

PROJECT MANUAL  
for  
CITY OF WICHITA  
CHENEY PUMP HOUSE BUILDING  
2301 N 391ST ST W  
CHENEY, KS

MARCH 17, 2020



SPANGENBERG PHILLIPS TICE  
A R C H I T E C T U R E



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## **00 72 00 GENERAL CONDITIONS**

### PART 1 - GENERAL

#### 1.1 AIA GENERAL CONDITIONS

- A. AIA Document A201 "General Conditions of the Contract for Construction", 2007 Edition, is hereby made part of the Contract Documents.

**END OF SECTION 00 72 00**



## **00 73 00 SUPPLEMENTARY CONDITIONS**

### **PART 1 - GENERAL**

#### **1.1 FORM OF SPECIFICATIONS**

- A. These Specifications are of abbreviated form and contain incomplete sentences. Omissions of words or phrases such as “the Contractor shall,” “shall be,” “as noted on the Drawings,” “according to the Drawings,” “a,” “an,” “the,” and “all” are intentional. Omitted words and phrases shall be supplied by inference in the same manner as they are when a “note” occurs on the Drawings.
- B. Specification instructions are directed to the Contractor, and inclusion of any work by mention, note, or itemization, however brief, implies the Contractor shall provide same unless specifically directed otherwise.
- C. In specifying an item by Manufacturer’s name and/or catalog number, unless specifically stated otherwise, such item shall be provided with all standard devices and accessories indicated in latest edition of manufacturer’s catalog or brochure published at date of invitation to bid. Furnish such item complete with component parts necessary for obviously intended use and installation, whether or not description or catalog number contains all supplemental information and/or numbers of such components.

#### **1.2 PAYMENT AND RETAINED PERCENTAGE**

- A. Submit three signed and notarized original copies of each Application for Payment to the Architect.
- B. Each item for which a value is included shall be listed on AIA Document G703. Master Schedule of Values included at end of this section shall be used.
- C. Provide a “Waive and Release” to claim a lien for labor, services, or materials furnished on construction project through each Application for Payment.
- D. Submittals that must precede or coincide with submittal of the first Application for Payment include the following:
  - 1. List of subcontractors
  - 2. List of principal suppliers and fabricators
  - 3. Schedule of values
  - 4. Contractor’s Construction Schedule
  - 5. Certificates of insurance and insurance policies
  - 6. Performance and payment bonds
- E. Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
  - 1. Completion of Project closeout requirements
  - 2. Ensure that unsettled claims will be settled
  - 3. Removal of temporary facilities and services
  - 4. Removal of surplus materials, rubbish and similar elements
  - 5. Change of door locks to Owner’s access
- F. Certificates for Payment will be issued for 95% of the amount completed as approved by the Architect, less amounts previously paid.

#### **1.3 BONDS**

- A. **PERFORMANCE BOND** - General Contractor shall provide for the full amount of the Contract. (see attachment).

## **00 73 00 SUPPLEMENTARY CONDITIONS**

- B. LABOR AND MATERIAL PAYMENT BOND - General Contractor shall provide for the full amount of the Contract. (see attachment)..
  - C. Bonding Company shall be subject to the approval of the Owner.
- 1.4 INSURANCE
- A. See Exhibit A.
  - B. Provide Certificate of Insurance in Owner(s) name prior to commencement of work.
- 1.5 CHANGE ORDERS
- A. The Architect will issue a description of proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time.
  - B. Proposal requests issued by the Architect are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
  - C. When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
  - D. For changes in the work the General Contractor may add the following maximum percentage for general conditions, fee, overhead, and profit:
    - 1. 15% of the direct cost of labor, materials, and equipment for work performed directly by the Contractor
    - 2. 10% for the work performed by a Subcontractor.
  - E. Subcontractors shall be allowed no more than 10% for their general conditions, fee, overhead, and profit, in addition to labor, materials, and equipment.
  - F. The same percentage for general conditions, fee, overhead, and profit shall be used for deduct change orders as for add change orders, EXCEPT, if all Change Orders at the end of the project result in a deduct, then no deduct shall be made for the amount for general conditions, fee, overhead, and profit for the portion of changes which lowers the contract sum below the initial contract amount.
  - G. Change orders shall be accompanied by a complete itemization of costs including labor, materials and subcontracts.
- 1.6 PLAN REVIEW
- A. The Owner will pay for the plan review fee.
  - B. The Contractor shall pay for the building permit.
- 1.7 STATE SALES TAX EXEMPTION
- A. This project is exempt from Kansas State Sales Tax.
  - B. A Sales Tax Exemption /Certificate will be provided by the Owner for use by the Contractor and Subcontractors in purchasing products for this project.
- 1.8 MASTER SCHEDULE OF VALUES
- 01 00 00 GENERAL REQUIREMENTS
    - General Requirements
    - Temporary Facilities and Controls
    - Field Engineering, Permits, Bonds, Insurance



**00 73 00 SUPPLEMENTARY CONDITIONS**

- 02 00 00 EXISTING CONDITIONS  
Demolition
  
- 03 00 00 CONCRETE  
Footings and Foundations  
Slab on Grade
  
- 05 00 00 METALS  
Metal Building Systems  
Structural Erection  
Metal Fabrications
  
- 08 00 00 OPENINGS  
Hollow Metal Doors and Frames  
Finish Hardware
  
- 09 00 00 FINISHES  
Painting
  
- 31 00 00 EARTHWORK  
Earthwork  
Soil Treatment
  
- 32 00 00 EXTERIOR IMPROVEMENTS  
Concrete Paving

**END OF SECTION 00 73 00**



## **01 23 00 ALTERNATES**

### **PART 1 - GENERAL**

#### **1.1 DEFINITION**

- A. An Alternate is an amount proposed by Bidders and stated on the Bid Form that will be added to or deducted from the Base Bid amount if the Owner elects to accept a change in the work as described in Contract Documents.

#### **1.2 COORDINATION**

- A. Coordinate related work, and modify or adjust as required to ensure that work affected by each accepted alternate is complete and fully integrated into the project.
- B. Include as part of each alternate, miscellaneous devices, appurtenances, and similar items, incidental to, or required, for a complete installation whether or not specifically mentioned as part of the alternate.

#### **1.3 SCHEDULE OF ALTERNATES**

##### **A. ALTERNATE NO. 1 – 15' WIDE CONCRETE APRON**

- 1. Base bid includes 15' concrete aprons at the two east overhead doors. This alternate adds additional concrete paving to provide a 15' concrete apron the full length of the building at east side.

##### **B. ALTERNATE NO. 2 – 30' WIDE CONCRETE APRON/DRIVE**

- 1. Base bid includes 15' concrete aprons at the two east overhead doors. This alternate adds additional concrete paving to provide a 30' concrete apron the full length of the building at east side and a drive connection to the existing concrete drive. When calculating cost for Alternate 2 assume Alternate 1 is not accepted.

##### **C. ALTERNATE NO. 3 – LINER PANELS**

- 1. Base bid does not include interior liner panels. This alternate adds 7' high liner panels at interior face of building perimeter.

##### **D. ALTERNATE NO. 4 – ROOF AND WALL PANEL GAGE**

- 1. Base bid provides 24 gage roof and wall panels. This alternate changes the gage of roof and wall panels to 22 gage.

##### **E. ALTERNATE NO. 5 – OVERHEAD DOORS**

- 1. Base bid provides sliding doors at 4 door openings. This alternate changes 2 of the 4 openings (at north and south elevations) to manual overhead doors instead of sliding doors. Door opening to remain same size.

**END OF SECTION 01 23 00**



## **01 30 00 ADMINISTRATIVE REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.1 SUBCONTRACTORS**

- A. Submit a complete list of principal subcontractors and suppliers to be used on the project within one week of award of Contract.

#### **1.2 SCHEDULE OF VALUES**

- A. Submit to the Architect within 2 weeks after award of Contract.
- B. This schedule shall be used for each Application for Payment showing percent completed for each item.
- C. Schedule shall be itemized in a format similar to the Master Schedule of Values in Division 007300.

#### **1.3 CONSTRUCTION SCHEDULE**

- A. Submit to the Architect within 2 weeks after award of Contract.
- B. Schedule shall be either of the critical path or bar graph type.
- C. Show all major construction events, and the dates that each event is to begin and is to be completed.
- D. Update schedule with each Pay Application, or more often if required, so that schedule remains current within one (1) week at all times.

#### **1.4 PROJECT MEETINGS**

- A. Schedule a preconstruction conference before starting construction, at a time convenient to the Owner and the Architect, but no later than 15 days after execution of the Agreement.
- B. Authorized representatives of the Owner, Architect and their consultants; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference.
- C. Discuss items of significance that could affect progress, including the following: tentative construction schedule, critical work sequencing, designation of responsible personnel, procedures for processing field decisions and Change Orders, procedures for processing Applications for Payment, distribution of Contract Documents, submittal of Shop Drawings, Product Data, and Samples, preparation of record documents, use of the premises, parking availability, office, work and storage areas, equipment deliveries and priorities, safety procedures, security, housekeeping and working hours.

