LAREDO HOUSING FACILITIES CORPORATION

RUSSELL TERRACE REVITALIZATION
NEW CONSTRUCTION – PHASE I

REQUEST FOR PROPOSAL NO. RFP LHFC 170401

NOVEMBER 27, 2017

SPECIFICATIONS

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11-24-17

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BOARD OF DIRECTORS

Dr. Sergio Garza ..... President
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RUSSELL TERRACE REVITALIZATION
NEW CONSTRUCTION – DWELLING UNITS
RFP Number: 170401

TABLE OF CONTENTS

DIVISION 3 - CONCRETE

DIVISION 4 – MASONRY

DIVISION 5 – METALS

DIVISION 6 – WOOD & PLASTIC

DIVISION 7 – THERMAL & MOISTURE PROTECTION

DIVISION 8 - DOORS & WINDOWS

DIVISION 9 – FINISHES

DIVISION 10 – SPECIALTIES

DIVISION 11 - EQUIPMENT (NOT USED)

DIVISION 12 – FURNISHINGS

DIVISION 13 - SPECIAL CONSTRUCTION (NOT USED)

DIVISION 14 – CONVEYING SYSTEMS (NOT USED)

DIVISION 15 – MECHANICAL (REFER TO PLANS)

DIVISION 16 – ELECTRICAL (REFER TO PLANS)

DRAWING INDEX

RUSSELL TERRACE REVITALIZATION
NEW CONSTRUCTION

	ELECTRICAL SPECIFICATIONS	E-3
	HVAC PLAN & NOTES	M-1B
	MECHANICAL SPECS. & NOTES	M-2
	PLUMBING WASTE FLR. PLAN & NOTES	P-1B
	PLUMBING WATER FLR. PLAN & NOTES	P-2B
	PLUMBING NOTES & SCHEDULES	P-3
	PLUMBING RISER DIAGRAMS & DETAILS	P-4
DUPLEX TYPE "B-2" –	TWO - 2 BEDROOM UNITS	
	COVER SHEET	B2-0
	FLOOR PLAN	B2-1
	ELEVATIONS	B2-2
	ROOF FRAMING & NOTES	S.1B2
	CROSS/WALL SECTIONS & NOTES	S.2B2
	ELECTRICAL POWER PLAN & NOTES	E-1B
	ELECTRICAL NOTES & DETAILS	E-2
	ELECTRICAL SPECIFICATIONS	E-3
	HVAC PLAN & NOTES	M-1B
	MECHANICAL SPECS. & NOTES	M-2
	PLUMBING WASTE FLR. PLAN & NOTES	P-1B
	PLUMBING WATER FLR. PLAN & NOTES	P-2B
	PLUMBING NOTES & SCHEDULES	P-3
	PLUMBING RISER DIAGRAMS & DETAILS	P-4
DUPLEX TYPE "B-3" –	TWO - 2 BEDROOM UNITS	
	COVER SHEET	B3-0
	FLOOR PLAN	B3-1
	ELEVATIONS	B3-2
	ROOF FRAMING & NOTES	S.1B3
	CROSS/WALL SECTIONS & NOTES	S.2B3
	ELECTRICAL POWER PLAN & NOTES	E-1B
	ELECTRICAL NOTES & DETAILS	E-2
	ELECTRICAL SPECIFICATIONS	E-3
	HVAC PLAN & NOTES	M-1B
	MECHANICAL SPECS. & NOTES	M-2
	PLUMBING WASTE FLR. PLAN & NOTES	P-1B
	PLUMBING WATER FLR. PLAN & NOTES	P-2B
	PLUMBING NOTES & SCHEDULES	P-3
	PLUMBING RISER DIAGRAMS & DETAILS	P-4
DUPLEX TYPE "C-1" –	TWO - 3 BEDROOM UNITS	
	COVER SHEET	C1-0
	FLOOR PLAN	C1-1
	ELEVATIONS	C1-2
	ROOF FRAMING & NOTES	S.1C1
	CROSS/WALL SECTIONS & NOTES	S.2C1
	ELECTRICAL POWER PLAN & NOTES	E-1C
	ELECTRICAL NOTES & DETAILS	E-2
	ELECTRICAL SPECIFICATIONS	E-3
	HVAC PLAN & NOTES	M-1C
	MECHANICAL SPECS. & NOTES	M-2
	PLUMBING WASTE FLR. PLAN & NOTES	P-1C
	PLUMBING WATER FLR. PLAN & NOTES	P-2C
	PLUMBING NOTES & SCHEDULES	P-3

	PLUMBING RISER DIAGRAMS & DETAILS	P-4

DUPLEX TYPE "C-2" –	TWO - 3 BEDROOM UNITS	
	COVER SHEET	C2-0
	FLOOR PLAN	C2-1
	ELEVATIONS	C2-2
	ROOF FRAMING & NOTES	S.1C2
	CROSS/WALL SECTIONS & NOTES	S.2C2
	ELECTRICAL POWER PLAN & NOTES	E-1C
	ELECTRICAL NOTES & DETAILS	E-2
	ELECTRICAL SPECIFICATIONS	E-3
	HVAC PLAN & NOTES	M-1C
	MECHANICAL SPECS. & NOTES	M-2
	PLUMBING WASTE FLR. PLAN & NOTES	P-1C
	PLUMBING WATER FLR. PLAN & NOTES	P-2C
	PLUMBING NOTES & SCHEDULES	P-3
	PLUMBING RISER DIAGRAMS & DETAILS	P-4

DUPLEX TYPE "D-1" –	TWO - 4 BEDROOM UNITS	
	COVER SHEET	D1-0
	FLOOR PLAN	D1-1
	ELEVATIONS	D1-2
	ROOF FRAMING & NOTES	S.1D2
	CROSS/WALL SECTIONS & NOTES	S.2D2
	ELECTRICAL POWER PLAN & NOTES	E-1D
	ELECTRICAL NOTES & DETAILS	E-2
	ELECTRICAL SPECIFICATIONS	E-3
	HVAC PLAN & NOTES	M-1D
	MECHANICAL SPECS. & NOTES	M-2
	PLUMBING WASTE FLR. PLAN & NOTES	P-1D
	PLUMBING WATER FLR. PLAN & NOTES	P-2D
	PLUMBING NOTES & SCHEDULES	P-3
	PLUMBING RISER DIAGRAMS & DETAILS	P-4

DUPLEX TYPE "D-2" –	TWO - 4 BEDROOM UNITS	
	COVER SHEET	D2-0
	FLOOR PLAN	D2-1
	ELEVATIONS	D2-2
	ROOF FRAMING & NOTES	S.1D2
	CROSS/WALL SECTIONS & NOTES	S.2D2
	ELECTRICAL POWER PLAN & NOTES	E-1D
	ELECTRICAL NOTES & DETAILS	E-2
	ELECTRICAL SPECIFICATIONS	E-3
	HVAC PLAN & NOTES	M-1D
	MECHANICAL SPECS. & NOTES	M-2
	PLUMBING WASTE FLR. PLAN & NOTES	P-1D
	PLUMBING WATER FLR. PLAN & NOTES	P-2D
	PLUMBING NOTES & SCHEDULES	P-3
	PLUMBING RISER DIAGRAMS & DETAILS	P-4

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01100 - SUMMARY

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Project consists of the complete construction of 138 new Dwelling Units at the Russell Terrace Residential Development

1. Project Location: 500 Richter Court Dr.., Laredo, Texas 78040.
2. Owner: Laredo Housing Authority
   2000 Houston St.
   Laredo, Texas 78040

B. The Contract Documents dated October 15, 2017, prepared as follows:

Architects Plus, Inc., 101 Merlin Rd., Laredo, TX. All questions pertaining to the construction work shall be addressed to Mario Jasso, Project Architect. Requirements of the work are contained in the contract documents, and include cross-references herein to published information, which is not necessarily bound therewith.

C. Verbal Summary: Without force and effect on requirements of contract documents, the (incomplete) description of the work of the Contract can be summarized as follows:

The work includes the complete construction of 138 new wood framed dwelling units on existing concrete slabs on grade including limited sitework, interior and exterior finishes, composition shingle roofs, thermal insulation, new kitchen cabinets, mechanical, electrical and plumbing as per the construction documents.

Existing building foundations and/or slabs on grade, sidewalks, trees, stumps, to remain. Protect all items noted to remain or within the project limits but which serve buildings which will remain from damage due to construction operations.

All Building Construction shall be in full compliance of the following codes:

International Building Code 2012 Edition
International Residential Code 2012 Edition
International Plumbing Code 2012 Edition
International Mechanical Code 2012 Edition
International Energy Code 2015
International Property Maintenance Code 2012
International Fuel Gas Code 2012
International Private Sewage Disposal Code 2012
International Existing Building Code 2012
National Electrical Code 201 Edition

All selected contractors shall be responsible for paying any applicable permit fees required by the City of Laredo for work of their trades and said fees shall be included in their respective proposals.

D. Project may be constructed under a general construction contract or separate contracts.

1.2 WORK SEQUENCE

A. The Work shall be conducted in a (6) Six Phases.

1. Work of all phases shall be substantially completed within 90 calendar days of the Notice to Proceed for each Phase.

1.3 USE OF PREMISES

A. General: Contractor shall have limited use of premises for construction operations and shall provide any necessary protective measures as required to provide free and safe access to LHFC personnel, Russell Terrace Residents and general public to and from occupied portions of the project site. Erect temporary covered passageways as required by authorities having jurisdiction. Contractor's use of premises is limited only by Owner's and Resident's right to occupy existing facilities which are to remain and to perform work or to retain other contractors on portions of Project.

1.4 WORK UNDER OTHER CONTRACTS

A. Separate Contract: Owner will award separate construction contracts for performance of certain construction operations at Project site. The construction operations of this contract are scheduled to be in conjunction with the work of separate construction Contracts.

1.5 FUTURE WORK

A. Future Contract: Owner will award a separate contracts for additional work to be performed at the site concurrently with this construction work. Completion of that work will depend on successful completion of preparatory work under this Contract.

1.6 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01100

SECTION 01210 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

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

1. Contingency allowances.

B. See Division 1 Section "Unit Prices" for procedures for using unit prices with quantity allowances.

C. See Division 1 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.2 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Project Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Project Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Project Architect from the designated supplier.

1.3 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

1.4 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Project Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Include a Ten Thousand ($10,000) dollar - Contingency Allowance.

END OF SECTION 01210

SECTION 01250 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. See Division 1 Section "Allowances" for procedural requirements for handling and processing allowances.

C. See Division 1 Section "Unit Prices" for administrative requirements for using unit prices.

1.2 MINOR CHANGES IN THE WORK

A. Project Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on District's approved "Field Order" Form.

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Project Architect will issue on District's approved "Construction Change Directive" form, a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Project Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.

1. Include a statement outlining 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 the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use LHFC approved "Construction Change Directive" form.

1.4 ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. 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. Submit claims within 10 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Owner will reject claims submitted later than 10 days after such authorization.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Project Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01250

SECTION 01290 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Submittals Schedule and Application for Payment forms with Continuation Sheets.
2. Submit the Schedule of Values to Project Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of Project Architect.
c. Project Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

a. Related Specification Section or Division.
b. Description of the Work.
c. Change Orders (numbers) that affect value.
d. Dollar value.
e. Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project

Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.

4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Project Architect and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times: The date for each progress payment is the 15th day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends 15 days before the date for each progress payment.

D. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Project Architect will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

F. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Project Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.

    a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Submittals Schedule (preliminary if not final).
5. List of Contractor's staff assignments.
6. Copies of building permits.
7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
8. Certificates of insurance and insurance policies.
9. Performance and payment bonds.
10. Data needed to acquire Owner's insurance.

I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01290

SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

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

1. Contractor's Construction Schedule.
2. Submittals Schedule.
3. Daily construction reports.
4. Field condition reports.

B. See Division 1 Section "Summary of Multiple Contracts" for preparing a combined Contractor's Construction Schedule.

C. See Division 1 Section "Payment Procedures" for submitting the Schedule of Values.

D. See Division 1 Section "Closeout Procedures" for submitting photographic negatives as Project Record Documents at Project closeout.

1.2 DEFINITIONS

A. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.

B. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

C. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

D. Major Area: A story of construction, a separate building, or a similar significant construction element.

1.3 SUBMITTALS

A. Submittals Schedule: Submit 3 copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).

4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Project Architect's final release or approval.

B. Preliminary Network Diagram: Submit 2 printed copies, one a single sheet of reproducible media and one a print, large enough to show entire network for entire construction period.

C. Contractor's Construction Schedule: Submit 2 printed copies of initial schedule, one a reproducible print and one a blue- or black-line print, large enough to show entire schedule for entire construction period.

D. CPM Reports: Concurrent with CPM schedule, submit 3 printed copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.

E. Daily Construction Reports: Submit 3 copies at weekly intervals.

F. Field Condition Reports: Submit 3 copies at time of discovery of differing conditions.

1.4 QUALITY ASSURANCE (Not Used)

1.5 COORDINATION

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

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

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

C. Auxiliary Services: Cooperate with photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities including temporary lighting.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

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

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

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

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

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

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

B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 30 days, unless specifically allowed by Project Architect.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include not less than 3 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Project Architect's administrative procedures necessary for certification of Substantial Completion.

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

1. Phasing: Arrange list of activities on schedule by phase.
2. Work under More Than One Contract: Include a separate activity for each contract.
3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
4. Work Restrictions: Show the effect on the schedule of the following:

a. Coordination with existing construction.
b. Limitations of continued occupancies.
c. Uninterruptible services.
d. Use of premises restrictions.
e. Provisions for future construction.
f. Seasonal variations.
g. Environmental control.

5. Work Stages: Indicate important stages of construction for each major portion of the Work.
6. Other Constraints: Discovery of environmental health hazards, asbestos, lead paint, etc., Stop work and notify Owner.

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

E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

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

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

1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

C. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Principal events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.

D. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

2.4 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording events at Project site, including the following:

1. List of subcontractors.
2. High and low temperatures and general weather conditions.
3. Accidents.
4. Stoppages, delays, shortages, and losses.
5. Meter readings and similar recordings.
6. Orders and requests of authorities having jurisdiction.
7. Services connected and disconnected.
8. Equipment or system tests and startups.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At two week intervals, update schedule to reflect actual construction progress and activities. Issue schedule 24 hours before each regularly scheduled progress meeting.

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

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

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

3.2 CONSTRUCTION PHOTOGRAPHS (Not Used)

END OF SECTION 01320

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

B. See Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule and construction photographs.

C. See Division 1 Section "Quality Requirements" for submitting test and inspection reports and Delegated-Design Submittals and for erecting mockups.

D. See Division 1 Section "Closeout Procedures" for submitting warranties Project Record Documents and operation and maintenance manuals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Project Architect's responsive action.

B. Informational Submittals: Written information that does not require Project Architect's approval. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

a. Project Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Project Architect's receipt of submittal.

1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Project Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Allow 10 days for processing each resubmittal.
4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately **4 by 5 inches** on label or beside title block to record Contractor's review and approval markings and action taken by Project Architect.
3. Include the following information on label for processing and recording action taken:

a. Project name.
b. Date.
c. Name and address of Project Architect.
d. Name and address of Contractor.
e. Name and address of subcontractor.
f. Name and address of supplier.
g. Name of manufacturer.
h. Unique identifier, including revision number.
i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Other necessary identification.

E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless Project Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

1. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Project Architect will discard submittals received from sources other than Contractor.

1. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
2. Transmittal Form: Use AIA Document G810.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Use only final submittals with mark indicating action taken by Project Architect in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Number of Copies: Submit 3 copies of each submittal, unless otherwise indicated. Project Architect will return 2 copies. Mark up and retain one returned copy as a Project Record Document.

B. Product Data: (Not Used)

C. Shop Drawings: (Not Used)

D. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."

E. Schedule of Values: Comply with requirements in Division 1 Section "Payment Procedures."

F. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit 2 copies of each submittal, unless otherwise indicated. Project Architect will not return copies.

2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."

B. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Project Architects and owners, and other information specified.

D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

J. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

K. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

L. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

M. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

N. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures."

O. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

P. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

Q. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections.

R. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Project Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 PROJECT ARCHITECT'S ACTION

A. General: Refer to General Conditions for indication and definition of action by Project Architect/Engineer upon receipt and processing of submittals from Contractor. Project Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action. When possible, Project Architect will return submittal within two (2) weeks of receipt of submittal and within three (3) weeks for submittals requiring engineer or other consultant review. Where submittal must be held for coordination, Project Architect/engineer will process submittal as soon as possible after all coordination information and material is provided by contractor.

B. Action Submittals: Project Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Project Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

Final Unrestricted Release: Work may proceed, provided it complies with contract documents, when submittal is returned with the following:

Marking: "A Action".

Final But Restricted Release: Work may proceed, provided it complies with notations and corrections on submittal and with contract documents, when submittal is returned with the following:

Marking: "B Action".

Returned For Resubmittal: Do not proceed with work. Revise submittal in accordance with notations thereon, and resubmit without delay to obtain a different action marking. Do not allow submittals with the following marking (or unmarked submittals where a marking is required) to be used in connection with performance of the work:

Marking: "Action R".

Other Action: Where submittal is returned for other reasons, with Project Architect/Engineer's explanation included, it will be marked as follows:

Marking: "Action X".

Action Stamp: Project Architect's/Engineer's action stamp, for use on submittals to be returned to Contractor, is self-explanatory as marked.

NOTE: The contractor shall not be relieved of responsibility for deviations from requirements of the contract documents by the Project Architect's approval of shop drawings, product data, samples, or similar submittals unless the contractor has specifically informed the Project Architect, in writing and on the submittal, of such deviation at the time of submittal and the Project Architect has given written approval to the specific deviation. The contractor shall not be relieved of responsibility for errors or omissions in shop drawings, product data, samples, or similar submittals by the Project Architect's approval thereof.

C. Informational Submittals: Project Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Project Architect will forward each submittal to appropriate party.

D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION 01330

SECTION 01400 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.

2. Requirements for Contractor to provide quality-control services required by Project Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. See Divisions 2 through 16 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Project Architect.

1.3 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Reports: Prepare and submit certified written reports that include the following:

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 tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Ambient conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

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

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project. Where manufacturer's warranty may be required, provide installer acceptable to the

manufacturer. Install shall be an authorized representative of the manufacturer for both installation and maintenance.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

1.5 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

    a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

1. Testing agency will notify Project Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.

2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Project Architect with copy to Contractor and to authorities having jurisdiction.
3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and re-inspect corrected work.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Project Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Project Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
6. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

SECTION 01420 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Project Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Project Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Project Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Installer": Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Using a term such as "carpentry" does not 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 tradespeople of the corresponding generic name.

J. "Experienced": When used with an entity, "experienced" means having successfully completed a minimum of 5 previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

K. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless 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 to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Project Architect for a decision before proceeding.

1. 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. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Project Architect for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available on request.

E. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list:

ADAAG	Americans with Disabilities Act (ADA)
CFR	Code of Federal Regulations
CRD	Handbook for Concrete and Cement
DOD	Department of Defense Specifications and Standards
FED-STD	Federal Standard (See FS)

FS	Federal Specification
FTMS	Federal Test Method Standard (See FS)
MILSPEC	Military Specification and Standards
UFAS	Uniform Federal Accessibility Standards

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list:

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Project Architectural Manufacturers Association
AAN	American Association of Nurserymen (See ANLA)
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists (The)
ABMA	American Bearing Manufacturers Association
ACI	American Concrete Institute/ACI International
ACPA	American Concrete Pipe Association
ADC	Air Diffusion Council
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AFPA	American Forest & Paper Association (See AF&PA)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHA	American Hardboard Association
AHAM	Association of Home Appliance Manufacturers
AI	Asphalt Institute
AIA	American Institute of Project Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction

ALA	American Laminators Association (See LMA)
ALCA	Associated Landscape Contractors of America
ALSC	American Lumber Standard Committee
AMCA	Air Movement and Control Association International, Inc.
ANLA	American Nursery & Landscape Association (Formerly: AAN - American Association of Nurserymen)
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts
APA	APA - The Engineered Wood Association
APA	Architectural Precast Association
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ASCA	Architectural Spray Coaters Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International (The American Society of Mechanical Engineers International)
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
AWCI	AWCI International (Association of the Wall and Ceiling Industries International)
AWCMA	American Window Covering Manufacturers Association (See WCMA)
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
CCC	Carpet Cushion Council
CCFSS	Center for Cold-Formed Steel Structures
CDA	Copper Development Association Inc.

CEA	Canadian Electricity Association
CFFA	Chemical Fabrics & Film Association, Inc.
CGA	Compressed Gas Association
CGSB	Canadian General Standards Board
CIMA	Cellulose Insulation Manufacturers Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CPA	Composite Panel Association (Formerly: National Particleboard Association)
CPPA	Corrugated Polyethylene Pipe Association
CRI	Carpet & Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSA	CSA International (Formerly: IAS - International Approval Services)
CSI	Construction Specifications Institute (The)
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
DHI	Door and Hardware Institute
EIA/TIA	Electronic Industries Alliance/Telecommunications Industry Association
EIMA	EIFS Industry Members Association
EJMA	Expansion Joint Manufacturers Association, Inc.
FCI	Fluid Controls Institute
FGMA	Flat Glass Marketing Association (See GANA)
FM	Factory Mutual System (See FMG)
FMG	FM Global (Formerly: FM - Factory Mutual System)
GA	Gypsum Association
GANA	Glass Association of North America (Formerly: FGMA - Flat Glass Marketing Association)
GRI	Geosynthetic Research Institute
GTA	Glass Tempering Division of Glass Association of North America (See GANA)
HI	Hydraulic Institute

HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (See NAAMM)
HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
IAS	International Approval Services (See CSA International)
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute (The)
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IGCC	Insulating Glass Certification Council
ILI	Indiana Limestone Institute of America, Inc.
IRI	Industrial Risk Insurers
ITS	Intertek Testing Services
IWS	Insect Screening Weavers Association (Now defunct)
KCMA	Kitchen Cabinet Manufacturers Association
LGSI	Light Gage Structural Institute
LMA	Laminating Materials Association (Formerly: ALA - American Laminators Association)
LPI	Lightning Protection Institute
LSGA	Laminated Safety Glass Association (See GANA)
MBMA	Metal Building Manufacturers Association
MCA	Metal Construction Association
MFMA	Maple Flooring Manufacturers Association
MFMA	Metal Framing Manufacturers Association
MGPHO	Medical Gas Professional Healthcare Organization, Inc.
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
ML/SFA	Metal Lath/Steel Framing Association (See SSMA)
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Project Architectural Metal Manufacturers

NAAMM	North American Association of Mirror Manufacturers (See GANA)
NACE	NACE International (National Association of Corrosion Engineers International)
NAIMA	North American Insulation Manufacturers Association (The)
NAMI	National Accreditation and Management Institute, Inc.
NAPM	National Association of Photographic Manufacturers (See PIMA)
NBGQA	National Building Granite Quarries Association, Inc.
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute
NCTA	National Cable Television Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NELMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	National Oak Flooring Manufacturers Association
NPA	National Particleboard Association (See CPA)
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSA	National Stone Association
NSF	NSF International (National Sanitation Foundation International)
NTMA	National Terrazzo and Mosaic Association, Inc.
NWWDA	National Wood Window and Door Association (See WDMA)
PCI	Precast/Prestressed Concrete Institute
PDCA	Painting and Decorating Contractors of America
PDI	Plumbing & Drainage Institute

PGI	PVC Geomembrane Institute
PIMA	Photographic & Imaging Manufacturers Association (Formerly: NAPM - National Association of Photographic Manufacturers)
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
RMA	Rubber Manufacturers Association
SAE	SAE International
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SGCC	Safety Glazing Certification Council
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)
SPI	The Society of the Plastics Industry
SPIB	Southern Pine Inspection Bureau (The)
SPI/SPFD	The Society of the Plastics Industry Spray Polyurethane Foam Division (See SPFA)
SPRI	SPRI (Single Ply Roofing Institute)
SSINA	Specialty Steel Industry of North America
SSMA	Steel Stud Manufacturers Association (Formerly: ML/SFA - Metal Lath/Steel Framing Association)
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, and Restoration Institute
TCA	Tile Council of America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TPI	Truss Plate Institute

TPI	Turfgrass Producers International
UFAC	Upholstered Furniture Action Council
UL	Underwriters Laboratories Inc.
UNI	Uni-Bell PVC Pipe Association
USITT	United States Institute for Theatre Technology, Inc.
USP	U.S. Pharmacopeia
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association (Formerly: AWCMA - American Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WIC	Woodwork Institute of California
WMMPA	Wood Moulding & Millwork Producers Association
WWPA	Western Wood Products Association

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list:

BOCA	BOCA International, Inc.
CABO	Council of American Building Officials (See ICC)
IAPMO	International Association of Plumbing and Mechanical Officials (The)
ICBO	International Conference of Building Officials
ICC	International Code Council (Formerly: CABO - Council of American Building Officials)
SBCCI	Southern Building Code Congress International, Inc.

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list:

CE	Army Corps of Engineers
CPSC	Consumer Product Safety Commission
DOC	Department of Commerce
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FCC	Federal Communications Commission

FDA	Food and Drug Administration
GSA	General Services Administration
HUD	Department of Housing and Urban Development
LBL	Lawrence Berkeley Laboratory (See LBNL)
LBNL	Lawrence Berkeley National Laboratory
NCHRP	National Cooperative Highway Research Program (See TRB)
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration
RUS	Rural Utilities Service (See USDA)
TRB	Transportation Research Board
USDA	Department of Agriculture
USPS	Postal Service

D. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list:

CAPUC	(See CPUC)
CBHF	State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation
CPUC	California Public Utilities Commission
TFS	Texas Forest Service Forest Products Laboratory

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01420

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

SUMMARY

This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

See Division 1 Section "Summary of Multiple Contracts" for division of responsibilities for temporary facilities and controls.

See Division 1 Section "Execution Requirements" for progress cleaning requirements.

DEFINITIONS

Permanent Enclosure: (Not Used)

USE CHARGES

General: Cost or use charges for temporary facilities are not chargeable to Owner or Project Architect and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, occupants of Project, Project Architect, testing and inspecting agencies and personnel of authorities having jurisdiction.

Water Service: Use water from Owner's existing water system without metering and without payment of use charges.

Electric Power Service: Use electric power from Owner's existing system without metering and without payment of use charges.

SUBMITTALS

Temporary Utility Reports: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.

QUALITY ASSURANCE

Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.

Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

PROJECT CONDITIONS

Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.

Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:

Keep temporary services and facilities clean and neat.
Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

MATERIALS

General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Project Architect. Provide materials suitable for use intended.

Pavement: Comply with Division 2 pavement Sections.

Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top rails.

Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry, Miscellaneous Carpentry."

Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.

Water: Potable.

EQUIPMENT

Field Offices: Prefabricated, mobile units, with lockable entrances, operable windows, and serviceable finishes; heated and air conditioned; on foundations adequate for normal loading.

Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.

Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

Self-Contained Toilet Units: Single-occupant units of chemical; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

Drinking-Water Fixtures: Containerized, drinking-water units, including paper cup supply.

Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

INSTALLATION, GENERAL

Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

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.

TEMPORARY UTILITY INSTALLATION

General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.

Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.

1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
2. Connect temporary sewers to municipal system as directed by sewer department officials.
3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. After heavy use, restore normal conditions promptly.
4. Provide temporary filter beds, settlement tanks, separators, and similar devices to purify effluent to levels acceptable to authorities having jurisdiction.

Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

1. Provide rubber hoses as necessary to serve Project site.
2. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.

Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.

1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Provide separate facilities for male and female personnel.
3. Drinking-Water Facilities: Provide bottled-water, drinking-water units.

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 disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.

1. Install electric power service underground, unless overhead service must be used.
2. Install power distribution wiring overhead and rise vertically where least exposed to damage.

Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.

1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

2. Telephone Service: Provide a portable cellular telephone for superintendent's use in making and receiving telephone calls when away from field office.

