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DIVISION

01019

CONTRACT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Schedule of values.
B. Application for payment.
C. Change procedures.
D. Alternatives.

1.2 RELATED SECTIONS

A. Section 01600 - Material and Equipment: Product substitutions.

1.3 SCHEDULE OF VALUES

A. Submit a printed schedule on Contractor's standard form. Electronic media printout will be considered.

B. Submit Schedule of Values in duplicate within 20 days after date of Owner-Contractor Agreement.

C. Revise schedule to list approved Change Orders, with each Application For Payment.

1.4 APPLICATIONS FOR PAYMENT

A. Submit four copies of each application on Contractor's electronic media driven form.
B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
C. Payment Period: 30 days.
D. Include an updated construction progress schedule.
E. Certified payroll records.

1.5 CHANGE PROCEDURES

A. The Architect/Engineer/Designermay issue a Notice of Change that includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required.

B. The Contractor may propose changes by submitting a request for change to the Architect/Engineer/Designer describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, the effect on the Contract Sum/Price and Contract Time, and a statement describing the effect on Work by the MoDOT District or other Contractors.

C. Stipulated Sum/Price Change Order: Based on Notice of Change and Contractor's fixed price quotation or Contractor's request for a Change Order as approved by Architect/Engineer/Designer.

D. Construction Change Directive: Architect/Engineer/Designermay issue a directive instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute the change.

E. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract. Architect/Engineer/Designerwill determine the change allowable in Contract Sum/Price and Contract Time as provided in the Contract Documents.

F. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

G. Execution of Change Orders: Architect/Engineer/Designerwill issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

1.6 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specify requirements.

B. If, in the opinion of the Architect/Engineer/Designer, it is not practical to remove and replace the Work, the Architect/Engineer/Designerwill direct an appropriate remedy or adjust payment.

1.7 ALTERNATIVES

A. Accepted Alternatives will be identified in Owner-Contractor Agreement.

END OF SECTION

01039

COORDINATION AND MEETING REQUIREMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordination and project conditions.
B. Field engineering.
C. Preconstruction meeting.
D. Site mobilization meeting.
E. Progress meetings.
F. Preinstallation meetings.
G. Equipment electrical characteristics and components.
H. Examination.
I. Preparation.
J. Cutting and Patching.
K. Alteration project procedures.

1.2 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to and placing in service, such equipment.

C. Coordinate space requirements, supports, and installation of mechanical and electrical Work, which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas, except as otherwise indicated, conceal pipes, ducts and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

E. Coordinate completion and clean up of Work of separate sections.

F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.3 FIELD ENGINEERING

A. Employ a Land Surveyor registered in the State of Missouri and acceptable to Architect/Engineer/Designer.
B. Owner will locate and protect survey control and reference points.
C. Control datum for survey is that established by Owner provided survey.
D. Verify setbacks and easements; confirm drawing dimensions and elevations.
E. Provide field engineering services. Establish elevations, lines and levels, utilizing recognized engineering survey practices.

1.4 PRECONSTRUCTION MEETING

A. Architect/Engineer/Designerwill schedule a meeting after Notice of Award.
B. Attendance Required: District engineer or representative, Architect/Engineer/Designerand

Contractor.

C. Record minutes and distribute copies within 5 days after meeting to participants, with two copies to District Engineer, Architect/Engineer/Designer, participants and those affected by decisions made.

1.5 SITE MOBILIZATION MEETING

A. Architect/Engineer/Designerwill schedule a meeting at the Project site prior to Contractor occupancy.

B. Architect/Engineer/Designerwill record minutes and distributes copies within 5 days after meeting to participants, with two copies to Architect/Engineer/Designer, participants and those affected by decisions made.

1.6 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at when arranged by Architect/Engineer/Designer.

B. Architect/Engineer/Designerwill make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, District engineer representative, Architect/Engineer/Designer, as appropriate to agenda topics for each meeting.

D. Agenda:
   1. Review of Work progress.
   2. Field observations, problems, and decisions.
   3. Identification of problems, which impede planned progress.
   4. Maintenance of progress schedule.
   5. Corrective measures to regain projected schedules.
   6. Coordination of projected progress.
   7. Effect of proposed changes on progress schedule and coordination.

E. Record minutes and distributes copies within 5 days after meeting to participants and those affected by decisions made.

1.7 PREINSTALLATION MEETING

A. When required in individual specification sections, convene a pre-installation meeting at the site prior to commencing work of the section.
B. Notify Architect/Engineer/Designerseven days in advance of meeting date.
C. Prepare agenda and preside at meeting:
   1. Review conditions of installation, preparation and installation procedures.
   2. Review coordination with related work.
D. Record minutes and distributes copies within 5 days after meeting to participants and those affected by decisions made.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 CUTTING AND PATCHING

A. Employ skilled and experienced installer to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements, which affect:
   1. Structural integrity of element.
   2. Integrity of weather-exposed or moisture-resistant elements.
   3. Work of Owner or separate contractor.

C. Execute cutting, fitting, and patching to complete Work, and to:
   1. Uncover Work to install or correct ill-timed Work.
   2. Remove and replace defective and non-conforming Work.
   3. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Cut masonry and concrete materials using masonry saw or core drill.

E. Fit Work tight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

F. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

G. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

H. Identify hazardous substances or conditions exposed during the Work to the Architect/Engineer/Designerfor decision or remedy.

3.2 ALTERATION PROJECT PROCEDURES

A. Materials: As specified in Product sections; match existing Products and work for patching and extending work.

B. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.

C. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to Architect/Engineer/Designerfor review.

D. Patch or replace portions of existing surfaces that are damaged, lifted, discolored or showing other imperfections.

E. Finish surfaces as specified in individual Product sections.

END OF SECTION

01300

SUBMITTAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittal procedures.
B. Construction progress schedules.
C. Proposed Products list.
D. Product Data.
E. Shop Drawings.
F. Samples.
G. Design data.
H. Test reports.
I. Certificates.
J. Manufacturer's instructions.
K. Manufacturer's field reports.
L. Erection drawings.
M. Construction photographs.

1.2 RELATED SECTIONS

A. Section 01300 – Submittals.
B. Section 01400 - Quality Control: Manufacturers' field services and reports.
C. Section 01700 - Contract Closeout: Contract warranties, bonds, manufacturers' certificates and closeout submittals.

1.3 REFERENCES

A. AGC Associated General Contractors of America publication "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry".

1.4 SUBMITTAL PROCEDURES

A. Submit five (5) hard copies of each submittal with Architect/Engineer/Designeraccepted form.

B. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number and specification section number, as appropriate.

C. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work and coordination of information is in accordance with the requirements of the Work and Contract Documents.

D. Schedule submittals to expedite the Project, and deliver to Architect/Engineer/Designerat business address. Coordinate submission of related items.

E. For each submittal for review, allow 15 days excluding delivery time to and from the contractor.

F. Identify variations from Contract Documents and Product or system limitations, which may be detrimental to successful performance of the completed Work.

G. Submittals not requested will not be recognized or processed.

1.5 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial schedule in duplicate within 15 days after date established in Notice to Proceed.
B. Revise and resubmit as required.
C. Submit revised schedules with each Application for Payment, identifying changes since previous version.
D. Submit a horizontal bar chart with separate line for each major portion of Work or operation, identifying first workday of each week.

1.6 PROPOSED PRODUCTS LIST

A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name and model number of each product.
B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation and reference standards.

1.7 PRODUCT DATA

A. Product Data for Review:
   1. Submitted to Architect/Engineer/Designer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
   2. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article above and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.

B. Product Data for Information:
   1. Submitted for the Architect/Engineer/Designer'sknowledge as contract administrator or for the Owner.

C. Product Data for Project Closeout:
   1. Submitted for the Owner's benefit during and after project completion.

D. Submit the number of copies, which the Contractor requires, plus two copies that will be retained by the Architect/Engineer/Designer.

E. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information specific to this Project.

F. After review distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01700 - CONTRACT CLOSEOUT.

1.8 SHOP DRAWINGS

A. Shop Drawings for Review:
   1. Submit five (5) hard copies to Architect/Engineer/Designerfor review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
   2. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article above and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.

B. Shop Drawings for Information:
   1. Submitted for the Architect/Engineer/Designer'sknowledge as contract administrator or for the Owner.

C. Shop Drawings For Project Closeout:
   1. Submitted for the Owner's benefit during and after project completion.

D. Indicate special utility and electrical characteristics, utility connection requirements and location of utility outlets for service for functional equipment and appliances.

E. Submit in the form of one reproducible transparency and one opaque reproduction.

1.9 SAMPLES

A. Samples for Review:
   1. Submitted to Architect/Engineer/Designerfor review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
   2. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article above and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.

B. Samples for Information:
   1. Submitted for the Architect/Engineer/Designer'sknowledge as contract administrator or for the Owner.

C. Samples for Selection:
   1. Submitted to Architect/Engineer/Designerfor aesthetic, color, or finish selection.
   2. Submit samples of finishes for Architect/Engineer/Designerselection.
   3. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article above and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.

1.10 DESIGN DATA

A. Submit for the Architect/Engineer/Designer'sknowledge as contract administrator or for the Owner.
B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.11 TEST REPORTS

A. Submit for the Architect/Engineer/Designer's knowledge as contract administrator or for the Owner.
B. Submit test reports for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.12 CERTIFICATES

A. When specified in individual specification sections, submit certification by the manufacturer, installation/application subcontractor, or the Contractor to Architect/Engineer/Designer, in quantities specified for Product Data.
B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits and certifications as appropriate.
C. Certificates may be recent or previous test results on material or Product but must be acceptable to Architect/Engineer/Designer.

1.13 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, and start-up, adjusting and finishing, to Architect/Engineer/Designer

for delivery to owner in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention and special environmental criteria required for application or installation.

C. Refer to Section 01400 - Quality Control, Manufacturers' Field Services article.

1.14 MANUFACTURER'S FIELD REPORTS

A. Submit reports for theArchitect/Engineer/Designer's benefit as contract administrator or for the Owner.

B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.15 ERECTION DRAWINGS

A. Submit drawings for the Architect/Engineer/Designer’s benefit as contract administrator or for the Owner.

B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

C. Data indicating inappropriate or unacceptable Work may be subject to action by the Architect/Engineer/Designer or Owner.

END OF SECTION

01400

QUALITY CONTROL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality assurance - control of installation.
B. Tolerances.
C. References and standards.
D. Mock-up.
E. Inspecting and testing laboratory services.
F. Manufacturers' field services.

1.2 RELATED SECTIONS

A. Section 01300 - Submittals: Submission of manufacturers' instructions and certificates.
B. Section 01600 - Material and Equipment: Requirements for material and product quality.
C. Section 01650 - Starting of Systems.

1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer/Designer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.4 TOLERANCES

A. Monitor fabrication and installation tolerance control of Products to produce acceptable Work. Do not permit tolerances to accumulate.
B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer/Designer before proceeding.
C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.5 REFERENCES AND STANDARDS

A. For Products or workmanship specified by association, trade or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date for receiving bids or date specified in the individual specification sections, except where a specific date is established by code.
C. Neither the contractual relationships, duties or responsibilities of the parties in Contract nor those of the Architect/Engineer/Designer shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.6 TESTING SERVICES

A. Contractor to provide all testing services as called out in these specifications.
B. Testing and source quality control may occur on or off the project site. Perform off-site testing as required by the Architect/Engineer/Designer or the Owner.
C. Testing does not relieve Contractor to perform Work to contract requirements.
D. Re-testing required because of non-conformance to specified requirements shall be performed by the same MoDOT personnel on instructions by the Architect/Engineer/Designer.

1.7 INSPECTION SERVICES

A. Owner will employ MoDOT Personnel to perform inspection.
B. Inspecting may occur on or off the project site. Perform off-site inspecting as required by the Architect/Engineer/Designer or the Owner.
C. Inspecting does not relieve Contractor to perform Work to contract requirements.

1.8 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and the balancing of equipment as applicable and to initiate instructions when necessary.
B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
C. Refer to Section 01300 - SUBMITTALS, MANUFACTURERS' FIELD REPORTS article.

PART 2 EXECUTION

2.1 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.

2.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.
C. Apply manufacturer required or recommended substrate primer, sealer or conditioner prior to applying any new material or substance in contact or bond.

END OF SECTION

01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities: Electricity, telephone service, facsimile service and sanitary facilities.
B. Temporary Controls: enclosures and fencing, protection of the Work and water control.
C. Construction Facilities: progress cleaning and temporary buildings.

1.2 TEMPORARY ELECTRICITY

A. Cost: By Contractor; pay for temporary power service furnished by MoDOT.

1.3 TELEPHONE SERVICE

A. Provide, maintain, and pay for telephone service to field office and Architect/Engineer/Designer's field office at time of project mobilization.

1.4 FACSIMILE SERVICE

A. Provide, maintain and pay for facsimile service and a dedicated telephone line to field office and Architect/Engineer/Designer's field office at time of project mobilization.

