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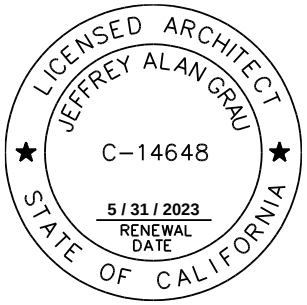
February 10, 2023



Rainforth Grau Architects Project No. 22-1515
DSA File and Application No. 39-73 / 02-120733

ADDENDUM NO. 3

Villalovoz Elementary School, Inc. #2
Tracy, California

Rainforth Grau Architects

1. ALL WORKMANSHIP, MATERIALS, APPLIANCES AND EQUIPMENT which may be included in the following items shall be the same relative quantity as described for similar work set forth in the original or main specifications of which these Addendum items shall be considered a part.

2. ADDENDUM SECTIONS: (included with this Addendum)
The following modify or supplement the issued bid documents.

Section 03 3000	ADD 03 3000, CAST-IN-PLACE CONCRETE
Section 09 5100	ADD 09 5100, ACOUSTICAL CEILINGS
Section 09 6723	ADD 09 6723, RESINOUS FLOORING
Section 32 1600	ADD 32 1600, SITE CONCRETE

3. ADDENDUM DRAWINGS: (included with this Addendum)
The following modify or supplement the issued bid documents.

AD3.01	REVISE SHEET A0.3-2
AD3.02	REVISE SHEET A2.1.3-2

4. PROJECT MANUAL:

A. Table of Contents

1. Division 09, Finishes
   a. ADD “03 3000 Cast-In-Place Concrete”
2. Division 09, Finishes

a. ADD “09 5100 Acoustical Ceilings”
b. ADD “09 6723 Resinous Flooring”

2. Division 32, Exterior Improvements
a. ADD “32 1600 Site Concrete”

5. DRAWINGS:

A. Sheet A0.3-2, TYPICAL DETAILS

1. REVISE detail 10 per sheet AD3.01 included with this addendum.

B. Sheet A2.1.3-2, TOILET ROOM DEMOLITON AND IMPROVEMENT PLANS – BUILDING A

1. REVISE the plumbing fixture specification & connection schedule per sheet AD3.02 included with this addendum.

6. RESPONSES TO BID RFIs:

A. RFI #1: On sheet A5.1.1-2 on the elevations W9 is indicated at the lower 4’8” of the walls. On the finish legend at the lower right side of the sheet there isn’t a finish shown for W9. Please provide the finish for W9.

1. finish W9 is Fiber Reinforced Laminate Panels.

B. RFI #2: Plastic laminate is identified in the spec but product & finish is not specified. Can you please provide that information?

1. Refer to spec section 12 3216; 2.3, A.2 and 12 3623; 2.3, C. Finish is CA

C. RFI #3: Plans calls to replace the damaged acoustical ceiling tiles. If possible, pleaser provide a percentage to be replaced?

1. 10% of existing ceiling tiles are to be replaced.

D. RFI #4: Paint is called out on the existing acoustical ceiling tiles and grid. Please confirm that these items are to be painted instead of matched to the existing, additionally, please provide any existing product information if available.

1. existing acoustical ceiling tiles and grid are to be painted. Remove the existing ceiling tiles, paint and store/protect to reinstall after the ceiling grid has been painted. Contractor shall remove all existing ceiling mounted fixtures and equipment, and to reinstall after painted ceiling tiles have been installed. Contractor to replace and ceiling tiles that are damaged during the painting process. Contractor to protect the existing carpet during the painting process.

E. RFI #5: Paint appears to be identified on the existing tackable wall coverings per the finish schedule at W2 locations; these items typically do not take well to paint per current trade subcontractors. Please confirm this is to be the case.

1. existing tackable wall coverings are to be painted per the following:

INT 9.4A-3
Acrylic on Vinyl Wallcovering, textured finish - Gloss Level 3

1 coat	SHZ-02 Zinsser Shieldz	Acrylic Wallcovering Primer
2 coats	1010 Premium Professional	Latex Eggshell

F. RFI #6: Addendum #1 calls for the power and data outlets for the projectors to be located behind the projector mounting plate. Please confirm this is compatible with the surface-mount wiremold called out in the plans for new raceways or provide an installation detail.

1. the projectors will be mounted at the learning walls per details 12 through14 on sheet A8.5.1-2.

G. RFI #7: Please confirm the district is removing and storing the projectors, arms and mounts for the contractor to reinstall.

1. Contractor is to remove, store and reinstall the existing projectors, arms and mounts.

H. RFI #8: Please confirm contents and furniture will be fully removed for this work.

1. School staff will remove all teaching materials from the walls. Movable furniture is to be moved by the contractor within the classroom and protected during construction. Contractor to take extra care and measures to protect the existing carpet during construction.

I. RFI #9: Plan call for a “fire resistant barrier” under the metal roofing. Specs mention a dens deck layer. Are these the same, or is there a separate fire resistant barrier?

