door control devices.
 - 9. Door trim units.
 - 10. Protection plates.
 - 11. Weatherstripping for exterior doors.
 - 12. Sound stripping for interior doors.
 - 13. Astragals or meeting seals on pairs of doors.
 - 14. Thresholds.
- D. Silencers included integral with hollow metal frames are specified with door frames elsewhere in Division 8.

1.3 QUALITY ASSURANCE:

- A. Manufacturer: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.
- B. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFIPA Standard No. 80 and local building code requirements. Provide only hardware which has been tested and listed by UL or FM for types and sizes of doors required and complies with requirements of door and door frame labels.
 - 1. Where emergency exit devices are required on fire-rated doors (with supplementary marking on doors' UL or FM labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL or FM label on exit devices indicating "Fire Exit Hardware".

- C. ANSI Standards: Provide hardware that meets or exceeds the performance requirements of ANSI A 156.2 for the following applications:

- 1. Doors in public areas: Series 4000, Grade 1.

1.4 SUBMITTALS:

- A. Product Data: Submit manufacturer's technical product data for each item of hardware in accordance with Division-1 section "Submittals". Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.
- B. Hardware Schedule: Submit hardware schedule in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.
- C. Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Cross reference to designations in door and hardware schedules in Contract Documents.
- D. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.
- E. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Review shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

1.5 PRODUCT HANDLING:

- A. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.
- B. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

PART 2 - PRODUCTS

2.1 SCHEDULED HARDWARE:

- A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Schedule. Products are identified by using hardware designation numbers of the following.
- B. Manufacturer's Product Designations: One or more manufacturers are listed for each hardware type required, whose product designation is used in the Hardware Schedule for purposes of establishing minimum requirements. Provide either the product designated, or, where more than one manufacturer is listed, the comparable product of one of the other manufacturers which comply with requirements including those specified elsewhere in this section.

1. Manufacturer: Provide products of one of the following:
 - a. Locksets: Corbin, Schlage, Sargent.
 - b. Closers: LCN, Norton, Rixson, Sargent.
 - c. Hinges: Hager, Stanley.
 - d. Panic Devices: Sargent, Von Duprin.
 - e. Door Trim and Accessories: Ives, Rockwood.
- C. ANSI/BHMA designations used elsewhere in this section or in schedules to describe hardware items or to define quality or function are derived from the ANSI A 156.1 standards. Provide products complying with these standards and requirements specified elsewhere in this section.

2.2 MATERIALS AND FABRICATION:

- A. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door as shown.
- B. Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable nameplates), except in conjunction with required UL labels and as otherwise acceptable to Architect.
 1. Manufacturer's identification will be permitted on rim of lock cylinders only.
- C. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for the applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
- D. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.
- E. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
- F. Provide concealed fasteners for hardware units which are exposed when door is closed, except to the extent no standard units of the type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use hex screw fasteners.

2.3 HINGES, BUTTS AND PIVOTS:

- A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- B. Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

- C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - 1. Steel Hinges: Steel pins.
 - 2. Non-ferrous Hinges: Stainless steel pins.
 - 3. Exterior Doors: Non-removable pins.
 - 4. Out-swing Corridor Doors: Non-removable pins.
 - 5. Interior Doors: Non-rising pins.
 - 6. Tips: Flat button and matching plug, finished to match leaves.
- D. Provide only ball bearing hinges at doors with closers.
- E. Number of hinges: Provide number of hinges indicated but not less than 3 hinges per door leaf for doors 90" or less in height.

2.4 LOCK CYLINDERS AND KEYING:

- A. General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.
- B. Standard System: Except as otherwise indicated, provide new masterkey system for project.
- C. Equip locks with manufacturer's special 6-pin tumbler cylinder, with construction master key feature, which permits voiding of construction keys without cylinder removal, or with cylinders for interchangeable-core pin tumbler inserts. Furnish only temporary inserts for the construction period, and remove these when directed.
- D. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.
- E. Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.
- F. Key Material: Provide keys of nickel silver only.
- G. Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system; and 5 grandmaster keys for each grandmaster system.
 - 1. Furnish one extra blank for each lock.
 - 2. Deliver keys to Owner's representative and obtain receipt.
- H. Provide a key control system including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of the number of locks required for the project.

2.5 LOCKS, LATCHES AND BOLTS:

- A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.
- B. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.
- C. Lock Throw: Comply with UL requirements for throw of bolts and latch bolts on rated fire openings. Provide 1/2" minimum throw on other latch and deadlock bolts.

- D. Flush Bolt Heads: Minimum of 1/2" diameter rods of brass, bronze or stainless steel, with minimum 12" long rod for doors up to 7'-0" in height.

2.6 CLOSERS AND DOOR CONTROL DEVICES:

- A. Type of Units: Overhead surface mounted, parallel arm door closers.
- B. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.
- C. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ADA provisions for door opening force and delayed action closing.

2.7 DOOR TRIM UNITS:

- A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws or self-tapping screw.
- B. Fabricate protection plates (armor, kick or mop) not more than 1-1/2" less than door width on stop side and not more than 1/2" less than door width on pull side, x the height indicated.
 - 1. Metal Plates: Stainless steel, 1/8" (0.125") thick.

2.8 HARDWARE FOR BY-PASSING / BI-FOLDING DOORS:

- A. General: Provide manufacturer's standard hardware for interior bypassing and/or bifolding doors which are not furnished as a "package" complete with hardware. Provide manufacturer's complete set, consisting of overhead extruded aluminum track, adjustable hangers(carriages), bumpers and floor guides; designed to accommodate the number, size, thickness and weight of door leaves indicated. Provide pulls for each door leaf of bypassing doors and each pair of bifolding doors.

2.9 WEATHERSTRIPPING:

- A. General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf. Provide type, sizes and profiles shown or scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application indicated.

2.10 THRESHOLDS:

- A. General: Except as otherwise indicated provide standard thermal barrier aluminum threshold unit of type, size and profile as shown or scheduled.
- B. Exterior Hinged/Pivoted Doors: Provide units not less than the width of door jambs, fabricated to accommodate door hardware and to fit door frames.
- C. Wheelchair accessibility: Provide units with maximum 1/2" rise and beveled edges, complying with ADA requirements for approach slope and coefficient of friction.

2.11 HARDWARE FINISHES:

- A. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if no latch-lock sets) for color and texture.
- B. Provide finishes which match those established by BHMA.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware" for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect. Comply with ADA and the Uniform Federal Accessibility Standard.
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division-9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.
- C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

3.2 ADJUST AND CLEAN:

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace items which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and

finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

- D. Initial maintenance: Return to the work one month after occupancy and inspect all doors, adjust hardware as necessary for proper operation and instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes.

END OF SECTION

SECTION 08800

GLASS AND GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. Extent of glass and glazing work is indicated on drawings and schedules.
- B. Types of work in this section include glass and glazing for:
 - 1. Window units, not indicated as "preglazed".
 - 2. Storefront construction.
 - 3. Entrances and other doors, not indicated as "preglazed".

1.3 SYSTEM DESCRIPTION:

- A. Provide glass and glazing that has been produced, fabricated and installed to withstand normal thermal movement, wind loading and impact loading (where applicable), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glass and glazing materials and other defects in the work.
- B. Normal thermal movement is defined as that resulting from an ambient temperature range of 120 deg. F (67 deg. C) and from a consequent temperature range within glass and glass framing members of 180 deg. F (100 deg. C).
- C. Deterioration of insulating glass is defined as failure of hermetic seal due to other causes than breakage which results in intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coating, if any, resulting from seal failure, and any other visual evidence of seal failure or performance.

1.4 SUBMITTALS:

- A. Product Data: Submit manufacturer's technical data for each glazing material and fabricated glass product required, including installation and maintenance instructions.
- B. Separate certification will not be required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE:

- A. Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent

requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.

- B. Safety Glazing Standard: Where safety glass is indicated or required by authorities having jurisdiction, provide type of products indicated which comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.
 - 1. Subject to compliance with requirements, provide safety glass permanently marked with certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.
- C. Fire Resistance Rated Wire Glass: Provide wire glass products that are identical to those tested per ASTM E 163 (UL 9) and are labeled and listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
- D. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component pane of units with appropriate certification label of inspecting and testing organization indicated below:
 - 1. Insulating Glass Certification Council (IGCC).
 - 2. Associated Laboratories, Inc. (ALI).
- E. Single Source Responsibility for Glass: To ensure consistent quality of appearance and performance, provide materials produced by a single manufacturer or fabricator for each kind and condition of glass indicated and composed of primary glass obtained from a single source for each type and class required.

1.6 DELIVERY, STORAGE, AND HANDLING:

- A. Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

1.7 PROJECT CONDITIONS:

- A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.
- B. Install liquid sealants at ambient and substrate temperatures above 40 deg. F (4.4? C).

1.8 WARRANTY:

- A. General: Warranties shall be in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.
- B. Manufacturer's Special Project Warranty on Insulating Glass: Provide written warranty signed by manufacturer of insulating glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, replacements for those insulating glass units developing manufacturing defects. Manufacturing defects are defined as failure or hermetic seal of air space (beyond that due to glass breakage) as evidenced by intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coatings, if any, and other visual indications of seal failure or performance; provided the manufacturer's

instructions for handling, installing, protecting and maintaining units have been complied with during the warranty period.

1. Warranty Period: Manufacturer's standard but not less than 10 years after date of substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include; but are not limited to, the following:
- B. Manufacturers of Clear and Tinted Float Glass:
 1. AFG Industries, Inc.
 2. Ford Glass Division.
 3. Guardian Industries Corp.
 4. LOF Glass, Inc.
 5. PPG Industries, Inc.
 6. Saint-Gobain/Euroglass.
- C. Manufacturers of Wire Glass:
 1. AFG Industries, Inc.
 2. Guardian Industries Corp.
 3. Hordis Brothers, Inc.
 4. Pilkington Sales (North America) Limited.
- D. Manufacturers of Heat-Treated Glass:
 1. AFG Industries, Inc.
 2. Cardinal IG.
 3. Environmental Glass Products.
 4. Falconer Glass Industries.
 5. Ford Glass Division.
 6. Guardian Industries Corp.
 7. Hordis Brothers, Inc.
 8. LOF Glass, Inc.
 9. PPG Industries, Inc.
 10. Saint-Gobain/Euroglass.
 11. Spectrum Glass Prod. Div., H. H. Robertson Co.
 12. Viracon, Inc.
- E. Manufacturers of Fire and Impact Rated Glazing:
 1. Specialty Architectural & Fire Technology International.
 2. Technical Glass Products.

2.2 GLASS PRODUCTS, GENERAL:

- A. Primary Glass Standard: Provide primary glass which complies with ASTM C 1036 requirements, including those indicated by reference to type, class, quality, and, if applicable, form, finish, mesh and pattern.
- B. Heat-Treated Glass Standard: Provide heat-treated glass which complies with ASTM C 1048 requirements, including those indicated by reference to kind, condition, type, quality, class, and, if applicable, form, finish, and pattern.
- C. Sizes: Fabricate glass to sizes required for glazing openings indicated, with edge clearances and tolerances complying with recommendations of glass manufacturer. Provide thicknesses indicated or, if not otherwise indicated, as recommended by glass manufacturer for application indicated.

2.3 PRIMARY GLASS PRODUCTS:

- A. Clear Float Glass: Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select).
- B. Wired Glass: Type I (transparent and wired glass, flat), Class 1 (clear), Quality q8 (glazing); complying with ANSI Z97.1; 1/4" thick; of form and mesh pattern indicated below:
 - 1. Polished Wire Glass: Form 1 (wired, polished both sides), Mesh m2 (square).

2.4 HEAT-TREATED GLASS PRODUCTS:

- A. Manufacturing Process: Manufacture heat-treated glass as follows:
- B. By vertical (tong-held) or horizontal (roller hearth) process, at manufacturer's option, except provide horizontal process where indicated as "tongless" or "free of tong marks".
- C. Uncoated Clear Heat-Treated Float Glass: Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select), kind as indicated below.
 - 1. Kind FT (fully tempered) where indicated.

2.5 FIRE AND IMPACT RATED GLAZING:

- A. Clear Glazing Material: ASTM C 1036, Type 1.
 - 1. Impact Rating: Complying with ANSI Z97.1 and CPSC 16CFR1201.
 - 2. Fire Rating: Tested under UL 10b, 60 minutes.

2.6 SEALED INSULATING GLASS UNITS:

- A. General: Provide preassembled units consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with ASTM E 774 for performance classification indicated as well as with other requirements specified for glass characteristics, air space, sealing system, sealant, spacer material, corner design and desiccant.

- B. For properties of individual glass panes making up units, refer to product requirements specified elsewhere in this section applicable to types, classes, kinds and conditions of glass products indicated.
- C. Provide heat-treated panes of kind and at locations indicated or, if not indicated, provide heat-strengthened panes where recommended by manufacturer for application indicated and tempered where indicated or where safety glass is designated or required.
 - 1. Performance Classification per ASTM E 774: Class A.
 - 2. Thickness of Each Pane: 1/4".
 - 3. Air Space Thickness: 1/2".
 - 4. Sealing System: Manufacturer's standard.
 - 5. Spacer Material: Manufacturer's standard metal.
 - 6. Desiccant: Manufacturer's standard; either molecular sieve or silica gel or blend of both.
 - 7. Corner Construction: Manufacturer's standard corner construction.
- D. Low Emissivity-Coated Insulating Glass Units: Manufacturer's standard units with one pane of glass coated with a durable, neutral-colored, low-emissivity metallic coating, of type and on surface indicated, and complying with the following requirements:
 - 1. Exterior Pane: Clear float glass, coated on second surface.
 - a. Kind: As indicated.
 - 2. Interior Pane: Clear float glass, uncoated.
 - a. Kind: As indicated.
- E. Performance Characteristics: Visible light transmittance of 63 percent, summer daytime U-value of 0.34, winter nighttime U-value of 0.31, shading coefficient of 0.47 and outdoor reflectance of 11 percent.

2.7 ELASTOMERIC GLAZING SEALANTS AND PREFORMED GLAZING TAPES:

- A. General: Provide products of type indicated and complying with the following requirements:
- B. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials with which they will come into contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
- C. Suitability: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants and tapes which have performance characteristics suitable for applications indicated and conditions at time of installation.
- D. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class and Uses.
 - 1. Colors: Provide color of exposed sealants indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

2.8 GLAZING GASKETS:

- A. Dense Elastomeric Compression Seal Gaskets: Molded or extruded gaskets of neoprene or EPDM, complying with ASTM C 864, of profile and hardness required to maintain watertight seal:

2.9 MISCELLANEOUS GLAZING MATERIALS:

- A. Compatibility: Provide materials with proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness.
- D. Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.
- E. Edge Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Require Glazier to inspect work of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for presence and functioning of weep system; for existence of minimum required face or edge clearances; and for effective sealing of joinery. Obtain Glazier's written report listing conditions detrimental to performance of glazing work. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION:

- A. Clean glazing channels and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.

3.3 GLAZING, GENERAL:

- A. Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.
- B. Protect glass from edge damage during handling and installation; use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one horizontal edge which would occur in vicinity of setting blocks so that these are located at top of opening. Remove

from project and dispose of glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.

- C. Apply primers to joint surfaces where required for adhesion of sealants.

3.4 GLAZING:

- A. Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, but with edge nearest corner not closer than 6" from corner, unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.
- B. Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (length plus height), except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.
- C. Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.
- D. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- E. Provide compressible filler rods or equivalent back-up material, as recommended by sealant and glass manufacturers, to prevent sealant from extruding into glass channel weep systems and from adhering to joint back surface as well as to control depth of sealant for optimum performance, unless otherwise indicated.
- F. Force sealants into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.
- G. Tool exposed surfaces of sealants to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.
- H. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement.
- I. Miter cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent pull away at corners; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.5 PROTECTION AND CLEANING:

- A. Protect glass from breakage immediately upon installation. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method recommended by glass manufacturer.

- C. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.
- D. Wash glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Wash glass by method recommended by glass manufacturer.