#### **1.5 PROGRESS MEETINGS**

- A. Conduct progress meetings at the Project Site at regular intervals. Notify the Owner and the Architect of scheduled meeting dates.
- B. In addition to representatives of the Owner and the Architect, each subcontractor, supplier, or other entity concerned with current progress, or involved in planning, coordination, or performance of future activities shall be represented at these meetings.
- C. Review items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.

## **01 30 00 ADMINISTRATIVE REQUIREMENTS**

- D. No later than three (3) days after each meeting, distribute minutes of the meeting to each party present and to parties who should have been present.
- 1.6 SHOP DRAWING AND DATA SUBMITTAL
- A. Submit to the Architect for all items where noted in the specifications.
  - B. Allow 2 weeks for Architect to review shop drawings. Allow additional time if the Architect must delay processing to permit coordination with subsequent submittals.
  - C. Shop drawings and data submittals shall bear Contractor's stamp stating that they conform to the Contract Documents signed by Contractor's representative.
  - D. Submit 1 reproducible copy and 1 non-reproducible of all drawings to Architect. To expedite the review, the reproducible copy can be emailed to Architect with the condition that hard copy will follow to Architect or Engineer. Electronic files are also permissible.
  - E. For Catalog cuts, submit one copy plus additional copies as Contractor may require for its own use, plus one copy to be retained for Owner.
  - F. Submit the following directly to the consulting engineers:
    - 1. Structural PEC
  - G. The Contractor shall send to the Architect, at the time shop drawings have been sent to the engineer, a transmittal letter indicating date and type of drawings sent as well as 1 copy of the drawings.
  - H. Architect will make copies for his own use and return approved original to Contractor.
  - I. Contractor shall make copies for his own use, for use of Subcontractors, plus an additional copy to be retained for Owner.
  - J. A copy of all approved shop drawings shall be at the job site at all times.
  - K. Architect's approval shall be for general conformance to design appearance only and shall not be construed as a verification of dimensions, nor shall it be construed to relieve the Contractor of any requirement set forth in the Contract Documents.
  - L. Contractor shall retain a copy of all shop drawings and product data and shall deliver to Owner, for his use, at completion of project.
  - M. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information.
- 1.7 COLOR SELECTIONS
- A. Where a product is available in more than one color, the color shall be selected by the Architect.
  - B. The Architect may select any standard color listed by the manufacturer in its product literature.
  - C. **SUBMIT SAMPLES FOR COLOR SELECTION FOR ALL PRODUCTS TO THE ARCHITECT AT THE SAME TIME, AND WITHIN 4 WEEKS AFTER AWARD OF CONTRACT.**
  - D. Submit 3 samples for each color.
  - E. Samples submitted shall be actual color samples, and not photographic reproductions.

## **01 30 00 ADMINISTRATIVE REQUIREMENTS**

- F. Provide large size samples where requested by the Architect.
  - G. ALLOW 4 WEEKS AFTER SUBMISSION OF ALL SAMPLES FOR ARCHITECT'S SELECTION.
- 1.8 SURVEYS, LOCATIONS AND LEVELS
- A. Verify, before proceeding with construction, that construction does not encroach on any property line, setback lines, or easements.
  - B. Bench marks shall be established and safeguarded by the General Contractor at 2 separate locations for use in establishing elevations.
  - C. Inconsistencies in dimensions or elevations shall be reported to the Architect before proceeding with work.
- 1.9 CONTROLS
- A. General Contractor shall establish locations of partitions, walls, openings, etc., for all trades.
- 1.10 USE OF SITE
- A. The work and storage area shall be limited to that portion of the site indicated on drawings.
  - B. Maintain the surrounding site conditions throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the adjacent buildings and its occupants during the construction period.
- 1.11 EXISTING UTILITIES
- A. Existing utilities shall be maintained in operation at all times.
  - B. Any temporary disconnection of utilities shall be coordinated with the Architect and scheduled so as to minimize any inconvenience to the Owner.
- 1.12 OCCUPANCY REQUIREMENTS
- A. Obtain a Certificate of Occupancy from local building officials prior to Owner occupancy.

**END OF SECTION 01 30 00**





## **01 40 00 QUALITY REQUIREMENTS**

### PART 1 - GENERAL

#### 1.1 PREPARATION FOR WORK

- A. Prepare all work properly to receive subsequent work or finish.
- B. Field check all dimensions prior to fabrication.
- C. Verify height or position with Architect, where not specifically indicated on drawings.
- D. Deliver equipment and materials in manufacturer's original package.

#### 1.2 BUILDING CODE REQUIREMENTS AND FIRE RATINGS

- A. The construction documents were prepared to indicate general requirements to meet codes and fire ratings.
- B. The drawings indicate Type of Construction and Fire Ratings of the various elements.
- C. The drawings shall not be construed to indicate every item or condition necessary to meet such requirements and ratings.
- D. The Contractor shall provide all necessary materials and work necessary to achieve the code and fire requirements whether specifically indicated or not.

#### 1.3 CUTTING AND PATCHING

- A. Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.
- B. Replace, patch and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.
- C. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible if identical materials are unavailable or cannot be used. Use materials whose installed performance will equal or surpass that of existing materials.
- D. Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

#### 1.4 CONFLICTING REQUIREMENTS

- A. Where conflicts, discrepancies or omissions in the drawings and/or specification occur, the Contractor shall 1) provide the better quality or greater quantity of work, or 2) comply with the more stringent requirements, either or both in accordance with Architect's interpretation. Refer uncertainties to the Architect for confirmation before proceeding.

#### 1.5 INSTALLATION OF WORK

- A. Manufacturer's requirements shall be strictly followed for installation of all products except where these specifications exceed those requirements.
- B. Provide all devices and materials to properly secure materials or equipment.
- C. Provide for ample expansion and contraction for all components.
- D. Install products only when temperature, moisture and humidity conditions are such that proper installation will result.

## **01 40 00 QUALITY REQUIREMENTS**

- E. Material and equipment shall be installed plumb, level, and true, with uniform joints and edge conditions, tight seams, and neatly fitting adjoining materials, unless specifically shown otherwise.
  - F. Seal all exterior joints to provide waterproof enclosure.
  - G. Keep labels intact until final cleaning. Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
- 1.6 COMPLETION OF WORK
- A. Adjust and service all equipment for proper operation.
  - B. Clean all materials in a manner not to damage finish.
  - C. Completed work shall illustrate first-class workmanship normal for trade involved.
  - D. Provide written instruction to the Owner for maintenance and operation of all materials and equipment furnished.
  - E. Instructions shall be those prepared by the manufacturer where possible.
- 1.7 REQUIREMENTS FOR PRODUCTS AND MATERIALS
- A. All products shall be new and of first grade quality.
  - B. Factory "seconds" shall not be furnished.
- 1.8 APPROVAL OF PRODUCTS SPECIFIED "OR EQUAL"
- A. Where "or equal" is specified for a product, Contractor may submit products for Architects approval which in its opinion are equal to those specified.
  - B. The Architect will consider design appearance as well as technical properties in determining whether or not a product is approved.
  - C. The Architect's opinion shall be final.
  - D. Request for approval shall be submitted maximum seven (7) days prior to bid opening and shall be accompanied by Contractors statement in writing that the product is equal to that specified.
- 1.9 APPROVAL OF PRODUCTS WHERE "OR EQUAL" IS NOT SPECIFIED
- A. Products other than those specified will not be considered except for one or more of the following reasons:
    - 1. There is a price advantage to the Owner.
    - 2. The specified material cannot be obtained in time to meet the schedule.
    - 3. The product is superior to that specified in the opinion of the Architect.
    - 4. The product is not acceptable to governing authorities.
- 1.10 SUBMITTALS FOR SUBSTITUTION
- A. Requests shall include the following:
    - 1. Product data and sample if requested;
    - 2. Detailed performance comparison;
    - 3. Effect of substitution on schedule;

## **01 40 00 QUALITY REQUIREMENTS**

4. Effect of substitution on cost;
5. Contractor's general certification of the recommended substitution.

**END OF SECTION 01 40 00**



## **01 50 00 TEMPORARY FACILITIES & CONTROLS**

### **PART 1 - GENERAL**

#### **1.1 TOILETS**

- A. General Contractor shall be responsible for providing and maintaining sanitary toilet facilities for all workmen on the project.
- B. Facilities shall be in compliance with health and safety codes.
- C. Temporary toilets shall be provided during construction.

#### **1.2 POWER**

- A. Contractor shall provide temporary power for construction operations as needed..
- B. Cost of temporary power is the responsibility of the Contractor.

#### **1.3 BARRICADES, ENCLOSURES AND WARNING SIGNS**

- A. Comply with standards and code requirements for erection of structurally adequate barricades and fence enclosures.
- B. Post appropriate graphics and warning signs to inform personnel and the public of the hazard.

#### **1.4 SECURITY ENCLOSURE**

- A. Provide for lock-up of structure adequate to prevent unauthorized entry at earliest date possible.