1. The metal roofing will be installed over underlayment (see spec section 07 4100, 2.3, A) over Barrier board (see spec section 07 4100, 2.3, C) over existing structural plywood.

J. RFI #10: Plans call to replace damaged ceiling tile. Plans also call for painting the existing ceiling tiles and grid. We assume we will replace damage tile and then paint them. If so, please define what constitutes a “damaged” ceiling tile.

1. Damaged tiles are to be determined during construction.

K. RFI #11: there are no specifications for the acoustic ceiling tile replacement panels. Please specify a product.

1. See spec section 09 5100 Acoustical Ceilings included with this addendum.

L. RFI #12: Plans call for the installation of “epoxy mosaic composition flooring” at the new restroom concrete. Please specify the desired product and process.

1. See spec section 09 6723 Resinous Flooring included with this addendum.

M. RFI #13: There are no specifications for concrete. Please provide specifications.

1. See spec section 03 3000 Cast-In-Place Concrete and spec section 32 1600 Site Concrete included with this addendum.

N. RFI #14: Addendum 1 calls for providing Schlage padlocks at gates, access doors, roof access hatches, etc. Quantity cannot be determined from the plans. Please specify quantity of padlocks required.

1. Provide 25 padlocks.

O. RFI #15: Page A2.1.3-2 includes a plumbing fixture schedule. At the right of this schedule is a table of dimensions which are not defined. Please define the meaning of these dimensions.

1. REVISE the plumbing fixture schedule per sheet AD2.02 included with this addendum.

P. RFI #16: Detail 9/A0.3-2 calls for a new aluminum threshold at existing bathroom doors. Please specify threshold. It appears 2 new door bottoms will also be required. Please specify new door bottoms.

1. Provide the following:
   - Threshold Zero 65A
   - Door Bottom Zero 39A

Q. RFI #17: Spec 28 3100 Intrusion Alarm System outlines the use of the Vista 128BPT for the intrusion system for this project. The district standard has been Bosch on previous TUSD projects to date. Is Vista the new spec for this project?

1. Yes, Vista 128BPT is the new spec for this project.

R. RFI #18: Spec 27 5123 for Sound and Communications outlines the use of Advanced Network Devices for the Public Address system. The prior standard has been VALCOM for the PA. is the spec accurate with the use of Advanced Network Devices Inc. for this project.

1. Yes, Advanced Network Devices Inc. is the spec for this project

S. RFI #19: Bid docs and specs note a 5/29/23 project start date with a completion date of 7/31/23. Currently, the specified Fire Alarm manufacturer for this project (Gamewell FCI) is experiencing industry wide long lead times on some fire alarm components. Some components, specifically the voice components, if ordered today, have an ETA of July 2023. Please advise.

1. Project Delays / Schedule Impacts

   The Owner recognizes and understands the potential for schedule disruptions and potential delays due to supply chain issues and the long-lead nature of certain items necessary for the completion of the project. It is the intention of the Owner to be reasonable with such impacts and provide time extensions under various circumstances. However, it is required that the Contractor make all possible efforts to avoid such delays and, if delayed, to make all possible efforts to return the project to schedule.

As part of this effort, the Contractor shall make all efforts necessary to identify, process, order and obtain long-lead items as quickly as possible including:

Identification of problematic items: The Contractor shall identify items that may be delayed within 5 days of bid award and provide a list of all items to the Owner for review and discussion. Such items shall be clearly identified and reasons for delays shall be documented and included with the submittal.

Equals/Substitutions: For long-lead items, the Contractor shall research and where possible identify equal products or systems that may be substituted and can be obtained within project schedule requirements. Such items shall be “equal” in quality and value and Owner decide if such substitutions are acceptable.

Processing: Long-lead items shall be submitted for A/E review and approval as quickly as possible but no longer than 15 days from award of contract. A/E will expedite review and return expeditiously.

Ordering: Contractor and subcontractors shall place orders for long-lead items as quickly as possible to minimize impact to schedule.

Occupancy / Prioritization: Should the lead time or unavailability of items impact occupancy, the Contractor shall coordinate with the Owner a priority list of sites to best accommodate school activities and usage.

In the event such impacts delay the Project Schule past Occupancy dates noted, and the Contractor has acted in good faith in coordination and cooperation with the Owner, time extensions shall be granted to the Contractor without penalty based on such delays.

* * * END OF ADDENDUM * * *

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PART 1 - GENERAL

1.1 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.2 SUMMARY

A. Section Includes:

1. Cast-in-place concrete.

1.3 RELATED REQUIREMENTS

A. Section 01 4523, Testing and Inspection Services.

B. Section 01 6116, Volatile Organic Compound (VOC) Content Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

C. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

D. Section 32 1600, Site Concrete

1.4 REFERENCES

A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code, edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).