END OF SECTION

Maine Mall Motors Toyota-Lexus-Scion				REVISED PROGRESS 3/17/2004
Portland, ME				PROGRESS 2/18/2004
Hardware Schedule				
Item/function	Manufacturer	Model No.	Finish	Remarks
Cylindrical Entrance 1	Sargent	10G05LB	630	Cylindrical Lever - Office Entrance
Deadbolt 1	Adams-Rite	MS1850S Series	313	Provide Kawneer's "Flush Bolts" Package Top & Bottom for inactive leaf where indicated. Single Cylinder on inside only. Coordinate Cylinder with Master Keying System
Deadbolt 2	Adams-Rite	MS1850S Series	313	Provide Kawneer's "Controller" Package for inactive leaf where indicated. Single Cylinder on inside only. Coordinate Cylinder with Master Keying System
Deadbolt 3	Adams-Rite	MS1850S Series	313	Double Cylinder, Coordinate Cylinder with Master Keying System
Deadbolt 4	Adams-Rite	MS1850SN Series	313	Single Cylinder on Inside only. Coordinate Cylinder with Master Keying System
Deadbolt 5	Adams-Rite	MS1850SN Series	313	Single Cylinder on outside only. Coordinate Cylinder with Master Keying System
Deadbolt 6	Adams-Rite	MS1850SN Series	313	Double Cylinder, Coordinate Cylinder with Master Keying System
Privacy 1	Sargent	10U65 LB	630	Cylindrical Lever
Passage 1	Sargent	10U15 LB	630	Cylindrical Lever
Storeroom 1	Sargent	10G04 LB	630	Cylindrical Lever - Permanently Locked - Abrasive Coating
Push/Pull 1	Kawneer	CPII/CO-9	#40	
Push/Pull 2	Ives	8200 3.5x15/8102-8	St Steel	
Push/Pull 3	Sargent	10U94-2 LB	630	Cylindrical Lever
Closer 1	Sargent	1430/1431-25P10	EP(US10B), EN	Adjust to meet ADA requirements. Provide "DELAYED ACTION" at doors noted. Provide "HOLD OPEN" at doors noted. Match Finish at Aluminum Storefront, Provide EN Finish elsewhere.
Closer 2	Sargent	281-25P10	EP(US10B), EN	Adjust to meet ADA requirements. Provide "DELAYED ACTION" at doors noted. Provide "HOLD OPEN" at doors noted. Match Finish at Aluminum Storefront, Provide EN Finish elsewhere.
Threshold 1	Pemko	252X3	Alum	Thermal barrier, ADA compliant - maximum 1/2" height
Hinges	McKinney	Full Mortise	630	Provide ball bearing hinges at doors with closers.
Floor Stop	Rockwood	442	630	
Wall Stop	Rockwood	409	630	
Kickplate	Rockwood	KP-.05 8"x34"	630	Secured to the approach side of the door.
Electric Strike	Locknetics			Coordinate electric locks with electrical drawings, keypad access and fire alarm systems
Surface Bolts	Ives	454-8H	630	Provide at top and bottom of door pair's inactive leaf.
Door Holder	Sargent	594H	630	Overhead Door Holder
Notes				
Provide high security Masterkey System (Sargent Signature Series), with construction keying system. Consult with Owner for instructions on keying.				
Products of one or more manufacturers are listed to establish quality and performance characteristics.				
Products of other manufacturers may be accepted subject to review by Architect.				
Provide wall or floor stops at all swinging doors.				
Acceptable Manufacturers				
Locksets:	Corbin, Sargent, Schlage Adams-Rite			
Closers:	Sargent, LCN, Norton, Rixson			
Hinges:	Hager, Stanley, McKinney			
Thresholds:	National Guard Products, Pemko, Reese, Zero			
Panic sets:	Sargent, Von Duprin			
Accessories	Ives, Hiawatha, Rockwood			

Maine Mall Motors Toyota-Lexus-Scion											REVISED PROGRESS 3/17/2004	
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Door Schedule												
No.	W	H	T	Door Material	Door Type	Frame Type	Lock Function	Closer Mechanism	Hardware	Label	Notes	
First Floor												
100	96	96	1-3/4	Wide Style Aluminum Storefront	2FGc	C	Deadbolt 2	Closer 2 w/ Delayed Action & Hold Open	Weatherstripping, Pivot, Automatic Door Bottom, Threshold, Push/Pull 1		Exterior pull shall be fixed.	
102A	72	96	1-3/4	Wide Style Aluminum Storefront	2FGa	A	Deadbolt 1	Closer 2 w/ Delayed Action	Weatherstripping, Pivot, Automatic Door Bottom, Threshold, Push/Pull 1		Exterior pull shall be fixed.	
102B	72	96	1-3/4	Wide Style Aluminum Storefront	2FGb	B	Deadbolt 1	Closer 2 w/ Delayed Action	Threshold, Pivot, Push/Pull 1		Exterior pull shall be fixed.	
109	96	96	1-3/4	Wide Style Aluminum Storefront	2FGc	C	Deadbolt 2	Closer 2 w/ Delayed Action & Hold Open	Weatherstripping, Pivot, Automatic Door Bottom, Threshold, Push/Pull 1		Exterior pull shall be fixed.	
110A	96	96	1-3/4	Wide Style Aluminum Storefront	2FGc	C	Deadbolt 2	Closer 2 w/ Delayed Action & Hold Open	Weatherstripping, Pivot, Automatic Door Bottom, Threshold, Push/Pull 1		Exterior pull shall be fixed.	
110B	36	96	1-3/4	Wide Style Aluminum Storefront	Fga	F	Deadbolt 3	Closer 2 w/ Delayed Action	Weatherstripping, Pivot, Automatic Door Bottom, Threshold, Push/Pull 1		Exterior pull shall be fixed.	
111A	72	96	1-3/4	Wide Style Aluminum Storefront	2FGa	A	Deadbolt 1	Closer 2 w/ Delayed Action	Weatherstripping, Pivot, Automatic Door Bottom, Threshold, Push/Pull 1		Exterior pull shall be fixed.	
111B	72	96	1-3/4	Wide Style Aluminum Storefront	2FGb	B	Deadbolt 1	Closer 2 w/ Delayed Action	Threshold, Pivot, Push/Pull 1		Exterior pull shall be fixed.	
120	36	84	1-3/4	Insulated Hollow Metal	F	J	StoreRoom 1	Closer 2 w/ Hold Open	Weatherstripping			
121	36	84	1-3/4	Solid Wood Core	F	L	Cylindrical Entrance 1					
122	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1		Pivot			
123A	36	84	1-3/4	Solid Wood Core	HG	L	Cylindrical Entrance 1					
123B	36	84	1-3/4	Solid Wood Core	HG	L	Cylindrical Entrance 1					
124	36	84	1-3/4	Insulated Hollow Metal	FV	J		Closer 2 w/ Delayed Action	KickPlate, WeatherStriping, Push/Pull 1	90 Min.		
125	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1		Pivot			
126	36	84	1-3/4	Solid Wood Core	HG	L	Cylindrical Entrance 1		Kickplate			
127	36	84	1-3/4	Solid Wood Core	F	L	StoreRoom 1					
128	36	84	1-3/4	Solid Wood Core	F	L	StoreRoom 1					
129	36	84	1-3/4	Hollow Metal	F	L	Privacy		Kickplate			
130	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1		Pivot			
132	36	84	1-3/4	Solid Wood Core	F	L	StoreRoom 1					
133	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E		Closer 1 w/ Delayed Action	Pivot, Push/Pull 1			
135A	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1		Pivot			

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Door Schedule												
No.	W	H	T	Door Material	Door Type	Frame Type	Lock Function	Closer Mechanism	Hardware	Label	Notes	
135B	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1	Closer 1 w/ Delayed Action	Pivot			
136A	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1		Pivot			
136B	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1	Closer 1 w/ Delayed Action	Pivot			
137A	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1		Pivot			
137B	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1	Closer 1 w/ Delayed Action	Pivot			
140A	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Deadbolt 1	Closer 2 w/ Delayed Action	Pivot, Push/Pull 1			
140B	120	144	1-3/4	Overhead Aluminum Sectional Door	OH1				Standard P-Button Controls Inside with Remote P-Button Inside & Electronic Eye Outside.		Standard Track Profile, Coodintae final Control Package w/ owner	
140C	120	144	1-3/4	Overhead Aluminum Sectional Door	OH1				Standard P-Button Controls Inside with Remote P-Button Inside & Electronic Eye Outside.		Standard Track Profile, Coodintae final Control Package w/ owner	
140D	36	96	1-3/4	Wide Style Aluminum Storefront	Fga	F	Deadbolt 1	Closer 2 w/ Delayed Action	Weatherstripping, Pivot, Automatic Door Bottom, Threshold, Push/Pull 1		Exterior pull shall be fixed.	
140E	36	84	1-3/4	Insulated Hollow Metal	FV	J	Passage 1	Closer 2 w/ Delayed Action	KickPlate, WeatherStriping	90 Min.		
140F	120	144	1-3/4	Overhead Aluminum Sectional Door	OH1						Lift Clearance Track Profile.	
140G	120	144	1-3/4	Overhead Aluminum Sectional Door	OH1						Lift Clearance Track Profile.	
141A	120	144	1-3/4	Overhead Aluminum Sectional Door	OH1						Lift Clearance Track Profile.	
141B	120	144	1-3/4	Overhead Aluminum Sectional Door	OH1						Lift Clearance Track Profile.	
141C	36	84	1-3/4	Insulated Hollow Metal	FV	J	Passage 1	Closer 2 w/ Delayed Action	KickPlate, WeatherStriping	90 Min.		
141D	36	96	1-3/4	Wide Style Aluminum Storefront	Fga	F	Deadbolt 1	Closer 2 w/ Delayed Action	Weatherstripping, Pivot, Automatic Door Bottom, Threshold, Push/Pull 1		Exterior pull shall be fixed.	
141E	120	144	1-3/4	Overhead Aluminum Sectional Door	OH1				Standard P-Button Controls Inside with Remote P-Button Inside & Electronic Eye Outside.		Standard Track Profile, Coodintae final Control Package w/ owner	
141F	120	144	1-3/4	Overhead Aluminum Sectional Door	OH1				Standard P-Button Controls Inside with Remote P-Button Inside & Electronic Eye Outside.		Standard Track Profile, Coodintae final Control Package w/ owner	

Maine Mall Motors Toyota-Lexus-Scion											REVISED PROGRESS 3/17/2004	
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Door Schedule												
No.	W	H	T	Door Material	Door Type	Frame Type	Lock Function	Closer Mechanism	Hardware	Label	Notes	
145	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1	Closer 1 w/ Delayed Action	Pivot			
146	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1	Closer 1 w/ Delayed Action	Pivot			
147	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1	Closer 1 w/ Delayed Action	Pivot			
148	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1	Closer 1 w/ Delayed Action	Pivot			
149	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1	Closer 1 w/ Delayed Action & Hold Open	Pivot			
150	36	84	1-3/4	Solid Wood Core	F	L	StoreRoom 1					
152	36	84	1-3/4	Insulated Hollow Metal	FV	J	Passage 1	Closer 2 w/ Delayed Action	KickPlate, WeatherStriping	90 Min.		
154	42	84	1-3/4	Insulated Hollow Metal	FNV	G	Deadbolt 6	Closer 2 w/ Delayed Action & Hold Open	KickPlate, WeatherStriping, Push/Pull 2	45 Min.		
155	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E	Cylindrical Entrance 1					
159	42	84	1-3/4	Insulated Hollow Metal	F	G	Deadbolt 4	Closer 2 w/ Delayed Action & Hold Open	KickPlate, WeatherStriping, Push/Pull 2	90 Min.		
160	36	84	1-3/4	Insulated Hollow Metal	F	L	StoreRoom 1	Closer 2		45 Min.		
161	36	84	1-3/4	Solid Wood Core	FNV	L	StoreRoom 1	Closer 1 w/ Delayed Action & Hold Open				
162A	96	96	2	Overhead Insulated Steel Sectional Door	OH2				Standard P-Button Controls Inside, Key Control w/ Stop Button		Lift Clearance Track Profile. Coordinate Cylinder with Master Keying System	
160B	36	84	1-3/4	Insulated Hollow Metal	HG1	L	Deadbolt 6	Closer 2	KickPlate, WeatherStriping, Push/Pull 2		Special Keying Requirements for Night Deliverly. Coordinate with Owner	
170	36	84	1-3/4	Solid Wood Core	F	L		Closer 1 w/ Delayed Action	Push/Pull 2			
171	36	84	1-3/4	Solid Wood Core	F	L		Closer 1 w/ Delayed Action	Push/Pull 2			
172	36	84	1-3/4	Hollow Metal	F	L		Closer 1 w/ Delayed Action	KickPlate, Push/Pull 2			
173	36	84	1-3/4	Solid Wood Core	F	L		Closer 1 w/ Delayed Action	Push/Pull 2			
174	36	84	1-3/4	Solid Wood Core	F	L		Closer 1 w/ Delayed Action	Push/Pull 2			
175	36	84	1-3/4	Solid Wood Core	F	L	StoreRoom 1					

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Door Schedule												
No.	W	H	T	Door Material	Door Type	Frame Type	Lock Function	Closer Mechanism	Hardware	Label	Notes	
180A	120	144	1	Overhead Rolling Fire Door	OH5				Key Control w/ Stop Button (Both Sides), Fire Sentinel Model B2	90 Min	Coodintae final Control Package w/ owner	
180B	120	144	1	Overhead Rolling Fire Door	OH5				Key Control w/ Stop Button (Both Sides), Fire Sentinel Model B2	90 Min	Coodintae final Control Package w/ owner	
180C	120	144	1	Overhead Rolling Fire Door	OH5				Key Control w/ Stop Button (Both Sides), Fire Sentinel Model B2	90 Min	Coodintae final Control Package w/ owner	
180D	120	144	1	Overhead Rolling Fire Door	OH5				Key Control w/ Stop Button (Both Sides), Fire Sentinel Model B2	90 Min	Coodintae final Control Package w/ owner	
180E	36	84	1-3/4	Insulated Hollow Metal	FV	J	Passage 1	Closer 2 w/ Delayed Action	KickPlate, WeatherStriping	90 Min.		
180F	36	84	1-3/4	Insulated Hollow Metal	HG1	J	Deadbolt 5	Closer 2 w/ Delayed Action	KickPlate, WeatherStriping, Push/Pull 2			
180G	264	144	2	Overhead Insulated Steel Sectional Door	OH3				Standard P-Button Controls with Car Detection Matt Inside & Electronic Eye Outside.		Lift Clearance Track Profile. Coodintae final Control Package w/ owner	
180H	240	144	2	Overhead Insulated Steel Sectional Door	OH4				Standard P-Button Controls with Car Detection Matt Inside & Electronic Eye Outside.		Lift Clearance Track Profile. Coodintae final Control Package w/ owner	
180J	36	84	1-3/4	Insulated Hollow Metal	HG1	J	Deadbolt 5	Closer 2 w/ Delayed Action	KickPlate, WeatherStriping, Push/Pull 2			
180K	264	144	2	Overhead Insulated Steel Sectional Door	OH3				Standard P-Button Controls with Car Detection Matt Inside & Electronic Eye Outside.		Lift Clearance Track Profile. Coodintae final Control Package w/ owner	
180L	36	84	1-3/4	Insulated Hollow Metal	HG1	J	Deadbolt 5	Closer 2 w/ Delayed Action	KickPlate, WeatherStriping, Push/Pull 2			
180M	56	50	1	Overhead Rolling Counter Fire Door	OH7					90 Min	Provide Fire Rated Counter with Laminate Finish.	
180N	56	50	1	Overhead Rolling Counter Fire Door	OH7					90 Min	Provide Fire Rated Counter with Laminate Finish.	
181A	72	84	1-3/4	Hollow Metal	FV	M	Deadbolt 5, Surface Bolts	Closer 2 w/ Delayed Action & Hold Open	KickPlate, Push/Pull 2	45 Min.		
181B	72	84	1-3/4	Insulated Hollow Metal	FV	M	Deadbolt 5, Surface Bolts	Closer 2 w/ Delayed Action & Hold Open	KickPlate, Push/Pull 2	45 Min.		
182	72	84	1-3/4	Insulated Hollow Metal	FV	K	Deadbolt 6, Surface Bolts	Closer 2 w/ Delayed Action	KickPlate, Push/Pull 2	60 Min.		