1.5 TEMPORARY WATER SERVICE

A. Connect to existing water source as directed for construction operations at time of project mobilization.
B. Contractor will reimburse Owner for water used in construction as agreed upon at time of project mobilization.

1.6 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

1.7 EXTERIOR ENCLOSURES

A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.8 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where specified in individual specification sections.
B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.
C. Provide protective coverings at walls, projections, jambs, sills and soffits of openings.
D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage or movement of heavy objects, by protecting with durable sheet materials.
E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

1.9 SECURITY

A. Provide security and facilities to protect Work and existing facilities and Owner's operations from unauthorized entry, vandalism or theft.
B. Coordinate with Owner's security program.

1.10 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris and rubbish from site periodically and dispose off-site.
E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.11 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities and materials prior to Final Application for Payment inspection.
B. Clean and repair damage caused by installation or use of temporary work.
C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS Not Used.

PART 3 EXECUTION Not Used.

END OF SECTION

01600

MATERIAL AND EQUIPMENT REQUIREMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products.
B. Transportation and handling.
C. Storage and protection.
D. Product options.
E. Substitutions.

1.2 RELATED SECTIONS

A. Instructions to Bidders: Product options and substitution procedures.
B. Section 01400 - Quality Control: Product quality monitoring.

1.3 PRODUCTS

A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
B. Provide interchangeable components of the same manufacture for components being replaced.

1.4 TRANSPORTATION AND HANDLING

A. Transport and handle Products in accordance with manufacturer's instructions.
B. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct and products are undamaged.
C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement or damage.

1.5 STORAGE AND PROTECTION

A. Store and protect Products in accordance with manufacturers' instructions.

B. Store with seals and labels intact and legible.

C. Store sensitive Products in weather tight, climate controlled, enclosures in an environment favorable to Product.

D. For exterior storage of fabricated Products, place on sloped supports above ground.

E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

F. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of Products.

G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

H. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement or damage.

I. Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.6 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description is acceptable.
B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.7 SUBSTITUTIONS

A. Architect/Engineer/Designer will consider requests for Substitutions only within 15 days after date established in Notice to Proceed.

B. Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that the Contractor:
1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
2. Will provide the same warranty for the Substitution as for the specified Product.
3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Will reimburse Owner for review or redesign services associated with re-approval by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:
1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
2. Submit shop drawings, product data and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.
3. The Architect/Engineer/Designer will notify Contractor in writing of decision to accept or reject request.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

01650

STARTING OF SYSTEMS REQUIREMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Starting systems.
B. Demonstration and instructions.
C. Testing, adjusting and balancing.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control: Manufacturers field reports.
B. Section 01700 - Contract Closeout: System operation and maintenance data and extra materials.

1.3 STARTING SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Architect/Engineer/Designer seven days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, and control sequence and for conditions that may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable manufacturer's representative or Contractors' personnel in accordance with manufacturers' instructions.

G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up and to supervise placing equipment or system in operation.

H. Submit a written report in accordance with Section 01300 that equipment or system has been properly installed and is functioning correctly.

1.4 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Final Completion.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.

D. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance and shutdown of each item of equipment at agreed time, at equipment location.

E. Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instruction.

F. The amount of time required for instruction on each item of equipment and system that's specified in individual sections.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

01700

CONTRACT CLOSEOUT REQUIREMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures.
B. Final cleaning.
C. Adjusting.
D. Project record documents.
E. Operation and maintenance data.
F. Spare parts and maintenance Products.
G. Warranties.

1.2 RELATED SECTIONS

A. Section 01500 - Construction Facilities and Temporary Controls: Progress cleaning.
B. Section 01650 - Starting of Systems: System start-up, testing, adjusting and balancing.

1.3 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect/Engineer/Designer'sreview.
B. Provide submittals to Owner that is required by governing or other authorities.
C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments and sum remaining due.
D. Owner will occupy portions of the building as specified in Section 01010.
E. Projects shall not be accepted by MoDOT until the vendor has completed all punch list items. The vendor will then have 30 days to submit all required paperwork necessary to close the project. Failure to submit the required paperwork within 30 days could result in the debarment or suspension of the contractor from future projects.

1.4 FINAL CLEANING

A. Execute final cleaning prior to final project assessment. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

B. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

C. Clean or replace filters of operating equipment used during construction and/or adjustment.

D. Clean debris from roofs, gutters, downspouts and drainage systems.

E. Clean site; sweep paved areas, rake clean landscaped surfaces.

F. Remove waste and surplus materials, rubbish and construction facilities from the site.

1.5 ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.6 PROJECT RECORD DOCUMENTS

A. Store record documents separate from documents used for construction.

B. Record information concurrent with construction progress.

C. Specifications: Legibly mark and record at each Product section description ofactual Products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

D. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish main floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

E. Submit documents to Architect/Engineer/Designer'swith claim for final Application for Payment.

1.7 OPERATION AND MAINTENANCE DATA

A. Submit data bound in 8-1/2 x 11 inch (A4) text pages, three D side ring binders with durable plastic covers.
B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project and subject matter of binder when multiple binders are required.
C. Internally subdivide the binder contents with permanent page dividers, logically organized; with tab titling clearly printed under reinforced laminated plastic tabs.
D. Submit 1 draft copy of completed volumes 15 days prior to final inspection. This copy will be reviewed and returned with Architect/Engineer/Designer comments. Revise content of all document sets as required prior to final submission.
E. Submit two sets of revised final volumes, within 10 days after final inspection.

1.8 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Provide spare parts, maintenance, and extra Products in quantities specified individual specification sections.
B. Deliver to Project site; obtain receipt prior to final payment.
C. Examine system components at a frequency consistent with reliable operation.Clean, adjust and lubricate as required.
D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
E. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the Owner.

1.9 WARRANTIES

A. Execute and assemble transferable warranty documents from Subcontractors, suppliers and manufacturers.
B. Submit prior to final Application for Payment.
C. For items of Work delayed beyond date of Final Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of the warranty period.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

02050

DEMOLITION

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. The work to be done under these Specifications shall include all labor, materials, equipment and services necessary to complete all demolition of designated structures; complete removal of foundations and slab-on-grade, disconnecting utilities to demolished structures and removing utility lines as noted on Plot Plan.

PART 2 PRODUCTS

This Section not used.

PART 3 EXECUTION

3.1 PROTECTION OF EXISTING FACILITIES

A. The contractor shall, as soon as he receives a Notice to Proceed with work, enter the premises and do any and all things necessary to protect the premises from damage by unauthorized persons. The contractor shall protect all existing equipment, pavements, tracks, poles, pipes, utilities, etc., which are not affected by demolition work. The contractor shall provide all shoring, bracing, tarps, temporary partitions, barricades, and/or other safety devices deemed necessary for protection.

3.2 OWNERSHIP OF PROPERTY

A. No right, title property or interest of any kind whatsoever in or to the land or premises upon which such buildings or structures stand, is created, assigned, conveyed, granted, or transferred to the contractor, or any other person or persons, except only the right on entry to remove such buildings and structures in strict accordance with the Contract.

B. Only such property may be salvaged by contractor as is owned by MoDOT, and in the event of any doubt respecting the ownership of any particular property, the contractor shall request from MoDOT a written statement respecting its ownership.

C. All salvage becomes the property of the contractor, but storage of such materials and equipment of the project area will not be permitted except for the duration of the demolition contract.

D. Personal property of third persons or of occupants of building on the site shall not become the property of the contractor.

A. The contractor shall furnish the disposal site for all demolition materials.

B. The contractor shall take whatever steps necessary to control dust during demolition and removal. The contractor will monitor the haul road for debris.

END OF SECTION

02221

TRENCHING, BACKFILLING AND COMPACTING

PART 1 GENERAL

1.1 SUMMARY

A. Trench, backfill, and compact as specified herein and as needed for installation of underground utilities associated with the Work.
B. Related work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirement and the methods needed for proper performance of the work of this Section.
B. Use equipment adequate in size, capacity and numbers to accomplish the work in a timely manner.
C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the construction soil engineer.

1.3 DELIVERY, STORAGE AND HANDLING

A. Comply with pertinent provisions of Section 01620.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Fill and backfill materials:
1. Provide soil materials free from organic matter and deleterious substances, containing no rocks or lumps over 6" in greatest dimension, and with not more than 15% of the rocks or lumps larger than 2-3/8" in their greatest dimension.
2. Fill material is subject to the approval of the owner/architect and is that material removed from excavations or imported from off-site borrow areas, predominantly granular, non-expansive soil free from roots and other deleterious matter.
3. Do not permit rocks having a dimension greater than 1" in the upper 12" of fill.
4. Cohesionless material used for backfill: Provide sand free from organic material and other foreign matter and as approved by the Owner/Architect.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FINISH ELEVATIONS AND LINES

A. Comply with pertinent provision of Section 01050.

02730

SANITARY SEWERAGE SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Provide sanitary sewerage system as shown on the Drawings, specified herein and needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.2 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01620.

PART 2 PRODUCTS

2.1 PIPE AND FITTINGS

A. Cast iron soil pipe and fittings (CIP):

1. Comply with ASTM A74, class SV.
2. Use rubber gaskets complying with ASTM C564 for compression joints.

B. Clay pipe and fittings (VCP):

1. Use extra strength, minimum of SDR 35.
2. Comply with ASTM D3034.

C. Polyvinyl chloride pipe and fitting (PVC):

1. Use extra strength, minimum of SDR 35.
2. Comply with ASTM D3034.

D. Acrylonitrile butadine styrene pipe and fittings (ABS):

1. Comply with ASTM D2680.

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2.2 CLEANOUTS

A. Provide cleanouts as required and where shown on the Drawings.
   1. Provide traffic weight covers and frames where clean-outs are within pavement, with the letters "SSCO" cast into the cover.
   2. Acceptable products:
      a. Alhambra Foundry, Model A_2100, 10" round cover, unless otherwise shown on the Drawings.

B. Where cleanout is within a graded area, construct as shown on the Drawings or 100 ft on center minimum.

2.3 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FIELD MEASUREMENTS

A. Make necessary measurements in the field to assure precise fit of items in accordance with the approved design.

3.3 INSTALLATION

A. Trench, backfill, and compact for the work of this Section in strict accordance with pertinent provisions of Section 02221 of these Specifications.

B. Location:
   1. Where the sewer location is not located clearly by dimensions on the Drawings, locate the sewer:
      a. Where the bottom of the water pipe will be at least 12" above the top of the sewer pipe, the horizontal spacing may be a minimum of six feet.
      b. Where the gravity flow sewers cross above water lines, fully encase the sewer pipe for a distance of ten feet on each side of the crossing; or
      c. Use acceptable pressure pipe with no joint closer horizontally than three feet from the crossing.
      d. Where concrete encasement is used, provide not less than 4" thickness including that on pipe joints.

C. Pipe laying:
   1. Protect pipe during handling against shocks and free fall. Remove extraneous material from the pipe interior.
   2. Lay pipe by proceeding upgrade with the spigot ends of bell-and-spigot pipe pointing in direction of flow.
   3. Lay each pipe accurately to the indicated line and grade, aligning so the sewer has a uniform invert.
   4. Continually clear interior of the pipe free from foreign material.
   5. Before making pipe joints, clean and dry all surfaces of the pipe to be joined.

6. Use lubricants, primers, and adhesives recommended for the purpose by the pipe manufacturer.
7. Place, fit, join, and adjust the joints to obtain the degree of water tightness required.

3.4 WYE BRANCHES

A. Provide wye branches where sewer connections are indicated or required.
   1. Where joining an existing line, join by placing a saddle over the line, and make connection in a manner that will not obstruct or interfere with the existing flow.
   2. When conditions are such that connection pipe cannot be supported adequately on undisturbed earth or compacted fill, encase the pipe in a concrete backfill or support on a concrete cradle.

B. Provide concrete required because of conditions resulting from faulty construction methods or negligence, at no additional cost to the Owner.

3.5 BUILDING CONNECTIONS

A. Terminate building connections where shown on the Drawings.
B. Provide temporary closures at terminals where the building pipe is not installed.
   1. Place marker post at grade end of plugged line.
   2. Where building piping has been installed, make connection to the building piping system.

3.6 TESTING AND INSPECTING

A. Do not allow or cause any of the work of this Section to be covered up or enclosed until after it has been inspected and tested and has been approved by the Architect.

