

SECTION 033300 INTERIOR CONCRETE SLAB-ON-GROUND

PART 1 GENERAL

1.01 SUMMARY

- A. Design and construct a chemically prestressed, shrinkage-compensating, jointless, steel-fiber reinforced concrete slab-on-ground marketed as PrīmX to minimize cracking due to edge restraints, re-entrant corners, discontinuities in the continuous concrete matrix (i.e. columns or large utility cutouts), and surface loading (i.e. rack loading).
- B. The slab-on-ground shall be constructed on top of a base with a measured modulus of subgrade reaction specified by PrīmX Structural Design.
- C. The slab on ground shall encompass all interior areas as shown in the project documents.
- D. Related Sections <<if needed>>
 - 1. Section xxxx
 - 2. Section xxxx

1.02 REFERENCES

- A. Definitions
 - 1. **Construction Joints (CJ)** will delineate a specified area of the concrete slab-on-grade. Areas of PrīmX separated by a construction joint shall be made continuous with the insertion of diamond dowels as shown by detail drawings. PrīmX is also compatible with metal joint treatments, such as armor or cosinus joints.
 - 2. **PE Elastic Strips** refer to the compressible bond breaker required between shrinkage compensating concrete and other elements, including but not limited to, walls, adjacent exterior concrete slabs, intrusions in the concrete plane such as from columns and large utilities, and construction joints.
- B. Reference Standards
 - 1. ASCE 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures
 - 2. ACI 301-16 *Specifications for Structural Concrete* Section 1—General Requirements, Section 3—Reinforcement and Reinforcement Supports, Section 4—Concrete Mixtures, Section 5—Handling, Placing, and Construction, Section 10—Shrinkage-Compensating Concrete for Interior Slabs, and Section 11—Industrial Floor Slabs.
 - 3. ACI 117-10(15) *Specification for Tolerances for Concrete Construction and Materials and Commentary* Section 1—General Requirements, Section 2—Materials, Section 4—Cast-in-place concrete for buildings, and Section 5—Cast-in-place concrete at interface with precast concrete (except tilt-up concrete)
 - a. <<<Specify FF/FL values if expectations are different than conventional expectations 20/15>>
 - b. ASTM E1155-14 *Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers*

1.03 ADMINISTRATION REQUIREMENTS

- A. Prior to commencing significant segments of preparation and concrete placement, give the owner and independent inspection and testing agencies appropriate notification in order to complete testing and review work.
- B. Coordination
- C. Preinstallation Meeting
- D. Scheduling/Sequencing

1.04 SUBMITTALS

- A. Design loads anticipated by the owner/developer (i.e. rack loading, equipment, forklifts, machinery, cranes, other)
- B. Configuration of racking and base plate size
- C. Forklift model and lifting capacity
- D. Maximum wheel loads and contact pressures for all wheel loads
- E. Record of measurement of modulus of subgrade reaction every 20,000 square feet before floor is placed. Measurement to be completed according to DIN 18134 *Determining the deformation and strength characteristics of soil by the plate loading test* per PrīmX Standard Operating Procedures (SOP).
- F. Signed and sealed design documents including calculations, detail amendments, and general details for the PrīmX slab on grade
- G. Pouring sequence if slab on grade will be poured over multiple days that shows how joints are located
- H. Anticipated placement rates
- I. Concrete mixture design
- J. Quality plan per PrimX agreement and standard operating procedure requirements

1.05 QUALITY ASSURANCE

- A. If PrīmX shrinkage compensating concrete system is used, the installer must be an approved PrīmX licensee and/or strategic partner.
- B. Testing to conform to requirements outlined in table below:

