

Section 03326

Green Umbrella WHITE CONCRETE FLOOR SYSTEM

SECTION 03326

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes all polished white concrete floor surfaces indicated on the finish schedule.
- B. Work includes providing a floor system within the scope of this specification.

1.02 RELATED DOCUMENTS

- A. Drawing and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.
- B. Cast-in Place Concrete, Section 03300

NOTE: Work specified in Article 3.02 of this section, shall not begin until after the walls and the roof are in place, and readying the structure for installation of this specialty floor system is completed. All ACI Specifications referenced will be followed.

1.03 REFERENCES

- A. Comply with the following codes standards, and guides:
 - ACI 211.1** “Standard Practice for Selecting Proportions for Normal, Heavyweight, Mass Concrete”
 - ACI 212** “Guide for Use of Admixtures in Concrete”.
 - ACI 301** “Specifications for Structural Concrete for Buildings”
 - ACI 302** “Guide for Concrete Floor and Slab Construction.
 - ACI 304** “Guide for Measuring, Mixing, Transporting, and Placing Concrete.”
 - ACI 306** “Hot Weather Concreting.” The use of a monomolecular film and evaporation retardant manufactured by the surface hardener manufacturer shall be used in accordance with ACI 302-80 to ensure compatibility.
 - ACI 306** “Cold Weather Concreting.”

- ACI 308** “Standard Practice For Curing Concrete.”
- ACIA185** “Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.”
- ASTM 497** “Standard Specification for Deformed Steel Welded Wire Fabric.”
- ASTM C33** “Specification for Concrete Aggregate.”
- ASTM C39** “Test Method for Compressive Strength of Cylindrical Concrete Specimens.”
- ASTM C94** “Specification for Ready-Mixed Concrete.”
- ASTM C150** “Specification for Portland Cement.”
- ASTM C309** “Specification for Liquid Membrane-Forming Compounds for Curing Concrete.”
- ASTM C494** “Specification for Chemical Admixtures for Concrete.”
- ASTM C779** “Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.”
- ASTM C1028** “Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.”

1.04 OWNER’S REVIEW AND SAMPLE

- A. It is highly recommended that the owner review existing floors to determine standard level of acceptance and appearance.
- B. If the floor system is being installed for the first time for the Owner a review of the first day’s application is recommended. The review may be by the Owner or Owner’s representative. See Article 1.06 for Quality Assurance.

1.05 SUBMITTAL

- A. Refer to Section 01300 “Submittals” for general information.
- B. Shop Drawings: Submit one (1) copy of drawings showing construction and control joint layout for all slabs-on-grade.
- C. Mix Designs: A proprietary blend of cement, pozzolans, aggregates and admixtures that conform to ACI guidelines will be used.
- D. Reports: Submit promptly one (1) copy of all test and inspection reports by Quality Assurance provision to the General Contractor, Engineer, and system applicator. Immediately report to the Engineer any deviations from the Specifications or Drawings encountered by testing or inspection personnel.

6. **QUALITY ASSURANCE**

- A. On a first time basis, owner may request a trial slab and a first day pour review of actual application procedures. This trial slab may be used to determine concrete characteristics for product application and finishing. This trial slab shall be incorporated as part of the finished floor. Notify the approved contractor during pre-job meeting if trial slab is requested. All controls and procedures will be maintained in strict accordance with the recommendations of ACI 302.
- B. Refer to Section 01400, Quality Control for payment for testing, and ACI Manual of Concrete Inspection.
- C. The following testing and inspection requirements shall be done by an independent laboratory approved by the Engineer. The General Contractor will assist in testing and inspection as necessary and in any corrective work required.
1. Inspect excavations and prepared sub-grade for suitability for placing of concrete. No standing water, organic material, debris, and other deleterious materials should be present.
 2. Compliance to ACI 302 4.1-Site Preparation and Placing Environment and 4.1.1 Proof-rolling will be followed with strict adherence and test inspection.
 3. Conduct concrete compressive strength test in accordance with ASTM C39 and as follows:
 - (a) Cast concrete cylinders in steel or plastic molds. Cardboard molds are not acceptable.
 - (b) Cast one set of 4 test cylinders for the first 150 cubic yards of each mix placed each day. If less than 150 cubic yards are placed, cast one set of four test cylinders for that amount.
 - (c) Cast one set of 4 test cylinders for each 100 cubic yards of each mix place each day.
 - (d) Test one cylinder at 7 days and 2 cylinders at 28 days. (Hold the last for testing at a later date as required.)
 - (e) Test the first and 5th concrete truck of each pour for slump, air content, and temperature.
 - (f) If reasonable consistency of slump and air test is recorded, the testing company may reduce requirements to test every 100 cubic yards.
 - (g) Deviation from Specifications shall be grounds for rejection.
 4. Examine location and construction of all joints in concrete for conformance with Drawings.