C. American Concrete Institute (ACI) Publications and Standards: Standards and manuals listed refer to the latest edition as of the issue date of this Project Manual.

1. ACI 211.5R, Guide for Submittal of Concrete Proportions.
2. ACI 301, Specifications for Structural Concrete.
3. ACI 302.1R, Guide to Concrete Floor and Slab Construction.
4. ACI 302.2R, Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
5. ACI 305R, Guide to Hot Weather Concreting.
6. ACI 306R, Guide to Cold Weather Concreting.
7. ACI 318, Building Code Requirements for Structural Concrete.

D. ASTM International:

1. ASTM C 33, Standard Specification for Concrete Aggregates.
2. ASTM C 94, Standard Specification for Ready-Mixed concrete.
3. ASTM C 143, Standard Test Method for Slump of Hydraulic-Cement Concrete.
4. ASTM C 150, Standard Specification for Portland Cement.
5. ASTM C 171, Standard Specification for Sheet Materials for Curing Concrete.
6. ASTM C 260, Standard Specification for Air-Entraining Admixtures for Concrete.
7. ASTM C 330, Standard Specification for Lightweight Aggregates for Structural Concrete.
8. ASTM C 494, Standard Specification for Chemical Admixtures for Concrete.
9. ASTM C 618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
10. ASTM C 1059, Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.
11. ASTM C 1077, Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.
12. ASTM C 1107, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
13. ASTM C 1602, Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.
14. ASTM D 4263, Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
15. ASTM D 5084, Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
16. ASTM E 329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
17. ASTM E 1643, Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs
18. ASTM E 1745, Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

A. Refer to Section 01 3300.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.

1. Within 35 days after award of Contract, and before any concrete materials are delivered to the job site, submit to the Architect a complete list of all materials proposed to be used in this portion of the work. Provide complete Manufacturer's product information for all items intended to be used in this project and as listed in Part 2 of this specification.

2. Submit concrete mix design for each type of concrete on the project in accordance with CBC Chapter 19A. Mix design shall be signed by a California Registered Civil Engineer to verify compliance with CBC Chapter 19A.

C. CAL-Green Submittals:

1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
2. Low/No-VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC emission limits specified in Section 01 6116. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions per gallon in terms of grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.

D. Shop Drawings: Submit proposed location of construction joints and cold joints when different or in addition to those shown on Drawings.

E. Transit-Mix Delivery Slips:

1. Keep a record at the job site showing time and place of each pour of concrete, together with transit-mix delivery slip certifying contents of the pour in accordance with the CBC Section 1705A.3.
2. Make all records available to the Architect and Division of the State Architect for their inspection upon request.
3. Upon completion of this portion of the work, deliver all records and the delivery slips to the Architect.
4. Batch Plant Certificates: Include with delivery of each load of concrete. Provide certificates to the Testing Agency and the Architect/Engineer as separate submittals. Concrete delivered to the site without such certificate shall be rejected and returned to the plant.

F. Qualification Data: For independent testing agency.

G. Sample Warranty: As specified.

H. Product data for each grinding machine, including all types of grinding heads, dust extraction system, penetrating sealer and any other chemicals used in the process.

I. Polished Concrete Samples: size 6”x6”.

1.6 CLOSEOUT SUBMITTALS

A. Submit under provisions of Section 01 7700.

B. Warranty: Submit executed warranty.

1.7 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. Use materials and products of one manufacturer whenever possible.

C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

D. Conflicting Requirements: In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards or these specifications, the provisions of the more stringent shall govern.

E. Pre-Installation Meeting:

1. Hold a pre-installation conference two weeks prior to the start of concrete pour at elevated concrete decks. Attendees shall include Contractor, Architect, Structural Engineer, and Project Inspector.
2. Review Contractor’s intended method of pour, including lines and levels, and Architect’s expectations related to floor flatness, inspection, self-leveling concrete floor underlayment, installation of casework and other related topics.

F. Polished concrete:

1. Hold a pre-installation conference two-weeks prior to the start of polished concrete process.
2. At location on project selected by Architect, place and finish 5 feet x 5 feet area.
3. Construct mockup using process and techniques intended for use on permanent work. Mockup shall be produced by the individuals/workers who will perform the work for the project.
4. Flatness and levelness:
    a. Concrete shall be cured a minimum of 28 days or at which point equipment can be put on the slab and does not displace aggregate.
    b. Finish concrete shall have a minimum floor flatness rating of at least 50.
    c. Finish concrete shall be closed to traffic during finish floor application.
    d. Protect finished floor from traffic and equipment for the time as recommended by the manufacturer or approved by owner.

1.8 DELIVER, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.

C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

D. Store cement in weathertight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.

E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report any discrepancies to Architect before proceeding with work.

1.10 WARRANTY

A. Refer to General Conditions and Section 01 3300 for Contractor’s General Guarantee requirements.

B. Submit fully executed Guarantee with Closeout Submittal package.

1. See Part 3 of this specification regarding concrete finishing and defective concrete.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Conform to ACI 302.1R-15 and ACI 302.2R-06.