SUPPORT FACILITIES INSTALLATION

General: Comply with the following:

1. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

Dewatering Facilities and Drains: Comply with requirements in applicable Division 2 Sections for temporary drainage and dewatering facilities and operations not directly associated with construction activities included in individual Sections. Where feasible, use same facilities. Maintain Project site, excavations, and construction free of water.

Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.

1. Prepare temporary signs to provide directional information to construction personnel and visitors.

Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution Requirements " for progress cleaning requirements.

1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
2. Develop a waste management plan for Work performed on Project. Indicate types of waste materials Project will produce and estimate quantities of each type. Provide detailed information for on-site waste storage and separation of recyclable materials. Provide information on destination of each type of waste material and means to be used to dispose of all waste materials.

SECURITY AND PROTECTION FACILITIES INSTALLATION

Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.

Storm water Control: Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from construction damage. Protect tree root systems from damage, flooding, and erosion.

Pest Control: Before starting demolition work, retain a local exterminator or pest-control company to perform extermination and control procedures at regular intervals so Project will be free of pests and their

residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.

Site Enclosure Fence: Before construction operations begin, install enclosure fence with lockable entrance gates. Locate where indicated, or enclose entire Project site or portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering site except by entrance gates.

1. Set chain-link fence posts in concrete footings.
2. Provide gates in sizes and at locations necessary to accommodate delivery vehicles and other construction operations.
3. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with one set of keys.

Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.

Temporary Fire Protection:

1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.

    a. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell or as required by codes.

    b. Store combustible materials in containers in fire-safe locations.
2. Maintain unobstructed access to fire extinguishers, fire hydrants, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
3. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
4. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

OPERATION, TERMINATION, AND REMOVAL

Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.

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

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

END OF SECTION 01500

SECTION 01731 - CUTTING AND PATCHING

PART 1 - GENERAL

SUMMARY

This Section includes procedural requirements for cutting and patching.

See Division 7 Section "Through-Penetration Firestop Systems" for patching fire-rated construction.

See Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

Requirements in this Section apply to mechanical and electrical installations. See Divisions 15 and 16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

SUBMITTALS

Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

1. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
2. Dates: Indicate when cutting and patching will be performed.
3. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
4. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
5. Project Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

QUALITY ASSURANCE

Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Project Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

WARRANTY (Not Used)

PART 2 - PRODUCTS

MATERIALS

General: Comply with requirements specified in other Sections of these Specifications.

Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

EXAMINATION

Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

PREPARATION

Temporary Support: Provide temporary support of Work to be cut.

Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

PERFORMANCE

General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and/or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

END OF SECTION 01731

SECTION 01770 - CLOSEOUT PROCEDURES

GENERAL

SUMMARY

This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project Record Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Instruction of Owner's personnel.
6. Final cleaning.

See Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.

See Division 1 Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.

See Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for products of those Sections.

SUBSTANTIAL COMPLETION

Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Touch up and otherwise repair and restore damaged exposed finishes to eliminate visual defects.

Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Project Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Project Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Project Architect, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

FINAL COMPLETION

Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. Submit certified copy of Project Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Project Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.

Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Project Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Project Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

LIST OF INCOMPLETE ITEMS (PUNCH LIST)

Preparation: Submit three (3) copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A.

1. Organize list of spaces in sequential order.

PROJECT RECORD DOCUMENTS

General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Project Architect's reference during normal working hours.

Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.

1. Mark Record Prints to show the actual location where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

    a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
    b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
3. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
4. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Note related Change Orders and Record Drawings, where applicable.

OPERATION AND MAINTENANCE MANUALS (NOT USED)

WARRANTIES (NOT USED)

PRODUCTS (NOT USED)

EXECUTION

FINAL CLEANING

General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

Cleaning: Employ experienced workers or professional cleaners for final cleaning.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

    a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    e. Clean exposed exterior finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces.
    f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    g. Sweep concrete floors broom-clean in unoccupied spaces.
    h. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

        1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
        i. Leave Project clean and ready for Owner's use.

Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

END OF DIVISION 1

DIVISION 2 SITEWORK

SECTION 02230 - SITE CLEARING

GENERAL

SUMMARY

This Section includes the following:

1. Protecting existing trees and vegetation to remain.
2. Removing trees and other vegetation.
3. Clearing and grubbing.
4. Topsoil stripping.
5. Removing above-grade site improvements.
6. Disconnecting, capping or sealing, and abandoning site utilities in place.
7. Disconnecting, capping or sealing, and removing site utilities.

MATERIALS OWNERSHIP

Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site on a daily basis.

PROJECT CONDITIONS

Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

Notify utility locator service for area where Project is located before site clearing.

PRODUCTS

SOIL MATERIALS

Satisfactory Soil Materials: As specified in Division 2 Section "Earthwork."

1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

EXECUTION

PREPARATION

Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

Locate and clearly flag trees and vegetation to remain or to be relocated.

Protect existing site improvements to remain from damage during demolition operations.

1. Restore damaged improvements to their original condition, as acceptable to Owner prior to substantial completion of each demolition phase.

TREE PROTECTION

Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.

Do not excavate within drip line of trees, unless otherwise indicated.

Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

Repair or replace trees and vegetation indicated to remain that are damaged by demolition operations, in a manner approved by Project Architect.

UTILITIES

Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

Do not interrupt utilities serving facilities occupied by Owner, Russell Terrace Residents or others unless permitted. Arrange to provide temporary utility services.

Excavate for and remove underground utilities indicated to be removed.

CLEARING AND GRUBBING

Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.

Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding 8-inch loose depth, and compact each layer to a density equal to adjacent original ground.

TOPSOIL STRIPPING

Remove sod and grass before stripping topsoil.

Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

SITE IMPROVEMENTS

Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

DISPOSAL

Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property on a daily basis.

END OF SECTION 02230

SECTION 02260 - EXCAVATION SUPPORT AND PROTECTION

GENERAL

SUMMARY

This Section includes temporary excavation support and protection systems.

PERFORMANCE REQUIREMENTS

Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.

SUBMITTALS (NOT USED)

PROJECT CONDITIONS

Verify existing conditions at site, including all improvements which are to remain, locate and identify existing utilities which will be affected by demolition operations.

PRODUCTS

MATERIALS

General: Provide materials that are either new or in serviceable condition.

Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.

Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.

Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of **4 inches**.

EXECUTION

PREPARATION

Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.

Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.

Promptly repair damages to adjacent facilities caused by demolition operations.

REMOVAL AND REPAIRS

Remove any excavation support and protection systems, **if utilized**, when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlying construction and abandon remainder.
2. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION 02260

SECTION 02270 - EARTHWORK

GENERAL

SUMMARY

This Section includes the following:

1. Excavating and backfilling.

DEFINITIONS

Backfill: Soil materials used to fill an excavation.

Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

Excavation: Removal of material encountered above subgrade elevations.

1. Additional Excavation: Excavation below subgrade elevations as directed by Project Architect. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Project Architect. Unauthorized excavation, as well as remedial work directed by Project Architect, shall be without additional compensation.

Fill: Soil materials used to raise existing grades.

Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

PROJECT CONDITIONS

Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Project Architect and then only after arranging to provide temporary utility services according to requirements indicated.

PRODUCTS

SOIL MATERIALS

General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

Backfill and Fill: Satisfactory soil materials.

Sub-base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2- inch sieve and not more than 12 percent passing a No. 200 sieve.

Detectable Warning Tape: Polyethylene film warning tape encasing a metallic core, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility.

EXECUTION

PREPARATION

Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, freezing temperatures or frost, and other hazards created by earthwork operations. Provide protective insulating materials as necessary.

Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

EXCAVATION

Excavate for removal of existing structures, pavements, and walks to not more the 48" depth

Excavate for removal of existing underground utilities.

Reconstruct subgrades damaged by demolition operations, accumulated water, or construction activities.

Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Project Architect.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Project Architect.

Stockpile borrow materials and satisfactory soil materials, without intermixing, in shaped, graded, drained, and covered stockpiles. Stockpile soil materials away from edge of excavations and outside drip line of remaining trees.

BACKFILLS AND FILLS

Fill: Place and compact fill material in layers to required elevations.

Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

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

Compact soil to not less than the following percentages of maximum dry density according to ASTM D 698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 95 percent.
3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 85 percent.

Grading: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated. Grade lawns, walks, and unpaved subgrades to tolerances of plus or minus 1 inch and pavements and areas within building lines to plus or minus 1/2 inch.

FIELD QUALITY CONTROL

Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.

Allow testing agency to test and inspect subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

PROTECTION AND DISPOSAL

Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction.

Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 02270

SECTION 02281 - TERMITE CONTROL

PART 1 - GENERAL

Related Documents: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-l Specification sections, apply to work of this section.

Description of Work: Provide soil treatment for termite control, as herein specified.

Quality Assurance: In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work, including preparation of substrate and application.

Engage a Professional Pest control operator, licensed in accordance with regulations of governing authorities for application of soil treatment solution.

JOB CONDITIONS:

Restrictions: Do not apply soil treatment solution until excavating, filling and grading operations are completed, except as otherwise required in construction operations.

To insure penetration, do not apply soil treatment to frozen or excessively wet soils or during inclement weather. Comply with handling and application instructions of the soil toxicant manufacturer.

SUBMITTALS:

Product Data: Submit manufacturer's technical data and application instructions.

Specific Product Warranty: Furnish written warranty certifying that applied soil poisoning treatment will prevent infestation of subterranean termites and, that if subterranean termite activity is discovered during warranty period, Contractor will re-treat soil and repair or replace damage caused by termite infestation.
Provide warranty for a period of 2 years from date of treatment, signed by Applicator and Contractor.

PART 2 - PRODUCTS

Soil Treatment Solution: Use an emulsible concentrate insecticide for dilution with water, specially formulated to prevent infestation by termites. Fuel oil will not be permitted as a dilutent. Provide a working solution of one of following chemical elements and concentrations:

Chlordane, 1.0% in water emulsion.

Aldrin, 0.5% in water emulsion.

Dieldrin, 0.5% in water emulsion.

Heptachlor, 0.5% in water emulsion.

Chlordane and Heotachlor, 0.5% chlordane plus 0.25% Heptachlor in water emulsion.

Other solutions may be used as recommended by Applicator and if acceptable to Architect and local governing authorities. Use only soil treatment solutions which are not injurious to planting.

PART 3 - EXECUTION

Application:

Surface Preparation: Remove foreign matter which could decrease effectiveness of treatment on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and foundations. Toxicants may be applied before placement of compacted fill under slabs, if recommended by toxicant manufacturer.

Application Rates: Apply soil treatment solution as follows:

Under slab-on-grade structures, treat soil before concrete slabs are placed using either power sprayer or tank-type garden sprayer.

Apply 4 gallons of chemical solution per 10 lin. ft. to soil critical areas under slab, including entire inside perimeter inside of foundation walls, along both sides of interior partition walls, and around plumbing pipes and electric conduit penetrating slab, and around interior column footers.

Apply one gallon of chemical solution per 10 sq. ft. as an overall treatment under slab and attached slab areas where fill is soil or unwashed gravel. Apply 1-1/2 gallons of chemical solution to areas where fill is washed gravel or other coarse absorbent material.

Apply 4 gallons of chemical solution per 10 lin. ft. of trench, for each foot of depth from grade to footing, along outside edge of building. Dig a trench 6" to 8" wide along outside of foundation to a depth of not less than 12". Punch holes to top of footing at not more than 12" o.c. and apply chemical solution. Mix chemical solution with the soil as it is being replaced in trench.

Allow not less than 12 hours for drying after application, before beginning concrete placement or other construction activities.

Post signs in areas of application warning workers that soil poisoning has been applied. Remove signs when areas are covered by other construction.

Reapply soil treatment solution to areas disturbed by subsequent excavation or other construction activities following application.

END OF SECTION 02281

SECTION 02480 - LANDSCAPE WORK

PART - 1 GENERAL LANDSCAPE REQUIREMENTS:

Contractor shall include in his bid an allowance of $2,500.00 for fine grading, sprinkler system in backyard and planting.

Submit planting schedule showing coordination of normal planting times with construction schedule for other (related) work.

Layout areas of planting and location of each major plant, for review by Architect prior to start of planting.

Plant Size and Quality: Provide sizes of plants as shown or scheduled, conforming to ANSI Z60.1

"American Standard for Nursery Stock" for shape and quality.

Furnish balled and burlapped (B&B) trees of shrubs, except container-grown plants may be furnished if indicated size is below limit established in ANSI Z60.1.

Warranty lawns, through specified lawn maintenance period and until final acceptance.

Warrant Plants, shrubs and trees for a period of one year against death and unhealthy condition, except as may result from neglect by Owner, damage by others, and unusual phenomena beyond Installer's control. Replace at optimum planting time.

Topsoil is available at the site for reuse as shown.

Provide topsoil to supplement that (if any) shown as available for reuse at site. Proved clean, fertile, friable, natural loam obtained from a local, well drained source.

Provide fertilizer, humus and other soil amendments of a type which are known to improve PH condition of soil for particular plant material to be planted. Mix peat humus (FS Q-P-166) with topsoil in the ratio of 1:3 for use in planting. For basis of quantity, assume topsoil which has not been stripped is 4 in depth.

Fertilize topsoil for planting trees, shrubs and ground cover with a 5-10-5 (5% nitrogen, 10% phosphorus and 5% potash) commercial fertilizer, applied and mixed at rate of not less than 0.25 lbs. per cu. ft. of soil and humus.

Fertilize topsoil for planting grass with a high-nitrogen content commercial fertilizer,l containing 4% phosphorus, 2% potash and nitrogen in sufficient quantity to supply not less than 1.0 lbs. of actual nitrogen per 1000 sq. ft. lawn area.

Planting Trees:

Excavate Pit to 1-1/2 times diameter of tree ball and not less than 6" deeper. Compact layer of topsoil in pit to locate collar of plant properly in a slightly dished finish grade. Backfill around ball with topsoil, compacted to eliminate voids and air pockets, watering thoroughly as layers are placed. Build 3" mulch of shredded hardwood, bark chips, peat, or other recognized organic planting mulch.