B. Leakage tests:
   1. Test lines for leakage by exhilaration tests.
      a. Prior to testing for leakage, backfill the trench to at least the lower half of the pipe.
      b. If required, place sufficient additional backfill to prevent pipe movement during testing, leaving the joints uncovered to permit inspection.
   2. Water exhilaration tests:
      a. Test each section of sewer line between successive manholes by closing the lower end of the sewer to be tested and the inlet sewer of the upper manhole, using stoppers.
      b. Fill the manhole and pipe with water to a point four feet above the invert of the sewer at the center of the upper manhole; or, if groundwater is present, four feet above the average adjacent groundwater level.
      c. Allowable leakage will be computed by the formula:
         (1) For mortared joints: $E = 0.0001\ LD\ H$;
         (2) For all other joints: $E = 0.0002\ LD\ H$;
         (3) "L" is the length of sewer and house connections tested, in feet;
         (4) "E" is the allowable leakage in gallons per minute of sewer test;
         (5) "D" is the internal pipe diameter in inches;
         (6) "H" is the difference in elevation between the water surface in the upper manhole and the invert of the pipe at the lower manhole; or, if groundwater is present above the invert of the pipe in the lower manhole, the difference in elevation between water surface in the upper manhole and the groundwater at the lower manhole.
   3. Water infiltration test:
      a. If, in the opinion of the Architect, excessive groundwater is encountered in the construction of a section of the sewer, the exhilaration test shall not be used.
      b. Close the end of the sewer at the upper structure sufficiently to prevent the

entrance of water.

c. Discontinue pumping of groundwater for at least three days, then test for infiltration.

d. Infiltration into each individual reach of sewer between adjoining manholes shall not exceed that allowed in the formula given for the exhilaration test, except that "H" in the formula shall be the difference between the groundwater surface and the invert of the sewer at the downstream manhole.

4. Provide and use measuring devices approved by the Architect.
5. Provide water, materials, and labor for making required tests.
6. Make tests in the presence of the Architect, gibing the Architect at least three days advance notice of being ready for test observation.

C. Submit test data to the Architect for review and approval.

END OF SECTION

03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Reinforcing steel bars, wire fabric and accessories for cast-in-place concrete.

1.2 RELATED SECTIONS

A. Section 03100 - Concrete Formwork.
B. Section 03300 - Cast-in-Place Concrete.

1.3 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

B. ACI 318 - Building Code Requirements For Reinforced Concrete.

C. ACI SP-66 - American Concrete Institute - Detailing Manual.

D. ACI 315-99 – Details and Detailing of Concrete Reinforcement.

E. ANSI/ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.

F. ANSI/ASTM A184 - Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.

G. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

H. ANSI/AWS D1.4 - Structural Welding Code for Reinforcing Steel.

I. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

J. AWS D12.1 - Welding Reinforcement Steel, Metal Inserts and Connections in Reinforced Concrete Construction.

K. CRSI - Concrete Reinforcing Steel Institute - Manual of Standard Practice.

L. CRSI - Placing Reinforcing Bars.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with CRSI - Manual of Standard Practice & ACI 318.

1.5 COORDINATION

A. Coordinate work under provisions of Section 01039.
B. Coordinate with placement of formwork, formed openings and other Work.

PART 2 PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Steel: ASTM A615, yield grade; deformed billet steel bars, unfinished.
B. Reinforcing Steel Plain Bar and Rod Mats: ASTM A704, ASTM A615, Grade 60; steel bars or rods, unfinished.
C. Stirrup Steel: ANSI/ASTM A82, unfinished.
D. Welded Steel Wire Fabric: ASTM A815; in flat sheets.

2.2 ACCESSORY MATERIALS

A. Tie Wire: Minimum gage annealed type.
B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor barrier puncture.
C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel; size and shape as required.

2.3 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI Manual of Practice ACI SP-66.

PART 3 EXECUTION

3.1 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
B. Do not displace or damage vapor barrier.
C. Accommodate placement of formed openings.
D. Conform to applicable code for concrete cover over reinforcement.

END OF SECTION

03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cast-In-Place Concrete floors, shear walls, foundation walls and supported slabs.
B. Floors and slabs on grade.
C. Control, expansion and contraction joint devices associated with concrete work, including joint sealants.
D. Equipment pads, light pole base, flagpole base, thrust blocks and manholes.

1.2 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

A. Section 03100 - Concrete Formwork: Placement of joint device anchors in formwork.

1.3 RELATED SECTIONS

A. Section 03100 - Concrete Formwork: Formwork and accessories.
B. Section 03200 - Concrete Reinforcement.
C. Section 03346 - Concrete Floor Finishing.
D. Section 03370 - Concrete Curing.
E. Section 07900 - Joint Sealers.

1.4 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

B. ACI 302 - Guide for Concrete Floor and Slab Construction.

C. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.

D. ACI 305R - Hot Weather Concreting.

E. ACI 306R - Cold Weather Concreting.

F. ACI 318 - Building Code Requirements for Reinforced Concrete.

G. ANSI/ASTM D994 - Preformed Expansion Joint Filler for Concrete (Bituminous Type).

H. ANSI/ASTM D1190 - Concrete Joint Sealer, Hot-Poured Elastic Type.

I. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

J. ANSI/ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

K. ASTM C33 - Concrete Aggregates.

L. ASTM C94 - Ready-Mixed Concrete.

M. ASTM C150 - Portland cement.

N. ASTM C260 - Air Entraining Admixtures for Concrete.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.
B. Product Data: Provide data on joint devices, attachment accessories and admixtures.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

1.7 COORDINATION

A. Coordinate work under provisions of Section 01039.
B. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal, Type II - Moderate, Type V - Sulfate Resistant.
B. Fine and Coarse Aggregates: ASTM C33.
C. Water: Clean and not detrimental to concrete.

2.2 ADMIXTURES

A. Air Entrainment: ASTM C260.

2.3 ACCESSORIES

A. Bonding Agent: Polymer resin emulsion.
B. Vapor Barrier: thick clear polyethylene film.
C. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

2.4 JOINT DEVICES AND FILLER MATERIALS

A. Joint Filler Type A: ASTM D1751; ASTM D994; Asphalt impregnated fiberboard or felt, 1/2" thick; tongue and groove profile.
B. Joint Filler Type B: ASTM D1752; Closed cell polyvinyl chloride foam, resiliency recovery of 95 percent if not compressed more than 50 percent of original thickness.
C. Joint Filler Type C; ASTM D1752; Pre-molded sponge rubber fully compressible with recovery rate of minimum 95 percent.
D. Expansion Joint Devices: ASTM B221 alloy, extruded aluminum; resilient filler strip with a Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery; extruded aluminum cover plate, of longest manufactured length at each location, flush Mounted, color as selected.
E. Sealant: ASTM D1190; polymer based asphalt or coal tar and rubber compound.

2.5 FIBEROUS REINFORCEMENT

A. Fiberous concrete reinforcement shall be one hundred percent (100%) virgin polypropylene fibrillated fibers specifically manufactured for use as concrete reinforcement, containing no reprocessed olefin materials. The fibers shall have the following physical characteristics:
   1. Specific gravity – 0.91.
   2. Tensile strength – 70,000 to 110,000 psi.
   3. Fiber length – per manufacturer's recommendation for specific use.

B. Add fiberous concrete reinforcement to concrete materials at the time the concrete is batched in the amounts recommended by the manufacturer (1.5 lb/cubic yard for sidewalks) or as indicated on the accepted plans.

C. Concrete shall be mixed in strict accord with the fiberous concrete reinforcement manufacturer's instructions and recommendations to assure uniform and complete dispersion.

2.6 CONCRETE MIX

A. All concrete shall be Type 1 cement with a compressive strength of 4,000 p.s.i. at 28 days.

B. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94.

C. Use accelerating admixtures in cold weather only not to exceed 1%. Use of admixtures will not relax cold weather placement requirements.

D. Use calcium chloride only when approved by Architect/Engineer.

E. Use set retarding admixtures during hot weather only when approved by Architect/Engineer.

F. Add air entraining agent to normal weight concrete mix for work exposed to exterior.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01039.

B. Verify requirements for concrete cover over reinforcement.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely and will not cause hardship in placing concrete.

3.2 PREPARATION

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

B. In locations where new concrete is dowelled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

3.3 PLACING CONCRETE

A. Place concrete in accordance with ACI 304 & ACI 301.

B. Notify Architect/Engineer minimum 24 hours prior to commencement of operations.

C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.

D. Separate slabs on grade from vertical surfaces with ½" thick joint filler.

E. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

F. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07900 for finish joint sealer requirements.

G. Install joint devices in accordance with manufacturer's instructions.

H. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

I. Install joint device anchors. Maintain correct position to allow joint cover to be flush with floor and wall finish.

J. Install joint covers in longest practical length, when adjacent construction activity is complete.

K. Apply sealants in joint devices in accordance with Section 07900.

L. Place concrete continuously between predetermined expansion, control and construction joints.

M. Do not interrupt successive placement; do not permit cold joints to occur.

N. Place floor slabs in pattern indicated on drawings.
O. Saw cut joints within 24 hours after placing. Use 3/16” thick blade, cut into 1/4 depth of slab thickness. If in-slab-heating is used cut joints 1/2 inch deep.

P. Screed floors and slabs on grade level, maintaining surface flatness of maximum.

3.4 SEPARATE FLOOR TOPPINGS

A. Prior to placing floor topping, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.
B. Place required dividers, edge strips, reinforcing, and other items to be cast in.
C. Apply bonding agent to substrate in accordance with manufacturer's instructions.

3.5 CONCRETE FINISHING

A. Provide formed concrete surfaces to be left exposed with smooth rubbed finish.
B. Finish concrete floor surfaces to requirements of Section 03346.

3.6 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
C. Cure concrete floor surfaces to requirements of Section 03370.
D. Cure floor surfaces in accordance with ACI 308.

3.7 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed in accordance with ACI 301 and under provisions of Section 01400.
B. Provide free access to Work and cooperate with appointed firm.
C. Submit proposed mix design to architect for review prior to commencement of Work.
D. Contractor shall supply testing of cement and aggregates to ensure conformance with specified requirements.
E. Contractor shall provide three concrete test cylinders per day for every 75 or less cu yards of concrete placed.
F. One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. Contractor shall provide one slump test to be taken for each set of test cylinders taken.

3.8 PATCHING

A. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.
B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect/Engineer upon discovery.
C. Patch imperfections as directed.

3.9 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
B. Repair or replacement of defective concrete will be determined by the Architect/Engineer.
C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

END OF SECTION

03346

CONCRETE FLOOR FINISHING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Finishing slabs-on-grade.
B. Surface treatment with concrete hardener, non-skid finish and sealer.

1.2 RELATED SECTIONS

A. Section 03300 - Cast-in-Place Concrete: Prepared concrete floors ready to receive finish; control and formed expansion and contraction joints and joint devices.
B. Section 03370 - Concrete Curing.
C. Section 07900 - Joint Sealers.

1.3 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.
B. ACI 302 - Guide for Concrete Floor and Slab Construction.
C. ASTM E1155 - Determining Floor Flatness and Levelness Using the F-Number System.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.
B. Product Data: Provide data on concrete hardener, sealer and slip resistant treatment, compatibilities and limitations.

1.5 MAINTENANCE DATA

A. Submit under provisions of Section 01700.
B. Maintenance Data: Provide data on maintenance renewal of applied coatings.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301 and ACI 302.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 01039.
B. Deliver materials in manufacturer's packaging including application instructions.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Temporary Lighting: Minimum 200 W light source, placed above the floor surface, for each 100 square feet of floor being finished.
B. Do not finish floors until the interior heating system is operational.
C. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

1.9 COORDINATION

A. Coordinate work under provisions of Section 01039.
B. Coordinate the work with concrete floor placement and concrete floor curing.

PART 2 PRODUCTS

2.1 CURING/SEALING COMPOUNDS

A. Curing/sealing compound equal to Ashford Formula as distributed by:
Curecrete Chemical Company, Inc.
1201 W. Spring Creek Place
Springville, UT 84663
(801) 489-5663

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01039.
B. Verify that floor surfaces are acceptable to receive the work of this section.

3.2 FLOOR FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.
B. Steel trowel surfaces that will receive carpeting, resilient flooring and seamless flooring.
C. Steel trowel surfaces that areas scheduled to be exposed.
D. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains at nominal.

3.3 FLOOR SURFACE TREATMENT

A. Apply sealer in accordance with manufacturer's instructions on floor surfaces.

3.4 TOLERANCES

A. Maximum Variation of Surface Flatness For Exposed Concrete Floors: 1/4 inch.
B. Maximum Variation of Surface Flatness Under Seamless Resilient Flooring: 1/8 in.
C. Maximum Variation of Surface Flatness Under Carpeting: 1/8 in.

END OF SECTION

03370

CONCRETE CURING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Initial and final curing of horizontal and vertical concrete surfaces.

1.2 RELATED SECTIONS

A. Section 03300 - Cast-In-Place Concrete.
B. Section 03346 - Concrete Floor Finishing.

1.3 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.
B. ACI 302 - Recommended Practice for Concrete Floor and Slab Construction.
C. ACI 308 - Standard Practice for Curing Concrete.
D. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
E. ASTM D2103 - Polyethylene Film and Sheeting.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301 and ACI 302.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products under provisions of Section 01600.
B. Deliver curing materials in manufacturer's packaging including application instructions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Curing/sealing compound equal to Ashford Formula as distributed by:
Curecrete Chemical Company, Inc.
1201 W. Spring Creek Place
Springville, UT 84663
(801)489-5663

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify substrate conditions under provisions of Section 01039.
B. Verify that substrate surfaces are ready to be cured.

3.2 EXECUTION - HORIZONTAL SURFACES

A. Cure floor surfaces in accordance with ACI 308.

3.3 EXECUTION - VERTICAL SURFACES

A. Cure surfaces in accordance with ACI 308.

3.4 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Section 01500.
B. Do not permit traffic over unprotected floor surface.