2.2 MATERIALS

A. Cement: Portland cement, ASTM C 150, Type II, per ACI 318 Section 3.2.

B. Concrete Aggregates: Normal weight aggregates shall conform to ASTM C 33, except as modified by this section. Combined grading shall meet limits of ASTM C 33.

C. Water: Clean and free from deleterious amounts of acids, alkalis, scale, or organic materials and per ACI 318 Section 3.4 and ASTM C 1602.

D. Gravel Below Slabs: Free-draining crushed rock graded so that 100 percent will pass a one inch sieve with no appreciable material passing a No. 4 sieve.

E. Vapor Barrier: Conform to ASTM E 1745.

1. Subject to compliance with requirements, provide one of the following:

a. Stego Wrap 15 mil Vapor Barrier System, with a Class A rating, and perm rating not to exceed 0.01 perms; by Stego Industries, San Juan Capistrano, CA; tel: (877) 464-7834; web: www.stegoindustries.com .
b. Griffolyn® 15 mil by Reef Industries, Inc.; tel: (800) 231-6074; web: www.reefindustries.com .
c. W.R Meadows, PERMINATOR 15-mil thick, www.meadows.com .
d. System to include Stego Mastic, Stego Tape, Stego Crete Claw® Tape, and pipe boots, or accepted equal by the specified manufacturers, for all vapor barrier penetrations.
e. No vapor barrier substitutions will be accepted.

F. Fly Ash: Western Fly Ash, conforming to ASTM C 618 for Class N or Class F materials (Class C is not permitted) and per CBC Section 1903A.6. Not more than 15 percent (by weight) may be substituted for portland cement.

G. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio, and ultimate shrinkage may be used. Admixture shall conform to ASTM C 494 and ACI 318 Section 3.6. Admixture must receive prior approval by the Architect, Structural Engineer, and the Testing Lab, and shall be included in original design mix.

1. Provide WRDA 64 by Grace Construction Products; tel: (877) 423-6491; web: https://gcpat.com .
2. Or approved equal.

H. Air-entraining Admixture: Conform to ASTM C 260 and CBC Section 1904A.1.

1. Daravair 1000 by Grace Construction Products; tel: (877) 423-6491; web: https://gcpat.com .
2. Or approved equal.

I. Surface Retarder (for exposed aggregate finishes):

1. Rugasol-S by Sika Corporation; tel: (800) 325-9504; web: http://usa.sika.com .
2. Or approved equal.

J. Wet Curing Blanket (for interior slabs): Conform to ASTM C 171.

1. Transguard 4000 by Reef Industries, Inc.; tel: (800) 231-6074; web: www.reefindustries.com .
2. Hydracure™ M5 Multi-Use Wet Curing Cover by PNA™ Construction Technologies, Inc.; tel: (800) 542-0214; web: ww.pna-inc.com .
3. CONKURE™ Wet Curing Blanket by Raven Industries, Engineered Films Division; tel: (800) 635-3456; web: http://RavenEFD.com .
4. Or approved equal.

K. Concrete Bonding Agent: Conform to ASTM C 1059.

1. Weld-Crete® by Larson Products Corporation; tel: (800) 633-6668; web: www.larsonproducts.com .
2. Daraweld® C by Grace Construction Products; tel: (877) 423-6491; web: https://gcpat.com .
3. Or approved equal.

L. Patching Mortar: One-component, trowel applied, polymer enhanced, shrinkage-compensated, fiber reinforced, cementitious repair mortar for horizontal, vertical and overhead applications.

1. Meadow-Crete GPS by W.R. Meadows; tel: (800) 342-5976; web: www.wrmeadows.com.
2. Or approved equal.

M. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking per CRD-C621, Corps of Engineers Specification and ASTM C 1107, Grades B and C.

1. Masterflow 713 by Master Builders Solutions, a division of BASF; tel: (800) 433-9517; web: www.master-builders-solutions.basf.us .
2. Or approved equal

2.3 CONCRETE DESIGN

A. Designed Strength and Classes of Concrete:

1. Class "A" concrete of 1-1/2 inch maximum size aggregate shall have 3500 psi 28 day strength with a maximum water to cementitious materials ratio of 0.55. Use for footings and other concrete of like nature. (Class "B" concrete may be used in lieu of Class "A" at Contractor's option.).
2. Class "B" concrete of 1 inch maximum size aggregate shall have 3500 psi 28 day strength with a maximum water to cementitious materials ratio of 0.55. Use for interior structural concrete less than 8" min. thickness excluding slabs on grade.
3. Class "C" concrete of 1 inch maximum size aggregate shall have 4000 psi 28 day strength with a maximum water to cementitious materials ratio of 0.45. Use for interior structural concrete less than 8 inches minimum thickness including interior floor slabs and curbs. At all interior slabs provide Moisture Barrier Admixture per manufacturers written instructions.