**END OF SECTION 01 50 00**



## **01 70 00 EXECUTION & CLOSEOUT REQUIREMENTS**

### **PART 1 - GENERAL**

- A. All items listed in this Section shall be performed as part of the project closeout.
- B. Final payment to the Contractor will be contingent upon completing all items listed in this Section.

#### **1.1 FINAL INSPECTION**

- A. Architect will not begin his final inspection until such time that he has received, in writing from the Contractor, a typed punchlist itemizing ALL deficiencies AND a Certificate of Occupancy has been issued by the Local Authority.
- B. If punchlist items are judged by the Architect to be minor, then Architect will walk-through the project with Contractor and a representative of the Owner.
- C. If it becomes apparent that the project is not ready for a final inspection, general verbal directions will be given by Architect and the walk-through will be rescheduled.
- D. Contractor shall have one worker available during the walk-through to make simple "on-the-spot" corrections and another person to record required corrections.
- E. Contractor shall be responsible for publishing punchlist items from Architect/Owner walk-through.
- F. When ALL punchlist items have been completed, Contractor shall schedule a walk-through with Architect to verify compliance.
- G. Architect reserves the right to add additional items to punchlist which were not detected in initial walk-through.
- H. If Owner must move in prior to completion of punchlist items, Contractor shall be responsible for documenting by photographs, conditions prior to Owner move-in.
- I. Final pay application will not be processed until all punchlist items are complete. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the work is not complete.

#### **1.2 PROJECT RECORD DRAWINGS**

- A. Contractor shall furnish one set of "red-lined/as-built" drawings and specifications.
- B. Contractor and/or subcontractor shall mark on drawings all changes and be responsible for accuracy of same.
- C. As the work progresses, each Contractor shall keep a complete and accurate record of changes or deviations from the Contract Documents and the shop drawings indicating the work as actually installed.
- D. Changes shall be neatly and correctly drawn on the respective portion of the affected document, using prints of the Drawings affected, or the specifications, with appropriate supplementary notes. Bind addenda, change orders and other written modifications into front of project manual.
- E. This record set of drawings, shop drawings, and specifications shall be kept at the job site for inspection by the Architect at all times.
- F. Contractor shall certify that each of the revised prints of the drawings and specifications is complete and accurate.

## **01 70 00 EXECUTION & CLOSEOUT REQUIREMENTS**

### 1.3 SHOP DRAWINGS

- A. Contractor shall maintain one complete set of approved shop drawings at the job.
- B. At the completion of work, box file or notebook, tabulate and deliver the following to Architect for submittal to the Owner:
  - 1. Shop Drawings - organized by Division and Indexed.
  - 2. Maintenance and operating instructions.
  - 3. Warranties, certifications and similar documents.

### 1.4 INSTRUCTIONS

- A. Equipment furnished under the drawings and these specifications shall be thoroughly tested for proper performance, oiled, greased, and turned over to Owner in clean condition, ready to operate.
- B. Instructions covering the proper operation of all equipment shall be furnished to the Owner. Training on critical items and controls to be provided to Owner by General Contractor.

### 1.5 SYSTEMS AND EQUIPMENT TESTING

- A. Provide a written record and a copy of all tests and results.
- B. Includes tests required by these contract documents, tests performed by the manufacturers, and tests required by any governing inspecting agencies.

### 1.6 SURPLUS MATERIALS

- A. The Contractor shall leave all surplus materials at the site for the Owner's use in making future repairs.
- B. Materials shall include, but not be limited to, paint, metal building panels.

### 1.7 CLEAN-UP

- A. Thoroughly clean the materials, equipment or other items.
- B. Cleaning shall be done by appropriate methods (scrubbing, washing, damp mopping, dusting, vacuuming) to leave surfaces, areas, spaces, and interiors free from stains, discolorations, oil, grease, dirt, dust or other soil to leave the work in a clean and streak-free condition.
- C. All labels shall be removed, except those labels, plates or tags that are necessary for the proper use of the equipment or items, or have data and characteristics that are necessary to leave.
- D. After cleaning for inspection for substantial completion and occupancy, any subsequent work in any space shall be likewise cleaned upon the completion of the work by the Contractor.

**END OF SECTION 01 70 00**



## **02 41 00 DEMOLITION, GENERAL**

### **PART 1 - GENERAL**

#### **1.1 ITEMS TO BE REMOVED**

- A. Remove all items indicated on drawings and all items as required for execution of the work.
- B. Ownership of all items to be demolished shall belong to the Contractor unless requested otherwise by Owner.
- C. Abandoned foundations within 5' of new construction shall be removed entirely.
- D. Debris shall be removed from the site and not buried on site.

#### **1.2 PRECAUTIONS**

- A. Protection of the existing structures, fixtures, and equipment is the complete responsibility of the Contractor.
- B. Owner will occupy the buildings immediately adjacent to selective demolition area. Conduct selective demolition so that Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- C. Explosives shall not be used.
- D. Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.
- E. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of building to be selectively demolished.
- F. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.

#### **1.3 UTILITIES**

- A. Utilities which are to be abandoned shall be capped and/or disconnected.
- B. No services in use shall be abandoned, without the permission of the user.

**END OF SECTION 02 41 00**



## **03 11 00 CONCRETE FORMING**

### PART 1 - GENERAL

#### 1.1 STANDARDS

- A. Materials and installation shall conform to ACI 301 and ACI 347R Recommended Practice for Concrete Formwork of the American Concrete Institute.

### PART 2 - PRODUCTS

#### 2.1 FORMS

- A. New, undamaged plywood, exterior grade, 3/4" thickness or metal forms.
- B. Forms may be reused if in good condition.

#### 2.2 FORM RELEASE AGENTS

- A. Form oil at concrete not exposed to view
- B. Non-staining type at exposed concrete.

#### 2.3 EXPANSION JOINT MATERIAL

- A. Premoulded asphalt impregnated fiber 3/8" width by concrete thickness.
- B. Tongue and groove design between adjacent slabs.
- C. Straight design between wall and slab.

#### 2.4 VAPOR RETARDER

- A. Multi-ply reinforced polyethylene sheet, ASTM E 1745 Class A and ASTM E 96. Vapor barrier shall have WVTR less than or equal to 0.006 Perms.
- B. Manufacturers:
  - 1. Stego Wrap by Stego Industries
  - 2. Vaporguard by REEF Industries
  - 3. Zero Perm by Alumiseal
  - 4. Barrier-Bac by Inteplast Group
  - 5. Or equal
- C. Seam tape by vapor barrier manufacturer shall have WVTR less than or equal to 0.3 perms.
- D. Repair, cut, or puncture damage and reseal vapor barrier before placing concrete.

### PART 3 - EXECUTION

#### 3.1 GENERAL REQUIREMENTS

- A. Form construction shall produce true, smooth surfaces
- B. Forms shall be tight to prevent leakage.
- C. Tolerances of finish surfaces:
  - 1. 1 in 200 horizontally and 1 in 500 vertically.
- D. Apply form release agents before placing reinforcing.
- E. Aluminum conduit shall not be embedded in concrete.
- F. Chamfer exterior corners and edges of permanently exposed concrete unless indicated otherwise.
- G. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt and other debris just before placing

## **03 11 00 CONCRETE FORMING**

concrete.

- H. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

### **3.2 SHORES AND RESHORES**

- A. Comply with ACI 318 (ACI 318M), ACI 301, and recommendations in ACI 347R for design, installation and removal of shoring and reshoring.

### **3.3 WORK FOR OTHER TRADES**

- A. Form chases, slots, sleeves, etc., and provide for installation of imbedded items.
- B. Install anchor bolts, accurately located, to elevations required.

### **3.4 FOOTINGS**

- A. Where soil type allows accurate excavation, side forms may be omitted.

### **3.5 EXPANSION JOINTS FOR EXTERIOR SLABS**

- A. Locate expansion joints 30' on center maximum.
- B. Locations to be approved by the Architect.

**END OF SECTION 03 11 00**

## **03 20 00 CONCRETE REINFORCING**

### **PART 1 - GENERAL**

#### **1.1 SHOP DRAWINGS**

- A. Drawings shall include bending diagrams, placement drawings, and bar lists.
- B. Payment shall be by General Contractor.
- C. Detailing shall comply with ACI-315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures."

### **PART 2 - PRODUCTS**

#### **2.1 REINFORCING BARS**

- A. ASTM A 615/A 615M, Grade 60 (Grade 420), deformed unless shown otherwise on drawings.

#### **2.2 WELDED WIRE FABRIC**

- A. ASTM A-185, 6 x 6 – W1.4 x W1.4 WWF at all interior & exterior concrete slabs on grade unless otherwise noted.

#### **2.3 ACCESSORIES**

- A. Supports, spacers, chairs, bolsters, ties, and other devices for proper placing, spacing, support, and fastening of reinforcement; shall conform to CRSI "Manual of Standard Practice for Reinforced Concrete Construction."
- B. All accessories to be galvanized.
- C. At exposed concrete, chairs or other items in contact with form shall be plastic coated.

### **PART 3 - EXECUTION**

#### **3.1 BENDING**

- A. Bend cold, conforming to ACI-315.