Maine Mall Motors Toyota-Lexus-Scion											REVISED PROGRESS 3/17/2004	
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Door Schedule												
No.	W	H	T	Door Material	Door Type	Frame Type	Lock Function	Closer Mechanism	Hardware	Label	Notes	
188A	36	84	1-3/4	Solid Wood Core	FV	L	Passage 1	Closer 2	KickPlate, Push/Pull 2	60 Min.	450o F temperature rise rating	
188B	36	84	1-3/4	Insulated Hollow Metal	FV	J	StoreRoom 1	Closer 2	KickPlate, WeatherStriping	60 Min.	450o F temperature rise rating	
189A	36	84	1-3/4	Insulated Hollow Metal	FV	J	StoreRoom 1	Closer 2	KickPlate, WeatherStriping	60 Min.	450o F temperature rise rating	
189B	36	84	1-3/4	Solid Wood Core	FV	L	Passage 1	Closer 2	KickPlate	60 Min.	450o F temperature rise rating	
191A	36	84	1-3/4	Solid Wood Core	FNV	L	Passage 1	Closer 1 w/ Delayed Action				
191B	48	84	1-3/4	Hollow Metal	FNV	H	Deadbolt 6	Closer 2 w/ Delayed Action & Hold Open	KickPlate, Push/Pull 2	45 Min.		
192	36	96	1-3/4	Wide Style Aluminum Storefront	Fga	D	Deadbolt 3	Closer 2 w/ Delayed Action	Weatherstripping, Pivot, Automatic Door Bottom, Threshold, Push/Pull 1		Exterior pull shall be fixed.	
194	36	84	1-3/4	Solid Wood Core	FNV	J	Passage 1	Closer 2 w/ Delayed Action	KickPlate			
196	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E		Closer 2 w/ Delayed Action	Pivot, Push/Pull 1			
197	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E		Closer 2 w/ Delayed Action	Pivot, Push/Pull 1			
198A	36	84	1-3/4	Solid Wood Core	FNV	L	Passage 1					
198B	36	84	1-3/4	Wide Style Aluminum Storefront	FGb	E						
Second Floor												
201	36	84	1-3/4	Solid Wood Core	HG	L	Cylindrical-Entrance 1					
202	36	96	1-3/4	Wide Style Aluminum-Storefront	FGb	E	Cylindrical-Entrance 1		Pivot			
203	36	84	1-3/4	Solid Wood Core	F	L	StoreRoom 1					
204	36	84	1-3/4	Solid Wood Core	F	L	StoreRoom 1					
206A	36	84	1-3/4	Solid Wood Core	HG	L	Cylindrical-Entrance 1					
206B	36	84	1-3/4	Solid Wood Core	HG	L	Cylindrical-Entrance 1					
207A	36	84	1-3/4	Solid Wood Core	HG	L	Cylindrical-Entrance 1					
207B	36	84	1-3/4	Solid Wood Core	HG	L	Cylindrical-Entrance 1					

Maine Mall Motors Toyota-Lexus-Scion											REVISED PROGRESS 3/17/2004
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Door Schedule											
No.	W	H	T	Door Material	Door Type	Frame Type	Lock Function	Closer Mechanism	Hardware	Label	Notes
208A	36	84	1-3/4	Solid Wood Core	FV	L	StoreRoom 1	Closer 1	KickPlate	45 Min.	
208B	36	84	1-3/4	Hollow Metal	FV	L	StoreRoom-1	Closer-1	KickPlate	60 Min.	
208C	36	84	1-3/4	Hollow Metal	FV	L	Cylindrical-Entrance-1	Closer-1	KickPlate	60 Min.	Magnetic Hold-Open
209A	36	84	1-3/4	Solid Wood Core	HG	L	StoreRoom 1	Closer 1 w/ Delayed Action		45 Min.	
209B	48	84	1-3/4	Hollow Metal	FNV	H	Deadbolt 6	Closer 2, w/ Delayed Action & Hold Open	KickPlate, Push/Pull 2	45 Min.	
288	36	84	1-3/4	Hollow Metal	FV	L	Passage 1	Closer 2	KickPlate	60 Min.	450o F temperature rise rating
289	36	84	1-3/4	Hollow Metal	FV	L	Passage 1	Closer 2	KickPlate	60 Min.	450o F temperature rise rating
290	36	84	1-3/4	Hollow Metal	FV	L	Passage 1	Closer-2	KickPlate	60 Min.	Magnetic Hold-Open
Mezzanine Floor											
220	60	84	1-3/4	Hollow Metal	FV	L	StoreRoom 1, Surface Bolts	Closer 2 w/ Hold Open	KickPlate	45 Min.	
221	36	84	1-3/4	Hollow Metal	FV	L	StoreRoom 1	Closer 2 w/ Hold Open	KickPlate	45 Min.	

Part II
Division 9

Finishes

SECTION 09250
GYPSUM DRYWALL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Exterior metal wall framing is specified in Division 5 section "Lightgauge Metal Framing."

1.2 SUMMARY:

- A. Extent of each type of gypsum drywall construction required is indicated on Drawings.

1.3 SUBMITTALS:

- A. Product data from manufacturers for each type of product specified.

1.4 QUALITY ASSURANCE:

- A. Fire-Resistance Ratings: Where indicated, provide materials and construction which are identical to those of assemblies whose fire resistance rating has been determined per ASTM E 119 by a testing and inspecting organization acceptable to authorities having jurisdiction.
- B. Provide fire-resistance-rated assemblies identical to those indicated by reference to listings in GA-600 "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.
- C. Single Source Responsibility: Obtain each type of gypsum board and related joint treatment materials from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, warping, construction traffic and other causes.

1.6 PROJECT CONDITIONS:

- A. Environmental Conditions, General: Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
- B. Minimum Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40oF (4oC).

- C. Ventilate building spaces to promote proper drying of joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

- 1. Steel Framing and Furring:

- a. Bostwick Steel Framing Co.
- b. Dale Industries Inc.
- c. Dietrich.
- d. Gold Bond Building Products/Div. National Gypsum Co.
- e. Incor Inc.
- f. Marino Industries Inc.
- g. Superior.
- h. United States Gypsum Co.
- i. Ware.

- 2. Gypsum Boards and Related Products:

- a. Domtar Gypsum Co.
- b. Georgia-Pacific Corp.
- c. Gold Bond Building Products/Div. National Gypsum Co.
- d. United States Gypsum Co.

- 3. Gypsum Sheathing:

- a. Georgia Pacific Corp.

2.2 STEEL FRAMING COMPONENTS:

- A. General: Provide components which comply with ASTM C 754 for materials and sizes, unless otherwise indicated.
- B. Refer to Section 05400 - Lightgauge Metal Framing for exterior wall components.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.
- D. Channels: Cold rolled steel, 0.0598 inch minimum thickness of base metal and 7/16 inch wide flange; protected with rust inhibitive paint, and as follows:
 - 1. Carrying Channels: 1 1/2 inches deep, 475 lbs per 1000 ft.
- E. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 deg and doubled over to form 3/16" minimum lip and complying with the following requirements for minimum thickness of base metal and for depth:
 - 1. Thickness: As indicated.

2. Depth: 6" at exterior walls, 3 5/8" at interior partitions, unless otherwise indicated.
- F. Steel Resilient Furring Channels: Manufacturer's standard product designed to reduce sound transmission, complying with ASTM C 645 for material, finish and widths of face and fastening flange, fabricated to form 1/2 inch deep channel of either following configuration:
1. Single-Leg Configuration: Asymmetric-shaped channel with face connected to a single flange by a single slotted leg (web).
 2. Double-Leg Configuration: Hat-shaped channel, with 1-1/2 inch wide face connected to flanges by double slotted or expanded metal legs (webs).
- 2.3 GYPSUM BOARD:
- A. General: Provide gypsum board of types indicated in maximum lengths available to minimize end-to-end joints.
- B. Thickness: Provide gypsum board in thicknesses indicated on drawings to comply with ASTM C 840 for application system and support spacing indicated.
- C. Gypsum Wallboard: ASTM C 36, and as follows:
1. Type: Regular, unless otherwise indicated.
 2. Type: Type X for fire-resistance-rated assemblies.
 3. Type: MR For high moisture area (all rooms w/shower units).
 4. Edges: Tapered.
 5. Thickness: 5/8", unless otherwise indicated.
- D. Gypsum Sheathing: GP Dens Glass sheathing.
1. Thickness: 5/8".
- E. Gypsum Tile Backer Board: GP Dens Shield.
1. Thickness: 5/8".
- 2.4 TRIM ACCESSORIES:
- A. Cornerbead and Edge Trim for Interior Installation: Provide corner beads, edge trim and control joints which comply with ASTM C 1047 and requirements indicated below:
1. Materials: Formed metal or plastic, with metal complying with the following requirement:
 - a. Sheet steel coated with zinc by hot-dip or electrolytic processes, or with aluminum.
 2. Edge trim shapes indicated below by reference to designations of Fig. 1 in ASTM C 1047:
 - a. "LC" Bead, unless otherwise indicated.
 - b. "L" Bead where indicated.
 - c. "U" Bead where indicated.

- B. One-Piece Control Joint: Formed with vee-shaped slot per Fig. 1 in ASTM C 1047, with slot opening covered with removable strip:

2.5 GYPSUM BOARD JOINT TREATMENT MATERIALS:

- A. General: Provide materials complying with ASTM C 475, ASTM C 840, and recommendations of manufacturer of both gypsum board and joint treatment materials for the application indicated.
- B. Joint Tape: Paper reinforcing tape, unless otherwise indicated.
- C. Drying-Type Joint Compounds: Factory-prepackaged ready-mixed vinyl-based products.

2.6 MISCELLANEOUS MATERIALS:

- A. General: Provide auxiliary materials for gypsum drywall construction which comply with referenced standards and the recommendations of the manufacturer of the gypsum board.
- B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum boards.
- C. Gypsum Board Screws: ASTM C 1002.
- D. Concealed Acoustical Sealant: Nondrying, nonhardening, nonskinning, nonstaining, nonbleeding, gunnable sealant complying with requirement specified in Division-7 section "Joint Sealers."
- E. Sound Attenuation Blankets: Unfaced mineral fiber blanket insulation produced by combining mineral fibers with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing).

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Examine substrates to which drywall construction attaches or abuts, preset hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of drywall construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF STEEL FRAMING, GENERAL

- A. Steel Framing Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installations.
- B. Refer to Section 05400 - Lightgauge Metal Framing for installation of exterior metal wall framing.
- C. Install supplementary framing, blocking and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar construction to comply with details indicated and with recommendations of gypsum board manufacturer.

- D. Isolate steel framing from building structure to prevent transfer of loading imposed by structural movement, at locations indicated below:
 - 1. Where edges of suspended ceilings abut building structure horizontally at ceiling perimeters or penetration of structural elements.
 - 2. Where partition and wall framing abuts overhead structure.
 - a. Provide slip or cushioned type joints to attain lateral support without axial loading.
- E. Do not bridge building expansion or control joints with steel framing or furring members; independently frame both sides of joints with framing of furring members.

3.3 INSTALLATION OF STEEL FRAMING FOR SUSPENDED CEILINGS

- A. Secure hangers to structural support by connecting directly to structure.
 - 1. Do not attach hangers to metal roof deck.
- B. Do not connect or suspend steel framing from ducts, pipes or conduit.
- C. Keep hangers and braces at least 2 inches clear of ducts, pipes and conduits.
- D. Sway brace suspended steel framing with hangers used for support.
- E. Install suspended steel framing components in sizes and at spacings indicated but not less than that required by referenced steel framing installation standards.
 - 1. Wire Hangers: 0.1620 in diameter (8 gage), 4 ft oc.
 - 2. Carrying Channels: 1 1/2", 4 ft oc.
 - 3. Rigid Furring Channels: 24" oc.
- F. Installation Tolerances: Install steel framing components for suspended ceilings so that cross furring members or grid suspension members are level to within 1/8" in 12 ft as measured both lengthwise on each member and transversely between parallel members.

3.4 INSTALLATION OF STEEL FRAMING FOR WALLS AND PARTITIONS

- A. Install runners at floors, ceilings and structural walls and columns where gypsum drywall stud system abuts other construction.
- B. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8" from plane of faces of adjacent framing.
- C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceilings to provide support for gypsum board.
- D. Install steel studs and furring in sizes and at spacings indicated but not less than that required by referenced steel framing installation standards.
- E. Frame door and window openings with solid wood blocking around perimeter of opening securely anchored to 20 ga. steel framing.

3.5 INSTALLATION OF STEEL FRAMING FOR FURRED CEILINGS AND WALLS:

- A. Screw furring members to framing.

3.6 APPLICATION AND FINISHING OF GYPSUM BOARD, GENERAL:

- A. Gypsum Board Application and Finishing Standard: Install and finish gypsum board to comply with ASTM C 840.
- B. Install sound attenuation blankets where indicated, prior to gypsum board unless readily installed after board has been installed.
- C. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 24 inches in alternate courses of board.
- D. Install ceiling boards across framing in the manner which minimizes the number of end-butt joints, and which avoids end joints in the central area of each ceiling. Stagger end joints at least 24 inches.
- E. Install wall/partition boards in manner which minimizes the number of end-butt joints or avoids them entirely where possible. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs.
- F. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16 inch open space between boards. Do not force into place.
- G. Locate either edge or end joints over supports. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
- H. Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cutouts.
- I. Form control joints and expansion joints at locations indicated, but not greater than 30' apart, or as recommended by gypsum board manufacturer, with space between edges of boards, prepared to receive trim accessories.
- J. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4 inch to 1/2 inch space and trim edge with "U" bead edge trim.
- K. Space fasteners in gypsum boards in accordance with referenced gypsum board application and finishing standard and manufacturer's recommendations.

3.7 METHODS OF GYPSUM BOARD APPLICATION:

- A. Single-Layer Application: Install gypsum wallboard as follows:
 - 1. On ceilings apply gypsum board prior to wall/partition board application to the greatest extent possible.
 - 2. On partitions/walls 8'-1" or less in height apply gypsum board horizontally (perpendicular to framing); use maximum length sheets possible to minimize end joints.

3. At walls only of showers, tubs and similar "wet" areas, install water- resistant gypsum backing board to comply with ASTM C 840 and recommendations of gypsum board manufacturer.
 4. At walls scheduled to receive ceramic tile finish, install GP Dens Shield tile backer board.
 5. At exterior walls, install GP Dens Glass exterior gypsum sheathing.
- B. Double-Layer Application: Install gypsum backing board for base layer and gypsum wallboard for face layer.
1. On partitions/walls apply layers with joints of base layer over supports and face layer joints offset at least 12 inches from base layer joints.
- C. Fastening Methods: Fasten gypsum boards to supports only with screws.

3.8 INSTALLATION OF DRYWALL TRIM ACCESSORIES:

- A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges to comply with manufacturer's recommendations.
- B. Install corner beads at external corners.
- C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound except where "U" bead (semi-finishing type) is indicated.
1. Install "LC" bead where drywall construction is tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
 2. Install "L" bead where edge trim can only be installed after gypsum board is installed.
 3. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).
- D. Install control joints at locations indicated, or if not indicated, at spacings and locations required by referenced gypsum board application and finish standard, and approved by the Architect for visual effect.

3.9 FINISHING OF DRYWALL:

- A. General: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects and elsewhere as required to prepare work for decoration.
- B. Prefill open joints and rounded or beveled edges, if any, using setting-type joint compound.
- C. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.

- D. Finish interior gypsum wallboard by applying joint compounds in 3 coats (not including prefill of openings in base), and sand between coats and after last coat.
- E. Partial Finishing: Omit third coat and sanding on concealed drywall construction which is indicated for drywall finishing or which requires finishing to achieve fire-resistance rating, sound rating or to act as air or smoke barrier.

3.10 PROTECTION:

- A. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall construction being without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 09300

TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Unglazed ceramic mosaic tile.
 - 2. Stone thresholds.
- B. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Division 7 Section "Joint Sealers" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of product specified.
- C. Samples for initial selection purposes in form of manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures, and patterns available for each type and composition of tile indicated. Include samples of grout and accessories involving color selection.
 - 1. Stone thresholds in 6-inch lengths.
- D. Material test reports from qualified independent testing laboratory indicating and interpreting test results relative to compliance of tile and tile setting and grouting products with requirements indicated.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain materials from a single source for each color, grade, finish, type, composition, and variety of tile, and for each setting and grouting material, with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- B. Installer Qualifications: Engage an experienced Installer who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.
- B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

1.6 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.
- C. Maintain temperatures at 50 deg F (10 deg C) or more in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

1.7 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials that match products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.
- B. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Tile:
 - a. American Olean Tile Co., Inc.
 - b. Dal-Tile Corp.
 - c. Mid-State Tile Co.
 - d. Monarch Tile Manufacturing, Inc.
 - e. Summitville Tiles, Inc.
 - f. United States Ceramic Tile Co.
 - 2. Mortars and Grouts:
 - a. American Olean Tile Co., Inc.
 - b. Boiardi Products Corp.
 - c. Bostik Construction Products Div.
 - d. DAP Inc. Div.; USG Corp.
 - e. L & M Mfg. Inc.
 - f. Laticrete International Inc.

- g. Mapei Corp.
- h. Southern Grouts & Mortars, Inc.
- i. Summitville Tiles, Inc.
- j. Syracuse Adhesives Co.