Prune tree to remove damaged branches, improve natural shape, thin out structure and remove not more that 15% of branches. Do not prune back terminal leader.

Wrap trunk from ground to first branch with tree wrapping tape.

Guy and stake tree 3 directions with galvanized wire, through flexible hose chafing guards, with wooden stake anchors.

Planting shrubs:

Excavate pits or trench to 1-1/2 times diameter of balls or containers, or 1'--0" wider than spread of roots, and 3" deeper than required for positioning at proper height. Lightly compact a layer of topsoil in topsoil, compacted to eliminate voids and air pockets. Water thoroughly as layers are placed. Form grade slightly dished, and hemmed at edges of excavation. Apply 2" mulch of peat, straw or other recognized organic planting mulch.

Prune shrubs to remove damaged branches, improve natural shape, thin out structure and remove not more than 15% of branches.

Planting ground cover:

Till soil to depth of 8" in areas where topsoil has not been stripped.

Loosen subgrade to depth of 4" in areas where topsoil has not bee stripped, and spread topsoil to depth of 4", except as otherwise indicated.

Space plants 2'-0" apart both ways, except as otherwise indicated. Dig holes large enough to allow for spreading of roots. Compact backfill to eliminate voids, and leave grade of shredded hardwood, bark ships, peat, straw or other recognized organic planting mulch over entire planting bed, lifting plant foliage above mulch.

During periods of hot sun and wind at time of planting, provide protective cover for several days.

Planting Lawns:

Sod: Clean, strongly rooted, uniformly sized strips of 2 year old St. Augustine grass, machine stripped not more than 24 hours prior to laying.

Grass Seed: A blend of predominantly Bermuda grass seed, with approximately 10% nurse grass seeds, complying with standards of Official Seed Analysis of North America, for 95% purity, 25% germination and 1% (max) weed seed, recommended by producer for full-sun exposure of lawns in geographic location of project.

Loosen subgrade to depth of 4" in areas where topsoil has been stripped, spread 2" depth of topsoil, till to mix topsoil with subsoil, spread additional 2" depth of topsoil, add specified soil amendments and mix thoroughly into top 4" of topsoil, till surface to level, fine texture.

Grade and roll prepared lawn surface. Water thoroughly but do not create muddy soil condition.

Lay sod strips with tight joints, roll or tamp lightly, and water thoroughly.

Sow grass seed uniformly in two directions in the quantity recommended by the seed producer, except as otherwise indicated. Rake seed lightly into top 1/8" of lawn surface. Water thoroughly with fine spray.

Protect seeded areas against erosion.

PART - 2 LANDSCAPE MAINTENANCE

Maintain landscape work for a minimum period of 60 days immediately following the complete installation of each major category of work, and including the first mowing and trimming of grass. Landscape maintenance shall include but not be limited to watering, weeding, cultivating, restoration of grade, mowing and trimming grass, pruning trees and shrubs, protection from insects and diseases, fertilizing and similar operations as needed to ensure normal growth and good health for live plant material.

END OF SECTION 02480
END OF DIVISION 2

DIVISION 3 CONCRETE

SECTION 03000 - CONCRETE

Codes and Standards: ACI 301 "Specifications for Structural Concrete Buildings"; ACI 318, "Building Code Requirements for Reinforced Concrete"; comply with applicable provisions except as otherwise indicated.

Concrete Testing Service: Employ acceptable testing laboratory to perform materials evaluation, testing and design of concrete mixes.

Contractor will employ separate testing laboratory to evaluate concrete delivered to and placed at site.

Certificates, signed by concrete producer and Contractor, may be submitted in lieu of material testing when acceptable to Architect.
Quality Control: Perform sampling and testing during concrete placement, as follows:

Quality Control: Owner's testing laboratory will perform sampling and testing during concrete placement, which may include the following, as directed by Architect. This testing does not relieve Contractor of responsibility of providing concrete in compliance with specifications. Contractor may perform additional testing as necessary, at no expense to Owner, to ensure quality of concrete.

Sampling: ASTM C 172.

Slump: ASTM C 143, one test for each load at point of discharge.

Air Content: ASTM C 173, one for each set of compressive strength specimens.

Compressive Strength: ASTM C 39, one set for each 50 cu. yds. or fraction thereof of each class of concrete; one specimen tested at 7 days, one specimen tested at 28 days, and one retained for later testing if required.

When the total quantity of a given class of concrete is less than 50 cu. yds, strength tests may be waived by Architect if field experience indicates evidence of satisfactory strength.

Test results will be reported in writing to Architect, Contractor and concrete producer on same day tests are made.

Manufacturer's Data: Submit manufacturer's product data with installation instructions for proprietary materials including reinforcement and forming accessories, admixtures, joint materials, hardeners, curing materials and others as requested by Architect.

Laboratory Reports: Submit 2 copies of laboratory test or evaluation reports for concrete materials and mix designs.

Mix Proportions and Design: Proportion mixes complying with mix design procedures specified in ACI 301.

Submit written report to Architect for each proposed concrete mix at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed and are acceptable to Architect.

Mix designs may be adjusted when material characteristics, job conditions, weather, test results or other circumstances warrant. Do not use revised concrete mixes until submitted to

and accepted by Architect.

Use air-entering admixture in all concrete providing not less than 4% nor more than 8% entrained air for concrete exposed to freezing and thawing, and from 2% to 4% for other concrete.

Concrete Materials:

Portland Cement: ASTM C 150, Type as required.

Fly Ash: ASTM C 618, Type C or F.

Limit use of fly ash in concrete mix design to not exceed 25% of cement content by weight.

Aggregates: ASTM C 33, except local aggregates of proven durability may be used when acceptable to Architect.

Water: Drinkable.

Air-Entraining Admixture: ASTM C 260.

Water-Reducing Admixture: ASTM C 494; type as required to suit project conditions. Only use admixtures which have been tested and accepted in mix designs, unless otherwise acceptable.

Related Materials:

Moisture Barrier: Clear 6-mils thick polyethylene; polyethylene coated barrier paper; 1/8" thick asphalt core membrane sheet.

Membrane-Forming Curing Compound: ASTM C 309, Type I.

Joint Fillers: See Division-7.

Form Materials:

Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.

Exposed Concrete Surfaces: Suitable material to suit project conditions.

Reinforcing Materials:

Deformed Reinforcing Bars: ASTM A 615, Grade 60 unless otherwise indicated.

Welded Wire Fabric: ASTM A 185.

Forming and Placing Concrete:

Job-Site Mixing: Use drum type batch machine mixer, mixing not less than 1-1/2 minutes for one cu. yd. or smaller capacity. Increase mixing time at least 15 seconds for each additional cu. yd. or fraction thereof.

Ready-Mix Concrete: ASTM C 94.

Formwork: Construct so that concrete members and structures are of correct size, shape, alignment,

elevation and position.

Provide openings in formwork to accommodate work of other trades. Accurately place and securely support items built into forms.

Clean and adjust forms prior to concrete placement. Apply form release agents or wet forms, as required. Retighten forms during concrete placement if required to eliminate mortar leaks.

Reinforcement: Position, support and secure reinforcement against displacement. Locate and support with metal chairs, runners, bolsters, spacers and hangers, as required. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

Install welded wire fabric in as long lengths as practicable, lapping at least one mesh.

Joints: Provide construction, isolation, and control joints as indicated or required. Locate construction joints so as to not impair strength and appearance of structure. Place isolation and control joints in slabs-on-ground to stabilize differential settlement and random cracking.

Installation of Embedded Items: 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 diagrams, templates and instructions provided by others for locating and setting.

Concrete Placement: Comply with ACI, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.

Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into forms.

Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement and curing.

In cold weather comply with ACI 306.

In hot weather comply with ACI 305.

Concrete Finishes:

Exposed-to-view Surfaces: Provide a smooth finish for exposed concrete surfaces and surfaces that are to be covered with a coating or covering material applied directly to concrete. Remove fins and projections, patch defective areas with cement grout, and rub smooth.
Slab Trowel Finish: Apply trowel finish to monolithic slab surfaces that are exposed-to-view or are to be covered with resilient flooring, paint or other thin film coating. Consolidate concrete surfaces by finish troweling, free of trowel marks, uniform in texture and appearance.

Curing: Begin initial curing as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than 72 hours. Continue curing by use of moisture-retaining cover or membrane-forming curing compound. Cure formed surfaces by moist curing until forms are removed. Provide protections as required to prevent damage to exposed concrete surfaces.

END OF SECTION 03310
END OF DIVISION 3

DIVISION 4 MASONRY

SECTION 04200 - UNIT MASONRY

Standards: Comply with recommendations of Brick Institute of America (BIA), and National Concrete Masonry Assoc. (NCMA).

Face Brick: ASTM C 2161 Grade SW, Type FBS, King Size, cored or un-cored. Provide a minimum of six different colors from which to select and an allowance of $ 240.00 per thousand bricks.

Brick Wainscot: Thin Brick Veneer: ASTM C 216, Un-cored. Selected from standard color choices of thin brick veneer manufacturers.

Stone Wainscot: Thin Stone Veneer: ASTM C 216, Selected from standard color choices of Manufactured Stone Veneer manufacturers.

Concrete Block: Provide Grade N loadbearing units complying with the following requirements:

Type I

Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

Hollow Block: ASTM C 90

Weight Classification: Lightweight.

Portland Cement: ASTM C 150 Type I; natural or white except white where required for color match.

Masonry Cement: ASTM C 91.

Lime: Hydrated lime, ASTM C 207, Type S.

Sand for Mortar: ASTM C 144, or finer if needed for joint sizes less than 1/4".

Colored Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes.

Water: Clean and Potable.

Masonry Veneer Anchors: 22 gage corrugated steel, 1" wide, 1.5 oz. hot-dip zinc coating or 7-mil copper coating, for wood.

Mortar for Unit Masonry: ASTM C 270, Proportion Specification for types of mortar required.

Limit cementitious materials to portland cement-lime.

Use Type M mortar for masonry below grade and in contact with earth, and where indicated.

Use Type S mortar for reinforced masonry and where indicated.

Use Type N mortar for exterior above-grade loadbearing and non-loadbearing walls; for interior loadbearing walls and for other applications where another type is not indicated.

Install (lay) masonry units in the bond pattern indicated, or if none is indicated, in running bond.

Cut exposed masonry units, where necessary, with a power saw. Avoid the use (by proper layout) of less-than-half-size units.

Wet brick of high absorption, prior to laying.

Bond intersecting walls with masonry units or provide anchors spaced 2'-0".

Hold uniform joint sizes as indicated, or if not indicated, hold joint sizes to suit modular size of masonry units.

Cut joints flush and tool slightly concave, unless otherwise indicated.

Keep cavities clean of mortar droppings, and install ties spaced 16" vertically and 24" horizontally. Provide weep holes spaced 24" apart at the bottom of (and at ledges in) cavities.

Anchor ends of walls to structure with anchors spaced 2'-0", except as otherwise shown.

Provide control and expansion joints at locations shown, and keep clean of mortar droppings.

Provide concealed flashing in exterior masonry work as indicated.

> Except as otherwise shown, provide flashing under copings and sills, through wall at counterflashing locations, and above elements of structural support for masonry.

Build other work into the masonry work as shown, fitting masonry units around other work, and grouting for secure anchorage.

Protect newly laid masonry from exposure to precipitation, excessive drying, freezing, soiling, backfill and other harmful elements.

Dry-Brush masonry work at end of each day's work.

Clean unglazed clay masonry with stiff brushes, and a solution of trisodium phosphate and detergent (1/2 cup of each in one gal. water).

> If above cleaning is unsuccessful, as judged by the Architect, clean with acid, complying with BIA recommendations.

Brick vents:

Provide where shown, or if not shown where required, Cast aluminum #356 alloy vents corrosion resistant with asphaltum paint on all parts in contact with masonry. Aluminum insect screen 18 x 14 mesh included. Provide straight duct made of 24 ga. galvanized steel securely fastened in place. Vents shall be as manufactured by Sunvent, P.O. Box 290005, Davie Florida 33329, Tele: (305) 475-4644 or approved equal.

END OF SECTION 04200
END OF DIVISION 4

DIVISION 5 METALS

SECTION 05500 - METAL FABRICATIONS

PART - 1 GENERAL

Submittals: In addition to product data, submit the following:

Shop Drawings showing details of fabrication, assembly and installation including templates for anchor bolt placement.
Samples of materials and finished products as may be requested by Architect.

Materials/Fabrications:

General: For work exposed to view use materials selected for their smoothness and freedom from surface blemishes.

Steel Plates, Shapes, Bars: ASTM A 36.

Steel Tubing: ASTM A 500 or ASTM A 501.

Galvanized Structural Steel Sheets: ASTM A 446, of grade required for design loading; coating designation G90 or as indicated.

Steel Pipe: ASTM A 53, type and grade as required for design loading (if applicable), black finish unless galvanizing indicated; standard weight (Schedule 40) unless otherwise indicated.

Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either galvanized ferrous castings, malleable iron, cast steel; with steel bolts, washers and shims; hot-dip galvanized.

Metallic Non-Shrink Grout: CE CRD-C588, Type M.

Non-Shrink Non-Metallic Grout: CE CRD-C621, non-staining, noncorrosive, non-gaseous; recommended by mfr. for types of applications indicated.

Fasteners: Provide bolts, nuts, lag bolts, machine screws, wood screws, toggle bolts, masonry anchorage devices, lock washers as required for application indicated and complying with applicable Federal standards. Hot-dip galvanize fasteners for exterior applications to comply with ASTM A 153.

Shop Painting: Apply shop primer to surface or metal fabrications except those embedded in concrete or galvanized; comply with SSPC-PA1 and requirements indicated below:

Surface Preparation: Comply with SSPC-SP6 "Commercial Blast Cleaning" for exterior work, and with SSPC-SP6" Power Tool Cleaning" for interior work.

Shop Primer: Fabricator's standard, fast-curing, lead-free, "universal" primer complying with performance requirements of FSTT-P-645.

Galvanizing: ASTM A 386 for assembled products; ASTM A 123 for rolled, pressed and forged steel shapes, plates, bars and strip 1/8" and thicker; galvanizing repair paint: MIL-P-21035 or SSPCPaint-20.