#### **3.2 PACKAGING**

- A. All reinforcing shall be bundled, clearly tagged, indicating location, length and size of each piece.
- B. Where different strengths of reinforcing are specified, grade shall be marked on tag.

#### **3.3 PROTECTION**

- A. Reinforcing shall be kept clean, free of flaky or loose rust, oil, paint, or other foreign coatings.
- B. Store in manner to prevent excessive rusting and accumulation of dirt, grease, and other bond-breaking coatings.

#### **3.4 PLACEMENT**

- A. Lap and adequately secure reinforcing to prevent movement.
- B. Clearances shall conform to ACI-318.

## **03 20 00 CONCRETE REINFORCING**

### 3.5 WELDED WIRE FABRIC

- A. Slabs-on-grade: Lap at least 1 mesh plus end extension of the wires, but not less than 8".

**END OF SECTION 03 20 00**

## **03 30 00 CAST-IN-PLACE CONCRETE**

### PART 1 - GENERAL

#### 1.1 SHOP DRAWINGS

- A. Drawings shall indicate location of all control and expansion joints.

#### 1.2 STANDARDS

- A. Materials and installation shall meet requirements of ACI-301 "Specifications for Structural Concrete for Buildings."

#### 1.3 DESIGN MIX

- A. Prior to placing any concrete on job, the design mix proposed shall be submitted for Architect's approval.
- B. Design mix shall show proportions, materials, aggregate gradation analysis, strength tests.
- C. Design mix from another project may be used if the design mix was prepared within the last 6 months.

#### 1.4 TESTS

- A. Tests shall be done by an Independent testing laboratory approved by Architect.
- B. Tests shall be paid by Contractor.
- C. Take 3 cylinders for:
  - 1. Each day's pour
  - 2. Each type of occurrence
  - 3. Each 100 cubic yards of concrete or fraction thereof.
- D. Test first cylinder @ 7 days; second @ 28 days; third if so directed by Architect.
- E. Take slump test for each cylinder group, in accordance with ASTM C-143; include in report for each cylinder group.
- F. Submit 3 copies of test results to Architect.
- G. NO WATER SHALL BE ADDED AT JOB SITE TO CONCRETE AFTER TAKING FINAL SLUMP TEST, OR AFTER TAKING CYLINDERS.

### PART 2 - PRODUCTS

#### 2.1 PORTLAND CEMENT

- A. GRAY: ASTM C150, Type I or II or Type I/II.

#### 2.2 AGGREGATE

- A. Fine aggregate: Natural sand, ASTM C-33.
- B. Coarse aggregate: ASTM C-33 crushed limestone not exceeding 1-1/2" nominal size.
- C. Size: In accordance with ACI standards for size of element and reinforcing.

#### 2.3 WATER

- A. Fresh, clean potable.

## **03 30 00 CAST-IN-PLACE CONCRETE**

### 2.4 AIR ENTRAINING ADMIXTURE

- A. ASTM C260
- B. Products:
  - 1. Grace-Daravair 1000
  - 2. W.R. Meadows - "Sealtight"
  - 3. Sonneborn - "Aerolith"

### 2.5 FLOOR SEALER

- A. Products:
  - 1. Hillyard Chemical Company "Cem-Seal II"
  - 2. Upco Company "Polyclear"
  - 3. Sonocrete Kure-N-Seal WB

### 2.6 FLOOR HARDENER

- A. Products:
  - 1. Nox-Crete Products Group, Duro-Nox liquid concrete floor hardener
  - 2. Or equal

### 2.7 JOINT FILLER STRIPS

- A. ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

### 2.8 CONCRETE MIX (NORMAL WEIGHT)

- A. Strength:
  - 1. 4000 PSI at 28 days
- B. Cement:
  - 1. 4000 PSI – 6 sack (94 lb.)
- C. Water: maximum of 6 gallons per sack of cement
- D. Fine and course aggregate, well graded, 50% min. retained of #4 sieve.
- E. Air entraining agent: (for concrete exposed to exterior only.) 5% to 7%.
- F. Slump: 4 inches.

### 2.9 MIX REQUIREMENTS

- A. Transit mixed, in accordance with ASTM C-94.
- B. Chemicals shall not be added to mix unless approved in writing by Architect.

## PART 3 - EXECUTION

### 3.1 GENERAL REQUIREMENTS

- A. Place no concrete until forms and reinforcing steel have been inspected and approved by the Architect and other required inspectors.
- B. Do not pour if 40 deg F and dropping.
- C. Do not pour if frost is on forms or reinforcing.
- D. Carts, buggies, or conveyors shall run on temporary runways supported clear of reinforcing steel.



## **03 30 00 CAST-IN-PLACE CONCRETE**

### **3.2 PLACEMENT OF CONCRETE IN FORMS**

- A. Clean forms before placing concrete.
- B. Use procedures to avoid separation.
- C. Place as near final position as possible.
- D. Deposit concrete in forms in horizontal layers no deeper than 24 inches.
- E. Place using 4 feet maximum free fall, use tremie for greater drops.
- F. Pour between predetermined construction joints approved by the Architect.
- G. Proceed at continuous rate so that previously poured concrete has not yet reached initial set.

### **3.3 USE OF VIBRATORS**

- A. Use mechanical vibrators for all concrete.
- B. Do not vibrate so as to cause segregation of aggregate.
- C. Vibrators shall be inserted and removed vertically.
- D. Vibrators shall not be used to transport concrete inside forms.
- E. Keep vibrators off sides of form.

### **3.4 PLACEMENT OF SLABS ON GRADE**

- A. Cover fill with one-layer vapor barrier for interior slabs. Install, protect and repair vapor-barrier sheets according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour. Lap joints 6 inches and seal with manufacturer's recommended tape. No penetrations of vapor barrier allowed except for reinforcing steel and permanent utilities.
- B. PULL REINFORCING UP TO CENTER OF SLAB.
- C. Locate and install construction joints so as not to impair strength or appearance of concrete, at locations indicated or as approved by Architect.
- D. Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams and other locations as indicated.
- E. Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness.
- F. Tool exposed joints and edges.
- G. Apply a hard trowel finish to floor and slab surfaces exposed to view or to be covered with paint, or another thin film-finish coating system.
- H. Apply a nonslip broom finish to exterior concrete platforms, steps and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

### **3.5 PROTECTION AND CURING**

- A. Protect concrete against frost and rapid drying. Comply with ACI 306.1 and ACI 305R.
- B. In freezing weather, provide means for maintaining concrete temperature above 70 deg F for three (3) days, or 50 deg F for five (5) days.
- C. Cure all slabs with moisture and approved membrane covering.
- D. Finished concrete shall be protected against damage, stains, foreign

## **03 30 00 CAST-IN-PLACE CONCRETE**

materials, etc., for duration of work.

### 3.6 FORM REMOVAL

- A. Removal time, methods, and safety involved is the direct responsibility of Contractor, but no less than ACI minimum recommendations.
- B. Forms shall not be removed until concrete members have acquired sufficient strength to safely support their weight and construction load. Concrete shall be at least 70 percent of 28-day design compressive strength.
- C. Immediately following removal of forms, inspect all surfaces for honeycombs, voids, defects, improper alignment, etc.
- D. Any work found to contain same is subject to removal and replacement if so determined by Architect.
- E. Work allowed to be patched by Architect shall be accomplished while concrete is green.

**END OF SECTION 03 30 00**

## **07 92 00 JOINT SEALANTS**

### **PART 1 - GENERAL**

#### **1.1 SUBMITTALS**

- A. Submit for Architect's approval for all items this Section
- B. Provide samples for Architect's color selection.

#### **1.2 WARRANTY**

- A. Written warranty, signed by installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this section within two years from date of Substantial Completion.

### **PART 2 - PRODUCTS**

#### **2.1 EXTERIOR SEALANT - ONE PART SILICONE**

- A. Dow Corning, Pecora, Sonneborn, or equal.
- B. Dow Corning 790 – Porous applications ie. Concrete, masonry; Pecora 890FTS-TXTR, Sonneborn Sonolastic 150.
- C. Dow Corning 795 – Non porous applications ie. metal; Pecora 890FTS

#### **2.2 MISCELLANEOUS MATERIALS**

- A. Primers shall be type recommended by manufacturer.
- B. Back-up material: Polyethylene foam rope.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

### **PART 3 - EXECUTION**

#### **3.1 EXTERIOR LOCATIONS TO RECEIVE SEALANT**

- A. All joints in exterior of building as required to provide and maintain watertight and air tight continuous joint seals without staining or deteriorating joint substrates.
- B. Thresholds at exterior doors shall be filled with sealant.

#### **3.2 JOINT PREPARATION**

- A. Remove all surplus material and debris from joint.
- B. Joints shall be clean, free from dirt, etc.
- C. Joints greater than 3/4" deep shall be packed with back-up material, or filler material to within 1/2" of finished surface.
- D. Primer shall be applied when and where recommended by manufacturer.

#### **3.3 SEALANT INSTALLATION**

- A. Do not proceed with installation of joint sealants when ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F or when joint substrates are wet.
- B. Do not proceed with installation of joint sealants when wind blown conditions cause discoloration of sealant.