2.2 PRODUCTS, GENERAL

- A. ANSI Standard for Ceramic Tile: Comply with ANSI A137.1 "American National Standard Specifications for Ceramic Tile" for types, compositions, and grades of tile indicated.
 - 1. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.
- B. ANSI Standard for Tile Installation Materials: Comply with ANSI standard referenced with products and materials indicated for setting and grouting.
- C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
 - 1. Provide selections made by Architect from manufacturer's full range of standard colors, textures, and patterns for products of type indicated.
 - 2. Provide tile trim and accessories that match color and finish of adjoining flat tile, unless otherwise indicated.
- D. Factory Blending: For tile exhibiting color variations within the ranges selected during sample submittals, blend tile in factory and package accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples.
- E. Mounting: Where factory-mounted tile is required, provide back- or edge-mounted tile assemblies as standard with manufacturer unless another mounting method is indicated.
- F. Where tile is indicated for installation in swimming pools, on exteriors or in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies that this type of mounting is suitable for these kinds of uses and has been successfully used on other projects.
- G. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating them with a continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.3 TILE PRODUCTS

- A. Unglazed Ceramic Mosaic Tile: Provide factory-mounted flat tile complying with the following requirements:
 - 1. Composition: Porcelain.
 - 2. Nominal Facial Dimensions: 2 inches by 2 inches.
 - 3. Nominal Thickness: 1/4 inch.
 - 4. Face: Plain with cushion edges.

- B. Trim Units: Provide tile trim units to match characteristics of adjoining flat tile and to comply with following requirements:
- C. Size: As indicated, coordinated with sizes and coursing of adjoining flat tile where applicable.
- D. Shapes: As follows, selected from manufacturer's standard shapes:
 - 1. Base for Thinset Mortar Installations: Coved.
 - 2. Wainscot Cap for Thinset Mortar Installations: Surface bullnose.
 - 3. External Corners for Thinset Installations: Surface bullnose.
 - 4. Internal Corners: Field-buttet square corners, except use coved base and cap angle pieces designed to member with stretcher shapes.

2.4 STONE THRESHOLDS

- A. General: Provide stone that is uniform in color and finish, fabricated to sizes and profiles indicated or required to provide transition between tile surfaces and adjoining finished floor surfaces.
- B. Marble Thresholds: Provide marble thresholds complying with ASTM C 503 requirements for exterior use and for abrasion resistance where exposed to foot traffic, a minimum hardness of 10 per ASTM C 241.
 - 1. Provide color as selected by Architect.
 - 2. Provide units with beveled edges complying with ADA requirements for floor surface transitions.

2.5 SETTING MATERIALS

- A. Portland Cement Mortar Installation Materials: Provide materials complying with ANSI A108.1 and as specified below.
- B. Latex-Portland Cement Mortar: ANSI A118.4, composition as follows:
- C. Prepackaged dry mortar mix composed of portland cement, graded aggregate, and the following dry polymer additive in the form of a re-emulsifiable powder to which only water is added at job site.
 - 1. Dry Polymer Additive: Manufacturer's standard.
- D. Latex additive (water emulsion) of type described below, serving as replacement for part or all of gauging water, combined at job site with prepackaged dry mortar mix supplied or specified by latex additive manufacturer.
 - 1. Latex Type: Manufacturer's standard.

2.6 GROUTING MATERIALS

- A. Latex-Portland Cement Grout: ANSI A118.6, color as indicated, composition as follows:
- B. Latex additive (water emulsion) serving as replacement for part or all of gauging water, added at job site with dry grout mixture, with type of latex and dry grout mix as follows:
 - 1. Latex Type: Manufacturer's standard.

- C. Dry Grout Mixture: Commercial portland cement specified or supplied by latex additive manufacturer.
 - 1. Application: Use commercial portland cement grout combined with latex additive for grouting joints in floor tile unless otherwise indicated.

2.7 ELASTOMERIC SEALANTS

- A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with requirements of Division 7 Section "Joint Sealers," including ASTM C 920 as referenced by Type, Grade, Class, and Uses.
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
- C. One-Part Mildew-Resistant Silicone Sealant: Type S; Grade NS; Class 25; Uses NT, G, A, and as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and temperature extremes.
- D. Multipart Pourable Urethane Sealant for Use T: Type M; Grade P; Class 25; Uses T, M, A, and as applicable to joint substrates indicated, O.

2.8 MISCELLANEOUS MATERIALS

- A. Temporary Protective Coating: Provide product recommended by tile manufacturer formulated to protect exposed surfaces of tile against adherence of mortar and grout, is compatible with tile and mortar/grout products, and is easily removable after grouting is completed without damaging grout or tile.

2.9 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with requirements of referenced standards and manufacturers including those for accurate proportioning of materials, water, or additive content; type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars and grouts of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and areas where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
- B. Verify that substrates for setting tile are firm, dry, clean, and free from oil or waxy films and curing compounds.
- C. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
- D. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Blending: For tile exhibiting color variations within the ranges selected during sample submittals, verify that tile has been blended in factory and packaged accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- B. Field-Applied Temporary Protective Coating: Where needed to prevent adhesion or staining of exposed tile surfaces by grout, protect exposed surfaces of tile against adherence of mortar and grout by precoating them with a continuous film of temporary protective coating recommended by tile manufacturer, taking care not to coat unexposed tile surfaces:

3.3 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standard: Comply with parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for the Installation of Ceramic Tile" that apply to type of setting and grouting materials and methods indicated.
- B. TCA Installation Guidelines: TCA "Handbook for Ceramic Tile Installation"; comply with TCA installation methods indicated.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions except as otherwise shown. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, or covers overlap tile.
- E. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths unless otherwise shown.
- F. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.
- G. Grout tile to comply with the requirements of the following installation standards:
- H. For ceramic tile grouts (sand-portland cement, dry-set, commercial portland cement, and latex-portland cement grouts), comply with ANSI A108.10.

3.4 FLOOR INSTALLATION METHODS

- A. Ceramic Mosaic Tile: Install tile to comply with requirements indicated below for setting bed methods, TCA installation methods related to types of subfloor construction, and grout types:
- B. Latex-Portland Cement Mortar: ANSI A108.5.
 - 1. Concrete Subfloors, Interior: TCA F113.

2. Grout: Latex-portland cement.
- C. Stone Thresholds: Install stone thresholds at locations indicated; set in same type of setting bed as abutting field tile unless otherwise indicated.

3.5 CLEANING AND PROTECTION

- A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
- B. Remove latex-portland cement grout residue from tile as soon as possible.
- C. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
- D. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to brick and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- E. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.
- F. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer that ensures that tile is without damage or deterioration at time of Substantial Completion.
- G. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- H. Prohibit foot and wheel traffic from tiled floors for at least 7 days after grouting is completed.
- I. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION

SECTION 09511

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section includes acoustical panel ceilings installed with exposed suspension systems.

1.3 SUBMITTALS:

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of product specified.
- C. Samples for verification purposes of each acoustical panel type, pattern, and color.

1.4 QUALITY ASSURANCE:

- A. Installer Qualifications: Engage an experienced Installer who has successfully completed acoustical ceilings similar in material, design, and extent to those indicated for Project.
- B. Fire-Performance Characteristics: Provide acoustical ceilings that are identical to those tested for the following fire-performance characteristics, per ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
- C. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
 - 1. Flame Spread: 25 or less.
 - 2. Smoke Developed: 50 or less.
- D. Single-Source Responsibility for Ceiling Units: Obtain each type of acoustical ceiling unit from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- E. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment and fire-suppression system components.

1.5 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them as recommended by manufacturer in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

1.6 EXTRA MATERIAL:

- 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 appropriate labels.
 - 1. Acoustical Ceiling Units: Furnish quantity of full-size units equal to 5.0 percent of amount installed.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. Products of one or more manufacturers are listed in schedules to establish standards of performance and characteristics of appearance. Equivalent products of other listed manufacturers may be accepted, as judged solely by the Architect.

2.2 MANUFACTURERS:

- A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:
 - 1. Acoustical Panels:
 - a. Armstrong World Industries, Inc.
 - b. Celotex Corp.
 - c. USG Interiors, Inc.
 - 2. Steel Suspension Systems:
 - a. Armstrong World Industries, Inc.
 - b. Chicago Metallic Corporation.
 - c. National Rolling Mills, Inc.
 - d. USG Interiors, Inc.

2.3 ACOUSTICAL CEILING UNITS, GENERAL:

- A. Standard for Acoustical Ceiling Units: Provide manufacturer's standard units of configuration as scheduled that comply with ASTM E 1264 classifications in reference to types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
- B. Colors and Patterns: Provide products to match appearance characteristics as scheduled for each product type.
 - 1. Product: 24x24x5/8" random fissured tegular edge panels, white finish: Armstrong "Cortega" 2195.

2.4 METAL SUSPENSION SYSTEMS, GENERAL:

- A. Standard for Metal Suspension Systems: Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements.
 - 1. Finishes and Colors: Provide manufacturer's standard factory -applied finish for type of system indicated.
- B. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
 - 1. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.
 - 2. Gage: Provide wire sized to that stress at 3 times hanger design load (ASTM C 635, Table 1, Direct-Hung), will be less than yield stress of wire, but provide not less than 0.106-inch diameter (12 gage).
 - 3. Hanger Rods and Flat Hangers: Mild steel, zinc coated. or protected with rust inhibitive paint.

2.5 NON-FIRE-RESISTANCE -RATED DIRECT-HUNG SUSPENSION SYSTEMS:

- A. Wide-Face Capped Double-Web Steel Suspension System: Main and cross-runners roll-formed from prepainted or electrolytic zinc-coated cold-rolled steel sheet, with prefinished 15/16-inch-wide metal caps on flanges; other characteristics as follows:
 - 1. Structural Classification: Intermediate-Duty System.

2.6 MISCELLANEOUS MATERIALS:

- A. Concealed Acoustical Sealant: Nondrying, nonhardening, nonskinning, nonstaining, nonbleeding, gunnable sealant complying with requirement specified in Division 7 Section "Joint Sealers".

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Examine substrates and structural framing to which ceiling system attaches or abuts, with Installer present, for compliance with requirements specified in this and other sections that affect installation and anchorage of ceiling system. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION:

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half-width units at borders, and comply with reflected ceiling plans.

3.3 INSTALLATION:

- A. General: Install acoustical ceiling systems to comply with ASTM C 636 and ASTM E 580 installation standards, per manufacturer's instructions and CISCA "Ceiling Systems Handbook."
- B. Arrange acoustical units and orient directionally patterned units in a manner shown by reflected ceiling plans.
- C. Suspend ceiling hangers from building structural members and as follows:
 - 1. Install hangers plumb, secure to substrate and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of other construction within ceiling plenum produces hanger spacings different than required to support standard suspension system members, install supplemental suspension members and hangers. Size supplemental members and hangers to support ceiling loads within performance limits established by referenced standards.
 - 3. Secure hangers either directly to structures or to inserts, eyescrews, or other devices that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
- D. Install edge moldings at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical units.
 - 1. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.
- E. Screw-attach moldings to substrate at intervals not over 24 inches oc. and not more than 3 inches from ends, leveling with ceiling suspension system to tolerance of 1/8 inch in 12'-0". Miter corners accurately and connect securely.
- F. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.

3.4 CLEANING:

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09680

CARPET

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes carpet direct-glued.

1.2 SUBMITTALS

- A. Shop Drawings: Indicate seaming plan, method of joining seams, direction of carpet pile and pattern, location of edge moldings and edge bindings.
- B. Samples: Submit two samples illustrating color and pattern for each carpet material specified.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit maintenance and cleaning instructions.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of Project.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Store materials in area of installation of 48 hours prior to installation.
- B. Maintain minimum 70 degrees F (21 degrees C) ambient temperature 3 days prior to, during and 24 hours after installation.
- C. Ventilate installation area during installation and for 3 days after installation.

1.6 WARRANTY

- A. Provide ten year manufacturer warranty for carpet integrity, wear, and colorfastness.

1.7 EXTRA MATERIALS

- A. Provide 5% of carpeting of each type, color, and pattern specified.

PART 2 - PRODUCTS

2.1 CARPET

- A. Manufacturers:
 - 1. Bigelow Commercial

2. J&J Industries.
3. Lees Carpet
4. Milliken Carpet
5. Mohawk Commercial Carpet
6. Shaw Industries

2.2 COMPONENTS

- A. Carpet Type A: Tufted textured loop, 100% continuous filament nylon with antimicrobial processing, permanent static control. For use in general office areas.
1. Roll Width: 12 ft
 2. Color: as selected
 3. Pattern: as selected
 4. Dye Method: 100% Solution dyed.
 5. Gauge: Minimum 1/10.
 6. Stitches per inch: Minimum 10.
 7. Face Weight: Minimum 28 oz.
 8. Pile Height: 0.144" or greater.
 9. Primary Backing: 100% Polypropylene.
 10. Secondary Backing: Unitary backing with 20 lb. tuft lock.
 11. Electrostatic Propensity: <3.5 kV
 12. Flame/Smoke Rating: <25/<450 in accordance with ASTM E84.
 13. Critical Radiant Flux: Conform to NFPA 253 ASTM E648, 0.45 watts/sq cm.
 14. Surface Flammability Ignition: Conform to ASTM D2859.
- B. Product: Subject to compliance with requirements, provide Shaw/Stratton "Scholar Uni".

2.3 ACCESSORIES

- A. Sub-Floor Filler: Cementitious type recommended by flooring material manufacturer.
- B. Moldings and Edge Strips: Vinyl color as selected.
- C. Seam Adhesive: Recommended by manufacturer.
- D. Contact Adhesive: Recommended by carpet manufacturer, releasable type

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that floor surfaces are smooth and flat within tolerances specified in Section 03000 and are ready to receive work.
- B. Verify that concrete floors for glue-down installation are ready for carpet installation by testing for moisture emission rate and alkalinity. Obtain instructions if test results are not within specified limits.
- C. By starting installation of carpet, installer assumes all responsibility for substrate conditions.

3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- C. Vacuum clean substrate.

3.3 INSTALLATION

- A. Install carpet in accordance with Carpet and Rug Institute CRI 104 - Standard for Installation of Commercial Textile Floorcovering Materials.
- B. Verify carpet match before cutting to ensure minimal variation between dye lots.
- C. Lay out carpet and locate seams in accordance with shop drawings:
 - 1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
 - 2. Do not locate seams perpendicular through door openings.
 - 3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
 - 4. Locate change of color or pattern between rooms under door centerline.
 - 5. Provide monolithic color, pattern, and texture match within any one area.
- D. Install carpet by direct glue-down method.
- E. Complete installation of edge strips, concealing exposed edges. Bind cut edges where not concealed by edge strips.
- F. Cleaning:
 - 1. Remove excess adhesive from floor, base, and wall surfaces without damage.
 - 2. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09770

FIBERGLASS REINFORCED PLASTIC PANELS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes: Special wall surfaces, including fiberglass reinforced plastic panels.
- B. Related Sections: Section(s) related to this section include:
 - 1. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
 - 2. 06100 - Rough Carpentry

1.2 REFERENCES

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation
- B. ASTM International:
 - 1. ASTM D2583 Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
 - 2. ASTM D5420 Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).
 - 3. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide fiberglass reinforced plastic (FRP) panels which have been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.4 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- B. Product Data: Submit product data, including manufacturer's SPEC-DATA™ product sheet, for specified products.
- C. Samples: Submit selection and verification samples for finishes, colors and textures. Submit (2) samples of each type of panel, trim and fastener.
- D. Quality Assurance Submittals: Submit the following:
 - 1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
 - 2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.
 - 3. Manufacturer's Instructions: Manufacturer's installation instructions.

- E. Closeout Submittals: Submit the following:
 - 1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.
 - 2. Warranty: Warranty documents specified herein.
- 1.5 QUALITY ASSURANCE
- A. Qualifications:
 - 1. Installer Qualifications: Installer should be experienced in performing work of this section and should have specialized in installation of work similar to that required for this project.
 - a. Certificate: When requested, submit certificate indicating qualifications.
- 1.6 DELIVERY, STORAGE & HANDLING
- A. General: Comply with Division 1 Product Requirements Sections.
 - B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
 - C. Delivery:
 - 1. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Package sheets on skids or pallets for shipment to project site.
 - 2. Deliver no components to project site until areas are ready for installation for duration of project.
 - D. Storage and Protection:
 - 1. Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.
 - 2. Store panels indoors in a dry place at the project site.
 - E. Handling:
 - 1. Remove foreign matter from face of panel by using a soft bristle brush, avoiding abrasive action.
 - 2. Handle materials to prevent damage to prevent damage to finished surfaces. Provide protective covering to prevent physical damage or staining following installation for duration of project.
- 1.07 PROJECT CONDITIONS
- A. Environmental Requirements:
 - 1. Installation shall not begin until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from plaster, concrete or terrazzo work has dissipated.
 - 2. During installation, and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.
 - 3. Provide ventilation to disperse fumes during application of adhesive as recommended by adhesive manufacturer.