B. Slump Limits: Provide concrete, at point of final discharge, of proper consistency determined by Test Method ASTM C 143. Slumps as follows:

1. Class "A", 4 inch plus or minus 1 inch.
2. Class "B", 4 inch plus or minus 1 inch.
3. Class "C", 3 inch plus or minus 1 inch.

C. Mix Design: All concrete used on this work will be designed for strength in accordance with provisions of CBC, Section 1903A. Should the Contractor desire to pump any of the concrete mix designs, a modified mix design will need to be submitted for review. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of cement weight.

2.4 MIXING OF CONCRETE

A. Conform to requirements of CBC Chapter 19A and ACI 211.5R-14.

B. Mix all concrete until there is uniform distribution of material and mass is uniform and homogenous. Mixer must be discharged completely before the mixer is recharged.

C. Concrete shall be Ready-Mix Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C 94 and ACI 301. Continuous Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, with approval by Structural Engineer of Record, approval by DSA, and the following:

1. Approved Testing Laboratory shall check the first batching for each class of concrete and furnish mix proportions to the Licensed Weighmaster.
2. Licensed Weighmaster to positively identify materials as to quantity and to certify to each load by ticket.
3. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt and will transmit two copies of record to DSA.
4. Do not add water at the site to concrete mixes with a maximum specified WCR unless the water content at batch time provides for a WCR less than specified and this provision, including the quantity of water which may be added at the site, is specifically noted on the Mix Design and Certification by the mix preparer.
5. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished conforms in every particular and to proportions established by mix designs.

2.5 EQUIPMENT

A. Handling and mixing of concrete: Project Inspector may order removal of any equipment which in his/her opinion is insufficient or in any way unsuitable.

PART 3 - EXECUTION

3.1 APPROVAL OF FORMS AND REINFORCEMENTS

A. Forms and reinforcements are subject to approval by the Project Inspector, and notice of readiness to place first pour shall be given to DSA, Architect and Structural Engineer 48 hours prior to placement of concrete.

B. Before placing concrete, clean tools, equipment and remove all debris from areas to receive concrete. Clean all reinforcing and other embedded items of all coatings and soil that may impair bond with concrete.

3.2 PLACEMENT OF VAPOR BARRIER

A. Install vapor barrier per manufacturer's instructions, illustrations, ASTM E 1643 "Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Slabs" per manufacturer's recommendations and as follows:

1. Level and tamp or roll gravel below slabs to minimize sharp edges.
2. Place Vapor Barrier with the longest dimension parallel with the direction of the pour.
3. Lap Vapor Barrier up and seal against foundation walls with the specified tape.
4. Lap joints 6 inches and seal with the specified tape.
5. Seal all penetrations with pipe boots made from Vapor Barrier and specified tape.
6. Protect Vapor Barrier from damage during installation of reinforcing steel and utilities.
7. Repair damaged areas by creating patches with vapor barrier material sized large enough to overlap damaged area by 6-inches. Tape all four sides with specified tape.
8. Apply specified tape at all other conditions not indicated above as recommended by the manufacturer.
9. After replacement of existing subbase as required, replace or repair existing vapor barrier per manufacturer's recommendations, which has been damaged or cut, as a result of the removal and replacement of slab-on-grade concrete, including saw cutting of slab for the installation of under slab utilities.

3.3 PLACING OF CONCRETE

A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to the owner.

B. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly over the top of reinforcing steel.

C. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of

concrete shall not to exceed 4 feet in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.

D. Remove form spreaders as placing of concrete progresses.

E. Place footings as monolithic and in one continuous pour.

F. Keep excavations free of standing water.

G. Compacting: All concrete shall be compacted by mechanical vibrators. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms. Vibrating shall not be applied to concrete which has already begun to initially set nor shall it be continued so long as to cause segregation of materials.

H. Grout under column bearing plates: Dry pack with specified Non-shrink Grout, as recommended by manufacturer. Use as little water as practicable. Ram grout solid into place.

I. Concrete Slabs:

1. All slabs shall be formed and finished to required line and grades. Slabs on grade shall be true and flat with a maximum tolerance of 1/8 inch in 10 feet for flatness, and shall also be level. Slabs which are not flat and are outside of the maximum specified tolerances shall be brought into compliance by the Contractor at no additional expense to the Owner.
2. Depress areas of interior floor slabs where required for shower stalls, walk-in refrigerators and freezers, door frames, tile, wheelchair lifts and various other equipment and as noted on plans. Slope slab to floor drain where indicated on plans.

J. Placing in Hot Weather: Comply with ACI 305R. Concrete shall not exceed 85 degrees F at time of placement. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface drying. Concrete shall be kept wet continuously after placement until implementation of curing procedure in accordance with this specification.

K. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted. When deposited concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.