END OF SECTION

06200

FINISH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Finish carpentry items.
B. Wood doorframes, glazed frames.
C. Wood casings and moldings.
D. Hardware and attachment accessories.

1.2 RELATED SECTIONS

A. Section 06410 - Custom Casework: Shop fabricated custom cabinetwork.
B. Section 08211 - Flush Wood Doors.
C. Section 09900 - Painting: Painting and finishing of finish carpentry items.
D. Section 12370 - Residential Casework: Shop fabricated cabinetwork.
E. Section 08710: Product requirements for hardware and attachment accessories for placement by this section.

1.3 REFERENCES

A. AHA A135.4 - Basic Hardboard; American Hardboard Association.

B. ANSI A208.1 - Wood Particleboard.

C. ASTM C1036 - Standard Specification for Flat Glass.

D. AWI P-200 - Architectural Woodwork Quality Standards; Architectural Woodwork Institute.

E. BHMA A156.9 - American National Standard for Cabinet Hardware.

F. HPVA HP-1 - Voluntary Standard for Hardwood and Decorative Plywood; Hardwood Plywood Manufacturer's Association.

G. NEMA LD 3 - High Pressure Decorative Laminates; National Electric Manufacturer's Association.

H. NIST PS 1 - Construction and Industrial Plywood.

I. NIST PS 20 - American Softwood Lumber Standard.

J. WIC - Manual of Millwork; Woodwork Institute of California.

1.4 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.
B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details and accessories, to a minimum scale of 1-1/2 inch to 1 ft.
C. Samples:
   1. Submit two samples of finish plywood, 12 x 12 inches in size illustrating wood grain and specified finish.
   2. Submit two samples of wood trim 24 inches long.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with AWI Architectural Woodwork Quality Standards, Custom Grade.

1.6 DELIVERY, STORAGE AND PROTECTION

A. Section 01600 - Material and Equipment: Transport, handle, store and protect products.
B. Protect work from moisture damage.

1.7 PROJECT CONDITIONS

A. Section 01039 - Coordination and Meetings.
B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
C. Coordinate the work with plumbing rough-in, electrical rough-in and installation of associated and adjacent components.

PART 2 PRODUCTS

2.1 LUMBER MATERIALS

A. Softwood Lumber: PS 20; Graded in accordance with AWI Custom species, maximum moisture content of 6 percent; with mixed grain of quality suitable for transparent finish.
B. Hardwood Lumber: Graded in accordance with AWI Custom [Premium]; oak species, quarter sawn, maximum moisture content of 6 percent; with mixed grain of quality suitable for transparent finish.

2.2 SHEET MATERIALS

A. Hardwood Plywood: HPVA HP-1; Graded in accordance with AWI Custom; lumber core, type of glue recommended for application; oak face species.

B. Prefinished Paneling: oak face species, vertical grain, V-cut vertical joint scoring; 1/4 inch thick, finished as satin.

C. Wood Particleboard: ANSI A208.1 Type 2; AWI standard, composed of wood chips, sawdust, or flakes of medium density, made with high waterproof resin binders; of grade to suit application; sanded faces.

D. Hardboard: AHA A135.4; Pressed wood fiber with resin binder, standard grade, 1/4 inch thick, smooth two sides.

E. Pegboard: Pressed wood fiber with resin binder, tempered grade; 1/8 inch thick with 3/16 inch diameter holes at 1 inch on center or 1/4 inch thick with 9/32 inch diameter holes at 1 inch on center.

2.3 FASTENERS

A. Fasteners: Of size and type to suit application; galvanized finish in concealed locations and brass finish in exposed locations.
B. Concealed Joint Fasteners: Threaded steel.

2.4 ACCESSORIES

A. Lumber for Shimming and Blocking: Softwood lumber of pine species.

B. Plastic Edge Trim: Extruded flat shaped; smooth finish; self-locking serrated tongue; of width to match component thickness; color as selected.
C. Glass: Type FG-A as specified in Section 08800.
D. Primer: Alkyd primer sealer type.
E. Wood Filler: Solvent base, tinted to match surface finish color.

2.5 FABRICATION

A. Fabricate to AWI Custom standards.

B. Shop assemble work for delivery to site, permitting passage through building openings.

C. Fit exposed sheet material edges with 3/8 inch matching hardwood edging. Use one piece for full length only.

D. Cap exposed plastic laminate finish edges with material of same finish and pattern.

E. Shop prepare and identify components for book match grain matching during site erection.

F. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

G. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Locate counter butt joints minimum 2 feet from sink cutouts.

H. Apply laminate backing sheet to reverse face of plastic laminate finished surfaces.

2.6 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.
B. Apply wood filler in exposed nail and screw indentations.
C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and of types recommended for applied finishes.
D. Finish work in accordance with AWI - Section 1500 System Transparent TR-2.
E. Prime paint or seal surfaces in contact with cementitious materials.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
B. Verify adequacy of backing and support framing.
C. Verify mechanical, electrical and building items affecting work of this section are placed and ready to receive this work.

3.2 INSTALLATION

A. Install work in accordance with AWI Custom quality standard.
B. Set and secure materials and components in place, plumb and level.
C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
D. Install trim with nails at 18 inches on center. Use wall adhesive by gun application.
E. Install prefinished paneling with full bed contact adhesive applied to substrate.
F. Install hardware supplied by Section 08710 in accordance with manufacturer's instructions.

3.3 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment in accordance with manufacturer's instructions.
B. Brush apply one coat of preservative treatment on wood in contact with cementitious materials, roofing and related metal flashings.
C. Allow preservative to dry prior to erecting members.

3.4 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand the work smooth.

3.5 ERECTION TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.
B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

06240

PLASTIC LAMINATE

PART 1 GENERAL

1.1 SUMMARY

A. Provide laminated plastic where shown on the Drawings, as specified herein and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.2 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Product data: Within 60 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.
2. Manufacturers' specifications and other data needed to demonstrate compliance with the specified requirements.
3. Samples of the full range of colors and patterns available in each of the specified grades from the proposed manufacturer.
4. Manufacturer's recommended methods of installation which, when approved by the Architect, will become the basis for acceptance or rejection of actual installation procedures used on the Work.

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.4 DELIVERY, STORAGE AND HANDLING

A. Comply with pertinent provisions of Section 01600.

PART 2 PRODUCTS

2.1 LAMINATED PLASTICS

A. Acceptable manufacturers:

1. Wilsonart Division of Ralph Wilson Plastics, 600 Bruce Drive, Temple, Texas 76501 (817) 778-2711.
2. Nevamar Corporation, 8339 Telegraph Road, Odenton, Maryland 21113 (301) 569-5000.
3. Micarta Division of Westinghouse Electric Corporation, 304 Hoover Street, Hampton, South Carolina 29924 (803) 943-2311.

B. Colors and patterns: Provide "solid colors, textured finish" selected by the Architect from standard colors and finishes of the approved manufacturer.

C. Qualities and types: Provide general-purpose type, 0.050" thick, complying with NEMA LD3.

2.2 ADHESIVES

A. For installation of laminated plastic, use only "rigid set" (urea-resin) or "semi-rigid set" (PVC acetate) adhesives. Do not use so-called "contact" adhesives.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install the approved laminated plastic in strict accordance with the manufacturer's recommendations as approved by the Architect.

END OF SECTION

08111

STANDARD STEEL DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-rated, fire rated and thermally insulated steel doors and panels.
B. Louvers. Glass and glazing.

1.2 RELATED SECTIONS

A. Section 08112 - Standard Steel Frames.
B. Section 08710 - Door Hardware.
C. Section 08800 - Glazing: Glass for doors.
D. Section 09900 - Painting: Field painting of doors.

1.3 REFERENCES

A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
B. ASTM A525 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
C. ASTM E152 - Methods of Fire Tests of Door Assemblies.
D. NFPA 80 - Fire Doors and Windows.
E. NFPA 252 - Fire Tests for Door Assemblies.
F. SDI-100 - Standard Steel Doors and Frames.
G. UL 10B - Fire Tests of Door Assemblies.

1.4 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.
B. Shop Drawings: Indicate door elevations, internal reinforcement, closure method and cutouts for glazing and louvers.

1.5 SUBMITTALS FOR INFORMATION

A. Section 01300 - Submittals: Procedures for submittals.
B. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

A. Manufacturer: Specializing in manufacturing products specified in this section with three years experience.

1.7 REGULATORY REQUIREMENTS

A. Installed Door and Panel Assembly: Conform to NFPA 80 for fire rated class as scheduled.

1.8 DELIVERY, STORAGE AND PROTECTION

A. Section 01600 - Material and Equipment: Transport, handle, store and protect products.
B. Accept doors on site in manufacturer's packaging. Inspect for damage.
C. Break seal on site to permit ventilation.

1.9 PROJECT CONDITIONS

A. Section 01039 - Coordination and Meetings.
B. Coordinate frame installation with size, location, and installation of service utilities.
C. Coordinate the work with door opening construction, doorframes and door hardware installation.
D. Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

PART 2 PRODUCTS

2.1 ACCEPTABLE PRODUCTS:

A. Allied Steel Products, Inc.
B. Amweld/Div. American Welding & Mfg. Co.
C. Ceco Corp.
D. Curries Mfg., Inc.
E. Pioneer Builders Products Corp./Div. CORE Industries, Inc.
F. Steelcraft/Div. American Standard Co.
G. Republic Builders Products Corp./Subs. Republic Steel.

2.2 DOORS AND PANELS

A. Astragals for Double Doors: Steel T shaped, specifically for double doors (As required).
B. Fabricate doors with hardware reinforcement welded in place.
C. Attach fire rated label to each fire rated door unit.
D. Configure exterior doors with special profile to receive recessed weather stripping.
E. Type and Design:
    1. Tightly hemmed vertical seam on lock and hinge edges, with top flush channel and beveled lock edge, in the dimensions and types shown on the drawings, reinforced for the finish hardware being provided under Section 08710 of these Specifications, and in the following gauges:
        a. Interior Doors: 18 gauge honeycomb core. Labeled and/or Non-labeled.
        b. Exterior Doors: 16 gauge insulated core. Labeled and/or Non-labeled.

2.3 FINISH

A. Steel Sheet: Exterior doors to be galvanized to ASTM A525.
B. Primer: Air-dried.
C. Paint per Specification Section 09900: color as selected.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.

3.2 INSTALLATION

A. Install doors in accordance with SDI-100 and DHI.
B. Coordinate installation of glass and glazing.
C. Install door louvers, plumb and level.
D. Coordinate installation of doors with installation of frames and hardware specified in Section 08710.

E. Touch-up finished doors.

3.3 ERECTION TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.4 ADJUSTING

A. Section 01650 - Starting of Systems: Adjusting installed work.
B. Adjust door for smooth and balanced door movement.

3.5 SCHEDULE

A. Refer to Door and Frame Schedule on architectural drawings.

END OF SECTION

08112

STANDARD STEEL FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-rated and fire rated steel frames.
B. Interior and Exterior glazed light frames.

1.2 RELATED SECTIONS

A. Section 08111 - Standard Steel Doors.
B. Section 08710 - Door Hardware: Hardware, silencers and weather stripping.
C. Section 08800 - Glazing.

1.3 REFERENCES

A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
B. ASTM A525 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
C. ASTM E152 - Methods of Fire Tests of Door Assemblies.
D. DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
E. NFPA 80 - Fire Doors and Windows.
F. NFPA 252 - Fire Tests for Door Assemblies.
G. SDI-100 - Standard Steel Doors and Frames.
H. UL 10B - Fire Tests of Door Assemblies.

1.4 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.
B. Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacing, location of cutouts for hardware and finish.

1.5 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.6 REGULATORY REQUIREMENTS

A. Fire Rated Frame Construction: Conform to NFPA 252 or UL 10B.
B. Installed Frame Assembly: Conform to NFPA 80 for fire rated class same as fire door.

1.7 DELIVERY, STORAGE AND PROTECTION

A. Section 01600 - Material and Equipment: Transport, handle, store and protect products.
B. Accept frames on site in manufacturer's packaging. Inspect for damage.

1.8 PROJECT CONDITIONS

A. Section 01039 - Coordination and Meetings.
B. Coordinate the work with frame opening construction, door and hardware installation.

C. Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

1.9 FRAMES

A. Frames: To suit SDI-100 Grade and Model of door specified in Section 08111.

PART 2 PRODUCTS

2.1 FRAMES

A. 16 gauge. To suit SDI-100 Grade.
   1. Provide drywall wrap around frames for interior and exterior doors.

2.2 ACCESSORIES

A. Removable Stops: Rolled steel channel shape, butted corners; prepared for countersink style tamper proof screws.
B. Bituminous Coating: Fibered asphalt emulsion.
C. Primer: Zinc chromate type.
D. Silencers: Specified in Section 08710.
E. Weatherstripping: Specified in Section 08710.