- B. Field Measurements: Verify actual measurements/openings by field measurements before fabrication. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.8 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

1.9 MAINTENANCE

- A. Extra Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals (Maintenance Materials) Section.
 - 1. Quantity: Furnish quantity of units equal to 5% of amount installed.
 - 2. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra materials.

PART 2 – PRODUCTS

2.1 FIBERGLASS REINFORCED PLASTIC (FRP) PANELS

- A. Manufacturer:
 - 1. Kemlite Company, Inc.
 - 2. Or Equal approved by Architect
- B. Proprietary Product(s)/System(s): Kemlite Fiberglass Reinforced Plastic (FRP) Panels.
 - 1. Glasbord Panels
 - a. Fire-X Glasbord FM
 - 1) Class A embossed Factory Mutual approved identified by trademarked blue and red threads manufactured into the back of the panel and trademarked dual blue fluorescent embedded threads on the front of the panel (visible only under UV light).
 - 2) Color selected by Owner/Architect: [Specify color - 85 white, 83 colonial white, 70 soft beige, 48 pearl gray, 66 silver, 84 ivory, 1201 black.] CGI is available in 85 white. Special colors can be custom matched and manufactured provided there is a minimum square footage order of 12,000 ft² (1116 m²). Allow 4 - 6 weeks lead time.
 - 3) Surface Texture selected by Owner/Architect: Embossed or Smooth.
 - 4) Size: Standard sizes are 4 feet x 8 feet, 4 feet x 9 feet, 4 feet x 10 feet and 4 feet x 12 feet; or as indicated on drawings.
 - b. Moldings: Provide harmonizing PVC (polyvinyl chloride) moldings.
 - 1) Color selected by Owner/Architect: Specify color - 85 white, 83 colonial white, 70 soft beige, 48 pearl gray, 66 silver, 84 ivory, 1201 black.
 - c. Rivets: [Specify optional rivets in harmonizing colors (by color name and number)]

in areas where there are large fluctuations in temperature and/or humidity, where the substrate is unusually uneven, and in all low temperature or cold storage applications. Refer to manufacturer's Installation Guide for rivet pattern and installation instructions.

2. Kemply Panels:
 - a. Fire-X Glasbord FM
 - 1) Class A embossed Factory Mutual approved identified by trademarked blue and red threads manufactured into the back of the panel and trademarked dual blue fluorescent embedded threads on the front of the panel (visible only under UV light).
 - 2) Laminated to 0.75 Inch Class A rated APA rated Plywood substrate
 - 3) Color selected by Owner/Architect: [Specify color - 85 white, 83 colonial white, 70 soft beige, 48 pearl gray, 66 silver, 84 ivory, 1201 black.] CGI is available in 85 white. Special colors can be custom matched and manufactured provided there is a minimum square footage order of 12,000 ft² (1116 m²). Allow 4 - 6 weeks lead time.
 - 4) Surface Texture selected by Owner/Architect: Embossed or Smooth.
 - 5) Size: Standard sizes are 4 feet x 8 feet, 4 feet x 9 feet, 4 feet x 10 feet and 4 feet x 12 feet; or as indicated on drawings.
 - b. Moldings: Provide harmonizing PVC (polyvinyl chloride) moldings.
 - 1) Color selected by Owner/Architect: Specify color - 85 white, 83 colonial white, 70 soft beige, 48 pearl gray, 66 silver, 84 ivory, 1201 black.
 - c. Rivets: [Specify optional rivets in harmonizing colors (by color name and number) in areas where there are large fluctuations in temperature and/or humidity, where the substrate is unusually uneven, and in all low temperature or cold storage applications. Refer to manufacturer's Installation Guide for rivet pattern and installation instructions.
3. *Surfaseal* Surface Protection: Provide Kem lite *Surfaseal*/surface protection for fiberglass reinforced plastic (FRP) panels.
4. Division Bars, Corner Trim: Panel manufacturer's standard length extruded vinyl pieces; longest length possible to eliminate end joints.
5. Fasteners: Noncorrosive drive rivets.

2.2 PRODUCT SUBSTITUTIONS

- A. Substitutions: No substitutions permitted.

2.3 ACCESSORIES

- A. Adhesive: Provide panel adhesive as recommended by panel manufacturer.

2.4 RELATED MATERIALS

- A. 06100 - Rough Carpentry

2.5 SOURCE QUALITY

- A. Source Quality: Obtain fiberglass reinforced plastic (FRP) panels from a single manufacturer. Provide panels and molding only from manufacturer specified to ensure warranty and color harmonization of accessories.

PART 3 – EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

3.2 EXAMINATION

- A. Site Verification of Conditions: Verify that substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
1. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails are countersunk and joints and cracks are filled flush and smooth with the adjoining surface.
 2. Do not begin installation until backup surfaces are in satisfactory condition.

3.3 PREPARATION

- A. Surface Preparation: [Specify applicable product preparation requirements.].

3.4 INSTALLATION

- A. Fiberglass Reinforced Panel (FRP) Installation:
1. Cut and drill panels with carbide tipped saw blades or drill bits, or cut with snips.
 2. Install panels with manufacturer's recommended gap for panel field and corner joints.
 3. Predrill fastener holes in panels with 1/8 inch (3.2 mm) oversize.
 4. For trowel type and application of adhesive, follow adhesive manufacturer's recommendations.
 5. Use products acceptable to panel manufacturer and install FRP system in accordance with panel manufacturer's printed instructions. Comply with panel manufacturer's *Installation Guide*.
- B. Site Tolerances: 1/8" in 8 feet of any direction
- D. Related Products Installation: Refer to other sections listed in Related Sections paragraph herein for related materials installation.

3.5 CLEANING

- A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace products that have been installed and are damaged. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.
1. Remove any adhesive or excessive sealant from panel face using solvent or cleaner recommended by panel manufacturer.

3.6 PROTECTION

- A. Protection: Protect installed product and finish surfaces from damage during construction.

END OF SECTION

SECTION 09900

PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.
- B. Surface preparation, priming, and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.
- C. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces unless otherwise directed. If color or finish is not designated, refer to the Architect for selection of finishes.
- D. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
- E. Prefinished items not to be painted include the following factory-finished components:
 - 1. Acoustic materials.
 - 2. Architectural woodwork and casework.
 - 3. Finished mechanical and electrical equipment.
 - 4. Light fixtures.
 - 5. Switchgear and distribution cabinets.
- F. Concealed surfaces not to be painted include wall or ceiling surfaces in generally inaccessible areas.
- G. Labels: Do not paint over Underwriter's Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.3 DEFINITIONS:

- A. "Paint" includes coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.4 SUBMITTALS

- A. Product Data: Manufacturer's technical information, label analysis, and application instructions for each material proposed for use.

1. List each material and cross-reference the specific coating and finish system and application. Identify each material by the manufacturer's catalog number and general classification.
 - B. Samples for color selection in the form of manufacturer's color charts.
 1. After color selection, the Architect will furnish color schedule for surfaces to be coated.
- 1.5 QUALITY ASSURANCE:
- A. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
 - B. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers. Notify the Architect of problems anticipated using the materials specified.
 - C. Material Quality: Provide the manufacturer's best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
 - D. Proprietary names used to designate colors or materials are not intended to imply that products named are required or to exclude equal products of other listed manufacturers.
- 1.6 DELIVERY, STORAGE, AND HANDLING:
- A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label with description of contents. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45oF (7oC). Maintain containers and storage area in a clean condition, free of foreign materials and residue.
- 1.7 JOB CONDITIONS:
- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are within manufacturer's limits, and between 50oF (10oC) and 90oF (32oC).
 - B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are within manufacturer's limits, and between 45oF (7oC) and 95oF (35oC).
 - C. Do not apply paint in snow, rain, fog, or mist, when the relative humidity exceeds 85 percent, at temperatures less than 5oF (3oC) above the dew point, or to damp or wet surfaces, and as restricted by manufacturer.
 - D. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:
 - 1. Dulux/Div. ICI Paints
 - 2. Benjamin Moore and Co..
 - 3. PPG Industries, Pittsburgh Paints.
 - 4. Pratt and Lambert.
 - 5. Sherwin-Williams.
- B. Paint Systems: Paint systems are scheduled at the end of this section.

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint. Do not begin paint application until unsatisfactory conditions have been corrected.
- B. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

3.2 PREPARATION:

- A. General Procedures: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
- B. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to cleaning. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted in accordance with the manufacturer's instructions for each particular substrate condition and as specified.
- D. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing of problems anticipated with using the specified finish-coat material with substrates primed by others.
- E. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
- F. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

- G. Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling. Backprime all exterior wood trim.
 - 1. When transparent finish is required, backprime with spar varnish.
 - 2. Seal tops, bottoms, and cutouts of wood doors where unprimed with a heavy coat of varnish or sealer immediately upon delivery.
- H. Ferrous Metals: Clean nongalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.
- I. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.
- J. Galvanized Surfaces: Clean galvanized surfaces with non-petroleum based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- K. Materials Preparation: Carefully mix and prepare paint materials in accordance with manufacturer's directions.
- L. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
- M. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material.
- N. Use only thinners approved by the paint manufacturer, and only within recommended limits.

3.3 APPLICATION:

- A. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of paint material.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
- C. Provide finish coats that are compatible with primers used.
- D. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce an even smooth surface in accordance with the manufacturer's directions.
- E. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.

- F. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.
1. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.
 2. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
 3. Finish tops, bottoms and side edges of doors. At exterior doors, finish the same as exterior faces.
- G. Sand lightly between each succeeding enamel or varnish coat.
- H. Omit primer on metal surfaces that have been shop-primed and touch up painted.
- I. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
- J. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- K. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.
- L. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.
- M. Pigmented Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- N. Transparent Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections. Provide satin finish for final coats.
- O. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

3.4 FIELD QUALITY CONTROL

- A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:
1. The Owner may engage the services of an independent testing laboratory to sample the paint material being used. Samples of material delivered to the

project will be taken, identified, sealed, and certified in the presence of the Contractor.

2. If test results show material being used does not comply with specified requirements, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing, repaint surfaces coated with rejected paint, and remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are noncompatible.

3.5 CLEANING:

- A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
- B. Upon completion of painting, clean glass and paint-spattered surfaces. Remove spattered paint as directed by manufacturer, using care not to scratch or damage adjacent finished surfaces.

3.6 PROTECTION:

- A. Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting.
- B. Provide "wet paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.
- C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 PAINT SCHEDULE

Application	Finish	Coating System	Coats	
<u>INTERIOR SURFACES</u>				
Drywall	Eggshell	Primer	ICI Ultra Hide PVA Primer Sealer 1030	1
		Finish	ICI Ultra Hide Eggshell Latex Enamel 1412 xxxx	2
Masonry	Gloss	Primer	ICI Ultra Hide Latex Block Filler 3010	1
		Finish	ICI Tru-Glaze-WB 4406 Water-Borne epoxy	2
Metal	Gloss	Primer	ICI Lifemaster Pro Primer	1
		Finish	ICI Lifemaster Pro Hi Performance Acrylic Coating 6900 series	2
Wood	Semigloss	Primer	ICI Ultra-Hide Latex Interior Wood Undercoater	1
		Finish	ICI Ultra-Hide Latex Semigloss Enamel 1416 xxxx	2
<u>EXTERIOR SURFACES</u>				
Metal	Gloss	Primer	ICI Lifemaster Pro Primer 9620	1
		Finish	ICI Lifemaster Pro Hi Performance Acrylic Coating 6900 series	2
Wood	Semi-Gloss	Primer	ICI Ultra-Hide Durus Exterior Alkyd Primecoat 2100-1200	1
		Finish	ICI Ultra-Hide Durus Exterior Alkyd Semi-Gloss 2516-xxxx	2

END OF SECTION

Maine Mall Motors Lexus/Toyota/Scion							Revised - Progress 04/07/2004
							Progress 1/29/2004
Room Finish Schedule							
No.	Room Name	Flooring	Base	Walls	Trim	Ceiling	Remarks
First Floor Spaces							
100	Lexus Showroom	Ceramic Tile 1, Ceramic Tile 2, Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	GWB / Acoustic Panel	
102	Vestibule	Ceramic Tile 1	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
103	New Car Delivery	Concrete Pavers		EIFS System		EIFS System	
104	Customer Lounge	Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
105	Customer Lounge	Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
106	Refreshments	Ceramic Tile 3	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
107	Kids Space	Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
108	New Car Delivery	Concrete Pavers		EIFS System		EIFS System	
109	Scion Display	Ceramic Tile 5	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
110	Toyota Showroom	Ceramic Tile 3	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
111	Vestibule	Ceramic Tile 3	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
120	Mechanical Room	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Painted Deck	
121	Steves Office	Carpet	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	
122	Peters Office	Carpet	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	
123	Conference Room	Carpet	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	
124	Training/ Lunch Room	Porcelain Tile 1	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	
125	Manager	Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
126	Lunch Room	Porcelain Tile 1	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	Provide Oil Resistant Grout
127	Storage	VCT	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	
128	Electrical Room	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Painted Deck	
129	Uniform Storage	Porcelain Tile 1	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	Provide Oil Resistant Grout
130	F&I	Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
131	Reception	Ceramic Tile 1	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
132	Refreshments	Ceramic Tile 1	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
132	Janitors Closet	VCT	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	
133	Kids Space	Ceramic Tile 1	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
134	Customer Space	Ceramic Tile 1	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
435							
136	Service Advisors	Ceramic Tile 1	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
137	Service Mngr/Advisor	Ceramic Tile 1	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
140	Lexus Service Reception	Sealed Concrete	Reveal Base	Eggshell Paint	Semigloss Paint	Painted Deck	
141	Toyota Service Reception	Sealed Concrete	Reveal Base	Eggshell Paint	Semigloss Paint	Painted Deck	
445							
446							
447							
148	Service Manager	Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
149	Parts Shop	Ceramic Tile 3	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
150	Cashier/Title Storage	Carpet	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	
151	Retail	Ceramic Tile 3	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	
152	Tech Parts	Ceramic Tile 3	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	
154	Computer Room	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	

Maine Mall Motors Lexus/Toyota/Scion							Revised - Progress 04/07/2004
							Progress 1/29/2004
No.	Room Name	Flooring	Base	Walls	Trim	Ceiling	Remarks
155	Manager	Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
156	Mgrs	Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
157	F&I	Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
158	F&I	Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
159	Toyota/Lexus Parts Storage	Sealed Concrete	Vinyl Cove	FRP/Eggshell Paint	Semigloss Paint	Painted Deck	Reference Wall Sections for Info.
160	Elevator Mach. Room	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Painted Deck	
161							
162	Parts Delivery	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Painted Deck	
170	Mens Room	Ceramic Tile 7	Ceramic Cove	Ceramic Tile/Eggshell Paint	Semigloss Paint	Acoustic Panel	
171	Womens Room	Ceramic Tile 7	Ceramic Cove	Ceramic Tile/Eggshell Paint	Semigloss Paint	Acoustic Panel	
172	Tech Toilet Rm	Ceramic Tile 7	Ceramic Cove	Ceramic Tile	Semigloss Paint	Acoustic Panel	Provide Oil Resistant Grout
173	Womens Room	Ceramic Tile 7	Ceramic Cove	Ceramic Tile/Eggshell Paint	Semigloss Paint	Acoustic Panel	
174	Mens Room	Ceramic Tile 7	Ceramic Cove	Ceramic Tile/Eggshell Paint	Semigloss Paint	Acoustic Panel	
175	Computer Room	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Painted Deck	
176	Corridor	Ceramic Tile 3	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	Provide Oil Resistant Grout
180	Toyota/Lexus Service Shop	Sealed Concrete		FRP/Eggshell Paint	Semigloss Paint	Painted Deck	Reference Wall Sections for Info.
181	Tool Room	Sealed Concrete		FRP/Eggshell Paint	Semigloss Paint	Painted Deck	Reference Wall Sections for Info.
182	Compressor/ Oil Room	Sealed Concrete		FRP/Eggshell Paint	Semigloss Paint	Painted Deck	Reference Wall Sections for Info.
183	Recon Bays 23 Thru 26	Sealed Concrete		FRP/Eggshell Paint	Semigloss Paint	Painted Deck	Reference Wall Sections for Info.
184	Car Wash Bay 27						
185	Stair #4	Sealed Concrete	Painted Steel	Eggshell Paint	Semigloss Paint	Painted Deck	Treads to be Sealed Concrete
184	Car Wash Bay 28						
188	Stair#3	VCT	Painted Steel	Eggshell Paint	Semigloss Paint	Acoustic Panel	Provide VCT at Landings
189	Stair#1	VCT	Painted Steel	Eggshell Paint	Semigloss Paint	Acoustic Panel	Provide VCT at Landings
190							
191	Corridor	Ceramic Tile 3	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	
192	Corridor	Ceramic Tile 1	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
193	Corridor	Carpet	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
194	Alcove	Ceramic Tile 1	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	Provide Oil Resistant Grout
195	Corridor	Ceramic Tile 1	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
196	Corridor	Ceramic Tile 1	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
197	Corridor	Ceramic Tile 3	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
198	Service Advisors	Ceramic Tile 3	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	
199	Corridor	Ceramic Tile 3	Reveal Base	Eggshell Paint	Semigloss Paint	Acoustic Panel	