Fabrication, General: Use materials of size and thickness shown or, if not shown, of required size, grade and thickness to produce strength and durability in finished product. Shop-paint all items not specified to be galvanized after fabrication.

Weld corners and seams continuously, grind exposed welds smooth and flush.

Form exposed connections with hairline, flush joints; use concealed fasteners where possible.

Rough Hardware: Furnish custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes for framing and supporting and anchoring woodwork.

Galvanized, unless otherwise indicated.

Closet Rods: Provide 3/4" diameter galvanized steel pipe with all wall plates, brackets and screws.

Steel Splash Guards: Provide splash guards with baked enamel finish as manufactured by Broan (or approved equal). One (1) each at every kitchen range location.

END OF SECTION 05500
END OF DIVISION 5

DIVISION 6 WOODS AND PLASTICS

06100 ROUGH CARPENTRY

Submittals: Submit the following:

Product data for insulating sheathing and underlayment.

Material certificates for dimension lumber indicated for compliance with selected minimum design values.

Wood treatment data including treatment plant's certification of compliance with indicated requirements.

Lumber, General: Manufacture lumber, S4S and grade stamped, to comply with PS 20 and applicable grading rules of inspection agencies certified by ALSC's Board of Review.

Provide seasoned lumber with 19% moisture content at time of dressing and shipment, for sizes 2" or less in thickness.

For exposed lumber, apply grade stamps to ends of back of each piece or omit grade stamps entirely and issue certificate of grade compliance.

Dimension Lumber: Provide lumber of the following product classification in grade and species indicated:

Light-framing: (2"- 4" thick, 2"- 4" wide).

Construction.

Structural Light Framing (2"- 4" thick,2"- 4" wide), Grade and species indicated:

No. 1.

Southern Pine graded under SPIB rules.

Structural Joists and Planks (2"- 4" thick, 5" and wider): Any species and grade complying with requirements for allowable unit stresses.

Fb (minimum extreme fiber stress in bending): 1500 psi. E (minimum modulus of elasticity): 1,500,000 psi.

Exposed Framing Lumber: Hand select material at factory from lumber of species and grade indicated below for compliance with "Appearance" grade requirements of ALSC National Grading Rule; issue inspection certificate of inspection agency for selected material.

Same species and grade as indicated for structural framing.

Southern Pine, Select Structural Grade per SPIB.

Posts, Beams and Timbers (5" and thicker): No. 1 grade HemFir (WWPA)~ green (non-moisture controlled); free of heart center.

Concealed Boards: Standard grade, any species graded under WWPA rules or No. 3 grade Southern Pine graded under SPIB rules.

Lumber for Miscellaneous Uses: Unless otherwise indicated, provide Standard grade lumber for support of other work, including cant strips, bucks, nailers, blocking, furring, grounds, stripping and similar members.

Construction Panels: For types of concealed applications indicated below, provide wood panel products complying with PS 1 where applicable, and with "APA Performance Standard and Policies for Structural Use Panels" (Form E445) for requirements indicated.

For following type of applications where exposure durability classification or span rating is not given, provide EXPOSURE 1 and rating required to suit support spacing indicated.

Roof Sheathing: APA RATED SHEATHING.

Plywood Backing for Electrical and Telephone Equipment: APA C-D PLUGGED INT with exterior glue, fire-retardant treated, 1/2" thick except as otherwise indicated.

Fasteners and Anchorages: Of size, type, material and finish suited to application shown and complying with applicable standards including FS FF-N-105 and FF-W-9Z and ANSI B18.6.1. Provide metal hangers and framing anchors of size and type recommended for intended use by manufacturer. Hot-dip galvanize fasteners and anchorages for work exposed to weather, in ground contact and high relative humidity to comply with ASTM A 153.

Building Paper: 30# Asphalt saturated felt, non-perforated ASTM D 226.

Preservative pressure treat lumber and plywood with water-borne preservatives to comply with AWPA C2 and C9, respectively, and with requirements indicated below:

Treat sills, sleepers, blocking, furring, stripping and similar items in direct contact with masonry or concrete.

Install rough carpentry work to comply with "Manual of House Framing" by National Forest Products Assoc. (N.F.P.A.) and with recommendations of American Plywood Association APA),unless otherwise indicated. For sheathing, underlayment and other products not covered in above standards, comply with recommendations of manufacturer of product involved for use intended. Set carpentry work to required levels and lines, with members plumb and true and cut to fit.

Provide wood framing members of size and spacing indicated; do not splice structural members between supports. Firestop concealed spaces with wood blocking not less than 2" thick, if not blocked by other framing members.

Fasten structural wood panel products as follows:

Sheathing:

Nail to framing.
Staple or nail to framing.

Underlayment:

Nail to framing.
Staple or nail to framing.

END OF SECTION 06100

06200 FINISH CARPENTRY

Product Data: Submit for factory-fabricated siding and paneling.

Samples: Submit samples of the following items:

Lumber machined to stock and custom patterns, 2'-0" long x pattern width and thickness, for each configuration, species and grade indicated.

Finish one side and one edge of samples for transparent finished items.

Plywood for transparent finish, 2'-0" panel width, finish applied to upper half of each piece.

Softwood Lumber: Comply with PS 20 and applicable grading rules of respective grading and inspecting agency for species and product indicated. Manufacture to sizes and patterns using seasoned lumber. Use pieces made from solid lumber for transparent finished work, and glued-up or solid, at contractor's option for painted work.

Exterior Standing and Running Trim: Boards and worked lumber products complying with requirements indicated below including those of grading agency listed with species:

Species: Spruce-pine-fir; WWPA

Grade: B & Btr. - 1 & 2 Clear

Texture: Surfaced (Smooth).

Furnish surfaced lumber for painted trim.

Siding, Board Type: Lumber worked to pattern and size indicated, complying with requirements indicated below including those of grading agency listed with species:

Type: Texture 1-11 plywood

Fasteners and Anchorages: Provide nails, screws and other anchoring devices of type, size, material and finish suitable for intended use and required to provide secure attachment, concealed where possible.

Hot-dip galvanize fasteners for work exposed to exterior and high humidities to comply with ASTM A 153.

Install finish carpentry work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Scribe and cut finish carpentry items to fit adjoining work. Anchor finish carpentry work securely to supports and substrates, using concealed fasteners and blind nailing where possible. Use fine finishing nails for exposed nailing except as indicated, countersunk and filled flush with finished surface.

Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces from maximum length of lumber available. Cope at returns, miter at corners to produce tight fitting joints. Use scarf joints for end-to-end joints.

Board-Type Paneling: Comply with paneling manufacturer's instructions using adhesive or concealed clip system as appropriate to type of substrate provided or as indicated.

END OF SECTION 06200

06400 ARCHITECTURAL WOODWORK

Standards: Comply with applicable requirements of the following: "Architectural Woodwork Quality Standards" by AWI.

Shop Drawings: Submit shop drawings for each item of architectural woodwork.

Samples: Submit finished samples of each wood species and cut indicated for transparent finish; of each material indicated for opaque finish; of each color, pattern and finish of plastic laminate; and of each type of cabinet hardware.

Exterior Wood:

Lumber Species for Transparent Finish: Clear Heart Cedar

Interior Wood:

Lumber Species for Transparent Finish: Rift-sawn Red Oak.

Lumber Species for Opaque Finish: Any closed-grain hardwood listed in referenced woodworking standard.

Veneer Species for Transparent Finish: Rift-cut Red Oak.

Panel Product for Opaque Finish: Medium density fiberboard.

Plastic Laminate: High pressure decorative laminate complying with NEMA LD 3, in color, pattern and finish indicated, or, if not indicated, as selected by Architect from laminate manufacturers' standard products.

Exterior Standing and Running Trim for Transparent Finish:

Grade: Custom.

Interior Standing and Running Trim. and Rails for Opaque Finish:

Grade: Economy.

Wood Cabinets for Transparent Finish:

Grade: Custom.

Construction: Flush overlay.

Plastic Laminate for Exposed Surfaces: GP-50 for non-post formed surfaces; PF-42 for post formed surfaces.

Edge Treatment: Same as laminate cladding on faces. exposed cabinet surfaces.

Closet and Utility Shelving for Opaque Finish:

Grade: Custom.

Shelving Material: Birch-faced veneer core plywood.

Exterior Door Frames for Opaque Finish:

Grade: Premium.

Interior Door Frames for Opaque Finish:

Grade: Custom.

Finishes for Architectural Woodwork: Finishing of architectural woodwork is work of this section to the extent indicated.

Provide factory finish system of type indicated for the following types of architectural woodwork.

Casework.

Shop-apply prime/base coat to the following types of architectural woodwork, in compliance with requirements indicated in Division-9 section "Painting".

Interior trim for opaque finish. Wood storage shelving.

Cabinet Hardware and Accessory Materials: Provide prefabricated factory assembled wood cabinets complete with hardware.

Installation: Install architectural woodwork plumb, level and straight with no distortion. Shim as required using concealed shims. Scribe and cut woodwork to fit adjoining work. Anchor woodwork to anchors or blocking or directly to substrates, using concealed fasteners.

Standing and Running Trim: Install with minimum number of joints possible using full-length pieces from maximum length of lumber available. Cope at returns, miter at corners.

Cabinets: Install without distortion so that doors and drawers fit openings and are properly aligned.

Paneling: Anchor paneling to supporting substrate with concealed panel hanger clips. Blind nail back-up strips and similar associated trim and framing.

TOPS: Anchor securely to base units.

Wood Storage Shelving: Complete assembly of units and install in areas indicated including hardware and accessories.

END OF SECTION 06400
END OF DIVISION 6

DIVISION 7 THERMAL & MOISTURE PROTECTION

SECTION 07190 - VAPOR BARRIERS

Elastic Sheet Vapor Barriers:

Polyethylene Vapor Barrier: 6-mil carbonated polyethylene film, rated 0.1 perms or less.

Seal lapped seams and laps onto other work with adhesive or self-adhesive tape of type recommended by vapor barrier manufacturer. Before covering over vapor barriers with other (concealing) work, patch punctures and tears with adhesively applied barrier material or tape with perm rating equal to barrier rating.

END OF SECTION 07190

SECTION 07200 - INSULATION

GENERAL

RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-l Specification sections, apply to work of this section.

DESCRIPTION OF WORK:

Extent of insulation work is shown on drawings and indicated by provisions of this section.

Applications of insulation specified in this section include the following:

Board-type building insulation, concealed.

Blanket-type building insulation.

QUALITY ASSURANCE:

Thermal Conductivity: Thicknesses indicate are for thermal conductivity (k-value at 750 F or 240C) specified for each material. Provide adjusted thicknesses as directed for equivalent use of material having a different thermal conductivity. Where insulation is identified by "R" value, provide thickness to achieve indicated value.

Federal Specifications: Where compliance with FS standard is indicated, specified requirements for marking individual boards/batts/blankets are waived, provided packages of units are labeled to show compliances.

SUBMITTALS:

Product Data: Submit manufacturer's product specifications and installation instructions for each type of insulation and vapor barrier material required.

Certified Tests: With product data, submit copies of certified test report showing compliance with specified performance values, including k-values (aged values for plastic insulations), densities, compression strengths, burning characteristics, perm ratings, water absorption ratings and similar ratings.

PRODUCT HANDLING:

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.

Protection for plastic insulation:

Do not expose to sunlight, except to extent necessary for period of installation and concealment.

Protect against ignition at all times. Do not deliver plastic insulating materials to project site ahead of installation time. Complete installation and concealment of plastic materials as rapidly as possible in each area of work.

PRODUCTS

MATERIALS:

Molded Polystyrene Board Insulation (MPsBd-Ins): Closed-cell, expanded polystyrene beads molded into rigid boards, complying with FS HH-I-524, Type I, 10 psi compressive strength; 4.0X maximum water absorption; k-value of 0.278; 5.0 perm-inch max. water vapor transmission; manufacturer's standard lengths and widths.

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:

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

Allied Foam Products, Inc.; Gainsville, GA
Arizona Diversified Prod., Inc.; Phoenix, AZ
Big Sky Insulations, Unltd.; Belgrade, MT
Contour Packaging, Inc.; Lenexa, KS
Foam Products Corp.; St. Louis, MO
Grace Const. Products Div.; Cambridge, MA
Insulation Corp. of America; Allentown, PA
Michigan Foam Products, Inc.; Grand Rapids, MI
Poly-Foam, Inc.; Lester Prairie, MN
Therma Foam, Inc.; Fort Worth, TX
Toyad Corps.; Latrobe, PA
United States Mineral Prod. co.; Stanhope, NJ
Vertex, Inc.; Los Angeles, CA

Mineral/Glass Fiber Blanket/Batt Insulation (M/GFB-Ins):
Inorganic (non-asbestos) fibers formed with hinders into resilient flexible blankets or semi-rigid batts; FS HH-I-521, Type as indicated, densities of not less than 0.5 lb. per cu. ft~ for glass fiber units and not less than 2.5 lb. per cu. ft. for mineral wool units, k-value of 0.27; manufacturer's standard lengths and widths as required to coordinate with spaces to be insulated; types as follows:

Provide Type I unfaced units where indicated, semi-rigid in vertical spaces and where self-support is required.

Flame-Spread Rating: Provide units with rating of 25, ASTM E 84.

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:

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

Certain-Teed Products Corp.; Valley Forge, PA
Clecon Inc.; Cleveland, OH
Manville Bldg Materials Corp.; Denver, CO
Mizell Bros. Co.; Atlanta, GA
Owens-Corning Fiberglas Corp.; Toledo, OH
Rockwool Industries, Inc.; Englewood, CO
United States Gypsum Co.; Chicago, IL

EXECUTION

INSPECTION AND PREPARATION:

Installer must examine substrates and conditions under which insulation work is to be performed, and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with insulation work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

Clean substrates of substances harmful to insulations, including removal of projections which might puncture vapor barriers.

INSTALLATION:

General:

Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.

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.

Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

General Building Insulation:

Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

Seal joints between closed-cell (non-breathing insulation units by applying mastic or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with mastic or sealant.