2.3 FABRICATION

A. Fabricate frames as welded unit.
B. Mullions for Double Doors: Fixed type, of same profiles as jambs.
C. Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.
D. Fabricate frames with hardware reinforcement plates welded in place. Provide mortar guard boxes.
E. Reinforce frames wider than 4" with roll formed steel channels fitted tightly into frame head, flush with top.
F. Configure exterior frames with special profile to receive recessed weather stripping.
G. Attach fire rated label to each fire rated door unit.

2.4 FINISH

A. Steel Sheet: Galvanized.
B. Primer: Air-dried.
C. Paint per Specification Section 09900: color as selected.
D. Coat inside of frame profile with bituminous coating.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.

3.2 INSTALLATION

A. Install frames in accordance with SDI-100 and DHI.
B. Coordinate with masonry, gypsum board or concrete wall construction for anchor placement.
C. Coordinate installation of glass and glazing.
D. Coordinate installation of frames with installation of hardware specified in Section 08710 and doors in Section 08111.

E. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

3.3 ERECTION TOLERANCES

A. Maximum Diagonal Distortion: 1/8" measured with straight edges, crossed corner to corner.

3.4 SCHEDULE

A. Refer to Door Schedule on drawings.

END OF SECTION

08710

DOOR HARDWARE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hardware for wood, hollow steel and aluminum doors.
B. Thresholds.
C. Weatherstripping, seals and door gaskets.

1.2 RELATED SECTIONS

A. Section 08111 - Standard Steel Doors.
B. Section 08112 - Standard Steel Frames.
C. Section 08211 - Flush Wood Doors.
D. Section 08341 - Overhead Coiling Grilles: Lockable coiling grilles.
E. Section 08410 - Aluminum Entrances and Storefronts: Hardware for it.
F. Section 08410: Product requirements for hardware and thresholds for aluminum entrance doors.

1.3 REFERENCES

A. NFPA 80 - Fire Doors and Windows.
B. NFPA 101 - Life Safety Code.
C. NFPA 252 - Fire Tests of Door Assemblies.
D. UL 10B - Safety Fire Tests of Door Assemblies.

1.4 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.
B. Shop Drawings:
   1. Indicate locations and mounting heights of each type of hardware, schedules and catalog cuts.
   2. Submit manufacturer's parts lists and templates.
C. Samples:
   1. Submit 1 sample of hinge, latchset, lockset and closer, illustrating style, color and finish.
   2. Samples will be incorporated into the Work.

1.5 SUBMITTALS AT PROJECT CLOSEOUT

A. Section 01700 - Operation and Maintenance Data.
B. Section 01300 - Procedures for submittals.
C. Maintenance Data: Include data on operating hardware, lubrication requirements and inspection procedures related to preventative maintenance.
D. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

1.6 REGULATORY REQUIREMENTS

A. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.

1.7 DELIVERY, STORAGE AND PROTECTION

A. Section 01600 - Material and Equipment: Transport, handle, store, and protect products.

B. Package hardware items individually, label and identify each package with door opening code to match hardware schedule.

1.8 PROJECT CONDITIONS

A. Section 01039 - Coordination and Meetings.
B. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
C. Sequence installation to ensure utility connections are achieved in an orderly andexpeditious manner.
D. Coordinate Owner's keying requirements during the course of the Work.

1.9 WARRANTY

A. Provide five-year manufacturer warranty for door closers.

1.10 MAINTENANCE PRODUCTS

A. Section 01730 - Operation and Maintenance Data.
B. Provide special wrenches and tools applicable to each different or special hardware component.
C. Provide maintenance tools and accessories supplied by hardware component manufacturer.

1.11 EXTRA MATERIALS

A. Section 01730 - Operation and Maintenance Data.

PART 2 PRODUCTS

2.1 KEYING

A. Door Locks: Keyed in like-groups. Master keyed.
B. Include construction keying, and control keying with removable core cylinders. Key to the existing keying system where requested.
C. Supply keys in the following quantities:
    1. Two master keys.
    2. Four construction keys.
    3. Three change keys for each lock.

2.2 KEY CABINET

A. Cabinet Construction: Sheet steel construction, piano hinged door with lockmaster keyed to building system.
B. Cabinet Size: Size for project keys plus 10 percent growth.
C. Hooks for all keys.
D. Horizontal plastic strips for key hook labeling with clear plastic strip cover over labels.
E. Finish: Baked enamel, finish, colors as selected.

2.3 FINISHES

A. Finishes: Identified in Schedule.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
B. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.
C. Verify that electric power is available to power operated devices and is of the correct characteristics.

3.2 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions.
B. Use templates provided by hardware item manufacturer.

3.3 FIELD QUALITY CONTROL

A. Section 01400 - Quality Control 01650 - Starting of Systems: Field inspection, testing, and adjusting.
B. Architectural Hardware Consultant will inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.4 ADJUSTING

A. Section: 01650 - Starting of Systems: Adjusting installed work.
B. Adjust hardware for smooth operation.

3.5 SCHEDULE

Hardware Group 1:	Doors 3,4,6	
1 ½ Pr. Butts (hinges)	BB1168 x 26D x 4 ½ x 4 ½	Hager
1 Passage Lockset	93KON15D-S3-626	Best
3 Silencers	608	Rockwood
1 Door Crash Stop	CS115-25	Ives

END OF SECTION

09260

GYPSUM BOARD SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Gypsum board and joint treatment.
B. Decorative gypsum board.
C. Gypsum sheathing.
D. Cementitious backer board.
E. Metal stud wall framing.
F. Metal channel ceiling framing.

1.2 RELATED SECTIONS

A. Section 06112 - Framing and Sheathing: Building wood framing system.
B. Section 06112 - Wood Blocking and Curbing.
C. Section 07212 - Batt Insulation: Thermal insulation.

1.3 REFERENCES

A. ASTM C36 - Standard Specification for Gypsum Wallboard.
B. ASTM C79 - Standard Specification for Gypsum Sheathing Board.
C. ASTM C442 - Standard Specification for Gypsum Backing Board and Coreboard.
D. ASTM C475 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
E. ASTM C630 - Standard Specification for Water-Resistant Gypsum Backing Board.
F. ASTM C645 - Standard Specification for Non-Load (Axial) Bearing Steel Studs,Runners (Track) and Rigid Furring Channels for Screw Application of Gypsum Board.
G. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Board.
H. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.
I. ASTM C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.
J. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
K. GA-201 - Using Gypsum Board for Walls and Ceilings.
L. GA-214 - Recommended Specification: Levels of Gypsum Board Finish.
M. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.
N. GA-600 - Fire Resistance Design Manual.
O. UL - Fire Resistance Directory.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C840.
B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience.

PART 2 PRODUCTS

2.1 FRAMING MATERIALS

A. Studs and Tracks: ASTM C645; galvanized sheet steel, 0.036-inch thick, C shape.
B. Furring, Framing, and Accessories: ASTM C645.

C. Fasteners: ASTM C1002.
D. Anchorage to Substrate: Tie wire, nails, screws and other metal supports, of type and size to suit application; to rigidly secure materials in place.
E. Adhesive: GA-216.

2.2 GYPSUM BOARD MATERIALS

A. Standard Gypsum Board: ASTM C36; 1/2 or 5/8 inch thick, maximum available length in place; ends square cut, tapered edges.
B. Fire Rated Gypsum Board: ASTM C36; fire resistive type, UL or WH rated; 5/8 inch thick, maximum available length in place; ends square cut, tapered edges.
C. Moisture Resistant Gypsum Board: ASTM C630; 5/8 inch thick, maximum available length in place; ends square cut, tapered edges.
D. Gypsum Backing Board: ASTM C442; standard or fire rated type; 3/8 thick; square edges, ends square cut, maximum available size in place.
E. Gypsum Sheathing Board: ASTM C79; moisture resistant type; 5/8 inch thick, maximum available size in place; ends square cut, tongue and grooved edges; water repellent paper faces.
F. Cementitious Backing Board: High density, glass fiber reinforced, 1/2 inch thick; 2 inch wide, coated glass fiber tape for joints and corners.

2.3 ACCESSORIES

A. Corner Beads: Metal or Trim-Tex® plastic corner bead.
B. Edge Trim: GA-201 and GA-216; Type LC exposed reveal bead.
C. Joint Materials: ASTM C475; reinforcing tape, joint compound, adhesive and water.
D. Textured Finish Materials: Latex based texturing material, containing fine aggregate.
E. Fasteners: ASTM C1002, Type S12 and GA-216.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
B. Verify that site conditions are ready to receive work and opening dimensions are as indicated on drawings.

3.2 METAL STUD INSTALLATION

A. Install studs in accordance with ASTM C754.6 and GA-600.
B. Metal Stud Spacing: 16 inches on center.
C. Refer to Drawings for indication of partitions extending stud framing through the ceiling to the structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
D. Door Opening Framing: Install double studs at doorframe jambs. Install stud tracks on each side of opening, at frame head height and between studs and adjacent studs.
E. Blocking: Bolt or screw steel channels to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, wood frame opening, toilet accessories and hardware.

3.3 WALL FURRING INSTALLATION

A. Erect wall furring for direct attachment to concrete masonry and/or concrete walls.
B. Erect furring channels horizontally; space maximum 16 inches o.c., not more than 4 inches from floor and ceiling lines or abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.

3.4 FURRING FOR FIRE RATINGS

A. Install furring as required for fire resistance ratings indicated and to GA-600 requirements.

3.5 CEILING FRAMING INSTALLATION

A. Install in accordance with ASTM C754.
B. Coordinate location of hangers with other work.
C. Install ceiling framing independent of walls, columns and above ceiling work.
D. Reinforce openings in ceiling suspension system that interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 24 inches past each end of openings.
E. Laterally brace entire suspension system.

3.6 GYPSUM BOARD INSTALLATION

A. Install gypsum board in accordance with GA-201, GA-216 and GA-600.
B. Erect single layer standard gypsum board horizontal, with ends and edges occurring over firm bearing.
C. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.
D. Erect exterior gypsum sheathing horizontally, with edges butted tight and ends occurring over firm bearing.
E. Use screws when fastening gypsum board to metal furring or framing.
F. Double Layer Applications: Use gypsum-backing board for first layer, placed perpendicular to framing or furring members. Use fire rated gypsum-backing board for fire rated partitions and ceilings.
G. Place second layer perpendicular to first layer. Offset joints of second layer from joints of first layer.
H. Treat cut edges and holes in moisture resistant gypsum board with sealant.
I. Place control joints 12 feet apart, or consistent with lines of building spaces as directed.
J. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.
K. Install backing board over plywood sheet in accordance with manufacturer's instructions.

3.7 JOINT TREATMENT

A. Tape, fill, and sand exposed joints, edges and corners to produce smooth surface ready to receive finishes.
B. Feather coats on to adjoining surfaces so that camber is maximum 1/32 inch.

3.8 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

09651

VINYL COMPOSITION TILE FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Resilient tile flooring.
B. Resilient base.

1.2 RELATED SECTIONS

A. Section 03300 - Self-Leveling Underlayment.

1.3 REFERENCES

A. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile.
B. ASTM F1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing.
C. FS L-F-001641 - Floor Covering Translucent or Transparent Vinyl Surface with Backing.
D. FS L-F-475 - Floor Covering Vinyl, Surface (Tile and Roll), with Backing.
E. FS SS-T-312B - Tile, Floor: Asphalt, Rubber, Vinyl and Vinyl Composition.

1.4 PERFORMANCE REQUIREMENTS

A. Conform to BOCA code for fire performance ratings as follows:
   1. Critical radiant flux (CRF): Minimum 0.45 watt per square centimeter, per ASTM E 648.
   2. Flame spread: Maximum 75, per ASTM E84.
   3. Smoke developed: Maximum 450, per ASTM E84.
   4. Smoke density: Maximum 450, per ASTM E662.

1.5 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.
B. Selection Samples: Submit manufacturer's complete set of color samples for Architect/Engineer's initial selection.
C. Verification Samples: Submit two samples, 12 x 12 inches in size illustrating color and pattern for each resilient flooring product specified.

1.6 SUBMITTALS AT PROJECT CLOSEOUT

A. 01730 - Operation and Maintenance Data: Procedures for submittals.
B. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping and re-waxing.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Material and Equipment: Transport, handle, store and protect products.
B. Protect roll materials from damage by storing on end.
C. Store materials for 2 days prior to installation in area of installation to achieve temperature stibility Store materials in manufacturer’s shipping packages.
D. Maintain ambient temperature required by adhesive manufacturer 2 days prior to, during, and 24 hours after installation of materials.
E. Store highly flammable materials (adhesives, fillers, solvents) segregated from other materials and arranged to facilitate fire fighting.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

1.9 EXTRA MATERIALS

A. Section 01730 - Operation and Maintenance Data.
B. Provide 75 sq ft of flooring, 20 lineal feet of base and 5 percent of installed materials of each type and color specified.

PART 2 PRODUCTS

2.1 MATERIALS - TILE FLOORING

A. Vinyl Composition Tile: ASTM F1066, Type IV:
1. Size: 12 x 12 inches.
2. Thickness: 0.125 inch.
3. Pattern: As selected.
1. Construction: Through-Pattern Vinyl Composition Tile
2. Static Load Limit: 125 p.s.i.
3. Warranty: Limited Five Year Commercial Warranty

2.2 MATERIALS - BASE

A. Base: Vinyl; top set coved.
1. Height: 4 inch.
2. Thickness: 0.080 inch thick.
3. Finish: Matte.
4. Length: Roll.
5. Accessories: Internal corners and end stops.