Maine Mall Motors Lexus/Toyota/Scion							Progress 1/22/2004
Room Finish Schedule							
No.	Room Name	Flooring	Base	Walls	Trim	Ceiling	Remarks
Mezzanine							
220	Mechanical Room	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Painted Deck	
221	Storage Room	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Painted Deck	
222	Alcove	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Painted Deck	
285	Stair #4	Rubber Treads	Painted Steel	Eggshell Paint	Semigloss Paint	Painted Deck	
Second Floor Spaces							
201							
202							
203							
204							
205	Corridor	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	Provide Sealer so that Future Floor Finshes can adhere to Sealer.
206	Future Space	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint		Provide Sealer so that Future Floor Finshes can adhere to Sealer.
207							
208	Toyota/Lexus Parts Storage	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	
209	Corridor	Sealed Concrete	Vinyl Cove	Eggshell Paint	Semigloss Paint	Acoustic Panel	Provide Sealer so that Future Floor Finshes can adhere to Sealer.
288	Stair #3	VCT	Painted Steel	Eggshell Paint	Semigloss Paint	Acoustic Panel	Provide VCT at Landings
289	Stair #1	VCT	Painted Steel	Eggshell Paint	Semigloss Paint	Acoustic Panel	
290							
Notes:							
Provide Brass Perimeter Protective Edge Trim as required. Brass Perimeter Protective Edge Trim as produced by Schluter Systems							

Part II
Division 10
Specialties

SECTION 10160
TOILET PARTITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. Extent of toilet partitions is indicated on drawings.
- B. Types of toilet compartments include:
 - 1. Solid phenolic.
- C. Styles of toilet compartments include:
 - 1. Floor-anchored, overhead braced.
- D. Toilet accessories are specified elsewhere in Division 10.

1.3 SUBMITTALS:

- A. Product Data: Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of toilet partition assemblies not fully described by product drawings, templates, and instructions for installation of anchorage devices built into other work.
- C. Samples: Submit full range of color samples for each type of unit required. Submit 6" square samples of each color and finish on same substrate to be used in work, for color verification after selections have been made.

1.4 QUALITY ASSURANCE:

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to ensure proper fitting of work.
- B. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet partitions and related work; coordinate delivery with other work to avoid delay.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
1. Accurate Partitions Corp.
 2. American Sanitary Partition Corp.
 3. Ampco Products, Inc.
 4. Bobrick Washroom Equipment, Inc.
 5. Capitol Partitions Inc.
 6. General Partitions Mfg. Corp.
 7. Global Steel Products Corp.
 8. Knickerbocker Partition Corp.
 9. Metpar Steel Products Corp.
 10. Sanymetal Products Co.
 11. Trespa North America, Ltd.

2.2 MATERIALS:

- A. General: Provide materials which have been selected for surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections on finished units are not acceptable.
- B. Toilet Partitions: Solid phenolic core with decorative melamine surface on both sides, in the following thicknesses:
1. Pilasters (overhead-braced): 1".
 2. Panels and Screens: 1/2".
 3. Doors: 3/4".
- C. Pilaster Shoes: ASTM A 167, Type 302/304 stainless steel, not less than 3" high, 20 gage, finished to match hardware.
- D. Stirrup Brackets: Manufacturer's standard design for attaching panels to walls and pilasters, stainless steel.
- E. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories of stainless steel.
- F. Overhead-Bracing: Continuous extruded aluminum, anti-grip profile, with clear anodized finish.
- G. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, chromium-plated steel, or brass finished to match hardware, with theft-resistant type heads and nuts. For concealed anchors, use hot-dip galvanized, cadmium-plated, or other rust-resistant protective-coated steel.

2.3 FABRICATION:

- A. General: Furnish standard doors, panels, screens, and pilasters fabricated for partition system, unless otherwise indicated. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.
- B. Door Dimensions: Unless otherwise indicated, furnish 24" wide inswinging doors for ordinary toilet stalls and 36" wide outswinging doors at stalls equipped for use by handicapped.
- C. Overhead-Braced Partitions: Furnish galvanized steel supports and leveling bolts at pilasters, as recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous extruded aluminum anti-grip overhead-bracing at top of each pilaster. Furnish shoe at each pilaster to conceal supports and leveling mechanism.
- D. Hardware: Furnish hardware for each compartment in partition system, as follows:
 - 1. Hinges: Cutout inset type, adjustable to hold door open at any angle up to 90 degrees. Provide gravity type, spring-action cam type, or concealed torsion rod type, to suit manufacturer's standards.
 - 2. Latch and Keeper: Recessed latch unit, designed for emergency access, with combination rubber-faced door strike and keeper.
 - 3. Coat Hook: Manufacturer's standard unit, combination hook and rubber-tipped bumper, sized to prevent door hitting mounted accessories.
 - 4. Door Pull: Manufacturer's standard unit for out-swing doors, complying with ADA requirements.

2.4 FINISHES:

- A. Decorative plastic laminate.
- B. Color: One of manufacturer's standard colors in each room, as indicated or, if not indicated, as selected by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. General: Comply with manufacturer's recommended procedures and installation sequence. Install partitions rigid, straight, plumb, and level. Provide clearances of not more than 1/2" between pilasters and panels, and not more than 1" between panels and walls. Secure panels to walls with not less than two stirrup brackets attached near top and bottom of panel. Locate wall brackets so that holes for wall anchorages occur in masonry or tile joints. Secure panels to pilasters with not less than two stirrup brackets located to align with stirrup brackets at wall. Secure panels in position with manufacturer's recommended anchoring devices.
- B. Overhead-Braced Partitions: Secure pilasters to floor and level, plumb, and tighten installation with devices furnished. Secure overhead-brace to each pilaster with not less

than two fasteners. Hang doors and adjust so that tops of doors are parallel with overhead-brace when doors are in closed position.

3.2 ADJUST AND CLEAN:

- A. Hardware Adjustment: Adjust and lubricate hardware for proper operation. Set hinges on inswinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors (and entrance swing doors) to return to fully closed position.
- B. Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

END OF SECTION

SECTION 10350

FLAGPOLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes flagpoles and accessories.

1.2 SUBMITTALS

- A. Product Data: Submit data on Product, accessories, and finishes.

1.3 QUALITY ASSURANCE

- A. Flagpoles: Design and construct flagpole to withstand wind speed of 90 mph with two flags.

PART 2 - PRODUCTS

2.1 FLAGPOLES

- A. Manufacturers:
 - 1. American Flagpole.
 - 2. Concord Industries
 - 3. Ewing.
 - 4. Pole Tech Inc.

2.2 COMPONENTS

- A. Flagpoles:
 - 1. Material: 6063-T6 Aluminum.
 - 2. Shape: Uniform conical taper.
 - 3. Finish: directional satin ground.
 - 4. Height: 25 feet above grade.
 - 5. Truck: Revolving with stainless steel bearing.
 - 6. Halyard: Internal stainless steel aircraft cable with four chrome plated bronze swivel snap hooks to receive 2 appropriately sized flags (by Owner).
 - 7. Winch: Internal gearless stainless steel, direct drive with automatic brake and removable crank handle, flush locking access door.
 - 8. Collar: Spun aluminum to match pole finish.
 - 9. Ball: 14 ga. gold anodized seamless.
 - 10. Foundation Tube: 16 ga. galvanized corrugated steel

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that excavation conditions are as instructed by the manufacturer.

3.2 INSTALLATION

- A. Install flagpoles in accordance with approved shop drawings and manufacturer's instructions.
- B. Concrete: Comply with section 03000.
- C. Provide positive lighting ground protection for each flagpole.
- D. Paint portions of ground set flagpoles below grade with heavy coat of bituminous paint.

END OF SECTION

SECTION 10425

SIGNS

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 types of signs:
 - 1. Interior panel signs.
 - 2. Exterior cast letters.
 - 3. Handicapped parking signs.
 - 4. Freestanding illuminated sign
- B. Related Sections: The following sections contain requirements that relate to this section:
- C. Division 1 Section "Temporary Facilities" for temporary project identification signs.

1.3 SUBMITTALS:

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data: Include manufacturer's construction details relative to materials, dimensions of individual components, profiles, and finishes for each type of sign required.
- C. Samples: Provide samples of each sign component for initial selection of color, pattern, graphic content and surface texture as required and for verification of compliance with requirements indicated.
- D. Schedule: Provide schedule of interior signage for coordination with Owner.

1.4 QUALITY ASSURANCE:

- A. Single-Source Responsibility: For each separate type of sign required, obtain signs from one source from a single manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS:

- A. Acrylic: 1/8" thick sheet acrylic for interior engraved panel signs, in colors indicated or, if not indicated, as selected by Architect from the manufacturer's standards.
- B. Aluminum: 0.080" mill finish aluminum sheet, for exterior panel signs.

- C. Cast Aluminum: AA535 alloy aluminum.
- D. Reflective sheet: 3M Scotchlite reflective sheeting for exterior panel sign backgrounds.

2.2 PANEL SIGNS:

- A. Panel Signs: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
- B. Produce smooth, even, level sign panel surfaces, constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally.
- C. Unframed Panel Signs: Fabricate signs with edges mechanically and smoothly finished to conform with the following requirements:
 - 1. Edge Condition: Square cut.
 - 2. Corner Condition: Rounded corners.
 - 3. Size: 6x4".
- D. Graphic Content and Style: Provide sign copy that complies with the requirements indicated for size, style, spacing, content, position, material, finishes, and colors of letters, numbers, and other graphic devices. Comply with requirements of ANSI A 117.1-1986, Uniform Federal Accessibility Standard and Americans with Disabilities Act.
- E. Tactile Signs: Machine-engrave background of letters, numbers, symbols, and other graphic devices into sign panel on the face indicated to produce precisely formed copy, raised to uniform thickness.
 - 1. Engrave the copy to produce a minimum character projection of 1/32" and a minimum stroke width of 1/4".
 - 2. Form tactile letters in Helvetica style with upper case letters 1" in height.
 - 3. Form accompanying Grade II Braille, raised 1/32".
- F. Handicapped Parking Sign: Provide 12x18" standard reflective aluminum handicapped parking sign displaying the International Symbol of Accessibility as indicated.
- G. Illuminated Prestanding Sign: Securely mount and wire sign and enclose as indicated w/illuminated backlit sign panel on concrete foundation. Provide structural design of sign box enclosure.

2.3 CAST LETTERS:

- A. Cast aluminum letters in sizes indicated.
- B. Finish: Manufacturer's standard baked enamel, color as selected by Architect.

2.4 FINISHES:

- A. Colors and Surface Textures: For exposed sign material that requires selection of materials with integral or applied colors, surface textures or other characteristics related to appearance, provide color matches as selected by the Architect from the manufacturer's standards.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions. Comply with installation requirements of ANSI A 117.1-1986, Uniform Federal Accessibility Standard and Americans with Disabilities Act.
- B. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.
- C. Wall Mounted Panel Signs: Attach panel signs to wall surfaces using the methods indicated below:
 - 1. Vinyl-Tape Mounting: Use double-sided foam tape, of thickness recommended by sign manufacturer for installation intended, to mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
 - 2. Silicone-Adhesive Mounting: Use liquid silicone adhesive recommended by the sign manufacturer to attach sign units to irregular, porous, or vinyl-covered surfaces. Use double-sided vinyl tape where recommended by the sign manufacturer to hold the sign in place until the adhesive has fully cured.
 - 3. Mount signs @ 60" above floor on latch side of door.
- D. Pole Mounted Panel Signs: Attach panel signs to heavy duty galvanized hat shaped channels. Mount signs @ 72" above grade. Paint poles in colors as directed.
- E. Cast Letters: Projected spacer mounting on masonry. Mount in locations indicated.

3.2 CLEANING AND PROTECTION:

- A. At completion of the installation, clean soiled sign surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.
- B. Restore sign surfaces that have been damaged prior to Substantial Completion. Replace damaged signs that cannot be repaired to satisfaction of Owner.

3.3 SIGN SCHEDULE:

- A. Exterior Signs:
 - 1. Temporary Project Sign: Provide temporary project sign during construction period as indicated.
 - 2. Handicapped Parking Signs (see door schedule for locations): Provide one pole mounted sign at each designated handicapped parking space.
- B. Interior Signs: Provide wall mounted tactile signs at the following locations:
 - 1. Room Identification: Provide individual room identification signs at each interior door, with room name as indicated on schedules.: Coordinate verbiage with Owner.

- C. Cast Letters: Provide letters as indicated on exterior walls.

END OF SECTION



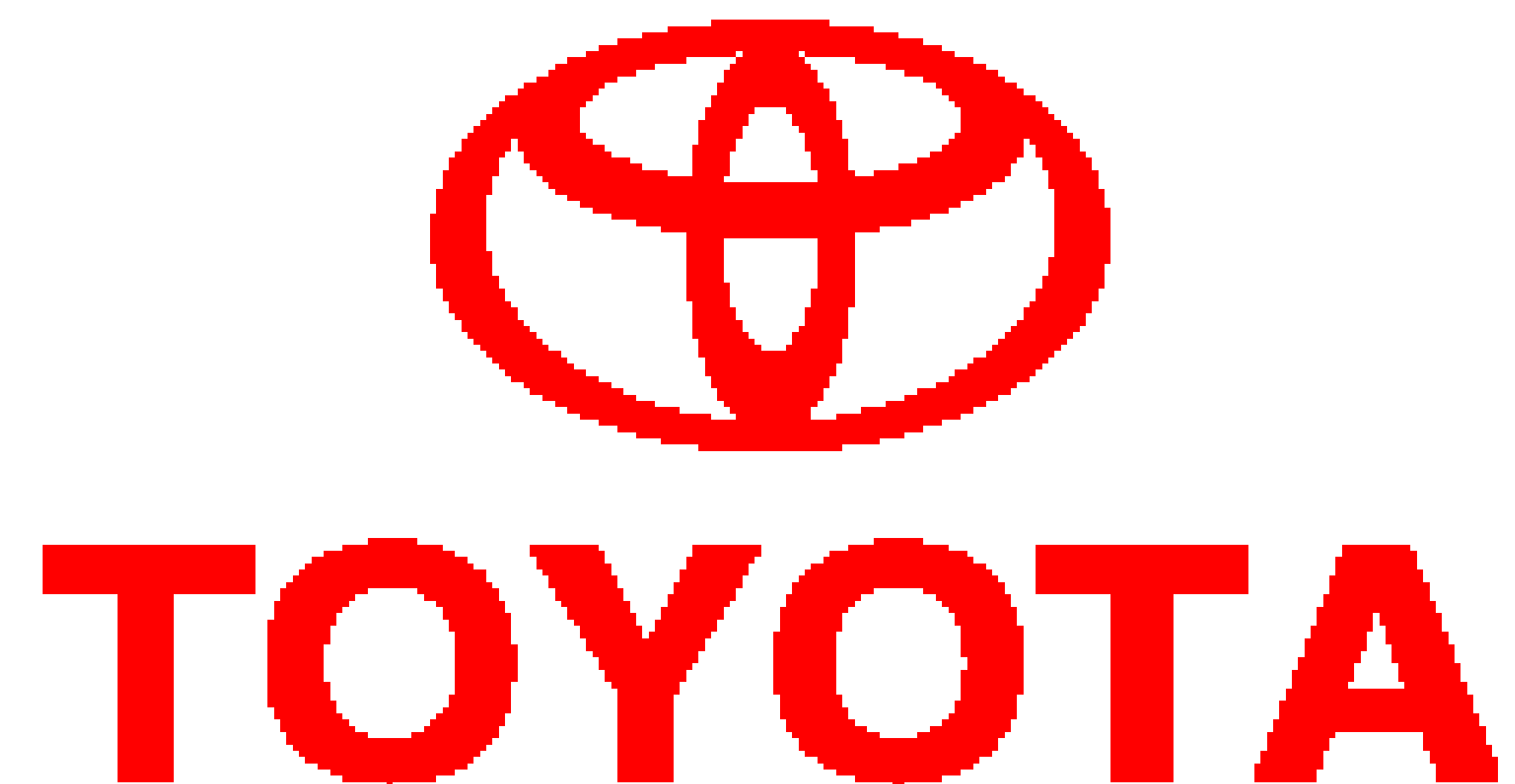
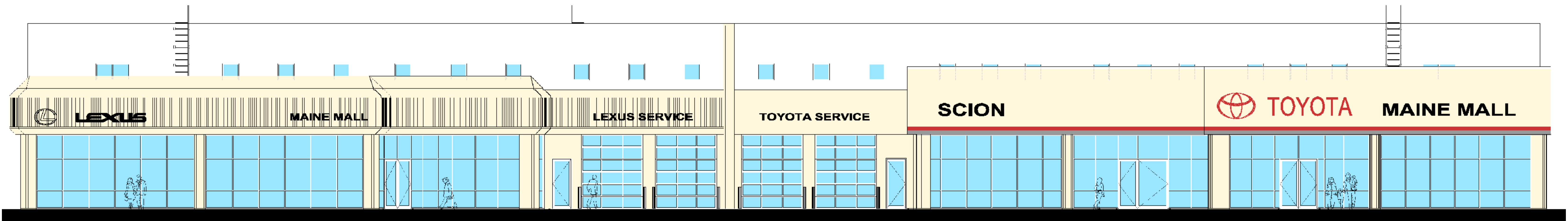
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SECTION 10522

FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section includes the following:
 - 1. Fire extinguishers.
 - 2. Fire extinguisher cabinets.
 - 3. Mounting brackets.