## **07 92 00 JOINT SEALANTS**

- C. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- D. Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- E. Apply with gun with proper size nozzle for joint width.
- F. Fill groove solidly and uniformly smooth.
- G. Joints shall be air and watertight, free of tool marks, slightly concave and smooth.
- H. Protect joints until material is cured. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.
- I. Clean materials free from stains and remove excess sealant.
- J. Sealant which is not installed in straight, smooth lines will be cause for rejection.

**END OF SECTION 07 92 00**

## **08 11 13 HOLLOW METAL DOORS AND FRAMES**

### **PART 1 - GENERAL**

- 1.1 SHOP DRAWINGS
  - A. Submit shop drawings of all work under this section for Architect's approval.
- 1.2 TEMPLATES
  - A. Coordinate receipt of templates with supplier of hardware.
- 1.3 COORDINATION
  - A. Coordinate with work in Section 13 34 19.

### **PART 2 - PRODUCTS**

- 2.1 HOLLOW METAL FRAMES
  - A. Manufacturers:
    - 1. Curries
    - 2. Ceco
    - 3. Republic
    - 4. Steelcraft
    - 5. Mesker
    - 6. Or approved equal
  - B. All frames to be the product of one manufacturer.
  - C. Material: 12 gauge steel, dimensions and profiles shown on drawings.
  - D. Type: Welded unit frames with head and jamb members mitered, securely welded and ground smooth.
  - E. Galvanized frames at all exterior doors.
  - F. All breaks, angles, etc., uniform, straight, sharply defined, true.
  - G. Adjustable type jamb anchors minimum three (3) per jamb.
  - H. Floor Anchors - 12 gauge welded clip angle with cinch bolts, with temporary spreader channel at bottom.
  - I. Reinforce frames for hinges, closers and holder arms, or as required for other hardware specified.
  - J. Reinforcing shall be continuous for full length of frame.
  - K. Mortise and tap frames as required for hardware.
  - L. Finish: Factory prime coat.
- 2.2 HOLLOW METAL DOORS
  - A. Manufacturers:
    - 1. Curries
    - 2. Ceco
    - 3. Republic
    - 4. Steelcraft
    - 5. Mesker
    - 6. Or approved equal
  - B. Doors and frames shall be from the same manufacturer.
  - C. 1-3/4" thickness, flush type, all joints welded.
  - D. 16 gauge steel face sheets, cold rolled, leveled flush tops and bottoms.
  - E. Interior reinforcing - 20 ga. steel vertical stiffeners at 6" center, welded to both faces.
  - F. Flush top and bottom channels.

## **08 11 13 HOLLOW METAL DOORS AND FRAMES**

- G. Vertical seams welded, filled and ground smooth.
- H. Spaces between reinforcing shall be filled with inert sound deadening filler.
- I. Reinforcing: 10 gauge minimum for hinge and closer, 14 gauge minimum channel or 7 gauge plate for lock reinforcing.
- J. Mortise, reinforce, and tap doors for hardware.
- K. Surfaces shall be flat, free of dents, depressions, etc
- L. Finish - Factory prime coat ready for finish painting.
- M. Galvanize exterior doors

### **PART 3 - EXECUTION**

- A. Hang doors and frames plumb and true.
- B. Fasteners shall be concealed.

**END OF SECTION 08 11 13**

## **08 30 00 SPECIALTY DOORS (Refer to Alternate #5)**

### PART 1 - GENERAL

#### 1.1 SHOP DRAWINGS

- A. Submit for all doors for Architect's approval.

### PART 2 - PRODUCTS

#### 2.1 OVERHEAD DOORS

- A. Manufacturers:
  - 1. Overhead Door Company
  - 2. Haas Door
  - 3. McKee Door Company
  - 4. Raynor Manufacturing Company
  - 5. Crawford Door Company
- B. Type - Sectional, upward acting 416 Series non-insulated, standard lift doors by Overhead Door Co. or equal.
- C. Panels - 1-5/8" to 2" thick. Height as indicated on drawings
- D. Wind load design pressure – 20 lb./sq.ft
- E. Exterior Surface: Ribbed, textured.
- F. Exterior Steel: 16 gauge, hot-dipped galvanized.
- G. End Stiles: 16 gauge.
- H. Springs: 25,000 cycles.
- I. Air Infiltration: 0.08 cfm at 15 mph; 0.08 cfm at 25 mph.
- J. Finish and Color: Two coat baked-on polyester.
  - 1. Interior color, as selected from Manufacturer's standard colors
  - 2. Exterior color, as selected from Manufacturer's standard colors
- K. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- L. Weatherstripping:
  - 1. EPDM bulb-type strip at bottom section.
  - 2. Flexible jamb and header seals similar to existing with white metal finish and white EPDM gasket.
- M. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
- N. Operation: Manual
- O. Furnish all hardware, accessories, and supports necessary for installation and operation.
- P. Provide for headroom clearance condition.
- Q. Counter balance type - Torsion spring.
- R. Padlockable slide bolts at each side of interior.

### PART 3 - EXECUTION

- A. Install per manufacturer's recommendations.
- B. Anchor to adjacent construction without distortion or stress.
- C. Brace upper portions of track to roof structure.
- D. Fit and align door assembly including hardware, level and plumb, to provide smooth operation.
- E. Adjust to operate smoothly throughout full operating range.

### **END OF SECTION 08 30 00**





## **08 70 00 HARDWARE**

### **PART 1 - GENERAL**

#### **1.1 SCOPE**

- A. The intent of this hardware specification is to show the design, quality, and function required.
- B. Hardware supplier shall be responsible for furnishing all necessary items to achieve the function intended.
- C. Hardware supplier shall be responsible for providing hardware as required to meet all code requirements.
- D. Furnish all necessary accessories, screws, etc., for complete installation.

#### **1.2 STANDARDS**

- A. Comply with the requirements of the latest edition of the following standards unless indicated otherwise.
- B. ANSI, BHMA, DHI, NFPA, IBC, ADA

#### **1.3 SHOP DRAWINGS**

- A. Submit for Architect's approval.
- B. Include complete hardware schedule with door location and all hardware with catalog numbers listed for that door. Same set numbers used on the Architectural Drawings shall be used on the submittal.
- C. Submit catalog cut for each item.
- D. Submit keying schedule indicating keying for all locks.

#### **1.4 TEMPLATES**

- A. Submit templates to door and frame manufacturer after hardware has been approved by Architect.

### **PART 2 - PRODUCTS**

#### **2.1 KEYING**

- A. System - Master keyed
- B. Doors shall be keyed as directed by Owner.
- C. Provide 6 master keys.
- D. Provide two keys for each lock.
- E. Provide "PROTECTED KEYWAY" system - Blank keys shall be available from the manufacturer only by an authorized agent of the owner.

#### **2.2 REQUIREMENTS**

- A. Any substitutes must be of approved equals.
- B. Provide concealed fasteners for hardware exposed when door is closed, except where no standard units are available with concealed fasteners.
- C. FINISH: Unless otherwise noted, finish for all items to be brushed chrome.
- D. Provide matching finishes for hardware units at each door to the greatest extent possible, unless otherwise indicated.

## **08 70 00 HARDWARE**

### 2.3 BUTTS

- A. Manufacturers:
  - 1. Stanley
  - 2. Hager
  - 3. Ives
  - 4. Bommer
  - 5. McKinney Products
- B. Provide 3 butts each door leaf. Doors over 36" wide or higher than 84" to have 4 butts.
- C. Type: FBB179
- D. Size as recommended by manufacturer for door size and type and by frame type.
- E. Exterior doors to have non-removable pin.

### 2.4 LOCKSETS

- A. Manufacturers:
  - 1. Yale
  - 2. Corbin
- B. Type - Heavy duty cylindrical, Grade 1
- C. Yale: 5400 Series.
- D. All locksets and latchsets to be lever operated to meet ADA section 309.4.

### 2.5 MISCELLANEOUS HARDWARE

- A. THRESHOLD (EXTERIOR) - Pemko 2005 AS or equal by National Guard, Zero or Reese.
- B. DOOR BOTTOM (EXTERIOR) – Pemko 345V,
- C. FLOOR STOP – Grainger FS18L Steel and Rubber exterior stop for grouted installation. Provide for proper height to meet finish conditions.
- D. WEATHERSTRIP - Pemko 316AV, mill finish aluminum.
- E. LATCH PROTECTORS: Rockwood 321 or equal stainless steel with concealed welded stud fasteners.

### PART 3 - EXECUTION

- A. Mount Hardware at heights indicated in respective DHI Standards, except as specifically indicated, or required to comply with governing regulations, and except as may be otherwise directed by the Architect.
- B. Do not install surface-mounted items until finishes have been completed on substrate.
- C. Set units level, plumb and true to line and location. Adjust and reinforce the attachments substrate as necessary for proper installation and operation.
- D. Provide fasteners and anchoring devices of suitable size, quantity and type to secure hardware in proper position for heavy use and long life.
- E. Adjust and check each operating item of hardware and each door, to ensure proper operation or function.