L. Horizontal Construction Joint: Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

M. Conduit, plumbing lines or any other embedment shall not be located in wall panels except where specifically detailed on approved structured drawings. Contractor shall provide detailed shop drawings for tilt-up wall panels showing panel dimensions and locations of all openings, reinforcement and embedded items.

N. Prior to the placing of concrete to replace or repair existing slab on grade concrete:

1. Install clean uniformly-graded 1/2 inch or larger free-draining aggregate to thickness required for matching surrounding subbase level and leaving no voids under the adjacent existing concrete slab.
2. Replace or repair vapor barrier to condition without punctures or gaps, placed directly below and in contact with new concrete slab sections.
3. Apply bonding agent to the exposed edges of the existing concrete slab.

3.4 CONCRETE FINISHES

A. Concrete Slab Finishing: Finish slab as required by ACI 302.1R. Use manual screeds, vibrating screeds or roller compacting screeds to place concrete level and smooth. Do not use “jitterbugs” or other special tools designed for the purpose of forcing the course aggregate away from the surface leaving too thick a layer of mortar. While concrete is still wet but sufficiently hardened to bear a person’s weight on knee boards, wood float surface to a true and even plane. Use sufficient pressure to bring moisture to surface and push course aggregate to just below surface. After surface moisture has disappeared, float to true surface and finish utilizing steel trowel. Surface shall be free from trowel marks, depressions, ridges or other blemishes, and shall be acceptable to finish flooring applicators. Tolerance for flatness shall be 1/8 inch in 10 feet. Provide final concrete slab finish for various floor types as follows:

1. Interior slabs, smooth finish: Typical finish to be used at all interior slabs to receive applied floor finishes including VCT, sheet vinyl, safety flooring, wood flooring and rubber stair treads/risers. Use also at colored concrete floors and slabs to be left exposed and sealed with Heavy Duty Concrete Sealer.
2. Interior slabs, medium broom finish: Typical finish to be used at all interior slab locations to receive ceramic or quarry tile or other finish materials requiring a roughened surface. Coordinate with general contractor. Use also at locations where slab will be left exposed and will not be colored or sealed, including ramps. At ramp locations, brooming direction shall run perpendicular to slope to form non-slip surface.

B. Curb Finishing: Steel trowel as described for slab finishing above.

C. Saw Cutting: Saw cutting must be performed within eight hours of completion of finishing. Do not make saw cuts if aggregate separates from cement paste during cutting operations. Prevent marring of surface finish. Fill with flexible sealant.

D. Exposed Concrete Surface Finishing (not including top surface of slabs): Remove fins and rough spots immediately following removal of forms from concrete which is to be left

exposed. Damaged and irregular surfaces and holes left by form clamps and sleeves shall be patched with grout. Tie wires are to be removed to below exposed surface and holes pointed up with neat cement paste similar to procedure noted under "Patching" below. Removal of tie wires shall extend to distance of 2 inches below established grade lines. Ends of tie wires shall be cut off flush at all other, unexposed locations. Care shall be taken to match adjacent finishes of exposed concrete surface. After patching, all concrete that is to remain exposed, shall be sacked with a grout mixture of 1-part cement, 1 1/2- parts fine sand and sufficient water to produce a consistency of thick paint. After first wetting the concrete surface, apply mixture with a brush and immediately float entire surface vigorously using a wood float. Keep damp during periods of hot weather. When set, excess grout shall be scraped from wall with edge of steel trowel, allowed to set for a time, then wiped or rubbed with dry burlap. Entire finishing operation of any area shall be completed on the same day. This treatment shall be carried to 4 inches below grade, and all patching and sacking shall be done immediately upon removal of the forms.

3.5 CURING

A. Concrete in Forms: Keep forms and top on concrete between forms continuously wet until removal of forms. Maintain exposed concrete in wet condition for 14 days following removal of forms.

B. Do not subject concrete to design loads until concrete is completely cured, and until concrete has attained its full specified twenty-eight (28) day compressive strength or until twenty-one (21) days after placement, whichever is longer.

C. Interior slabs shall be cured utilizing Wet Curing Blanket. For slabs utilizing a Moisture Barrier Admixture within the concrete mix, Contractor must confirm with admixture manufacturer, that the Wet Curing Blanket may be omitted.

3.6 SURFACE TREATMENTS, COLORING AGENTS, AND SEALERS

A. General: Apply surface treatments, coloring agents, and sealers per manufacturer’s recommendations and written instructions.

3.7 WATER REPELLENT & ANTI-GRAFFITI COATING

A. General: Provide at exposed architectural concrete where indicated.

B. Refer to Section 07 1900, Water Repellents & Anti-Graffiti Coatings.

3.8 DEFECTIVE WORK

A. Determination of defective concrete shall be made by the Architect. His/her opinion shall be final in identifying areas to be replaced, repaired or patched.