1.3 SUBMITTALS:

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of product specified. For fire extinguisher cabinets include rough-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style, door construction, panel style, and materials.

1.4 QUALITY ASSURANCE:

- A. Single-Source Responsibility: Obtain fire extinguishers and cabinets from one source from a single manufacturer.
- B. Coordination: Verify that fire extinguisher cabinets are sized to accommodate fire extinguishers of type and capacity indicated.
- C. UL-Listed Products: Fire extinguishers UL-listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Allenco.
 - 2. Amerex.
 - 3. Bobrick Washroom Equipment, Inc.
 - 4. JL Industries.
 - 5. Larsen's Manufacturing Co.

6. Potter-Roemer/Div. Smith Industries, Inc.
7. Walter Kidde, Division of Kidde, Inc.
8. Watrous/Div. American Specialties Inc.

2.2 FIRE EXTINGUISHERS

- A. General: Provide fire extinguishers for each extinguisher cabinet and other locations indicated, in colors and finishes selected by Architect from manufacturer's standard, which comply with requirements of governing authorities.
- B. Fill and service extinguishers to comply with requirements of governing authorities and manufacturer.
- C. Multipurpose Dry Chemical Type: UL-rated 2-A:10-B:C, 5-lb. nominal capacity, in enameled steel container.

2.3 MOUNTING BRACKETS:

- A. Provide brackets designed to prevent accidental dislodgment of extinguisher, of sizes required for type and capacity of extinguisher indicated in plated finish.
- B. Provide brackets for extinguishers not located in cabinets.

2.4 FIRE EXTINGUISHER CABINETS:

- A. General: Provide fire extinguisher cabinets where indicated, of suitable size for housing fire extinguishers of types and capacities indicated.
- B. Construction: Manufacturer's standard enameled steel box, with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Weld all joints and grind smooth. Miter and weld perimeter door frames.
- C. Cabinet Type A: Suitable for mounting conditions indicated, of the following types:
 1. Fully recessed: Cabinet box fully recessed in walls.
 2. Trim Style: Fabricate trim in one piece with corners mitered, welded, and ground smooth.
 3. Exposed Trim: One-piece stainless steel combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
 - a. Flat Trim with 5/16-inch projection.
 4. Door Material and Construction: Manufacturer's standard door construction, of material indicated, coordinated with cabinet types and trim styles selected.
 - a. Stainless Steel: Manufacturer's standard finish, hollow steel door construction with tubular stiles and rails.
 5. Door Style: Manufacturer's standard design, vertical duo panel with wired glass.
- D. Cabinet Type B: Suitable for mounting conditions indicated, of the following types:
 1. Semi-recessed: Cabinet box partly recessed in walls.

2. Trim Style: Fabricate trim in one piece with corners mitered, welded, and ground smooth.
 3. Exposed Trim: One-piece stainless steel combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
 - a. Radius Trim with 2-1/2-inch projection.
 4. Door Material and Construction: Manufacturer's standard door construction, of material indicated, coordinated with cabinet types and trim styles selected.
 - a. Stainless Steel: Manufacturer's standard finish, hollow steel door construction with tubular stiles and rails.
 5. Door Style: Manufacturer's standard design, vertical duo panel with wired glass.
- E. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam action latch, or door pull, exposed or concealed, and friction latch. Provide concealed or continuous-type hinge permitting door to open 180 deg.
- F. Identify fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" applied to door. Provide lettering to comply with requirements indicated for letter style, color, size, spacing, and location or, if not otherwise indicated, as selected by Architect from manufacturer's standard arrangements.
 1. Application Process: Silk screen.
- G. Identify bracket-mounted extinguishers with red letter decals spelling "FIRE EXTINGUISHER" applied to wall surface. Letter size, style, and location as selected by Architect.

2.5 FINISHES FOR FIRE EXTINGUISHER CABINETS, GENERAL:

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.
- B. Provide #4 satin polished finish on stainless steel.
- C. Protect mechanical finishes on exposed surfaces from damage by application of strippable, temporary protective covering prior to shipment.

2.6 STEEL FIRE EXTINGUISHER CABINET FINISHES:

- A. Surface Preparation: Solvent-clean surfaces in compliance with SSPS-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel in compliance with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).
- B. Baked Enamel Finish: Immediately after cleaning and pretreatment, apply manufacturer's standard 2-coat baked enamel finish consisting of prime coat and thermosetting topcoat. Comply with paint manufacturer's instructions for application and baking to achieve a minimum dry film thickness of 2.0 mils.

- C. Color and Gloss: Manufacturer's standard color and gloss for cabinet boxes.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities and ADA.
- B. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
- C. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.
- D. Where exact location of surface-mounted cabinets and bracket-mounted fire extinguishers is not indicated, locate as directed by Architect.

END OF SECTION

SECTION 10800

TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section includes the following toilet accessory items:
 - 1. Folding Shower Seats.
 - 2. Grab bars.
 - 3. Mop and broom holders.
 - 4. Paper towel dispensers.
 - 5. Shower curtain rods.
 - 6. Stainless steel framed mirror units.
 - 7. Toilet tissue dispensers.
 - 8. Towel hooks.

1.3 SUBMITTALS:

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specifications Sections.
- B. Product Data for each toilet accessory item specified, including details of construction relative to materials, dimensions, gages, profiles, method of mounting, specified options, and finishes.
- C. Setting Drawings: Where cutouts are required in other work, provide templates, instructions for substrate preparation, cutouts and for installation of anchorage devices.

1.4 QUALITY ASSURANCE:

- A. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to Architect.

1.5 PROJECT CONDITIONS:

- A. Coordination: Coordinate accessory locations, installation, and sequencing with other work to avoid interference and to assure proper installation, operation, adjustment, cleaning, and servicing of toilet accessory items.

1.6 WARRANTY:

- A. Special Project Warranty: Provide manufacturer's written 5-year warranty against silver spoilage of mirrors, agreeing to replace any mirrors that develop visible defects within warranty period.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

- A. Manufacturers: Subject to compliance with requirements, provide toilet accessories by one of the following:
 - 1. A&J Washroom Accessories.
 - 2. American Specialties, Inc.
 - 3. Bobrick Washroom Equipment, Inc.
 - 4. Bradley Corporation.
 - 5. General Accessory Manufacturing Co.
 - 6. McKinney/Parker Products Co.

2.2 MATERIALS, GENERAL:

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22-gage (.034-inch) minimum thickness, unless otherwise indicated.
- B. Brass: Leaded and unleaded, flat products, ASTM B 19; rods, shapes, forgings, and flat products with finished edges, ASTM B 16, Castings, ASTM B-30.
- C. Sheet Steel: Cold-rolled, commercial quality ASTM A 366, 20-gage (.040-inch) minimum, unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.
- D. Galvanized Steel Sheet: ASTM A 527, G60.
- E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.
- F. Mirror Glass: Nominal 6.0 mm (0.23 inch) thick, conforming to ASTM C 1036, Type I, Class 1, Quality q2, and with silvering, electro-plated copper coating, and protective organic coating.
- G. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.
- H. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.
- I. Keys: Unless otherwise indicated, provide universal keys for access to toilet accessory units requiring internal access for servicing, resupply, etc. Provide minimum of six (6) keys to Owner.

2.3 PAPER TOWEL DISPENSERS:

- A. Surface-Mounted Towel Dispensers: Fabricate of stainless steel with hinged front equipped with tumbler lockset. Provide pierced slots at sides as refill indicator.
 - 1. Capacity: Not less than either 400 C-fold or 525 multi-fold paper towels.

2.4 TOILET TISSUE DISPENSERS:

- A. Double-Roll Dispenser: Surface mounted unit fabricated of type 304 stainless steel with satin finish. Sized to accommodate two rolls of core tissue to 5 inch diameter, with vandal resistant spindles and unrestricted dispensing, one roll held in storage.

2.5 GRAB BARS:

- A. Stainless Steel Type: Provide grab bars with wall thickness not less than 18 gage (.050 inch) and as follows:
 - 1. Mounting: Exposed, manufacturer's standard flanges and anchorages.
 - 2. Clearance: 1-1/2 inches clearance between wall surface and inside face of bar.
 - 3. Gripping Surfaces: Manufacturer's standard nonslip texture.
 - 4. Heavy-Duty Size: Outside diameter of 1-1/2 inches.

2.6 SHOWER AND BATH ACCESSORIES:

- A. Towel Hook: 1-1/4" square satin-finished Type 304 stainless steel hook with exposed mounting. Provide vandal resistant fasteners.
- B. Folding Shower Seat: Solid phenolic seat with stainless steel folding support, ADA compliant.

2.7 MISCELLANEOUS ACCESSORIES:

- A. Mop and Broom Holder: 18-gage (.050-inch) Type 304 stainless steel "hat" channel with spring-loaded rubber cam-type mop/broom holders. Provide unit 36 inches long and complete with 4 holders.

2.8 MIRROR UNITS:

- A. Stainless Steel Framed Mirror Units: Fabricate frame with angle or channel shapes of not less than 20 gage (.040 inch), with square corners carefully mitered to hairline joints, welded and ground smooth.

2.9 FABRICATION:

- A. General: Only a maximum 1-1/2-inch diameter, unobtrusive stamped logo of manufacturer, as approved by Architect, is permitted on exposed face of toilet or bath accessory units. On either interior surface not exposed to view or back surface, provide additional identification by means of either a printed, waterproof label or a stamped nameplate, indicating manufacturer's name and product model number.
- B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.
- C. Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all welded construction, without mitered corners. Hang doors or access panels with full-length stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.
- D. Framed Mirror Units, General: Fabricate frames for glass mirror units to accommodate wood, felt, plastic, or other glass edge protection material. Provide mirror backing and

support system that will permit rigid, tamperproof glass installation and prevent accumulation of moisture. Provide galvanized steel backing sheet, not less than 22 gage (.034 inch) and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not an acceptable filler material.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Install toilet accessory units in accordance with manufacturers' instructions, using fasteners appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations and at heights indicated. Comply with ADA requirements.
- B. Secure mirrors to walls in concealed, tamperproof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, in accordance with manufacturer's instructions for type of substrate involved.
- C. Anchor grab bars securely to substrate to withstand a minimum load of 250 lb applied at any point.

3.2 ADJUSTING AND CLEANING:

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish all exposed surfaces in strict accordance with manufacturer's recommendations after removing temporary labels and protective coatings.

3.3 ACCESSORY SCHEDULE:

ITEM	MFR	MODEL NO.
Surface Mounted Waste Receptacle	Bobrick	B-275
Contura Series Partition-Mounted Sanitary Napkin Disposal	Bobrick	B-4354
Grab Bar with Non-slip Gripping Surface (36", 42")*	Bobrick	B-5507.99 series
Grab Bar Anchors	Bobrick	B-2562 Series
Mirror (60Wx36H, 54Wx36H)*	Bobrick	B-290 series
Mop and broom holder	Bobrick	B-223x36
Lavatory-Mounted Soap Dispenser	Bobrick	B-822
Extra Heavy Duty Shower Curtain Rod*	Bobrick	B-6047
Clothes Hook	Bobrick	B-2116
Contura Series Sanitary Napkin Disposal	Bobrick	B-4353
Mop and Broom Holder	Bobrick	B-223-24

* Sizes and lengths indicated within the drawings.

END OF SECTION

Part II
Division 11

Equipment
(Not Applicable)

Part II
Division 12

Furnishings

SECTION 12372

KITCHEN CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section includes wood kitchen cabinets and plastic laminate countertops.

1.3 DEFINITIONS:

- A. Exposed portions of casework include all surfaces including edges visible when doors and drawers are closed. Also included are visible surfaces and visible edges of shelves in open casework and underside of bottoms of casework more than 4 feet above floor.
- B. Semiexposed portions of casework include surfaces behind opaque doors and drawer fronts including shelves, dividers, interior faces of cabinet ends, backs, tops, and bottoms, drawer sides, backs, and bottoms, and back face of doors.
- C. Concealed portions of casework include sleepers, web frames, dust panels, and other surfaces not normally visible after installation.

1.4 SUBMITTALS:

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of casework specified.
- C. Shop drawings showing location and size of each type of casework, accessories, materials, finishes, hardware types and locations, filler panels, and anchorage details. Include fully dimensioned plans and elevations and anchorage details to countertop and walls.
- D. Samples for selection purposes showing full range of colors, textures, and patterns available for selection by Architect and Owner.
 - 1. 2-inch-square samples of plastic laminate required.

1.5 QUALITY ASSURANCE:

- A. Installer Qualifications: Engage an experienced Installer who has successfully completed the installation of kitchen casework similar in material, design, and extent to that indicated for project.
- B. Kitchen Casework: Complying with ANSI/NKCA-A161.1.

- C. NKCA Certification: Provide kitchen casework with National Kitchen Cabinet Association (NKCA) "Certified Cabinet" seal affixed in a semiconcealed location of each unit, evidencing compliance with above standard.
 - D. Plastic Laminate Countertop: Complying with ANSI-A161.2.
 - E. Single-Source Responsibility: Obtain kitchen casework from one source from a single manufacturer.
- 1.6 DELIVERY, STORAGE AND HANDLING:
- A. Do not deliver wood casework until painting, wet work, grinding, and similar operations have been completed in installation areas.
 - B. Deliver casework as a factory-assembled unit, packaged individually, and shipped each in its own carton.
- 1.7 PROJECT CONDITIONS:
- A. Field Measurements: Verify casework and countertop dimensions by field measurements. Verify that kitchen casework may be installed in compliance with the original design and referenced standards.

PART 2 - PRODUCTS

- 2.1 GENERAL:
- A. Products of one or more manufacturers have been specified to establish quality, design, and performance characteristics. Provide either specified products or equivalent products of listed manufacturers, offering equal or better characteristics, as judged solely by the Architect.
 - B. Manufacturer: Provide the following:
 - 1. IXL "Rutledge", Natural finish, "Premier" construction.
 - C. Alternate manufacturers:
 - 1. Aristokraft.
 - 2. Excel.
 - 3. HomeCrest.
 - 4. Kraft Maid.
 - 5. Merillat.
- 2.2 MATERIALS, GENERAL:
- A. Particle Board: ANSI-A208.1 mat-formed particle board, Grade 1-M-2 with minimum density of 40 pcf, internal bond of 60 psi, and minimum screw-holding capacity of 225 lbs. on faces and 200 lbs. on edges.
 - B. Plastic Laminate: Complying with NEMA-LD-3, of thickness, type, and grade designation indicated; in colors or patterns and finishes indicated, or, if not indicated, as selected by Architect from manufacturer's standard selections.

- C. Hardwood Plywood: ANSI/HPMA HP hardwood and decorative plywood, Good Grade (1) or better, of thickness, species, cut, and core construction indicated.
- D. Hardwood Lumber: Clear, dry, sound, and free of defects selected from First Grade lumber (NHLA), of species indicated.
- E. Hardboard: ANSI-A135.4, Class 1, tempered.