**END OF SECTION 08 70 00**

## **09 90 00 PAINTING AND COATING**

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Painting and coating systems.

#### 1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00, Submittal Procedures.
- B. Product Data: Manufacturer's data sheets on each paint and coating product should include:
  - 1. Product characteristics
  - 2. Surface preparation instructions and recommendations
  - 3. Primer requirements and finish specification
  - 4. Storage and handling requirements and recommendations
  - 5. Application methods
  - 6. Cautions, VOCs
- C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's color samples available.
- D. Verification Samples: For each finish product specified, submit 8" x 10" samples that represent actual product, color and sheen.

#### 1.3 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label and the following list of information:
  - 1. Product name and type (description)
  - 2. Application and use instructions
  - 3. Surface preparation
  - 4. VOC content
  - 5. Environmental issues
  - 6. Batch date
  - 7. Color number/name
- B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.
- C. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

#### 1.4 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits. This specification does not take into consideration wet areas or areas needing high performance coatings.

### PART 2 – PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
  - 1. The Sherwin-Williams Company
  - 2. Benjamin Moore

## **09 90 00 PAINTING AND COATING**

3. I.C.I.
  4. PPG Pittsburgh Paints
  5. Porter Paint
  6. Pratt & Lambert
  - B. Substitutions: Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 Product Requirements.
  - C. When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.
- 2.2 EXTERIOR PAINTING SCHEDULE
- A. METAL (Aluminum, Galvanized)
    1. 1st and 2nd Coats: SW A-100 Exterior Latex
      - a. Satin (4 mils wet, 1.3 mils dry per coat)
    2. 1st and 2nd Coats, Early Moisture Resistant Finish: SW Resilience Latex
      - a. Satin (4 mils wet, 1.44 mils dry per coat)
  - B. METAL (Misc. Iron, Ornamental Iron, Ferrous Metal)
    1. 1st Coat: SW Pro Industrial Pro-Cryl Universal Primer (5-10 mils wet, 2-4 mils dry)
    2. 2nd and 3rd Coats: SW Metalatex Acrylic, Semi-Gloss (4 mils wet, 1.5 mils dry per coat)
- 2.3 MATERIALS – GENERAL REQUIREMENTS
- A. Paints and Coatings – General: Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such a procedure is specifically described in manufacturer's product instructions. VOC numbers need to be confirmed by using the products' MSDS sheets.
  - B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- 2.4 ACCESSORIES
- A. Coating Application Accessories: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

### **PART 3 – EXECUTION**

- 3.1 EXAMINATION
- A. Do not begin application of coatings until substrates have been properly prepared. Notify Architect of unsatisfactory conditions before proceeding.
  - B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
  - C. Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

## **09 90 00 PAINTING AND COATING**

### **3.2 SURFACE PREPARATION**

- A. Proper product selection, surface preparation, and application affect coating performance. Coating integrity and service life will be reduced because of improperly prepared surfaces. Selection and implementation of proper surface preparation ensures coating adhesion to the substrate and prolongs the service life of the coating system.
- B. Selection of the proper method of surface preparation depends on the substrate, the environment, and the expected service life of the coating system. Economics, surface contamination and the effect on the substrate will also influence the selection of surface preparation methods.
- C. The surface must be dry and in sound condition. Remove oil, dust, direct, loose rust, peeling paint, or other contamination to ensure good adhesion.
- D. Remove mildew before painting by washing with a solution of one (1) part liquid household bleach and three (3) parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes; however, do not allow the solution to dry on the surface. Rinse thoroughly with clean water and allow the surface to dry 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.
- E. No painting should take place when the interior temperature is below 50 degrees F unless the specified product is designed for the marginal conditions.
- F. Methods
  - 1. Galvanized Metal: Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils. Apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP7 is necessary to remove these treatments.
  - 2. Steel: Structural, Plate, etc.: Should be cleaned by one or more of the surface preparations described below. These methods are used throughout the world for describing methods for cleaning structural steel. Visual standards are available through the Society of Protective Coatings. A brief description of these standards together with numbers by which they can be specified follow.

### **3.3 INSTALLATION**

- A. Apply all coating and materials with manufacturer specifications in mind. Mix and thin coatings according to manufacturer's recommendation.
- B. Do not apply to wet or damp surfaces.
  - 1. Wait at least 30 days before applying to new concrete or masonry. Or follow manufacturer's procedures to apply appropriate coatings prior to 30 days.
  - 2. Test new concrete for moisture content.
  - 3. Wait until wood is fully dry after rain or morning fog or dew.
- C. Apply coatings using methods recommended by manufacturer.

## **09 90 00 PAINTING AND COATING**

- D. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.
- E. Apply coatings at spreading rate required to achieve the manufacturer's recommended dry film thickness.
- F. Coverage – Number of coats or mil thickness specified presumes full coverage with coating applied in thickness recommended for each coat by manufacturer. If additional coatings are required to provide full coverage, the Contractor shall provide additional coatings until full coverage is obtained at no additional cost.
- G. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

### **3.4 PROTECTION**

- A. Protect finished coatings from damage until completion of project.
- B. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of coatings.

**END OF SECTION 09 90 00**

## **13 34 19 METAL BUILDING SYSTEMS**

### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. Coordinate with work in Section 08 11 13.

#### 1.2 GENERAL

- A. The design of the structural system shall be a clear or multi-span rigid frame with straight columns and roof beams; with a monoslope roof.
- B. All components and parts shall be clearly marked and erection drawings shall be supplied for identification and assembly of the parts.
- C. All drawings shall carry the stamp of a registered professional engineer.
- D. All reactions for the proper design of foundations shall be supplied by metal building manufacturer.
- E. Anchor bolts shall be supplied by the contractor, not the building manufacturer.
- F. Building shall be produced in a manufacturing facility that is certified by the International Accreditation Service (IAS).
- G. All structural mill sections or welded-up plate sections shall be designed in accordance with the 2005 AISC "Specification for Structural Steel Buildings," and all cold-formed steel structural members shall be designed in accordance with the 2004 AISI "North American Standard for Cold Formed Steel Framing."
- H. The structural system will be designed in accordance with the 2012 International Building Code.
- I. Welding: Welding procedure, operation qualifications, and welding quality standards shall be in accordance with the American Welding Society structural welding code.
- J. Underwriters Laboratories - The roof system shall carry a U.L. wind uplift resistance classification of 90 to ensure structural integrity and possible reduction of insurance rates.
- K. Panel design shall be accordance with AISI "Specifications for the Design of Light-Gage, Cold-Formed Steel Structural Members," or CAN/CSA-S136 "Cold Formed Steel Structural Members," - latest editions and in accordance with sound engineering methods and practices.

#### 1.2 DESIGN CRITERIA

- A. System shall be designed for the design loads specified on Sheet S0.0 of the construction documents.
- B. System deflection shall not exceed  $L/240$  for any member.

#### 1.3 SHOP DRAWINGS

- A. Submit for Architect's approval, showing layouts of panels, details of edge conditions, joints, panel profiles, supports, anchorages, trim, flashings, underlayment, closure, snow guards and special details. Distinguish between factory and field assembled work.

#### 1.4 SUBMITTALS

- A. Provide sample panels 12 inches long by actual panel width, in the profile, style, color and texture indicated.

## **13 34 19 METAL BUILDING SYSTEMS**

### 1.5 ERECTOR

- A. Shall be approved by the manufacturer and shall be an experienced installer who has completed metal panel projects similar in material, design and extent to that indicated for this project and with a record of successful in-service performance.

### 1.6 WARRANTY

- A. Submit a written warranty executed by manufacturer agreeing to repair or replace metal panel assembly that fails to remain weathertight within 5 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Manufacturer:
  - 1. Varco Pruden Buildings
  - 2. Butler Mfr Co.
  - 3. Alliance Steel Building Systems
  - 4. Kustom Building Inc
  - 5. Frontier Steel Buildings
  - 6. American Buildings
  - 7. Metallic
  - 8. Star
  - 9. Behlen
  - 10. Whirlwind Building Systems
  - 11. Rigid Global Buildings
  - 12. or approved equal
- B. Provide materials and accessories required for a complete panel assembly and as recommended by panel manufacturer, unless otherwise indicated.

### 2.2 LINER PANEL (REFER TO ALTERNATE #3)

- A. Provide 7 feet high, 26 gage, 36" wide prefinished metal liner panel at interior of building perimeter.
- B. Liner panel to be Varco Pruden Panel Ribwall panel with KXL paint system or equal.

### 2.3 PREFINISHED GALVANIZED STEEL GUTTERS AND DOWNSPOUTS

- A. Gutters: 0.0217 inch thick minimum. 6 x 6 box style.
- B. Downspouts: 0.0217 inch thick, 4" x 5" corrugated.
- C. Gutter Joints: Nesting style without brackets, clips or covers.
- D. Gutter Hangers: Concealed type strape hangers.
- E. Downspout Accessories: Elbows, brackets and bottom turn out.
- F. Gutter Screen: 1/4 inch hardware cloth installed in hinged sheet metal frames. Fabricate screen and frame of same basic material as gutters and downspouts.
- G. Finish to match flashing finish.