Set vapor barrier faced units with vapor barrier to warm side of construction, except as otherwise shown. Do not obstruct ventilation spaces, except for firestopping.

Tape joints and ruptures in vapor barriers, and seal each continuous area of insulation to surrounding construction to ensure vapor-tight installation.

Set reflective foil-faced units accurately with air space in front of foil as shown. Provide not less than 0.75" air space where possible.

Vapor Barrier Installations:

General: Extend vapor barriers to extremities of areas to be protected from vapor transmission.

Secure in place with adhesives or other anchorage system as indicated. Extend vapor barriers to cover miscellaneous voids in insulated substrates, including those which have been stuffed with loose fiber type insulation.

Seal joints/seams in vapor barriers, seal to objects penetrating barriers, and seal to other surfaces at extremities of coverage by lapping with adhesive or taping to form a continuous barrier.

Lap edges of sheets of vapor barrier not less than 4" so as to provide complete coverage of protected areas.

Repair Punctures and tears in vapor barriers, immediately before concealment by other work. Cover with adhesively applied vapor barrier material or with self-adhesive vapor barrier tape.

PROTECTION:

General: Protect installed insulation and vapor barriers from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure. Installer shall advise Contractor of exposure hazards, including possible sources of deterioration and fire hazards.

END OF SECTION 07200

SECTION 07311 - COMPOSITION SHINGLES

Delivery, Storage and Handling: Deliver materials in manufacturer's unopened, labeled bundles, rolls or containers. Store materials to avoid water damage, and store rolled goods on end. Comply with manufacturers recommendations for job-site storage and protection.

Job Conditions: Proceed with shingle installation only when all penetrating work has been completed and when substrate is dry and weather conditions are favorable.

Composition Shingle Roofing:

Square Tab Strip Shingles. UL Class A. Heavyweight: Mineral surfaced, self-sealing, 3-tab fiberglass based asphalt strip shingles complying with ASTM D 3018, bearing UL Class A external fire exposure label an UL Wind Resistant label, weighing not less than 235 lbs. per square. Color as selected by Architect.

Fireline; Bird & Son/Genstar Building Materials Co.
Fiberglass Asphalt/25; The Celotex Corp.
Glasstex; Certainteed Corp.
Royal Sovereign, Self-Sealing; GAF Corp.
Fireking III, Manville Building Materials Corp.
Supreme Plus; Owens-Corning Fiberglas Corp.

Hip and Ridge Shingles; Manufacturer's standard factory pre-cut units to match shingles or job-fabricated units cut from actual shingles used.

Roofing Felt: New No. 15, asphalt-saturated unperforated organic roofing felt, complying with ASTM D 226, Type 1, 36 wide, approximate weight 18 lbs./square.

Asphalt Plastic Cement: Fabricated asphalt cement complying with ASTM D 2822, designed for trowel application.

Smooth Surface Roll Roofing: 50 lb. smooth surface asphalt roll roofing, 36 wide, complying with ASTM D 224, Type I. For valley flashing.

Nails: Aluminum or hot-dip galvanized 11 or 12-9age sharp pointed conventional roofing nails with barbed shanks, minimum 3/8 diameter head, and of sufficient length to penetrate minimum 3/4 into solid decking or to penetrate through plywood sheathing.

Metal Drip Edge: Minimum .024 mill finish aluminum sheet, brake formed to provide 3 roof deck flange and 1-1/2 fascia flange with 3/4 drip at lower edge. Furnish in 8' or 10' lengths.

Ridge Vent System: Embossed stucco .024 aluminum vent, fasten with 1-1/4 aluminum screw nails at 8 o.c., minimum 1.5 sq. in. free area per running inch. Furnish complete with weather baffles, end caps, connectors and related accessories. Vent openings must comply with HUD insect screen requirements. Ridge vent shall be as manufactured by Leigh Products, Cooperville, Michigan; H.C. Products, Princeville, Illinois; AuVent, Inc., Peoria, Illinois or an approved equal.

Installation:

General: Comply with published recommendations of shingle manufacturer details and recommendations of NRCA Steep Roofing section of NRCA Roofing and Waterproofing Manual for installation of underlayment and shingles, using number of nails and coursing shingles in accordance with manufacturer's standards.

Final Adjustment: Replace any damaged shingles and remove shingle installation debris from site.

END OF SECTION 07311

SECTION 07600 - FLASHING AND SHEET METAL

Fabricated Sheet Metal. General:

Conform to profiles and sizes shown, and comply with "Architectural Sheet Metal Manual" by SMACNA, for each general category of work required.

Gravel stops, fascias and trim.

Zinc-Coated Steel Sheet: ASTM A 526, 0.20% copper, 26 gage (0.0179"); ASTM A 525, designation G90 hot-dip galvanized, mill phosphatized.

Fabricate sheet metal with flat-lock seams; solder with type solder and flux recommended by manufacturer, except seal aluminum seams with epoxy metal seam cement and, where required for strength, rivet seams and joints.

Coat back-side of fabricated sheet metal with 15-mil sulfur-free bituminous coating, FS TT-C-494, or SSPC-Paint 12, where required to separate metals from corrosive substrates including cementitious materials, wood or other absorbent materials; or provide other permanent separation.

Provide for thermal expansion of running sheet metal work, by overlaps or expansion joints in fabricated work. Where required for water-tight construction, provide hooked flanges filled with polyisobutylene mastic for 1" embedment of flanges. Space joints at intervals of not more than 50' for steel, 24' for copper or stainless steel, or 30' for zinc alloy or aluminum. Conceal expansion provisions where possible.

Installation Requirements:

Anchor work in place with noncorrosive fasteners, adhesives, setting compounds, tapes and other materials and devices as recommended by manufacturer of each material or system. Provide for thermal expansion and building movements. Comply with recommendations of "Architectural Sheet Metal Manual" by SMACNA.

Seal moving joints in metal work with elastomeric sealants, complying with FS SS-T-00227, -00230, or -001543.

Clean metal surfaces of soldering flux and other substances which could cause corrosion.

Nail flanges of expansion joint units to substrates at spacing of 6" o.c.

Composition stripping: Cover flanges (edges) of work set on bituminous substrate with 2 courses of glass fiber fabric (ASTM D 1668) set in and covered with roofing cement, FS SS-C-153.

Performance: Water-tight/weatherproof performance of flashing and sheet metal work is required.

Ridge Vent System: Embossed stucco .024" aluminum vent fasten with 1-1/4" aluminum screw nails at 8" o.c., minimum 1.5 sq. in. free area per running inch. Furnish complete with weather baffles, end caps, connectors and related accessories. Bent openings must comply with HUD insect screen requirements. Ridge vent shall be as manufactured by Leigh Products, Cooperville, Michigan; H.C. Products, Princeville, Illinois; Auvent, Inc., Peoria, Illinois or approved equal.

Base Flashing: Provide 30# felt base flashing at all building perimeter walls a minimum of 6" above the finished floor.

END OF SECTION 07600

SECTION 07900 - JOINT SEALERS

MATERIALS:

General:

Colors: Manufacturer's standard highest-performance color; except "black" where exposed to view, unless another color is indicated or selected by Architect.

Compatibility: Provide materials selected for compatibility with each other and with substrates in each joint system; confirm with manufacturer.

General Characteristics: Provide type, grade, class, hardness and similar characteristics of material as indicated or, where not indicated, to comply with manufacturer's recommendations relative to exposures, traffic, weather conditions and other factors of the Joint system for best possible overall performance. Except as otherwise indicated, joint sealers are required to permanently maintain airtight and waterproof seals, without failures in joint movement accommodation, cohesion, adhesion (where applicable), migration, staining, and other performances as specified.

Multi-Component Polyurethane Sealant: ASTM C 920 Type M Class 25, or FS TT-5-00227E Class A; self-leveling, except non-sag where joints are not horizontal.

Provide sealant at wood base inside exterior walls, all frames of windows and doors in exterior walls and electrical boxes.

Non-Elastomeric Sealants and Caulking Compounds:

Single-Component Acrylic Sealant: ASTM C 920 Type 5 Class 12.5 Grade NS or FS TT-5-00230 Class B Type Non-sag; solvent based, solids 95% acrylic.

Joint Fillers and Sealant Backers:

Sealant Backer Rod: Non-absorptive closed-cell (or jacketed open cell) compressible/flexible plastic or rubber rod stock which is compatible with sealant (polyethylene, butyl, neoprene, polyurethane, PVC).

INSTALLATION:

Clean Joint Surfaces and prime or seal as recommended by sealant manufacturer.

Support sealants from back with construction as shown, or with joint filler, or with back rod.

Install sealants to size and shape shown or, if not shown, with "hour-glass" section profile as follows:

Pavement/Sidewalk Traffic Joints: Depth equal to 75% of normal joint width, but not more than 3/4" and not less than 3/8".

Non-Elastomeric Sealants, Non-Traffic Joints: Depth in range of 75% to 125% of normal joint width.

Install liquid sealants by proven methods which will ensure complete "wetting" of joint bond surfaces, without gaps or air pockets in beads, slightly concave on surface and slightly below adjoining surfaces, except form slight cove with sealant at inverted corner joints.

END OF SECTION 07900
END OF DIVISION 7

DIVISION 8 DOORS & WINDOWS

SECTION 08210 - WOOD DOORS

MATERIALS

Standards: Comply with requirements of ANSI/NWMA I.S. 1 and Section 1300 of AWI "Architectural Woodwork Quality Standards" except as otherwise indicated.

Submittals: In addition to product data, submit the following:

Shop drawings indicates location, size, face materials, core construction, fire-ratings (if any), finishes, and elevations for each door required.

Samples for each type of door construction, face material and finish required.

Product warranty on door manufacturer's standard form, signed by Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors as defined by referenced standards. Warranty shall be in effect during following periods of time after date of substantial completion.

Hollow Core Flush Interior Doors: One year.

Insulated Steel Exterior Doors: One year.

Manufacturers: Subject to the compliance with requirements, provide doors by one of the following:

Algoma Hardwoods Inc.
Buell Door Company.
Cal-Wood Door Div.; Timberland Ind., Inc.
Eggers.
Glen-Mar Door Mfg. Co.
Graham Mfg. Co.
Ipik Door Co., Inc.
Weyerhauser Company.
Castlegate Division; USG Industries, Inc.
Benchmark; General products company, inc.
Stanley Door Systems Div.; The Stanley works

GENERAL REQUIREMENTS

Exposed Surfaces: Same exposed surface material on both faces of each door, except as otherwise indicated.

Exterior Insulated Steel Doors:

Embossed solid core construction, 1 3/4" thick, completely filled with 2- to 2.5-pcf density foamed polyurethane insulation, enclosed by steel stiles with rigid vinyl thermal break and solid wood rails. Skins of nominal 24ga. galvanized steel with flanged returns top and bottom edges, thermal-break lock seam on stiles.

Hollow Core Flush Doors for Opaque Finish:

Face: Any closed-grain hardwood of mill option.

Grade: Custom.

Construction: SHC (Standard hollow core).

Pre-fitting and Preparation for Hardware:

Pre-fit and pre-machine wood doors at factory. Coordinate with builder's hardware and door frame requirements.

INSTALLATION

Job-Fit Doors: Fit doors to frames with uniform clearances and bevels to dimensions indicated in referenced standards. Machine doors for hardware indicated. Seal cut surfaces after fitting and machining.

Install doors to comply with manufacturer's instructions. Contractor may provide pre-hung door units for both wood doors and insulated steel doors at his option.

END OF SECTION 08210

SECTION 08520 - ALUMINUM WINDOWS

SCOPE

Furnish and install aluminum windows, glazing, and related materials and items as shown and specified.

GENERAL REQUIREMENTS

A. Glazing: See Specification Section 08810.

B. All materials shall be identified by the manufacturer's label until accepted by architect. Windows are based on Ply Gem Windows or approved equal.

MATERIALS

A. Aluminum Windows:

1) Windows shall conform to the requirements for "Quality Certified" aluminum windows of the Architectural Aluminum Manufacturers Association Master Specifications.

2) Windows shall be extruded aluminum, 3710 Series, single-hung. Windows shall be furnished with necessary subframes, subsills, mullions, jamb closures, head closures, nailing flanges, sill extensions, anchors, and clips to provide a complete installation. Use appropriate subsill at wood stud walls and at concrete masonry unit walls. Use manufacturer recommended jamb closures.

3) Exposed surfaces of aluminum members shall be mill finish, uniform in color, clear, and free from serious blemishes.

4) Protective Coat: Applied to all surfaces of aluminum after fabrication and finishing.

5) Coating: Type to which glazing compound will adhere and which will withstand the action of lime mortar for a period of at least one month. Before coating is applied, remove all fabrication compounds, dirt, and other accumulations.

B. Glazing: All windows shall be inside glazed at the factory. Factory standard extruded aluminum glazing beads with glazing tape, sealant. and gaskets as required shall be used. Windows shall be glazed with 1" insulated glass.

INSTALLATION

A. By skilled mechanics, plumb, level, square, securely anchored all joints, tight fitting. Corners shall be mitered with hairline joints. Install in accordance with manufacturer's printed instructions and approved shop drawings and as set forth herein.

B. All frames shall be checked for alignment before glazing is started. Any misalignment shall be reported to the contractor for correction before unit is glazed.

C. Glass shall be accurately cut for each opening; allow for expansion and contraction.

D. Sealer and Mastic: Set all frames in mastic as follows: Prime all masonry surfaces with primer sealer, set frames into full beads or beds of mastic. Take care not to get on exposed surfaces.

E. Sealant: All frames shall be sealed (not caulked) in accordance with Section 07900.

5. CLEANING AND PROTECTION

A. Protect from lime, mortar, plaster, acids or other harmful substances. Cover surfaces for proper protection as directed by manufacturer.

B. Cleaning: All cleaning shall be in strict accordance with window and glazing manufacturer's printed instructions.

C. Replace any damaged material.

TESTING AND GUARANTEE

A. At completion of work, all glass setting systems shall be tested for water tightness by a "hose test" where water shall be shot against panels under city water pressure as directed. Test shall be made in and under the direction of the architect. Any leaks shall be repaired and tested again after repair.