2.3 ACCESSORIES

A. Subfloor Filler: White premix latex.
B. Primers and Adhesives: Use non-staining and waterproof types as recommended by the flooring material manufacturer. Asphalt emulsions and other non-waterproof types will not be acceptable.
C. Moldings and Edge Strips: Same material as flooring.
D. Filler for Coved Base: Plastic.
E. Sealer and Wax: Types recommended by flooring manufacturer.
F.Fillers and Leveling Compounds: As recommended by the flooring material manufacturer for filling small cracks, holes, and depressions in the substrate.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that concrete floors are dry to maximum moisture content of 7 percent and exhibit negative alkalinity, carbonization, and dusting.
B. Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.

3.2 PREPARATION

A. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes and other defects with sub-floor filler to achieve smooth, flat, hard surface.
B. Prohibit traffic until filler is cured.
C. Clean substrate.
D. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances that cannot be removed.
E. Thoroughly clean all surfaces to receive covering. Where replacement of existing floor tile is specified on the drawings, remove all traces of floor tile adhesive. The floor surface temperature shall be 60 degrees F or highter.

3.3 INSTALLATION - TILE FLOORING

A. Install in accordance with manufacturer's instructions.
B. Mix tile from container to ensure shade variations are consistent when tile is placed.
C Spread only enough adhesive to permit installation of materials before initial set.
D. Set flooring in place, press with heavy roller to attain full adhesion.
E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
F. Install tile to ashlar pattern. Allow minimum 1/2 full size tile width at room or area perimeter.
G. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints.
H. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
I. Install edge strips at unprotected or exposed edges, where flooring terminates and where indicated. Secure metal strips, where required, before installation of flooring with stainless steel screws.
J. Install flooring in recessed floor access covers. Maintain floor pattern.
K. At movable partitions, install flooring under partitions without interrupting floor pattern.
L. Install feature strips and floor markings where indicated. Fit joints tightly.

3.4 INSTALLATION - BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
B. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.
C. Install base on solid backing. Bond tightly to wall and floor surfaces.
D. Scribe and fit to doorframes and other interruptions.

3.5 CLEANING

A. Keep surfaces of resilient covering free of adhesive while installing. Remove excess adhesive from floor, base, and wall surfaces within recommended working time.
B. Remove soil, stain, and extraneous material caused by installation of resilient material from adjacent surfaces.
C. Clean and finish resilient covering surfaces as recommended by the manufacturer. Remove and replace defective, off color, or improperly installed materials than cannot be made to satisfactorily match adjacent surfaces.
D. Clean, seal, and wax resilient flooring products in accordance with manufacturer’s instructions.

3.6 PROTECTION OF FINISHED WORK

A. Protecting installed work.
B. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

09900

PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.
B. Field application of paints, stains, varnishes and other coatings.

1.2 RELATED SECTIONS

A. Section 05500 - Metal Fabrications: Shop primed items.
B. Section 05500 - Metal Stairs: Shop primed items.
C. Section 06410: Shop finished cabinetwork.

1.3 REFERENCES

A. ASTM D16 - Standard Terminology Relating to Paint, Varnish, Lacquer and Related Products.
B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials.
C. NACE (National Association of Corrosion Engineers) - Industrial Maintenance Painting.
D. NPCA - Guide to U.S. Government Paint Specifications; National Paint and Coatings Association.
E. PDCA - Architectural Specifications Manual; Painting and Decorating Contractors of America.
F. SSPC - Steel Structures Painting Manual; Steel Structures Painting Council.

1.4 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.5 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.
B. Samples:
    1. Submit two paper chip samples, 2 x 4 inches in size illustrating range of colors and textures available for each surface finishing product scheduled.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience.

1.7 DELIVERY, STORAGE AND PROTECTION

A. Section 01600 - Material and Equipment: Transport, handle, store and protect products.
B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
C. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation and instructions for mixing and reducing.
D. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 01600 - Material and Equipment: Environmental conditions affecting products on site.
B. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
C. Do not apply exterior coatings during rain or snow or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior, unless required otherwise by manufacturer's instructions.
E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.9 PROJECT CONDITIONS

A. Section 01039 - Coordination and Meetings.
B. Sequence application to the following:
    1. Do not apply finish coats until paintable sealant is applied.
    2. Back prime wood trim before installation of trim.

1.10 EXTRA MATERIALS

A. Section 01730 - Operation and Maintenance Data.
B. Supply 1 gallons of each color, type and surface texture; store where directed.
C. Label each container with color, type, texture and room locations in addition to the manufacturer's label.

PART 2 PRODUCTS

2.1 MATERIALS

A. Coatings: Ready mixed, except field-catalyzed coatings. Prepare pigments:
    1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
    2. For good flow and brushing properties.
    3. Capable of drying or curing free of streaks or sags.
B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; commercial quality.
C. Patching Materials: Latex filler.
D. Fastener Head Cover Materials: Latex filler.

2.2 FINISHES

A. Refer to finish schedule on drawings for surface finish.

2.3 BRAND OF PAINT

A. Sherwin-Williams or equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting Work.

B. Verify that surfaces and substrate conditions are ready to receive Work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:

1. Plaster and Gypsum Wallboard: 12 percent.
2. Masonry, Concrete and Concrete Unit Masonry: 12%.
3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
4. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
5. Concrete Floors: 8 percent.

3.2 PREPARATION

A. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons and fittings prior to preparing surfaces or finishing.

B. Surfaces: Correct defects and clean surfaces that affect work of this section.

C. Marks: Seal with shellac those that may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Aluminum Surfaces Scheduled for Paint Finish: Remove surface contamination by steam or high-pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.

F. Asphalt, Creosote, or Bituminous Surfaces Scheduled for Paint Finish: Remove foreign particles to permit adhesion of finishing materials. Apply compatible sealer or primer.

G. Insulated Coverings: Remove dirt, grease and oil from canvas and cotton.

H. Concrete Floors: Remove contaminations, acid etch and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow it to dry.

I. Copper Surfaces Scheduled for Paint Finish: Remove contamination by steam, high-pressure water or solvent washing. Apply vinyl etch primer immediately following cleaning.

J. Copper Surfaces Scheduled for a Natural Oxidized Finish: Remove contamination by applying oxidizing solution of copper acetate and ammonium chloride in acetic acid. Rub on repeatedly for required effect. Once attained, rinse surfaces with clear water and allow to dry.

K. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.

L. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

M. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powded and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow it to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow it to dry.

N. Plaster Surfaces: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

O. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt and rust. Where heavy coatings of scale are evident, remove by [hand] [power tool] wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Spot prime paint after repairs.

P. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with a solvent. Prime paint bare steel surfaces.

Q. Interior Wood Items Scheduled to Receive Paint Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.

R. Interior Wood Items Scheduled to Receive Transparent Finish: Wipe off dust and grit prior to

sealing, seal knots, pitch streaks and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats.

S. Exterior Wood Scheduled to Receive Paint Finish: Remove dust, grit and foreign matter. Seal knots, pitch streaks and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied.

T. Exterior Wood Scheduled to Receive Transparent Finish: Remove dust, grit and foreign matter; seal knots, pitch streaks and sappy sections with sealer. Fill nail holes with tinted exterior calking compound after sealer has been applied.

U. Wood Doors Scheduled for Painting: Seal wood door top and bottom edge surfaces with clear sealer.

V. Metal Doors Scheduled for Painting: Prime metal door top and bottom edge surfaces.

3.3 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

D. Sand wood surfaces lightly between coats to achieve required finish.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

F. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

G. Prime concealed surfaces of interior woodwork with primer paint.

H. Prime concealed surfaces of interior wood surfaces scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with thinner.

3.4 CLEANING

A. Collect waste material that may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.5 SCHEDULE - INTERIOR SURFACES

A. Wood - Painted:
   1. One coat of latex prime sealer.
   2. One coat of alkyd enamel, semi-gloss.

B. Wood - Transparent:
   1. Filler coat (for open grained wood only).
   2. One coat of stain.
   3. One coat sealer.
   4. Two coats of varnish, satin.

C. Concrete, Concrete Block, Restored Masonry Cement Plaster:
   1. One coat of block filler.
   2. Two coats of high-gloss polyamide epoxy.

D. Interior Gypsum Drywall
   1. One coat of vinyl latex primer sealer.
   2. Two coats of latex eggshell enamel.

E. Steel - Unprimed:
   1. One coat of alkyd primer.
   2. Two coats of alkyd enamel, gloss.

F. Steel - Shop Primed:
   1. Touch-up with zinc chromate primer.
   2. Two coats of alkyd enamel, gloss.

END OF SECTION

10160

METAL TOLIET COMPARTMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Metal toilet compartments.
B. Urinal and Vestibule screens.
.

1.2 RELATED SECTIONS

A. Section 05500 - Metal Fabrications.
B. Section 06112 - Framing and Sheathing: Concealed wood framing and blocking for compartment support.
C. Section 10800 - Toilet and Bath Accessories.

1.3 REFERENCES

A. ASTM A167 - Standard Specification for Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
B. ASTM A424 - Standard Specification for Steel Sheet for Porcelain Enameling.
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
D. FS RR-P-1352 - Partitions, Toilet, Complete.

1.4 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.
B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall, floor supports, ceiling supports and door swings.

1.5 PROJECT CONDITIONS

A. Section 01039 - Coordination and Meetings.
B. Coordinate the work with placement of support framing and anchors in wall and ceiling.

PART 2 PRODUCTS

2.1 MATERIALS

A. Steel Sheet: ASTM A653/A653M, with G90/Z275 zinc coating.
B. Toilet Compartments: FS RR-P-1352; Baked enameled floor-mounted headrail-braced.wall-hung.
C. Doors, Panels, and Pilasters: Sheet steel faces, pressure bonded to sound deadening core, formed and closed edges, mitered and welded corners ground smooth.
    1. Panel and Door Faces: 20 gauge.
    2. Pilaster Faces: 18 gauge.
    3. Reinforcement: 12 gauge.
    4. Internal Reinforcement: Provide in areas of attached hardware and fittings. Mark locations of reinforcement for partition mounted washroom accessories.
D. Door and Panel Dimensions:
    1. Thickness: 1 inch.
    2. Door Width: 24 inch.
    3. Accessible Door Width: 36 inch, out-swinging.

4. Height: 58 inch.

E. Pilasters: 1-1/4 inch thick of sizes required to suit compartment width and spacing.

F. Urinal and Vestibule screens: Wall mounted with two panel brackets and floor-to-ceiling vertical upright consisting of pilaster anchored to floor and ceiling.

G. Urinal Screen Splash Panels: Stainless steel sheet 30 inch wide x 42 inch high mounted on partitions adjacent to urinals. Fasten with stainless steel screws spaced 8 inches oc.

2.2 ACCESSORIES

A. Pilaster Shoes: Formed chromed steel with satin finish, 3-inch high, concealing floor and ceiling fastenings. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster. Provide ceiling attachment using two adjustable hanging studs, attached to above-ceiling framing.

B. Brackets: chrome-plated non-ferrous cast metal, to color as selected.

C. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.

1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof. Hardware: Satin finish non-ferrous cast metal:
2. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
3. Nylon bearings.
4. Thumb turn door latch with exterior emergency access feature.
5. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
6. Coat hook with rubber bumper; one per compartment, mounted on door.
7. Provide door pull for out swinging doors.

2.3 FINISHING

A. Baked Enamel Steel Compartments: Clean, degrease, and neutralize. Follow immediately with a phosphatizing treatment; prime coat and two-finish coats baked enamel.

B. Color: Single color as selected.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.

B. Verify that field measurements are as indicated on shop drawings.

C. Verify correct spacing of and between plumbing fixtures.

D. Verify correct location of built-in framing, anchorage and bracing.

3.2 INSTALLATION

A. Install partitions secure, rigid, plumb and level in accordance with manufacturer's instructions.

B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.

C. Attached panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster centerlines.

3.3 ERECTION TOLERANCES

A. Maximum Variation From True Position: 1/4 inch.

B. Maximum Variation From Plumb: 1/8 inch.

3.4 ADJUSTING

A. Section 01650 - Starting of Systems: Adjusting installed work.

B. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
C. Adjust hinges to position doors in partial opening position when unlatched. Return out swinging doors to closed position.
D. Adjust adjacent components for consistency of line or plane.

END OF SECTION

10800

TOILET AND BATH ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Toilet and shower room accessories.

1.2 RELATED SECTIONS

A. Section 05500: In wall framing and plates for support of accessories.
B. Section 06112: Placement of concealed anchor devices and placement of backing plate reinforcement.
C. Section 08800 - Glazing: Other mirrors.
D. Section 10160 - Metal Toilet Compartments.

1.3 REFERENCES

A. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
C. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
D. ASTM C1036 - Standard Specification for Flat Glass.
E. FS DD-M-411C -- Mirrors, Glass.