### 2.4 PRIMARY FRAMING

- A. Rigid Frames
  - 1. Frames shall consist of welded-up plate section columns and roof beams complete with necessary splice plates for bolted



## **13 34 19 METAL BUILDING SYSTEMS**

field assembly.

- a. All base plates, cap plates, compression splice plates and stiffener plates shall be factory welded into place and have the connection holes shop fabricated.
  - b. Columns and roof beams shall be fabricated complete with holes in webs and flanges for the attachment of secondary structural members and bracing except for field work as noted on manufacturer's erection drawings.
2. All bolts for field assembly of frame members shall be A-325 high strength bolts.
- B. Endwall structurals shall be cold-formed channel members designed in accordance with the 1986 AISI Specification or welded-up plate sections designed in accordance with the 1989 AISC Specification.

### **2.5 SECONDARY FRAMING**

- A. Roof Purlins and Wall Girts: Purlins and girts shall be 8-1/2" "Z" shaped, precision roll formed.
- B. Eave Struts: Shall be factory pre-punched, deep "C" sections.
- C. Bracing: Diagonal bracing shall be hot-rolled rod and attached to columns and roof beams.
- D. Door Support: Provide post and beam support for door track where extends beyond the building wall. Size for wind load with door in open position.
- E. All structural steel shall be prime painted as temporary protection.
- F. Prior to painting all steel shall be cleaned of loose rust, loose mill scale, dirt and other foreign material.

### **2.6 ROOF SYSTEM**

- A. The roof shall be covered with SSR roof panel system as furnished by Varco Pruden Buildings or equal. 24" wide, 3" high,
- B. Panel material as specified shall be 24 gage galvalume coating (refer to Alternate #4). Warrant that coating shall not chalk, fade, blister, peel, crack, chip or experience material rust through for 20 years.
- C. Panel of maximum possible length shall be used to minimize endlap; eave panel shall extend beyond the structural line of the sidewall.
- D. Panel end splice and ridge assembly shall be designed to allow roof panels to move lengthwise with expansion/contraction as the roof panel temperature changes.
- E. Panel closure and interior reinforcing strap shall be installed to seal the panel end at the ridge. The attachment fasteners shall not be exposed on the weather side. A lockseam plug shall be used to seal the lockseam portion of the panel. A hi-tensile steel ridge cover shall span from panel closure to panel closure and flex as the roof system expands and contracts.
- F. Roof system panel shall be designed in accordance with AISI "Specifications for the Design of Light-Gage, Cold-Formed Steel Structural Members" or CAN/CSAS136 "Cold-Formed Steel Structural Members" - latest edition.
- G. Panel system shall be designed to support design live load.
- H. Connection of roof system panel-to-structural member, except at eave, shall be made with clips with movable stainless steel tabs that are

## **13 34 19 METAL BUILDING SYSTEMS**

seamed into the standing seam sidelap.

- I. Panel clip shall be fastened to structural member with fastener using factory prepunched hole in structural member. Fastener shall contain a metal backed rubber washer which serves as a torque indicator.
- J. Fasteners penetrating the metal membrane at the following locations shall not exceed the frequency listed.

<u>Fastening System</u>	<u>Frequency</u>
Basic Panel System	0 per s.f.
Exterior Eave Gutter	2 per l.f.
Gable Trim (no parapet)	2 per l.f.
Ridge	1 per l.f.
High Eave (no parapet)	2 per l.f.
Panel Splices	2 per l.f.
High Side Transition	1 per l.f.

- K. The color coating on all gutter, downspout, gable trim and eave trim to match wall panel specification.
- L. Parts shall be compatible and shall not cause a corrosive condition.
- M. Air infiltration shall not exceed .050 cfm per square foot of roof area when tested in reference to ASTM E 1680, latest edition at a static pressure differential of 12.0 psf.
- N. There shall be no uncontrolled water penetration through the panel seams when tested in reference to ASTM E 1646, latest edition at a static pressure differential of 12.0 psf.

### 2.7 WALL SYSTEM

- A. Exterior wall shall be covered with precision roll-formed Panel Rib wall system panel as furnished by Varco Pruden Buildings or equal.
- B. Panel shall be 3' wide with four major corrugations, 1-1/4" high 12" on center with minor corrugations between each of the major corrugations the entire length of the panel.
- C. Panel shall be one piece from base to building eave.
- D. The upper end of the panel shall be fabricated with a mitered cut to match corrugations of roof panel and square cut for all other roof panels.
- E. The bottom end of the panel shall be straight cut except where grade at building slopes.
- F. The panel material shall be 24 gage galvanized (Refer to Alternate #4), per ASTM specification A653, and painted with exterior colors of KXL finish system. Manufacturer warrants that coating shall no chalk, fade, blister, peel, crack, chip or experience material rust through for 20 years.

### 2.8 SLIDING DOOR SYSTEM (RE: ALTERNATE #5)

- A. Type: Two Bi-parting doors meeting at opening center. Doors to open full distance to allow maximum doorway width.
- B. Construction to be all galvanized steel with 16 gauge 1-7/8" thick lateral frames and verticals at ends with channel to receive panels. Cover to match metal building wall panels.
- C. Box Style overhead rails with drop bolt tandem steel roller bearing adjustable hangers; Metal flashing over top of rails; Guide rail brackets with stay rollers; Track end caps; Door stops; No handles at exterior of doors.

## **13 34 19 METAL BUILDING SYSTEMS**

- D. Adjustable cam action jamb latches at two locations per jamb.
- E. Provide all accessories, trim, hardware required for fully functioning operation.
- F. Provide adequate support for all load bearing components.
- G. Adjust for smooth operation of doors.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL**

- A. Field cutting exterior panels by torch is not permitted.

#### **3.2 ROOF SYSTEM**

- A. Panel sidelap shall be field-seamed by a self-propelled and portable electrical lock seaming machine. Sidelap sealant shall be factory applied.
- B. Panel endlap, when required, shall be at least 6", sealed and fastened together by clamping plates.

#### **3.3 WALL SYSTEM**

- A. Structural system shall be plumb before wall panel is attached
- B. All sidelap shall be at least one full corrugation.
- C. Panel shall be sealed at the base with foam or rubber closure.
- D. All exterior trim shall be of the same finish as the exterior wall system.
- E. Fasteners: Wall system panel-to-structural and panel-to-panel connections shall be made with fastener with self-drilling screw Torx head or Lock-Rivet fastener.
- F. Fastener locations shall be as shown on erection drawings.
- G. All exposed fasteners shall be either prepainted to match wall color or shall be covered with plastic color caps to match wall color.

**END OF SECTION 13 34 19**



## **31 00 00 EARTHWORK**

### **PART 1 - GENERAL**

#### **1.1 SCOPE OF CUT OR FILL**

- A. It has not been established whether fill from off site is required or not, Contractor shall bring in off site fill if required, or shall remove excess fill from site if required.

#### **1.2 SCOPE**

- A. Contractor shall include in his proposal all work necessary to achieve the site grading and excavation necessary, at no additional cost to the Owner, regardless of sub-grade conditions encountered.

#### **1.3 TESTS FOR COMPACTION**

- A. Testing laboratory shall be approved by the Architect.
- B. All tests to be at Contractor's expense.
- C. At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade.
- D. Test for optimum moisture twice for each type of fill to determine maximum density.
- E. Test compaction of each 200 cubic yards of fill for each condition of use, but no less than one test for each 2' depth of fill.
- F. At each compacted initial and final trench backfill layer, at least one test for each 150 feet or less of trench length, but no fewer than two tests
- G. Test results are to be submitted to Architect.
- H. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

### **PART 2 - PRODUCTS**

#### **2.1 FILL**

- A. Test material for suitability.
- B. Approval must be obtained, in writing, from the testing laboratory, for all fill material.
- C. Foreign matter, such as topsoil, organic matter, or deleterious substances will not be permitted in fill material.
- D. Rocks larger than 6" are not permitted in fill material nor more than 10% rocks or lumps (larger than 2" diameter).
- E. Not more than 10% rocks or lumps (larger than 2" diameter) will be permitted in fill material.

#### **2.2 GRANULAR FILL**

- A. Type: Riversand, pit run.
- B. Allow sufficient time for moisture to drain.
- C. Provide 4" thickness under all interior slabs on grade.
- D. Provide 2" thickness under all exterior concrete slabs.

## **31 00 00 EARTHWORK**

### PART 3 - EXECUTION

#### 3.1 PROTECTION

- A. Take all precautions necessary to protect utilities, pavements, and other facilities designated to remain.
- B. Provide proper drainage of construction area at all times. Do not allow water to accumulate in excavations.
- C. Subgrades and excavations shall be kept free of standing water at all times.
- D. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- E. Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.