B. Windows shall be guaranteed against water leakage for a period of two (2) years in lieu of the one (1) year guarantee required in the Supplementary General Conditions.

END OF SECTION 08520

SECTION 08710 - FINISH HARDWARE

SCOPE

This section is one of material supply only and shall include finish hardware as may be described herein or may be required to make a complete and workable job. The general contractor will include installation costs for finish hardware in his contract.

GENERAL

A. Installation of finish hardware is in Section 06100. Hardware shall be fitted prior to the painting and then removed. After painting is completed, final installation of the hardware shall be made.

B. Finish hardware must be neatly and properly installed in accordance with the best practices as approved by the architect. All hardware must be thoroughly clean when it is turned over to the owner.

C. No extra cost will be allowed because of changes or corrections necessary to facilitate the proper installation of any hardware. The general contractor shall be responsible for the proper fabrication of all work or materials to receive the hardware.

D. Any required hardware not specifically mentioned herein shall be called to the attention of the architect during the bidding period so that an addendum may be prepared to cover such items. It shall be the responsibility of the successful bidder to furnish all required finish hardware, whether herein specified or not, unless excluded from this section of the specifications.

E. All door hardware installation shall meet State Purchasing and General Services Commission, Building and Property Services Division, Handicap Barriers and Standards Provisions including mounting heights, door opening force, type, shape, function, etc.

F. All hardware for fire rated doors (see door schedule) shall be rated hardware for fire rated assemblies

G. First line quality products of the following manufacturers are approved:

Locksets: Must be keyed to Master system.
Closers: Yale, Russwin, Corbin, LCN,Sargent.
Exit Devices: Von Duprin, Yale, Sargent.
Hinges: McKinney, Hager, Stanley, Lawrence.
Cylinders: Must be keyed to Master system.

QUALIFICATIONS

The finish hardware supplier shall be a person or firm technically proficient and experienced in this trade and shall be responsible for properly detailing and fitting material to the conditions required by the drawings.

GUARANTEE

All goods furnished under this section of the specifications shall be guaranteed free of defects of material and workmanship and shall perform the services for which they are intended for a period of one year (door closers 5 years) after completion of the job. Any item failing to fulfill the guarantee shall be replaced, repaired, and adjusted to the complete satisfaction of the architect at no further expense to said owner.

FINISH HARDWARE SCHEDULE SUBMITTAL

A. The successful bidder shall submit six (6) copies of the finish hardware schedule to the architect for review.

B. The schedule shall be complete in every detail listing all items of hardware needed for its intended use.

C. All items of hardware shall be correlated with the drawings by group heading numbers and/or item numbers.

D. The hardware supplier shall not order or furnish any templates, hardware, or schedules to anyone prior to the review of the schedule by the architect.

E. A complete line of physical samples, properly identified, shall be submitted upon request of the architect.

F. If any door is omitted from the schedule, it shall be trimmed as doors in similar openings.

TEMPLATES

The hardware vendor shall be responsible to the general contractor for the procurements and expediting of the templates required for all items that are included in his schedule.

FINISHES

All exposed hardware, unless otherwise noted, shall be dull chrome (US26D) finish except door closer covers and exit device mullions which shall be sprayed enamel to match existing devices. Exit devices may be brushed stainless steel.

FASTENINGS

Hardware furnished under this section of the specifications shall be complete with all necessary screws, bolts, anchors, or other fastenings for proper application. Such fastenings shall be of suitable size and type and shall harmonize with hardware as to material and finish. Stops and holders shall be fastened to concrete with machine screws and tamp-in shields and to doors with sex bolts.

LEVERS AND TRIM

A. Levers shall be cast with clutch type screw-less shank. Adjusting hub to be held in alignment with knob to prevent hub (nut) from loosening knob attachment when the thimble is tightened. Tightening or loosening of thimble shall be by special spanner wrench. Furnish three such spanner wrenches.

B. Roses shall be cast clamp-type screw-less.

C. Cast lever trim shall be similar to Sargent "LNJ" to meet requirements of "ADA" (wrought levers are not acceptable). These shall be detent retained with the outer detent inactive when trim is installed.

D. All levers to hazardous areas (mechanical, electrical spaces, etc.) shall have a knurled surface.

DOOR CLOSERS

A. All door closers, unless otherwise specified or shown on the drawings, shall be full rack and pinion liquid type with cast iron or extruded aluminum cases, capable of controlling door through 180° of swing.

1) Surface closers shall be adjusted by key valves. Furnish six (6) adjusting keys.

2) No closer shall be installed on the outside of any exterior door nor on the corridor side of any room door. Wherever it is necessary to install a closer on the side of a door away from the butts, a parallel arm shall be used. Corner or soffit brackets will not be permitted. Corridor installation is acceptable where abutting walls prevent normal installation. All fastenings to the door shall be by sex bolts.

B. All door closers must be covered by a 5-year factory guarantee against defective material or workmanship.

C. The successful bidder is required to keep in touch with the progress of the job and have a factory representative visit the job to see that all closers are properly installed and adjusted at completion of the installation.

BUTTS

A. Butts shall be of the class as indicated by manufacturers number in the hardware sets. All butts shall have sufficient throw to clear the door trim, plinth, or cove base, but shall have no more throw than is necessary.

1) All butts for out-opening exterior doors shall have pins held in place by a set screw which can only be removed while the door is open.

FLUSH BOLTS

Edge mount all flush bolts unless specifically noted to be face mounted.

DELIVERY

A. All hardware shall be delivered to the job site, securely boxed, bagged, wrapped, or otherwise packaged, complete with screws, bolts, anchors, or other fasteners as may be required for proper and secure installation.

1) Each package shall be labeled, tagged, or marked with schedule item number or otherwise unmistakably identify the contents with the location of the installation.

B. Each delivery shall be accompanied by a dray ticket listing the items by schedule item number or description correlated to the hardware schedule.

KEY CONTROL

Furnish and install one complete wall key cabinet with lock and with sufficient hooks for all the cylinder locks, padlocks and cabinet locks for the building, plus 10% extra and miscellaneous keys. The system shall be what is known as the double tag system. The file key has a tag of a different color from the duplicate key. All keys have a fiber tag. Also, provide system with triple cross index, collection envelopes, receipt forms, etc.

KEYING

A. All locks, panic devices, cylindrical locks, cabinet locks, and padlocks to be great grand and grandmaster keyed to existing system.

B. Contractor shall schedule keying meeting with owner and architect. Locks shall be master keyed, sub-mastered, keyed alike, or otherwise keyed upon contractor's written confirmation of keying with owner prior to placement of the order with the manufacturer.

C. Two or more doors entering the same room shall be keyed alike in one set for the room.

D. Furnish ten (10) master keys; two (2) change keys for each individually keyed lock.

HARDWARE SCHEDULE

Hardware is based on the following manufacturers:

Cylinders & Deadbolts - Schlage
Locks and Latchsets - Schlage
Butts - Lawerence Bros.
Panic Devices - Monarch
Closers- LCN (Norton)
Push, Pulls, Flush Bolts - Quality
Kickplates - Trimco
Hinge Stops - H.B. Ives

H/C BUILDINGS

Set #1 - Entrance (each)

1-1/2Pr.	Butts	BB4101 (4-1/2 x 4-1/2)-626 finish
1	Closer	1604 Stat
1	Panic Devices	19-R-L (Aries Control) w/LE handle-626

Set #2 - Ext. Stor. (each)

1 - 1/2 Pr.	Butts	BB4101 (4-1/2 x 4-1/2)-626 finish
1	Cylinder	B160N-626
1	Lockset	F51N Levon x Levon 626
1	Hinge Stop	69-626

Set #3 - Bedroom/Bathroom (each)

1 - 1/2 Pr.	Butts	BB4101 (4-1/2 x 4-1/2)-626 finish
1	Lockset	F40N Levon x Levon 626
1	Hinge Stop	69-626

Set #4 - Interior Closet/Linen/A/C/Water Heater (each)

1 - 1/2 Pr.	Butts	BB4101 (4-1/2 x 4-1/2)-626 finish
1	Lockset	F10N Levon x Levon 626
1	Hinge Stop	69-626

Set #5 - Ext. Water Heater (each)

1 - 1/2 Pr.	Butts	BB4101 (4-1/2 x 4-1/2)-626 finish
1	Cylinder	B160N-626
1	Lockset	F80N Levon x Levon 626

DWELLING UNITS

Set #6 - Entrance (each)

1 - 1/2 Pr.	Butts	BB4101 (4-1/2 x 4-1/2)-626 finish
1	Cylinder	B160N-626
1	Lockset	F51N Plymouth x Plymouth 626
1	Hinge Stop	69-626

Set #7 - Storage (each)

1 - 1/2 Pr.	Butts	BB4101 (4-1/2 x 4-1/2)-626 finish
1	Lockset	F10N Plymouth x Plymouth 626
1	Hinge Stop	69-626

Set #8 - Bedroom/Bathroom (each)

1 - 1/2 Pr.	Butts	BB4101 (4-1/2 x 4-1/2)-626 finish
1	Cylinder	B160N-626
1	Lockset	F40N Plymouth x Plymouth 626
1	Hinge Stop	69-626

Set #9 - Interior Closet/Linen/A/C/Water Heater (each)

1 - 1/2 Pr.	Butts	BB4101 (4-1/2 x 4-1/2)-626 finish
1	Lockset	F40N Plymouth x Plymouth 626
1	Hinge Stop	69-626

END OF SECTION 08710

SECTION 08810 - THRESHOLDS AND WEATHERSTRIPPING

SCOPE

Furnish and install threshold, door bottom seal, door shoe and weatherstripping at all exterior doors. Install astragal meeting stile seal at each set pairs of exterior doors.

MATERIALS

A. Thresholds: National Guard Products, Inc. No. 425, 1/2" x 5", aluminum.

B. Door Bottom Seals: National Guard Products, Inc. No. l99N, aluminum and vinyl.

C. Weatherstripping:

1) Exterior Door Head and Jambs: National Guard Products, Inc. No. 164, aluminum with vinyl bubble.

D. Astragal/Meeting Stile Seals: National Guard Products, Inc. No. 1 25NG.

E. Approved Manufacturers: A. J. May; Pemko; Chamberlain; Zero; Accurate.

INSTALLATION

A. Install in accordance with manufacturer's printed instructions and as indicated on the drawings.

B. Adjust for tight, snug fit without binding, even around all sides.

C. Extend thresholds full width of opening. Notch at stops and set interior toe in full bed of caulking compound.

D. All thresholds and weatherstripping shall be installed with appropriate screws and anchors as required for permanent secure anchorage. Do not use wood plugs in concrete!

E. All items shall be installed with anchors appropriate to the construction; see Section 05200.

END OF SECTION 08810
END OF DIVISION 8

DIVISION 9 FINISHES

SECTION 09250 - GYPSUM DRYWALL

GENERAL

Gypsum Board Standard: ASTM C 840.

Fire-Resistance Ratings: Provide gypsum drywall work with ratings indicated and conforming to assemblies tested and listed by recognized authorities.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

American Gypsum Co.
Flintkote Products, Genstar Building Materials Co.
Georgia-Pacific Co.
Gold Bond Building Products Div., National Gypsum Co.
United States Gypsum Co.

Drywall Materials:

Exposed Gypsum Board: ASTM C 36.

Provide Type X where indicated at each side of party walls to bottom of roof deck and where required for fire- resistance rated assemblies.

Thickness: 5/8", except as otherwise indicated.

Provide paper-backed type:

Long Edges: Standard taper.

Thickness: 1/2", except as otherwise shown.

Water-Resistant Gypsum Backing Board: ASTM C 630.

Provide Type X where indicated and where required for fire resistance rating assemblies.

Thickness: 5/8", except as otherwise indicated.

Trim Accessories: Provide manufacturer's. standard metal trim accessories, of the beaded type with face flanges for concealment in joint compound except where semi-finishing or exposed type is indicated. Provide corner beads, L-type edge trim beads, U-type trim beads, special L-kerf-type edge trim-beads, and one piece control beads.

Fastening Adhesive for Wood Framing: ASTM C 557. Supplement adhesive with permanent or temporary fasteners as recommended by mfr.

Gypsum Board Fasteners: Type recommended by gypsum board mfr., except as otherwise indicated. (8" OC @ ceiling and 7" OC @ walls).

Acoustical Sealant: As recommended by gypsum board mfr.

Sound Attenuation Blankets: Semi-rigid mineral fiber without membrane, FS HH-I-521, Type I, thicknesses as shown.

Joint Tape: ASTM C 475, paper reinforcing tape.

Joint Compound: ASTM C 475, of the type indicated.

Provide vinyl type powder for interior work.

Provide a single multi-purpose compound for 3 courses of compound application.

Provide chemical-hardening type for tape bedding, and ready mixed vinyl-type for topping, on interior work.

Provide water-resistant type manufactured by United States Gypsum Co. for use with water-resistant backing board.

Water-Resistant Adhesive: Type I organic adhesive for ceramic tile complying with ASTM A 136.1.

Install supplementary framing runners, furring, blocking and bracing at openings and terminations in gypsum drywall and where required for support of other work which cannot be adequately supported on

gypsum board alone.

PART 2 - DRYWALL INSTALLATION AND FINISH

Install Gypsum boards in lengths and directions which will minimize number of end joints, and avoid end joints in central area of ceilings. Install walls and partitions with exposed gypsum boards vertical, with joints offset on opposite sides of partitions. Otherwise, install boards with edges perpendicular to supports, with end joints staggered over supports, except where recommended in a different arrangement by mfr.

Form control joints with 1/2" space between boards. Install acoustical sealant at base of space, and apply trim accessory at face.

Form "Floating" construction for gypsum boards at internal corners, except where special isolation or edge trim is indicated.

Isolate drywall work from abutting structural and masonry work; provide edge trim and acoustical sealant as recommended by mfr.

Install sound attenuation blankets where indicated, without gaps; and support where necessary to prevent movement or dislocation.