1.4 COORDINATION

A. Section 01039 - Coordination and Meetings.
B. Coordinate the work with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

PART 2 PRODUCTS

2.1 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with fittings, steel anchor plates, adapters and anchor components for installation.
    1. Grind welded joints smooth.
    2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
B. Keys: Provide 3 keys for each accessory to Owner.
C. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof type.
D. Expansion Shields: Fiber, lead or rubber as recommended by accessory manufacturer for component and substrate.

2.2 FINISHES

A. Chrome/Nickel Plating: ASTM B456, Type SC 2, satin finish, unless otherwise noted.
B. Baked Enamel: Pretreat to clean condition, apply one coat of primer and minimum two coats epoxy baked enamel.
C. Galvanizing for Items other than Sheet: ASTM A123 to 1.25 oz/sq yd. Galvanize ferrous metal and fastening devices.
D. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.

E. Back paint components where contact is made with building finishes to prevent electrolysis.

2.3 TOILET ROOM ACCESSORIES

A. Toilet Paper Dispenser: Double roll surface mounted bracket type, chrome-plated zinc alloy brackets eccentric-shaped plastic spindle for 1/2 revolution delivery designed to prevent theft of tissue roll.
B. Paper Towel Dispenser: Folded paper type, surface-mounted, with viewing slots on sides as refill indicator and tumbler lock.
   1. Capacity: 400 C-fold minimum.
C. Paper Towel Dispenser: Surface Mounted automatic. Four D-sized batteries. Non-perforated paper towels. Provide one roll of towels. Equal to Bobrick B-72974.
D. Waste Receptacle: freestanding style with swing top.
   1. Liner: Removable rigid molded plastic receptacle.
   2. Minimum capacity: 20 gallons.
E. Soap Dispenser: Equal to Bobrick B-2111 surface mounted soap dispenser for liquid and lotion soaps and detergents.
   1. Minimum Capacity: 40 ounces.
   2. Surface mounted type 304 stainless steel with satin finish.
   3. Corrosion resistant valve.
F. Soap Dispenser: Wall mounted translucent high-impact plastic container, 1.5-gallon capacity. To be located by the service sinks.
G. Mirrors: Stainless steel framed, 6 mm thick float glass, abrasion-resistant coated mirror.
   1. Size: As indicated on drawings.
   2. Frame: 0.05 inch channel shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 bright annealed finish.
   3. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
   4. Shelf: Stainless steel; gage and finish to match mirror frame, turned down edges, welded to frame; 5 inches deep, full width of mirror.
H. Grab Bars: Stainless steel, 1-1/4 inches outside diameter, minimum 0.05 inch wall thickness, nonslip grasping surface finish, exposed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar. Length and Configuration: As indicated on drawings.
I. Hat and Coat Hook: Equal to Bobrick B-682.
   1. Wall Mounting Flange: 2”x 2” bright polished stainless steel.
   2. Hook: 1” wide x 6-1/4” high, bright polished stainless steel with 3” projection.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
B. Verify exact location of accessories for installation.
C. Verify that field measurements are as indicated on product data.

3.2 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.
B. Provide templates and rough-in measurements as required.

3.3 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions.
B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights and Locations: As required by accessibility regulations.

END OF SECTION

15400

PLUMBING SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Water piping.
   2. Sanitary drainage.
   3. Condensate piping.
   4. Testing.

B. Comply with other Division 15 Sections, as applicable. Refer to other Divisions for coordination of work.

1.2 SUBMITTALS

A. Make submittals for all products specified in the specification.

PART 2 PRODUCTS

2.1 MATERIALS

A. Water Piping Above Grade, Type "L" hard drawn, seamless copper water tube, ASTM B88 and Federal Specification WW-T-799. Joined with wrought copper pressure fittings, ANSI B16.22. Make joints using "lead free" solder and a non-corrosive paste-type flux. Core solder is not allowed. Solder will be solid string or wire type. Where soldered copper piping is connected to threaded brass piping, use a cast brass adaptor.

B. Water Piping Below Grade, Type "K" hard drawn, seamless copper water tube, ASTM B88 and Federal Specification WW-T-799. Joined with wrought copper pressure fittings, ANSI B16.22. Make joints using "lead free" solder and a non-corrosive paste-type flux. Core solder is not allowed. Solder will be solid string or wire type. Where soldered copper piping is connected to threaded brass piping, use a cast brass adaptor.

C. Make piping connections to fixtures and equipment with chrome-plated seamless brass tube, ASTM B-125 and Federal Specification WW-T0791. No ferrous piping or materials are allowed in water piping smaller than 4 inches.

2.2 SANITARY DRAINAGE

A. Sanitary Drainage lines (Soil, Waste and Vent): Cast iron soil pipe and fittings, coating inside and outside, ASTM A74 and Federal Specification WW-P-401. Label with Cast Iron Soil Pipe Institutes' "Mark of Quality and Permanence". Weights of pipe are required by code for location and duty. Joints shall be fabricated by use of "Push-On" type gasketed joints (above or below ground) or "No-Hub" mechanical joints (above ground only). Where permitted by local codes, PVC-DWV Plastic Schedule 40, NSF Seal CS-272 may be used for sanitary drainage pipes (soil, waste, and vent), with solvent-welded joints.

2.3 VALVES

A. Valves for Domestic Water Piping Systems: Nibco S580 or equal.

2.4 PRESSURE REDUCING VALVE

A. When the water system static pressure is greater than 75 PSI, furnish and install a pressure-reducing valve ahead of all fixtures and located in an accessible place. Set pressure at 50 PSI downstream of backflow preventer. Contractor to verify supply pressure.

2.5 COMMERCIAL TYPE WATER HAMMER ARRESTERS

A. Provide commercial type water hammer arrester on hot and cold water supplies as generally indicated, with precise location and sizing to be in accordance with PD1-WH201.
B. Water hammer arresters, where concealed, shall be accessible by means of access doors or removable panels.
C. Water hammer arresters shall be in accordance with PD1-WH201, as furnished by Watt, Josam or equal.
D. Vertical capped pipe columns will not be permitted.

2.6 BACKFLOW PREVENTER

A. Provide a Watts #909 reduced pressure backflow preventer for the domestic water service.

2.7 PLUMBING FIXTURES

A. Provide and install fixtures as shown on plans.

PART 3 EXECUTION

3.1 PIPING INSTALLATION

A. Install piping neatly and parallel with or perpendicular to lines of the structure. Install pipe hangers to maintain accurately aligned piping systems, adequately supported both laterally and vertically. Install horizontal soil, waste, and vent pipe with a grade of 1/4" per foot where possible and not less than 1/8" per foot. Where practicable, connect two or more vents together and extend as one vent through roof. Make vent connections to stacks by appropriate use of 45 wyes, long sweep quarter bends, sixth, eighth or sixteenth bends, except that sanitary tees may be used on the vertical stacks.
B. Extend condensate drain piping from units with condensate discharge.
C. Install drains at all low points and vents at high points in water distribution system.

3.2 PIPING

A. Refer to Section 15700 for insulation requirements.

3.3 PIPE TESTS

A. Test water piping before installing equipment and before insulation is applied, using specified methods and conditions. Subject piping to test for not less than 24 hours under inspection by the Engineer. Make necessary replacements and repairs and repeat tests until entire system is accepted as satisfactory. Work includes testing equipment. After installation of equipment, operate systems; clean out scale, dirt, oil, waste and foreign matter, and correct additional leaks. Test underground piping prior to backfilling.
B. Test plumbing drainage systems under 10 foot static head. Test water systems under 150 PSIG hydrostatic pressure.

C. Flush system thoroughly of dirt and foreign matter, then fill with water treated with 50 ppm of chlorine. During filling process, open valves and faucets several times to assure treatment of entire system. Leave treated water in system for 24 hours after which time system may be flushed; if residual chlorine is not less than 10 ppm, repeat flushing. After sterilization, receive approval by regulatory agency on samples of water in system.

END OF SECTION

15440

PLUMBING FIXTURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Plumbing fixtures and trim.
B. Related Sections:
   1. Refer to other Divisions for coordination of work.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's descriptive literature for all products specified.

PART 2 PRODUCTS

2.1 FITTINGS AND PIPING

A. Provide brass fittings and piping in connection with plumbing fixtures; polished chrome-plated where exposed to view.
B. Provide tight-fitting wall or floor escutcheons of chrome-plated brass wherever pipes pass through floors, walls or ceilings.
C. Provide required water, waste, soil, and vent connections to plumbing fixtures and equipment, together with fittings, supports, fastening devices, cocks, valves and traps, leaving all in complete working order.

2.2 FIXTURES

A. Provide new plumbing fixtures, first quality, free from mars or chips. Sufficient means to support each fixture in an adequate and rigid manner that permits no perceptible movement of fixture by manually applied forces. Fixtures to be standard products as manufactured by American Standard, Crane, Eljer or Kohler. The space between fixtures and floor or walls to be sealed with silicone sealant.
B. Each fixture shall be complete with required trim, and exposed piping and trim shall be polished chrome-plated brass. Each fixture shall be furnished with stop valves having metal-to-metal seats.
C. Provide for each lavatory and sink, a flow-limiting device that will limit flow to not more than 3 g.p.m. Devices shall be integral with fixture trim, wherever possible and shall be products of the fixture trim Manufacturer in all cases.
D. Provide plumbing fixtures as scheduled on Drawings.
E. See Specification Section 15410 - Compressed Air Piping, 2.2 Valves and Specialties.

PART 3 EXECUTION

3.1 INSTALLATION

A. Plumbing fixtures and equipment shall be set in place at locations indicated on the Drawings, leveled and connected. Fixtures shall be protected from damage during construction.
B. Installation procedures shall be in accordance with these Specifications and the Manufacturer's directions.

3.2 ADJUSTING AND CLEANING

A. Prior to final acceptance, inspect faucets, flush valves, stop valves, and similar devices, to determine that they operate properly and discharge the proper quantities of water. Correct any deficiencies as directed by the Engineer.

B. Clean fixtures, trim and accessories of foreign materials, including labels.

END OF SECTION

15500

HEATING, VENTILATING AND AIR CONDITIONING

PART 1 GENERAL

1.1 SUMMARY

A. Provide heating, ventilating, and air conditioning systems where shown on the Drawings, as specified herein and as needed for a complete and proper installation including but not necessarily limited to:
   1. Heating and Central Air Condenser Unit.
   2. Engineering and design, refer to drawings.

B. Related work:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.2 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Manufacturers catalogs, samples and other items needed to fully demonstrate the quality of the proposed materials and equipment.

C. Record drawings:
   1. Comply with pertinent provisions of Section 01720.
   2. Include a copy of the Record Drawings in each copy of the operation and maintenance manual described below.

D. Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Architect two copies of an operation and maintenance manual compiled in accordance with the provisions of Section 01730 of these Specifications.

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Without additional cost to the Owner, provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.

C. Provide minimum 1-year manufacturer's warranty on all units.

1.4 DELIVERY, STORAGE AND HANDLING

A. Comply with pertinent provisions of Section 01620.

PART 2 PRODUCTS

2.1 PIPING

A. For refrigerant piping, provide Type "L" copper, refrigerant grade, with wrought copper fittings,and with joints thoroughly cleaned prior to soldering.

2.2 AUTOMATIC TEMPERATURE CONTROL

A. Provide a system of temperature control with the attributes listed below.
   1. Include thermostats, sensors, temperature controllers, and air piping as requiring for a complete and operable system compatible with approved Heating and Central Air Unit.
   2. Provide devices calibrated and adjusted with the actual operating conditions.

2.3 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 COORDINATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.3 EQUIPMENT INTERFACE

A. Provide all required shutoff valves, unions and final connections of piping to the work of this Section.
B. For electrically operated equipment, verify the electrical characteristics actually available for the work of this Section and provide equipment meeting those characteristics.

3.4 PAINTING

A. Paint inside of all air outlets and connecting plenums with one coat of black paint or provide all such items factory preprinted.

3.5 INSTRUCTIONS

A. Upon completion of this portion of the Work, and prior to its acceptance by the Owner, provide a qualified engineer and fully instruct the Owner's maintenance personnel in the proper operation and maintenance of items provided under this Section.
B. Demonstrate the contents of the approved operation and maintenance manual required under Article 1.2 above.

3.6 TESTING AND ADJUSTING

A. Test and adjust each piece of equipment and each system as required to assure proper balance and operation.
   1. Test and regulate ventilation and air conditioning systems to conform to the air volumes shown on the approved design drawings.
   2. Make tests and adjustments in apparatus and ducts for securing the proper volume and face distribution of air for each grille and ceiling outlet.

3. Where required, provide pulleys for fans at no additional cost to the Owner and set to drive the fans at the speed needed to give the indicated volume.
4. For each system, take the following data in tabulated form:
    a. Air volumes at all supply return and exhaust outlets;
    b. Total c.f.m. supplied;
    c. Total c.f.m. returned;
    d. Total static pressure at each fan and at each system;
    e. Motor speed, fan speed and input ampere rating for each fan.