5. Perform all work in accordance with ACI requirements for hot or cold weather concrete practices as applicable.
 6. Inspect for adequate consolidation of concrete.
 7. Verify specific methods of curing and protection of concrete are being followed.
 8. Verify location depth of reinforcing steel in slabs on grade.
- D.** Submit daily reports to the Engineer during concrete operations indicating location of pour; quantity of concrete placed; concrete slump, temperature, and air content; site conditions including ambient temperature, wind speed and curing method.

1.07 FIELD SERVICE

- A.** Pre-installation Conference: General Contractor shall provide 3 weeks notice to the Green Umbrella White Concrete Floor contractor to arrange a “pre-job” conference related to all aspects of the complete installation of the Green Umbrella White Concrete floor system. At the “pre-job” conference, pour schedules, specification review and all application procedures will be reviewed in detail. Notification to be submitted by calling Meidling Concrete at 509/924-7180 or the approved contractor.

1.08 WARRANTY

- A.** The approved contractor shall warranty the floor system for one (1) year. The manufacturer shall warrant the floor to be abrasion resistant and for a period of 10 years.

PART 2 PRODUCTS

2.01 MATERIALS

- A.** ASTM C 150, blended white cement.
- B.** Fine Aggregate: White architectural sand, AASHTO T27 & T11 guidelines, as approved by Green Umbrella.
- C.** Coarse Aggregate: ASTM C 33 guidelines, white architectural rock as approved by Green Umbrella.
- D.** Water: Potable.
- E.** Admixture: Proprietary blend by Green Umbrella.
- F.** Welded Wire Fabric: ASTM A 185 or ASTM A 497, flat sheets for floor slabs on grade. ASTM A 497 deformed welded wire fabric shall have a minimum spacing of 16” centers in each direction.

- G. Joint Sealant: A two part poly-urea sealant. Colors are available to meet architectural design specifications.
- H. Monomolecular film shall be used under drying conditions, due to high concrete and / or ambient temperatures, low humidity, high winds, etc. This also includes work in heated interiors during cold weather conditions, to aid in the maintaining of concrete moisture, during the early placement stages of plastic concrete.
- I. Curing material shall be a dissipating curing compound, applied at 350 square feet per gallon.
- J. Accessories: Cutting agent from Green Umbrella
- K. Hardener & densifying liquid to be Dry Shield and Shield & Enhance from Green Umbrella.
- L. Protective stain resistant treatment to be Microfilm from Green Umbrella.

2.02 PROPORTIONING AND MIX DESIGN

- A. Design all concrete mixes from the following Table of requirements:

ASTM standards.	
Water-cement ratio. (W/C)	.50 or less
Air content.	1%-Maximum 3%
Compressive strengths.	4,000 PSI (28-days)

 1. Concrete must be completely protected from weather (sun, rain, wind, freezing temperatures).
 2. Concrete must be “Non Air Entrained”.
 3. Maximum 4” slump allowed without plasticizer in the mix.
 4. Superplasticizer allowed at 8 inch maximum slump.
- B. Minimum Cement Content:

f’c = 4,000 psi: 5-1/2 sacks #517 lb.
- C. Ready-mixed concrete: Conform to requirements of ASTM C-94 except where requirements in Table above (2.02.A) are more restrictive.

PART 3 EXECUTION

3.01 APPROVED APPLICATORS

- A. Meidling Concrete, Inc. / 12411 E. Empire Ave./ Spokane, Washington 99216 / 509/924-7180 or an approved applicator shall in provide a formal, “Performance Proposal,” for field installation of the Green Umbrella White Concrete Floor System. This proposal will include a 2-stage process to install the White Concrete Floor System. The 2 stages are:
 1. Installation of concrete, dowels, mesh, finishing, curing, and saw-cut

control joints,.

2. After a minimum 30 day cure, the approved Green Umbrella contractor, will return to install the joint filler and grind & polish the floor. At this time the owner's floor maintenance team should be on hand for maintenance training for the care of the Green Umbrella White Concrete Floor System.

3.02 CONCRETE PLACEMENT

- A. Section 03300, Cast-In-Place Concrete, specifies basic concrete materials and placement requirements.

3.03 APPLICATION OF WHITE CONCRETE FLOOR SYSTEM

- A. Only contractors pre-approved by the architect will be allowed to complete this work. Contact: Meidling Concrete (Curt Meidling) for quotes at 509/924-7180.

3.03 CURING AND PROTECTION

- A. Floor protection will be covered during the pre-job meeting.(Under FIELD SERVICE 1.07). Floor should be protected from damage from oil, machinery leaks, torch cutting, chipping and gouging.
- B. Maintain floors free of traffic and loads for 3 to 5 days after completion. Provide adequate provisions for maintaining the concrete temperature at 50 degrees F (10 Degrees C) or above during the curing period.

END OF SECTION