Install water-resistant backing board where indicated, to receive thin-set tile and similar rigid applied finishes at tubs, showers and similar "wet" areas.

Drywall Finishing: Except as otherwise indicated, apply joint tape and joint compound at joints (both directions) between gypsum boards. Apply compound at accessory flanges, penetrations, fasteners heads and surface defects.

> Install compound in 3 coats (plus prefill of cracks where recommended by mfr.); sand after last 2 coats.

Treat joints, fastener heads, cut edges and penetrations in water-resistant backing board to comply with board manufacturer's directions.

END OF SECTION 09250

SECTION 09310 - TILE

Standards: Mortar and grout materials and installation standards of the American National Standards Institute (ANSI) and Standard Specification for Ceramic Tile ANSI A137.1 apply to the work, except as otherwise indicated.

Submittals: With manufacturer's technical data and installation instructions for tile work, submit 3 samples of each type, color, and texture of tile mounted on 12" square backing with joints grouted.

Colors, Textures, and Patterns: As selected by Architect from manufacturer's standards.

Sizes and Thicknesses: As indicated or, if not indicated, as selected by Architect form manufacturer's standard sizes and thicknesses.

Tile Grade: "Standard Grade" unless otherwise indicated.

Porcelain Floor Tile: Factory machine fabricated flat tile.

Glazed Wall Tile: Factory mounted flat tile and as follows:

Face: Plain with square, modified square, or cushioned edges.

Mounting: Back mounted.

Trim Shapes: Same material, size, color, and texture as field tile.

Dry-Set Mortar: ANSI A118.1.

Dry-Set Grout: ANSI A118.6.

Installation: Comply with ANSI A108.1 and 108.4 through A108.10, as applicable for type of tile, setting materials, grout and methods of installation. Comply with manufacturer's instructions for application of proprietary materials.

Joint Pattern: Use grid pattern with 1/16" wide joints, unless otherwise indicated.

Expansion, Control, Contraction, and Isolation Joints: As indicated.

Edge Strips: Provide at exposed edge of tile meeting carpet, wood, or resilient flooring, unless otherwise indicated.

Cleaning and Protection: Clean tile in accordance with applicable ANSI standard for type of tile and method of installation used and manufacturer's instructions. Apply heavy kraft paper or other protective covering to prevent surface damage.

END OF SECTION 09310

SECTION 09900 - PAINTING

GENERAL

Submittals: Prior to beginning work, Architect will furnish color chips for surfaces to be painted. In addition to manufacturer's data, application instructions, and label analysis for each coating material, submit samples for Architect's review of color and texture only. Resubmit samples if requested until required sheen, color and texture is achieved.

On 12" x 12" hardboard, provide 2 samples of each color and material, with texture to simulate finish conditions.

SCOPE

Description of Work Painting and finishing of interior and exterior items and surfaces, unless otherwise indicated.

Includes field painting of bare and covered pipes and ducts (including color coding), and hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under mechanical and electrical work.

Paint exposed surfaces, except as otherwise indicated, whether or not colors are designated. If not designated, colors will be selected by Architect from standard colors available for the coatings required.

Work Not included: Unless otherwise indicated, shop priming of ferrous metal items and fabricated components are included under their respective trades. Pre-finished items, such as metal toilet partitions, acoustic material and the like, are not included. Unless otherwise indicated, painting not required on surfaces of concealed areas except for piping, equipment and other such items within the concealed spaces. Finished metals such as anodized aluminum, stainless steel, bronze, and similar metals will not be painted. Do not paint any moving parts of operating units, or over any equipment identification, performance rating, name or nomenclature plates or code-required labels.

Delivery and Storage: Deliver materials to job site in new, original, and unopened containers bearing manufacturer's name, trade name, and label analysis. Store where indicated in accordance with manufacturer's instructions.

Job Conditions: Do not apply paint in snow, rain, fog or mist or when relative humidity exceeds 85%. Do not apply paint to damp or wet surfaces.

Protection: Protect work of other trades. Correct any painting related damages by cleaning, repairing or replacing, and refinishing, as directed by Architect.

Co-ordination: Provide finish coats which are compatible with prime paints used. Provide barrier coats over incompatible primers where required. Notify Architect in writing of anticipated problems using specified coatings with substrates primed by others.

Surface Preparation: Perform preparation and cleaning procedures in strict accordance with coating manufacturer's instructions for each substrate condition.

Remove hardware and accessories, machined surfaces, plates, lighting fixtures and similar items in place and not to be finish-painted or provide surface-applied protection. Reinstall removed items and remove protective coverings at completion of work.

Seal wood required to be job-painted. Prime edges, ends, face, undersides and backsides of counters, cases, cabinets, counters, etc. Use spar varnish for back-priming where transparent finish is required.

Back-prime interior paneling only where masonry, plaster, or other wet wall construction occurs on backside.

Seal tops, bottoms, and cut-outs of wood doors with heavy coat of varnish or similar sealer immediately upon delivery to job.

Clean ferrous surfaces which are not galvanized or shop-coated. Remove oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning. Touchup shop-applied prime coats wherever damaged.

Clean galvanized surfaces free of oil and surface contaminants with non-petroleum based solvent.

Material Preparation: Mix, prepare, and store painting and finishing materials in accordance with manufacturer's directions.

APPLICATION

Apply painting and finishing materials in accordance with manufacturer's directions. Use applicators, and techniques best suited for materials and surfaces to which applied.

Apply additional coats when undercoats, stains or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance.

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 equiPment is installed.

Paint interior surfaces of ducts, where visible through registers or grilles, flat, non-specular black.

Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.

Finish exterior doors on tops, bottoms and edges same as exterior faces, unless otherwise indicated.

Sand lightly between succeeding enamel or varnish coats.

Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise specified.

Apply prime coat to material which is required to be painted or finished, and which has not been prime coated by others.

Apply each material at not less than the manufacturer's recommended spreading rate, to provide a

total dry film to thickness of not less than 4.0 mils for entire coating system of prime and finish coats for 3-coat work.

Provide a total dry film thickness of not less than 2.5 mils for entire coating system of prime and finish coat for 2-coat work.

Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

MATERIALS

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

Devoe & Reynolds Co. (Devoe)
Glidden Coatings and Resins, Division of SCM Corp. (Glidden)
Benjamin Moore & Co. (Moore)
PPG Industries, Pittsburg Paints (pittsburg)
Pratt & Lambert (P&L)
The Sherwin-Williams Co. (S-W)

Material Quality: Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturers identification as a standard, best-grade product will not be acceptable.

PAINTING SCHEDULE:

	Surface Primer	First Coat	Second Coat
Exterior:			
Factory primed metals	Spot primer touch-up	Exterior met enamel, semi-gloss	Exterior metal enamel, semi-gloss
Galvanized metals	Galvanized metal primer	Exterior met enamel, semi- gloss	Exterior metal enamel, semi-gloss
Wood doors & frames	Factory sanded & sealed	Exterior wood trim, semi- gloss	Exterior wood trim enamel, semi-gloss
Ferrous metal	Rust-inhibitive primer	Exterior trim enamel, semi-gloss	Exterior trim enamel, semi-gloss
Interior:			
Softwood frames doors & trim	Oil base primer enamel undercoat	Semi-gloss enamel	Semi-gloss enamel
Metal surfaces	Primer touch-up	Semi-gloss enamel	Semi-gloss enamel
Taped & textured gypsum board walls (except kitchens & bathrooms)	Alkyd primer & sealed or self-priming finish coat	Latex paint, semi-gloss	Latex paint, semi-gloss

gypsum board walls, kitchen & bathroom		emulsion,	
Plywood or softwood Acoustical ceilings	Sanding sealer or factory primed one coat vinyl acoustical welcote course texture	Semi-gloss enamel	Semi-gloss enamel
Cedar fascia	N/A	Clear sealer	

END OF SECTION 09900
END OF DIVISION 9

DIVISION 10 SPECIALTIES

10440 ARCHITECTURAL SIGNAGE

1. SCOPE

Building plaque and Building identification, including anchors.

2. MATERIALS

A. Building Plaque: Furnish and install 18" x 24" aluminum plaque as manufactured by Southwell Company, San Antonio, Texas (one per project site). Plaque shall contain no more than five hundred (500) letters and thirty (30) lines. Metal Arts, ASI, and Mills Mfg. Company are also approved manufacturers.

1) Cast virgin ingots, F-214 aluminum alloy. Casting shall be free of pits and gas holes and all letters shall be sharp and hand tooled.

2) Single line border. Border and faces of raised leners are to be satin finish and plaque background to be leatherette texture. Background shall be sprayed with black acrylic lacquer. Plaque shall be chemically cleaned and etched and treated with alodine. Two coats of clear acrylic lacquer shall be sprayed on completed plaque.

3) Letter style shall be Helvetica.

4) Plaque shall be mounted on masonry wall with concealed fastening.

5) Architect will furnish plaque design and general layout. Contractor will furnish rubbing of actual pattern for owner's approval prior to casting.

B. Dimensional Letters:

1) Allow for 34 letters as selected by Architect; Helvetica medium, 8" height, 3/4" thickness, medium bronze finish as manufactured by Southwell, Metal Arts and Mills Mfg. Company are also approved manufacturers.

2) Letters shall be mounted with concealed anchors.

C. Graphics: In addition to building plaque, dimensional letters and signage outlined in detail book, allow $3,000.00 for purchase of graphics and directional signage. Graphics will be selected by owner. In addition to the allowance, contractor shall include his overhead and profit and installation of graphics in base bid.

3. INSTALLATION

All architectural signage items shall be securely mounted with first quality anchors; mechanical mounting with sheet metal/wood screws. full threaded/ one-way theft resistant. Mount level and square to surrounding surfaces. Location as directed by Architect.

END OF SECTION 10440

SECTION 10800 - TOILET ROOM ACCESSORIES

SCOPE

Provide and install toilet room accessories and mounting devices. Install accessories noted to be furnished by owner and installed by contractor. Location, if not shown on drawings, shall be at location as required to comply with ADA standards.

STANDARDS

Bobrick items are specified to be purchased and installed by contractor. Items of equal quality and same design features and standards from the following firms are acceptable:

Charles Parker	World Dyer, Model "A" hand dryer
Accessory Specialties	Sloan Valve Co., "Optima" hand dryer
American Dispenser Co.	Bradley Corporation

ACCESSORIES (MMC)

Mirrors: Furnish and install Bobrick B-165, size as shown on drawings (if not noted, install 18" x 30"), stainless steel framed mirrors, concealed hangers, grade #1,1/4" polished plate glass. Mount mirrors at handicapped lavatory locations at 37" above finish floor to bottom of mirror. Install a mirror at each lavatory/sink in each toilet or restroom shown on plans.

Toilet Paper Holders: At each water closet, install one Bobrick No. B-273.

Paper Towel Dispenser: Owner will furnish and install paper towel dispensers.

Hand Dryers: Furnish and install Bobrick B-7017, surface-mounted hand dryers. Color as selected by architect from manufacturer's seven standard colors; U.L. rated, ten (10) year warranty. Install at locations as noted on drawings.

ACCESSORIES (FOR EACH RESIDENTIAL UNIT)

(1)	HM #675	Toilet Paper Holder
(1)	HM #622	Soap Dish
(1)	HM #630	Toothbrush Holder
(1)	HM #681	Robe Hook
(1)	HM #686	Towel Ring
(1)	HM #695	Towel Bar - 24"
(1)	HM #1622	Framed Plate Glass Mirror
(1)	HM-P #1622	Recessed Medicine Cabinet w/o mirror

NOTE: B - Numbers re: Bobrick, HM - Numbers re: Hallmack

INSTALLATION

Install all accessories in accordance with manufacturers written instructions, securely anchored, plumb and level. At all areas where accessories are attached to gypsum board walls use metal toggle bolts; plastic expansion shields are not allowed.

END SECTION 10800
END OF DIVISION 10

DIVISION 12 FURNISHINGS

SECTION 12390 - KITCHEN CABINETS

Kitchen Cabinet Standard: Comply with ANSI A161.1.

Provide "Certified Cabinet" seal, of the Kitchen Cabinet Manufacturers Association (KCMA), affixed to each unit in a semi-concealed location of each unit, evidencing compliance with above standard.

Countertop Standard: ANSI A161.2.

Cabinet Hardware: Comply with ANSI A156.9 as applicable to the work indicated.

Provide style and finish of cabinet hardware which is cabinet manufacturer's standard for the required cabinet style and finish.

Sizes, Shapes and Types: Provide the sizes and types of units as shown, complete with drawers, doors, shelves, compartments for appliances and fixtures.

Base Units: Except as otherwise indicated, nominal 24" depth x height required for 36" height of finished counter-top.

Over-Counter Wall Units: Except as otherwise indicated, nominal 12" depth x height required for top to be 7'-0" above floor.

Full-Height Units: Except as otherwise indicated, match depth of base units and height of wall units.

Product/Manufacturer: Provide the following or approved equal:

Manufacturer: Cardell/Arrowwood, Millenia Series, 15443 Capital Port, San Antonio, Texas 78249.

Product: "Oakbrook", solid wood fronts kitchen cabinets, with stained "Pearl" finish.

Counter Top: High-pressure plastic laminate on particleboard (3/4"), with built-up edges (1-1/2") and integral back-splash (to bottom of wall cabinets above); 0.050" thick general purpose plastic laminate, except 0.042" thick wherever post-forming is required; low gloss finished white except as otherwise indicated or selected by Architect. Finish exposed edges.

Construction: Continuous sheet (post-formed) with waterfall and-cove back-splash and no-drip bull-nose edge.

Installation: Anchor cabinet units securely in place with concealed (when doors and drawers are closed) fasteners, anchored into structural support members of wall construction. Comply with manufacturer's instructions and recommendations for support of units. Use steel screws for anchoring cabinets to wall.

Counter Tops: Attach counter tops securely to base units. Spline and glue joints in counter tops; provide concealed mechanical clamping of joint. Provide cut-outs for fixtures and appliances as indicated; smooth cut edges and coat with waterproof coating or adhesive.

Complete hardware installation and adjust doors and drawers for proper operation.

END SECTION 12390
END OF DIVISION12