	Trial Batch	@ Batch Plant (first Truck)	Jobsite by Third Party
Timing	~2 weeks prior to first pour	Day of Pour (Each)	
Testing Requirements	Test slump, weight, air % and temp @ three points: <ul style="list-style-type: none"> • Once mix is batched • After first dose of PrīmXFlow • After final dose of PrīmXFlow 	Test slump, weight, air % and temp at least every 150 yd ³ during pour Test cylinders @ 3, 7, and 28 days	-FIRST TRUCK UPON ARRIVAL: temperature/slump -FIRST TRUCK AFTER ADDITION OF ADMIXTURES: temperature/slump/unit weight/air content/cylinders from first truck SECOND/THIRD TRUCK AFTER ADDITION OF ADMIXTURES: temperature/slump/unit weight/air content ONGOING, AT LEAST ONCE EVERY 100 YD³: temperature/slump/unit weight/air content/cylinders
Responsible Party	PrīmX Licensee + Batch Plant QC	PrīmX Licensee + Batch Plant QC	PrīmX Licensee + Third Party Testing Contact

- C. Hold 4" x 8" cylinder from any truck in case one is needed for later investigation. To be saved by QA testing laboratory for 180 days following placement.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Subgrade shall be amended with clear stone or approved equal to depths shown on plans, required by the geotechnical evaluation, or as otherwise specified, per ACI 302.1R-15.
- B. Concrete Mixture—design in collaboration with PrimX
 - 1. Minimum concrete strength = 4,000 psi unless otherwise noted
 - 2. Portland cement conforming to ASTM C150 Type I/II, Slag cement conforming to ASTM C989/C989M, natural pozzolans and/or Coal fly ash conforming to ASTM C618. Composition of cementitious materials to be approved by PrimX.
 - 3. Aggregates
 - a. For truck discharged PrimX, maximum nominal aggregate size of 1" - 1 ½"
 - b. In accordance with ASTM C33
 - c. Aggregates conforming to ASTM C33, to be approved by PrimX
 - d. ASR restrictions per project details
 - 4. Steel Fibers
 - a. Steel fibers conforming to ASTM A820 Type 1
 - b. Dosage rate specified by PrimX
 - 5. Water must be potable. Do not use recycled water.
 - 6. Admixtures to be approved by PrimX
- C. Diamond Dowels—size and spacing specified in detail drawings
- D. Slip Sheet - PrimX does not require a slip sheet. If deemed a requirement for other reasons, it is to be placed beneath subgrade. Overlap seams a minimum of 6 inches.
- E. Vapor Barrier – Cases where and how vapor barrier must be installed, per ACI 302.1R, Figure 5.2.3.2.

PART 3 EXECUTION

3.01 PREPARATION

- A. Slab placement may only commence once obtained plate load tests validates that the modulus of subgrade reaction has met requirements per design. Test must be completed once subbase is prepared for pour and retested with any change in subgrade. Applicable changes include, but are not limited to, moisture, frost, and disturbed excavation.
- B. Subbase shall be free of frost before concrete placing begins and able to support construction traffic such as loaded truck mixers. At time when subbase had been frozen, compaction and testing process must be repeated.
- C. Properly vent work area if supplemental heat is required to maintain above freezing ambient temperatures during and following placing. Avoid pointing blowers directly at exposed slab surface.

3.02 CONCRETE PLACEMENT

- A. Prior to concrete placement, uniformity and stability of the subbase must be verified by Proof-rolling. Any depression in the surface deeper than 1/2 in. (13 mm) should be repaired.
- B. Steel fibers shall be integrated into concrete only with PrīmX approved blowers.
- C. PrimX DC shall be added to concrete with PrīmX approved devices.
- D. Concrete is to be placed by direct truck discharge to subgrade where possible.
- E. Screeding and leveling shall be completed with a laser screed.

3.03 CURING

- A. Wet cure PrīmX slab-on-grade with approved blankets for a minimum of 14 days.
- B. Begin wet cure immediately following finishing activities.
- C. Monitor and rehydrate each day for the first three days.
- D. Following the wet cure period, scrub slab and apply hardener per project specification.

3.04 PROTECTION

- A. Loading at early age of a slab must be validated with PrīmX Engineering Team.

3.05 REPAIR

- A. Cracks in the slab-on-grade that impair the operation of the facility (1 mm unless otherwise specified) shall be repaired per PrīmX Crack Treatment Procedure.

3.06 QUALITY CONTROL

- A. Approved installers will adhere to the requirements of the PrimX Quality and standard operating procedures.

End of Section 033300