B. The Owner reserves the right to survey the slabs, if the slabs are determined to be outside of the maximum tolerance for slab flatness. If the slabs are found to be out of tolerance, then the Contractor will be required to bring the slabs to within tolerance by either grinding and filling or replacing the slab. Repair methods proposed by the

Contractor must be acceptable to the Owner and Architect. The Contractor will be responsible for reimbursing the Owner for any surveying costs incurred. Determination of slab flatness, surveying and any remedial work must be completed far enough in advance of the scheduled date for installation of the floor finishes so that the project schedule is maintained, delays are avoided and the new slabs or slab repairs are properly cured.

C. As directed by Architect, cut out and replace defective concrete. All defective concrete shall be removed from the site. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.

D. Permission to patch any area shall not be considered waiver of right, by the Owner, to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.

E. Defective concrete is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Excessive Shrinkage, Cracking, Crazing or Curling; Defective Finish: Remove and replace if repair to acceptable condition is not feasible.

F. Patching: Install specified Patching Mortar per manufacturer’s recommendations. REPAIRS TO DEFECTIVE CONCRETE WHICH AFFECT THE STRENGTH OF ANY STRUCTURAL CONCRETE MEMBER OR COMPONENT ARE SUBJECT TO APPROVAL BY THE ARCHITECT AND DSA.

G. Repair damaged and defective work and eliminate functional and visual defects. Where repair is not possible replace work. Adjust joints for uniform appearance.

3.9 FIELD QUALITY CONTROL

A. Inspection: There will be initial or preliminary inspection of the finished concrete slabs by the Project Inspector and/or Architect for flatness. If deemed necessary, the Owner reserves the right to have a survey performed by a registered surveyor or testing lab. If it is determined that floors not meeting the flatness criteria is due to means and methods fully within the control of the Contractor, the cost of the survey will be back charged to

the Contractor. This includes, but is not limited to the erection of steel and metal deck outside industry tolerances and referenced standards.

B. Concrete Strength Testing: Comply with CBC Section 1705A.3, 1903A, 1904A, 1905A.1.16, ACI 318, and as specified in this Section. Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports

1. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
2. Strength tests will be conducted by the Testing Lab on one cylinder at seven (7) days and two cylinders at twenty-eight (28) days. The fourth remaining cylinder will be available for testing at fifty-six (56) days if the 28-day cylinder test results do not meet the required design strength.
3. On a given project, if the total volume of concrete is such that the frequency of testing required in Paragraph A.1 above would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
4. Cost of retests and coring due to low strength or defective concrete will be paid by School District and back-charged to the Contractor.

C. Moisture and PH Testing of Concrete Slab-On-Grade and Above-Grade Concrete, Scheduled to Receive Floor Finish Material: Refer to Section 09 0512, Concrete Floor

1. Testing Laboratory Requirements: The Contractor or installer may not conduct testing for concrete slab permeability. These tests will be provided by the Contractor through an independent third party testing laboratory.
2. Provide access for and cooperate with the approved independent third party testing lab.
3. Following testing, the test results must be submitted to the Contractor, Architect, Owner's Representative, and Flooring Installer a minimum of 10 days prior to scheduled installation date of flooring. Installation of flooring at tested areas may not begin without Architect's review and approval of the testing results.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Suspended acoustical ceiling panels.
2. Ceiling suspension system.

1.2 RELATED REQUIREMENTS

A. Section 01 6116, Volatile Organic Compound (VOC) Content Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

C. Division 26, Electrical Work.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code, edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. DSA Interpretation of Regulations:

1. IR A-5: Acceptance of Products, Materials, and Evaluation Reports.
2. IR 25-2.13: Metal Suspension Systems for Lay-in Panel Ceiling: 2016 CBC.

D. ASTM International (ASTM):

1. A 568: Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.
2. A 641: Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
3. C 423: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
4. C 635: Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
5. C 636: Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
6. C 1414: Standard Practice for the Separation of Americium from Plutonium by Ion Exchange.

7. D 3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
8. E 84: Standard Test Method for Surface Burning Characteristics of Building Materials.
9. E 119: Standard Test Methods for Fire Tests of Building Construction and Materials.
10. E 580: Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
11. E 1111: Standard Test Method for Measuring the Interzone Attenuation of Open Office Components
12. E 1264: Standard Classification for Acoustical Ceiling Products.
13. E 1477: Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.

E. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):

1. 62.1: Ventilation for Acceptable Indoor Air Quality.

F. International Code Council-Evaluation Services (ICC-ES):

1. AC 156: Acceptance Criteria for Seismic Qualification Testing of Non-structural Components.
2. ESR-1308: Fire- and Nonfire-Resistance-Rated Suspended Ceiling Framing Systems Evaluation Report.

G. American Society of Civil Engineers (ASCE) and Structural Engineering Institute (SEI):

1. ASCE/SEI 7: Minimum Design Loads for Buildings and Other Structures.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

B. Coordination:

1. Develop and coordinate locations of work supported by or penetrating through ceiling with the other Sections involved prior to making shop drawing submittal. In particular, note partitions that are to be installed prior to ceiling installation.
2. Coordinate work with items specified under other Sections.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Dimensioned reflected ceiling plans indicating location of light fixtures, mechanical air-supply and return outlets and other items which affect ceiling.