#### 3.2 EXCAVATION

- A. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities and other item indicated to be removed; together with soil, boulders, and other materials not classified as rock.
- B. Remove and dispose of material necessary to obtain required subgrade elevations.
- C. Excavate for footings 12" minimum into native soil, do not place on fill.
- D. Trim bottom of excavation to required lines and grade to provide solid base to receive concrete.
- E. Allow for ample working room around items to be installed.
- F. Stockpile approved material for back fill and fill; remove all other.
- G. Observe and evaluate bearing capacity of all excavations before placing any reinforcing steel or concrete.
- H. If unsatisfactory soil material is observed at design elevation, notify Architect and proceed only at his direction.
- I. Proof roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.
- J. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities.

#### 3.3 OVEREXCAVATION

- A. Fill with lean concrete or correct by extending bottom of footing to lower elevations, as acceptable to Architect.
- B. No additional cost shall be incurred to Owner.

#### 3.4 COMPACTION REQUIREMENTS

- A. Compact under floor slabs to 95% of maximum density of optimum moisture.
- B. Compact adjacent to building within 5'-0", the same as for under floor slabs.
- C. Compact under exterior paving to 92% of maximum density at optimum moisture.

## **31 00 00 EARTHWORK**

### 3.5 CLEAN UP

- A. Excess soil and debris must be removed from site.

**END OF SECTION 31 00 00**





## **31 31 16 TERMITE CONTROL**

### **PART 1 - GENERAL**

#### **1.1 QUALIFICATIONS**

- A. Applicator shall have had not less than three (3) years experience in the Termite Control business in central Kansas.

#### **1.2 GUARANTEE**

- A. Provide a written guarantee to Owner for five (5) years after date of Substantial Completion.
- B. Surety Company and the form of guarantee will be subject to Architect's approval.
- C. Guarantee shall state that the effectiveness of the soil treatment against termite infestation will continue for not less than the guarantee period, and that the applicator will retreat work and repair or replace damage caused by termite infestation, without additional cost to the Owner, upon evidence of infestation within the guarantee period.
- D. Provide a proposal for continuing service, including monitoring, inspection, and retreatment for occurrences or termite activity, from applicator to Owner, in the form of a standard yearly (or other period) continuing service agreement, starting on the date of Substantial Completion. State services, obligations, conditions and terms for agreement period and for future renewal options.
- E. Standards
  - 1. Products and applications shall be in accordance with latest FHA and EPA requirements.
  - 2. Chemicals used shall not be harmful to humans or to plant life.

### **PART 2 - PRODUCTS**

#### **2.1 TERMITICIDE**

- A. Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation.

#### **2.2 MANUFACTURER**

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. American Cyanamid Co.
  - 2. Bayer Corp.
  - 3. DowElanco
  - 4. FMC Corp.
  - 5. Zeneca Professional Products.

## **31 31 16 TERMITE CONTROL**

### **PART 3 - EXECUTION**

#### **3.1 EXTENT OF TREATMENT**

- A. Floor Slabs: treatment earth or fill under slabs.
- B. Exterior Paving: treat earth or fill under paving within 5' of the building.
- C. Walls: treat along both sides, interior, and exterior of exterior foundation.

#### **3.2 CONDITIONS**

- A. Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate.
- B. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.
- C. Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated.
- D. Treat below slabs immediately prior to placement of slab.
- E. Prevent disturbance to soil after treatment.
- F. Soil shall not be wet or frozen during treatment.
- G. Protect soil from rain after treatment.

#### **3.3 APPLICATION**

- A. Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and treat for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.
- B. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping or other construction activities following application.

**END OF SECTION 31 31 16**

## **32 13 13 CONCRETE PAVING**

### **PART 1 - GENERAL**

#### **1.1 STANDARDS**

- A. Comply with ACI 301, "Specification for Structural Concrete," unless modified by the requirements of the Contract Documents.

#### **1.2 SUBMITTALS**

- A. Design mixes for each concrete pavement mix.
- B. Material test report from a qualified testing agency indicating and interpreting test results for compliance of the requirements indicated.
- C. Product data for each joint-sealant product indicated.

#### **1.3 TESTING**

- A. Testing shall be performed according to the following requirements:
  - 1. Slump: ASTM C 143; one test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete.
  - 2. Air Content: ASTM C 231, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of air-entrained concrete.
  - 3. Compression Test Specimens: ASTM C 31/C31M; one set of four standard cylinders for each compressive-strength test, unless otherwise indicated.
  - 4. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. yd., but less than 25 cu. yd., plus one set of each additional 50 cu. yd. One specimen shall be tested at 7 days and two specimens at 28 days; one specimen shall be retained in reserve for later testing if required.
  - 5. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 24 hours of testing.
  - 6. Testing agency shall make additional test of the concrete when test results indicate slump, air entrainment, concrete strengths or other requirements have not been met, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

### **PART 2 - PRODUCTS**

#### **2.1 FORMS**

- A. Form materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
- B. Use flexible or curved forms for curves of a radius 100 feet or less.
- C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

#### **2.2 STEEL REINFORCEMENT**

- A. Plain-Steel Welded Wire Fabric ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

## **32 13 13 CONCRETE PAVING**

- B. Reinforcement Bars ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- C. Plain steel joint dowel bars, ASTM A 615/A 615M, Grade 60 (Grade 420). Cut bars true to length with ends square and free of burrs.
- D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcement bars, welded wire fabric, and dowels in place.

### **2.3 CONCRETE MATERIALS**

- A. Use the same brand and type of cementitious material from the same manufacturer throughout the project.
- B. Portland Cement: ASTM C 150, Type I or II.
- C. Aggregate: ASTM C 33, uniformly graded, from a single source.
- D. Water: ASTM C 94, fresh, clean potable.
- E. Air-Entraining Admixture: ASTM C 260.

### **2.4 JOINT SEALANTS**

- A. Provide joint sealants, backing materials and other related materials that are compatible with one another and with joint substrates under conditions of service and application.
- B. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS. Roadsaver Silicone-SL; Crafcoc, Inc., 888; Dow Corning or equal.

### **2.5 ACCESSORIES**

- A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

### **2.6 CONCRETE MIXES**

- A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301 for each type and strength of normal weight concrete determined by either laboratory trial mixes or field experience.
  - 1. Compressive Strength (28 days): 4000 psi
- B. Slump Limit: 4 inches.
- C. Limit percentage, by weight, of cementitious materials other than Portland Cement according to ACI 301 requirements for concrete exposed to deicing chemicals.
- D. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94 and ASTM C 1116.

## **PART 3 - EXECUTION**

### **3.1 GENERAL REQUIREMENTS**

- A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. Proceed with pavement only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.
- B. Set, brace, and secure edge forms, bulkheads and intermediate screed guides for pavement to required lines, grades and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

## **32 13 13 CONCRETE PAVING**

- C. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.

### **3.2 STEEL REINFORCEMENT**

- A. Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement and with recommendations in CRSI's "Placing Reinforcing Bars" for placing and supporting reinforcement.
- B. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- C. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- D. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities or replace units as required before placement. Set mats for a minimum 2 inch overlap to adjacent mats.

### **3.3 JOINTS**

- A. Locate expansion joints 30' on center maximum.
- B. Construct construction, isolation and contraction joints and tool edgings true to line with face perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
- C. When jointing existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- D. Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at isolation joints.
- E. Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
- F. Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.
- G. Form weakened-plane contraction joints, section concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness.
- H. Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.
- I. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shape and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- J. Place sealants so they directly contact and fully wet joint substrates.
- K. Completely fill recesses provided for each joint configuration.
- L. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- M. Remove excess sealants from surfaces adjacent to joint.
- N. Use tooling agents that are approved in writing by joint sealant manufacturer and that do not discolor sealants or adjacent surfaces.

## **32 13 13 CONCRETE PAVING**

- O. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

### **3.4 CONCRETE PLACEMENT**

- A. Before placing concrete, inspect and complete formwork installation, reinforcement steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.
- D. Comply with requirements and with recommendations in ACI 304R for measuring, mixing, transporting and placing concrete.
- E. Do not add water to concrete during delivery, at project site or during placement.
- F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- G. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete according to recommendations in ACI 309R.
- H. Screed pavement surfaces with a straightedge and strike off. Commence initial floating using bull floats or darbies to form an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading dry-shake surface treatments.
- I. Tool edges of pavement, gutter, curbs and joints in concrete after initial floating with an 3/8" radius edging tool. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.
- J. Do not operate equipment on concrete until pavement has attained 85 percent of its 28 day compressive strength.
- K. Exclude traffic from pavement for at least 14 days after placement.
- L. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.
- M. Maintain concrete pavement free of stains, discoloration, dirt and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.
- N. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions or low temperatures.
  - 1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50

## **32 13 13 CONCRETE PAVING**

- deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

### **3.5 CONCRETE FINISHING**

- A. Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.
- B. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with stiff-bristled broom, perpendicular to line of traffic.

### **3.6 CONCRETE PROTECTION AND CURING**

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and follow recommendations in ACI 350 R for hot-weather protection during curing.

### **3.7 PAVEMENT TOLERANCES**

- A. Elevation: 1/4 inch.
- B. Thickness: Plus 3/8 inch, minus 1/4 inch.
- C. Surface: Gap below 10 foot long, unlevelled straightedge not to exceed 1/4 inch.

**END OF SECTION 321313**