2.3 WOOD CASEWORK, LAMINATE FINISH:

- A. Solid Lumber: Dry, sound, selected to eliminate appearance defects, of any species of hardwood or softwood with color and grain characteristics similar to exposed portions.
- B. Style of face construction for base, wall, and full-height units, if any, with drawer fronts, doors, and fixed panels as follows:
 - 1. Reveal overlay style, raised panel doors.
- C. Construction for face frame of casework as follows:
 - 1. Rails and Stiles: Not less than 3/4-inch by 1-1/2-inch solid hardwood lumber with glued mortise and tenon joints.
 - 2. Exposed Ends: Not less than 1/2-inch thick, 45 lb. industrial grade particle board core with not less than 2-mil vinyl laminate on both surfaces. Connect to stile with pressure-glued tongue and plow joint and supplemented by concealed mechanical fasteners.
 - a. Unexposed Ends: Same as exposed ends.
 - 3. Wall and Base Hanging Rails: Not less than 3/4-inch by 3 1/2-inch solid lumber, machined to interlock with end panels, and rabbeted to receive top and bottom panels; with back rails secured under pressure with glue and mechanical fastening devices.
 - 4. Shelving: Not less than 3/4-inch-thick 45 lb. industrial grade particle board prefinished with not less than 2-mil vinyl laminate on top and bottom, and filled and sealed front edge, adjustable.
- D. Construction for wall units with doors and fixed panels as follows:
 - 1. Tops and Bottoms: Not less than 3/8-inch-thick, 45 lb. industrial grade particle board, fully supported by and secured in rabbets in end panels, front frame, and back rail.
 - 2. Backs: Not less than 1/8-inch thick fiberboard, with 2 mil. vinyl laminate, fastened to machined rear edge of ends and to top and bottom hanger rails.
- E. Construction for base units with doors and fixed panels as follows:
 - 1. Front Frame Drawer Rails: Not less than 3/4-inch by 1-1/2-inch lumber mortised and fastened into face frame.
 - 2. Bottoms: Not less than 3/8-inch-thick 45 lb. industrial grade particle board with 2-mil vinyl laminate finish, fully supported by and secured in rabbets in end panels, front frame, and back bottom rail.

3. Back Panels: Not less than 1/8-inch thick tempered hardboard fastened to machined rear edge of end panels and to top and bottom rails. Interior surface prefinished with 2-mil vinyl laminate.
 4. Toe Boards: Not less than 1/2x4", 45 lb. industrial grade particle board core attached between end panels and extended from bottom panel to floor.
 5. Corner Blocks: Glued and fastened in each of 4 top corners to maintain cabinet squareness and rigidity.
- F. Construction for drawer units as follows:
1. Drawer Body: Not less than 7/16-inch-thick hardwood plywood sides and back and 1/2" thick front. Provide box-type construction with subfront and back rabbeted into sides and secured with glue and mechanical fasteners. Exposed fronts fastened to subfront with mounting screws from interior of body. Drawer bottom of not less than 1/8-inch-thick hardwood plywood, set into rabbets in back, sides, and front.
 2. Drawer Suspension: Not less than 75-lb.-capacity twin track, side-mounted drawer glide suspension with nylon rollers, self-closing feature, and positive stop.

2.4 COUNTERTOPS:

- A. Exposed Surfacing Material: 0.042-inch-thick high-pressure plastic laminate, PF.
- B. Substrate (Core) for Exposed Surfacing Material: Particle board.
- C. Countertop Configuration: Provide countertops with the following front styles (nose), cove, and backsplash style, unless otherwise indicated:
 1. Front Style: Square.
 2. Cove: Direct bond.
 3. Backsplash Style: Square.
- D. Countertop Thickness: As indicated, or, if not indicated, not less than 1-1/2 inch, unless otherwise indicated, with substrate (core) not less than 3/4-inch thick.

2.5 CABINET HARDWARE:

- A. General: Manufacturer's standard hardware units of type, size, and finish indicated, complying with ANSI A156.9, of type, material, size, and finish as selected by Architect from manufacturer's standard choices.
- B. Hinges: Manufacturer's standard concealed hinges, fully adjustable.
- C. Pulls: 4" wire pulls on all doors and drawers, brushed aluminum finish.

2.6 FABRICATION:

- A. Fabricate wood kitchen casework to dimensions and profiles and details indicated.
- B. Assemble units in shop in components as large as practicable to minimize field cutting and jointing.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Install casework plumb, level, true, and straight with no distortions using concealed hardwood shims. Where wood kitchen casework abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings as indicated or required and in finish to match cabinet face.
- B. Anchor casework securely in place with concealed fasteners, anchored into structural support members of wall construction. Comply with manufacturer's instructions for support of units.
- C. Attach countertops securely to base units. Spline and glue joints in countertops; provide concealed mechanical clamping of joint. Cut out for fixtures and appliances as indicated; drill pilot holes at corners before making cutouts. Smooth-cut edges and coat with waterproof coating or adhesive.
- D. Complete hardware installation and adjust doors and drawers for proper operation.
- E. Clean all casework surfaces upon completion of installation.

3.2 PROTECTION:

- A. Protect installed casework from damage during construction period. Replace units damaged prior to Substantial Completion.

END OF SECTION

SECTION 12500

WINDOW TREATMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide window treatment on exterior windows, as specified herein, and as needed for a complete and proper installation. (Re: Window Schedule for specified locations)
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Glazing - Section 08800
 - 3. Gypsum Drywall - Section 09260

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340
- B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit sufficient technical data to enable interface of the work of this Section with other trades.
- C. Submit color selections with accurate color representations for use by Owner.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Acceptable Manufacturers:

1. Levelor Lorentzen, Inc. or equal
- B. Basic materials shall meet or equal specifications for "Riviera" (25mm) Blind manufactured by Levolor Lorentzen, Inc.
- C. Components
 1. Head Channel shall be inset-mounted type of .025" thick Tomized steel, U-shaped 3/4" high x 1-3/16" wide and flanged with edges at top and coated with baked-on finish. All hardware shall be enclosed in the metal head.
 2. Guardian Tilter shall be not less than .031" Tomized steel with automatically disengaging worm and gear mechanism to eliminate overdrive and prevent strain or damage to blind or wand.
 3. Tilt Wand shall be transparent with a round fluted cross section approximately 5/16" in diameter with non slip grip.
 4. Cord lock shall be not less than .025" thick Tomized steel and shall be securely attached to head channel. It shall be crashproof with sufficient sensitivity to lock slats at desired height upon release of cords.
 5. Drum and Cradle shall be provided for each blind ladder:
 - a. Drum shall be of .031" thick Tomized steel having two holes with rolled edges to anchor barbs of both ladder ends.
 - b. Cradles shall be of .025" Tomized steel, having two holes with rolled edges to guide cords through bottom of head channel without abrasion.
 6. Tilt Rod shall be u-shaped, with a circular radius of approximately 1/8" designed to achieve minimum torsional deflection.
 7. Inset-mounted end braces shall be nominally .025" thick minimum to .031" maximum Tomized steel with reinforcing ribs and field adjustable tabs.
 8. Installation Brackets shall incorporate a rivet-hinged safety locking front cover and shall be at least .042" thick Tomized steel with baked on finish to match head channel.
 9. Inset-mounted intermediate brackets shall be U-shaped .050" Tomized steel with retainer fingers and shall be supplied with blinds over 36" wide.
 10. Ladders (slat supports) shall be of braided polyester yarn designed for maximum strength and flexibility combined with minimum stretch. Rungs shall consist of not less than two crossed cables inter-braided with the vertical components. Ladders shall support the slats without visible distortion. Distance between ladders shall not exceed 23" for blinds up to 80" long, 22" for blinds over 80" long.
 11. Slats shall be of virgin aluminum alloyed for maximum strength and corrosion resistance. Slats shall be nominally 1" (25mm) wide with an elliptical crown formed after coating and curing. Slat thickness and ladder support distances shall prevent

visible sag or bow after continued usage indoors.

12. Bottom Rail shall be of .031" Tomized steel formed after coating and shall be provided with color compatible molded plastic ladder caps and matching color end caps.
13. Lift cord shall be braided of high strength polyester fiber cord fabric, shall be flexible, have minimum stretch, and maximum abrasion resistance characteristics. Cord shall be of sufficient length, equalized to properly control raising and lowering of blind and spaced not over 46" between cords.
14. Color of blinds shall be in accordance with the schedule provided by the Owner.

PART 3 - EXECUTION

3.1 FABRICATION, INSTALLATION AND WORKMANSHIP

- A. Field measure each opening to receive blinds. Hold constant dimensions from edge of opening to edge of blinds. Size and shape each units so that privacy is maintained though all inset-mounted openings. Length shall be set to assure full closure at sill of each opening.
- B. All workmanship, details, and procedures shall comply with current manufacturer's recommendations.
- C. Fabricate, assemble and finish items at factory as far as practical. Deliver ready to assemble and set in place. Provide blinds free of machine or tool marks or defects that will effect final appearance and operation.
- D. Set all work straight, plumb, level, and in true alignment. Fasten all members securely, and conceal connections where possible. Leave work in complete and operating condition.

3.2 CLEAN UP

- A. Clean adjacent material which has been soiled after installation of this work.
- B. Leave in a neat, clean and unsoiled condition.

END OF SECTION

Part II
Division 13

Special Construction
(Not Applicable)

Part II
Division 14

Conveying Equipment

SECTION 14245
HYDRAULIC ELEVATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Passenger elevator systems.
- B. Motor and pump, controllers, equipment and fitments.

1.3 SYSTEM DESCRIPTION

- A. Hydraulic Elevator System: One unit; telescoping holeless, with motor and pump at location indicated on the plans from the hoistway.
- B. Characteristics of each elevator are as follows:
1. Rated Net Capacity: 2500 lbs.
 2. Rated Speed: 125 ft./min.
 3. Clear Net Platform Size: 6'-8" x 4'-3" inches.
 4. Cab Ceiling Height: 7'-3" inches.
 5. Hoistway and Cab Entrance Frame Opening Sizes: 42 x 84 inches.
 6. Door Type: Single Slide, Right Hand Arrangement.
 7. Door Operation: Side opening.
 8. Number of Stops: 2
 9. Number of Openings: 2 Front; 0 Rear.
- C. Control System: Conform to the following criteria:
1. Single Automatic Operation elevator control system.
- D. Special Operational Features:
1. Key operated Independent Service, Fire Fighter's Service with 3502 cylinders
 2. Interconnect with building fire alarm system, with automatic recall to first floor.
 3. Door Edge Protective Device: Infrared multi-beam door reversal device.
 4. Seismic Design: In accordance with applicable code.

1.4 SUBMITTALS

- A. Shop Drawings: Indicate the following minimum information on shop drawings:
1. Motor and hydraulic pump, valves, and other component locations.
 2. Car, supporting beams, guide rails, and other components in hoistway.
 3. Loads on rails.

4. Applicable seismic design data; certified by a Registered Professional Structural Engineer.
 5. Elevator control functions and operational description.
- B. Product Data: Provide data on the following items:
1. Signal and operating fixtures, operating panels, indicators.
 2. Cab design, dimensions, layout, and components.
 3. Cab and hoistway door and frame details.
- C. Schematic: Provide 3 copies of legible schematic of hydraulic piping and electric wiring diagrams describing installed equipment, to become property of the Owner. Provide one copy of master schematic, mounted in plastic glazed metal frame, mounted on machine room wall.
- D. Samples: Submit samples, illustrating cab floor material, cab interior finishes, cab and hoistway door and frame finishes.
- E. Warranty: One year parts and labor warranty on installed system after date of substantial completion.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
1. ASME A17.1 - Safety Code for Elevators and Escalators.
 2. UL 10B - Fire Tests of Door Assemblies.

1.6 MAINTENANCE

- A. Include full maintenance program during warranty period. Prior to end of warranty period, submit proposal for continued maintenance program to Owner.
- B. Include description of elevator system's method of operation, control description, motor control system, cab and hoistway door operation, visual and audio signals, fire fighter's service, and specified non-standard features.
- C. Include a parts catalog with complete list of equipment replacement parts and spare parts inventory.
- D. Include legible schematic wiring diagrams of installed electrical equipment.
- E. Provide one copy of master hydraulic and electrical schematic and one copy of lubrication chart, each framed with clear plastic; mount on machine room wall.

PART 2 - PRODUCTS

2.1 ELEVATOR SYSTEM AND COMPONENTS

- A. Manufacturers:
1. Canton Elevator
 2. Dover Elevator Systems, Inc.

3. Otis Elevator Co.
 4. Schindler Elevators.
- B. Structural Components: Required to construct elevator system and conform to code.
- C. Sheet Steel: ASTM A366/A366M Class 1 .
- D. Stainless Steel: ASTM A167 Type 304 #4 finish.
- E. Aluminum: ASTM B221, extruded.
- F. Plastic Laminate: General Purpose type, fire retardant finish, surface finish, color/pattern as selected.
- G. Motor; Pump, Valves, Regulators, Fluid Tank, Hydraulic Fluid, Controller, Controls, Buttons, Wiring and Devices, Indicators: UL approved.
1. Motor and Pump: dry type.
 2. Valves: shutoff valves in both hoistway and machine room.
- H. Spring Buffers, Attachment Brackets and Anchors: Purpose designed, sized according to code with safety factors.
- I. Pump Housing: Sheet steel, acoustically insulated, removable with minimum 1" isolation pads.
- J. Guides: T-shaped steel cab guide rails with 4" roller guides.

2.2 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Electrical Characteristics:
1. 208 volts, three phase, 60 Hz.
 2. Starter Characteristics: Reduced voltage, soft start system.
 3. Refer to Division 16 Section for electrical connections.
- B. Operating system: Single car collective controller.

2.3 CAB FABRICATION

- A. Flooring: Carpet, of type specified in Section 09680.
- B. Walls: Plastic laminate on plywood
- C. Front Return Panel: Stainless steel.
- D. Base: Stainless steel, recessed.
- E. Ceiling: Stainless steel.
- F. Light Fixtures: Recessed halogen
- G. Ventilation: Fan above ceiling; perforations in base.
- H. Control Panel and Face Plate: Stainless steel with illuminating call buttons.

- I. Indicator Panel: Above door with illuminating position indicators.
- J. Hand Rail: Stainless steel flat bar stock spaced from wall; placed at rear wall and side walls.
- K. Pad Hooks: Permanent stainless steel button type.
- L. Protective Pads: One set, canvas cover, padded, brass grommets.

2.4 CAB ENTRANCES

- A. Cab Doors: Stainless steel of hollow sandwich panel construction, flush design, rolled profiles, rigid construction.
- B. Cab Door Frames: Stainless steel, welded corner design with smooth invisible joints.
- C. Thresholds: Extruded aluminum type.

2.5 HOISTWAY ENTRANCES

- A. Hoistway Doors: Stainless steel ; of hollow sandwich panel construction, flush design, rolled profiles, rigid construction.
- B. Hoistway Door Frames: Stainless steel of rolled profiles, welded corner with smooth invisible joints. knocked down design.
- C. Door and Frame Construction: 1-1/2 hour fire rating.
- D. Sills: Extruded aluminum.
- E. Landing Buttons: Illuminating type, one for originating UP and one for originating DOWN calls, one button only at terminating landings; marked with arrows
- F. Car Direction Indicators: None.
- G. Car Position Indicator: Wall mounted at each floor with illuminating position indicators.

2.6 FINISHES

- A. Baked Enamel on Steel: Clean and degrease metal surface; apply one coat of primer sprayed and baked; two coats of enamel sprayed and baked; color as selected.
- B. Stainless Steel: #4 Satin Polished.
- C. Aluminum: Clear anodized finish.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Verify that hoistway, pit and machine room are ready for work of this Section.
- B. Verify shaft and openings are of correct size and within tolerances.

- C. Verify that electrical power is available and of the correct characteristics.

3.2 INSTALLATION

- A. Install in accordance with ASME A17.1.
- B. Install system components and connect to building utilities. Power connection of equipment to be done by Electrical Contractor.
- C. Accommodate equipment in space indicated.
- D. Coordinate installation of hoistway wall construction.
- E. Grout sills in place. Set entrances in vertical alignment with car openings and aligned with plumb hoistway lines.
- F. Fill hoistway door frames solid with grout
- G. Adjust for smooth acceleration and deceleration of car so not to cause passenger discomfort.
- H. Adjust automatic floor levelling feature at each floor to achieve 1/4 inch from flush.

3.3 TESTS BY REGULATORY AGENCIES

- A. Obtain required permits to perform tests. Perform tests required by regulatory agencies.
- B. Schedule tests with agencies and Architect, Owner, and Contractor present.

END OF SECTION

Part II
Division 15
Mechanical

Part II
Division 16

Electrical