B. Submit two sets of test and balance reports to the Architect for approval.

C. Eliminate noise and vibration, and assure proper function of all controls, maintenance of temperature and operation in accordance with the approved design.

D. Secure required approval from governmental agencies having jurisdiction.

END OF SECTION

16100

ELECTRICAL WORK

16101 GENERAL

A. Requirements of the conditions of the contract and Instruction to Bidders, and General Conditions, apply to all work of this Section.

B. Provide complete electrical service where shown on the drawings, as specified herein, and as needed for a complete and proper installation including, but not necessarily limited to:
   1. Panelboards as needed.
   2. Branch circuit wiring, in conduit for lighting, receptacles, junction boxes and motors.
   3. Hangers, anchors, sleeves, chases, supports, for fixtures and other electrical material and equipment in association therewith.
   4. Lighting fixtures and lamps.
   5. Wiring system, in conduit, for equipment and control provided under other Sections of these specifications.
   6. Other items and services required to complete the system.

C. Related Work
   1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these specifications.

16102 FIELD CONDITIONS AND MEASUREMENTS

A. The Electrical Contractor shall visit the site of the work and familiarize himself with all available information concerning the structural, excavations, the location condition bearing on transportation, handling, and storage of materials. The Electrical Contractor shall make his own estimate of the facilities needed, and difficulties of execution of the contract including local conditions, availability of labor, uncertainties of weather, transportation, and other contingencies. Failure of the contractor to acquaint himself with all available information concerning these conditions will not relieve him from responsibility for estimating the difficulties and costs or successfully performing the complete work.

16103 CLEANUP

A. The Electrical Contractor shall have electrical rubbish and debris removed from the premises as directed. On completion of the electrical contract all associated debris and rubbish shall be removed from the premises.

B. All electrical equipment and materials furnished by this contractor shall be thoroughly cleaned and ready for use upon completion of the work.

16104 GUARANTEE

A. Contractor guarantees by his acceptance of the contract, that all work installed shall be free from any defects in workmanship and/or materials and that all apparatus will develop capacities and characteristics specified and that if, during a period of one year or as therefore specified, from completion of work, any such defects in workmanship, materials or performance appear, he will with no cost to owner remedy such defect.

16105 CODES

A. All electrical work shall be done in strict accordance with the National Electrical Code and all regulations, laws and ordinances which may be applicable.

16106 SUBMITTALS

A. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Manufacturer's recommended installation procedures which, when approved by the owner/architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

B. Submittals shall include the following:
1. Panelboards.
2. Lighting fixtures.
3. Wiring devices.
4. Electric cord reels.

C. Samples
1. When so requested by the owner/architect, promptly provide samples of items scheduled to be exposed in the final structure.
2. When specifically so requested by the Contractor and approved by the Architect, approved samples will be returned to the Contractor for installation on the work.

D. Manuals: Upon completion of this portion of the work, and as a condition of its acceptance, deliver to the owner/architect two copies of an operation and maintenance manual. Include with each manual.
1. Copy of the approved record documents for this portion of work.
2. Copies of all circuit directories.
3. Copies of all warranties and guarantees.

16107 QUALITY ASSURANCE

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

B. Without additional cost to the owner, provide such other labor and materials as are required to complete the work of this section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these contract documents.

16108 CONDUIT

A. All interior wiring above grade shall be installed in electrical metallic tubing with screw coupling fittings.

B. All interior wiring below slab shall be Galvanized Rigid Steel conduit. Schedule 40 PVC conduits may be used if approved by Owner/Architect. If PVC is used the last two feet to point of emergence shall be Galvanized Rigid Steel conduit with grounding bushing and a grounding conductor sized according to ART. 250-95 of the National Electrical Code shall be installed.

C. Wiring in office areas shall be concealed, wiring in shop and storage areas shall be installed on surface.

D. All exterior wiring shall be in galvanized Rigid Steel Conduit.

E. Type MC cable with grounding conductor or type AC cable may be used for fixture whips.

16109 WIRE AND CABLE

A. Building wire and cable with 600 volt insulation shall be 98% conductivity copper unless otherwise noted. The minimum size conductor for lighting and power shall be No. 12 AWG. The minimum size conductor for control shall be No. 14 AWG.

B. Conductors sized No. 10 and smaller shall be Type “THHN” solid or stranded as required unless otherwise noted, sizes No. 8 and larger shall be type “THHN” stranded unless otherwise noted.

C. Conductors shall be colored coded as required by governmental agencies having jurisdiction or as required by the National Electrical Code.

D. Contractor shall provide and install all telephone and data cable and equipment as required by the project and per specifications sections 16930.

E. Contractor shall provide and install all of the grounding and grounding field as required by this project and per specification section 16931.

F. Tele/ data cables installed above accessible ceilings may be installed without conduit. Tele/data cables installed above non-accessible ceilings and on surface shall be in conduit. Open cables installed in space used for environmental air shall be rated for plenum use.

16110 JUNCTION AND OUTLET BOXES

A. Outlet Boxes
   1. Provide standard one-piece units, galvanized or sherardized steel of shape and size best suited to that particular location, of sufficient size to contain enclosed wires according to ART. 370-16 of the National Electrical Code.
   2. Provide outlet boxes 2 1/8” deep for 1” conduits.
   3. For lighting outlets, provide standard 4” octagon or square units with 3/8” fixture stud and box hanger where required.
   4. For switches and receptacles, provide standard boxes with plaster or dry wall ring with stainless steel cover plate for concealed devices and pressed steel boxed with galvanized or cadmium plated steel cover plates for exposed devices.

B. Junction or Pull Boxes
   1. Interior junction boxes shall be galvanized code-gauge sheet steel units with screw-on covers, of size and shape required to accommodate wires without crowding, and to suit the location.
   2. Exterior boxes shall meet NEMA 3R or 4 standards.

16111 LIGHTING FIXTURES

A. Install lighting fixtures, complete with lamps, as shown on drawings and schedules. Manufacturers shown on schedules are for quality and type only, manufacturers of equal quality will be accepted if approved by owner.
   1. Recessed fixtures:
      a. Provide unit having an attached pull box and with UL label.
      b. Provide local label in addition if so required by governmental agencies having jurisdiction..
   2. Fluorescent fixtures
      a. Provide ballasts thermally protected against overheating by built-in thermal protectors sensitive to ballast winding temperature and current.
      b. Provide protector preventing winding temperature from exceeding 120 degrees C, allowing winding temperatures to reach 105 degrees C under normal operating conditions at 40 degrees C ambient and, after opening, not reclosing above 80 degrees C.
      c. Exterior ballast shall be cold weather type.
      d. Where fixture substitutes are proposed, submit a sample fixture with materials list required to be submitted under Art. 16106 above.
      e. Light fixtures in work areas shall be located so as not to interfere with the operation of overhead doors.

16112 WIRING DEVICES

A. Toggle switches - Mount 48” above finished floor.

1. Single pole Leviton 5521-I.
2. 3-way Leviton 5523-I.

B. Receptacles - Mount 18” above Finished Floor in office area 48” above Finished Floor in garage and storage areas and above splashboard over counters.
1. Duplex receptacles Leviton 5800-I.
2. Weatherproof duplex receptacles Leviton 6599-I mounted in FS box and 6196-VFS cover.
3. Ground Fault Interrupter duplex receptacles Leviton 6599-I.
4. Isolated ground receptacles Leviton 5262-IG.

C. Telephone and Computer Outlets shall be 4” x 4” x 1 1/2” outlet box with plaster ring. Install 3/4” EMT from box to just above accessible ceiling as required.

D. Outlets in finished walls shall be 4’ x 4” x x1 1/2” outlet box with plaster ring and a cover plate.

E. Outlets on surface shall be 4” x 4” x 1 1/2” outlet box and 4” x 4” raised cover plate.

F. Devices of the following manufacturers will be accepted as equal.
1. Hubbel
2. Arrow-Hart
3. General Electric

16113 PANELBOARDS

A. Panelboards shall be Sq. ‘D’ Type with circuit breakers as shown on drawings and schedules, and shall be Service Entrance Rated.

B. Devices of the following manufactures will be accepted as equal.
1. General Electric
2. Cuttler-Hammer

16114 TRANSFORMERS

A. Service Entrance Transformer is not part of this contract.

16115 DISCONNECT SWITCHES

A. Disconnect switches shall be Sq. ‘D’ Class 3130 General Duty fusible or non-fusible as shown on drawings. Interior switches shall be NEMA 1 and Exterior switches shall be NEMA 3R.

16116 GROUNDING

A. Install a 5/8” x 10’ copperclad ground rod at service entrance with a #6 bare copper conductor between ground rod and grounding bus in Panel board.

B. All grounding shall comply with ART. 250 of the National Electrical Code.

16117 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation as approved by the Architect.

16118 EXECUTION

A. Surface Conditions
1. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

16119 PREPARATION

A. Coordinate
1. Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this section.

2. Coordinate the installation of electrical items with the schedule for work of other trades to prevent unnecessary delays in the total work.

B. Data indicated on the drawings and in these specifications are as exact as could be secured but there absolute accuracy is not warranted. The exact locations, distances, levels and other conditions will be governed by actual construction and the drawings and specifications should be used only for guidance in such regard.

C. Verify all measurements at the building. No extra compensation will be allowed because of differences between work shown on the drawings and actual measurements at the site of construction.

D. Branch circuit wiring and arrangement of home runs have been designed for maximum economy consistent with adequate sizing for voltage drops and other considerations. Install the wiring and circuits arranged exactly as shown on the Drawings, except as otherwise approved in advance by the architect.

E. The electrical drawings are diagrammatic, but are required to be followed as closely as actual construction and work of other trades will permit. Where deviations are required to conform actual construction and the work of other trades, make such deviations without additional cost to the owner.

16120 TRENCHING AND BACKFILLING

A. Perform trenching and backfilling associated with the work of this section in strict accordance with the provisions of the appropriate sections of these specifications.

16121 INSTALLATION OF RACEWAYS AND FITTINGS

A. Where conduit is installed concealed in the walls or above the ceiling, or exposed in work areas, provide rigid galvanized conduit or electrical metallic tubing with screw type fittings.

B. Use flexible metal conduit only for short motor connections or where subject to vibration.

C. Provide necessary sleeves and chases where conduits pass through floors and walls, and provide other necessary openings and spaces, arranging for in proper time to prevent unnecessary cutting in connection with the work. Perform cutting and patching in accordance with the provisions for the original work.

D. Where conduit is exposed, run parallel to or at right angle with lines of the building.

E. Securely and rigidly support conduits throughout the work. Conduits and wiring above a ceiling assembly shall not be supported to, or supported by, the ceiling assembly, including the ceiling support wires.

16122 INSTALLATION OF CONDUCTORS

A. Unless otherwise shown use #12 type THHN conductors for all branch circuits protected by 20 amp circuit breakers. Where so indicated on the drawings, use larger wires to limit voltage drops.

B. Use identified (white) neutrals and color-coded phase wires for all branch circuit wiring.
1. Make splices electrically and mechanically with pressure-type connectors.
   a. For wire size #6 AWG and smaller, provide “Scotch-Lock” connectors.
2. Insulate splices with a minimum of two half-lapped layers of Scotch Brand #33 vinyl-plastic electrical tape where insulation is required.

C. Tape all joints with rubber tape 1 1/2 times the thickness of the conductor insulation, than cover with vinyl-plastic electrical tape specified above.

D. The drawings do not indicate the home runs. Continue all home runs to the panel as though the routes were shown completely.

16123 INSTALLATION OF PANELS

A. Install panels as shown on drawings and specifications or as directed by the owner/architect.

B. Mount a typewritten directory behind glass or plastic on the inside of each panel door and, on the directory, show the number and complete description of all outlets on each circuit.

16124 TESTING AND INSPECTION

A. Make required tests in the presence of the owners representative and required approvals from the owner/architect and governmental agencies having jurisdiction.

B. Make written notice to the owner/architect adequately in advance of each of the following stages of construction.

1. In the underground condition prior to placing concrete floor slab, when all associated electrical is in place.
2. When all rough in is complete, but not covered.
3. At completion of the work of this section.

C. When material and/or workmanship is found to not comply with the specified requirements, within three days after receipt of notice of such non-compliance remove the non-complying items from the job site and replace them with items complying with the specified requirements, all at no additional cost to the owner.

D. In the owner/architect's presence:

1 Test all parts of the electrical systems for phase to phase and phase to ground short circuits and prove that all such items provided under this section function electrically in the required manner.

2. Immediately submit to the architect a report of maximum and minimum voltages and a copy of the recording voltmeter chart.

3. Also measure voltages between phase wires and neutral and report these voltages to the Architect.

16125 PROJECT COMPLETION

A. Upon completion of the work of this section, thoroughly clean all exposed portions of the electrical installation, removing all traces of soil, labels, grease, oil, and other foreign material and using only the type cleaner recommended by the manufacturer of the item being cleaned.

B. Thoroughly indoctrinate the owner's operation and maintenance personnel in the contents of the operations and maintenance manual required to be submitted under article 16106 of this section of these specifications.

END OF SECTION