1. Clearly indicated where proposed installation deviates from that indicated in the Drawings.
2. Show parts, connections and anchorages and suspension system details including:
   a. Trapeze details.
   b. Seismic control details.

B. Product Data: Submit list and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

C. Samples:

1. Each type of grid member, grid accessory and ceiling panel to Architect for review.
2. Manufacturer's full range of colors for Architect's selection.

D. CAL-GREEN Submittals:

1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

1.6 INFORMATIONAL SUBMITTALS

A. Test Reports: Test Report on load capacities.

1. Prior to installation of the suspended ceiling system, a copy of an acceptable substantiating test report and certifications shall be submitted to the Architect.
2. The test shall show that the axial tension and compression ultimate load capacity of the runners and cross runners and their splices, intersection connections and expansion devices complying with these specification requirements.
3. Evaluation of test results shall be made on the basis of the mean values resulting from tests of not fewer than three identical specimens, provided the deviation of any individual test result from the mean value does not exceed plus or minus 10 percent.
4. Tests shall be made by an approved testing agency.

B. Sample of Manufacturer’s warranty.

1.7 CLOSEOUT SUBMITTALS

A. Warranty: Submit executed warranties.

1.8 MAINTENANCE SUBMITTALS

A. Deliver open partially used boxes of acoustical panels and tile to Owner for replacement stock. Supplement with full boxes to assure submitted amount is not less than five percent of the amount installed of each type of acoustical panel and acoustical tile installed under this Contract.

1.9 QUALITY ASSURANCE

A. Submitted system shall comply with design and performance criteria.

B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

C. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.

D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.10 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.

C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.11 FIELD CONDITIONS

A. Installer shall be responsible for checking Drawings and job conditions, conforming to code requirements, and for providing additional channels and hangers as required for support of electrical and mechanical work for type and extent of work. Coordinate layout with other work which penetrates or is supported by ceiling suspension system.

B. Ceiling products and suspension systems shall be installed and maintained in accordance with manufacturer’s written installation instructions for that product in effect at the time of installation and best industry practice.

C. Ambient Conditions:

1. Do not install ceiling system when building is excessively cold and damp or hot and dry. Prior to installation, the ceiling product shall be kept clean and dry, in an environment that is between 32 degrees Fahrenheit and 120 degrees Fahrenheit and not subject to abnormal conditions. Abnormal conditions include exposure to

chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.

2. Heating system shall be installed and operating when necessary to maintain temperature. Roof and exterior doors shall be completed and made watertight.

D. Existing Conditions:

1. Make and be responsible for field dimensions necessary for proper fitting and completion of work. Report any discrepancies to Architect before proceeding.
2. Do not install acoustical ceilings until work above ceilings is completed, including testing and approval of Mechanical work.
3. Plastering, drywall and concrete installation shall be complete and fully cured. Windows shall be in place and glazed.
4. Protect adjacent surfaces from damage during work of this Section.
5. Notify Architect, in writing, of any conditions preventing proper application of acoustical ceilings.

1.12 WARRANTY

A. Manufacturer: In addition to the Contractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty agreeing to repair or replace acoustical panels and ceiling grid that fails within the warranty period.

1. Failures include, but are not limited to:
   a. Acoustical Panels: Sagging and warping of standard panels as a result of defects in materials or factory workmanship. In addition, acoustical panels that are designed to resist the growth of micro-organisms and installed with manufacturer's suspension system and which exhibit any visible sag and fail to resist the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria.
2. Warranty Periods:
   a. Acoustical Panels:
      1) Typical: Ten years.
      2) Panels with with "HumiGuard Plus," *ClimaPlus*," or equal dimensional stability characteristic and supplied by a single source manufacturer: 30 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers: As follows, or equal.

1. Armstrong World Industries, 717-397-0611, www.armstrongceilings.com.
2. CertainTeed – Saint Gobain, 800-233-8990, www.certainteed.com.
3. USG, 800-950-3839, www.usg.com.

B. Substitutions: Any substitution to be considered equal shall be similar in texture and pattern, provide similar color options, meet physical characteristics of specified material, and be submitted for approval in accordance with Section 01 3300, Submittal Procedures.

2.2 DESIGN AND PERFORMANCE CRITERIA

A. Provide completely designed system complying with requirements of CBC Section 808, ASTM C 635, ASTM C 636 and DSA Interpretation Regulation 25-2.13.

B. Seismic Requirements:

1. Provide acoustical ceiling system that has been evaluated by an independent party and found to be compliant with the California Building Code, current edition, Seismic Categories D, E, and F.
2. System shall be tested in accordance with International Code Council - Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components as evidenced by International Code Council Evaluation Report.

C. Fire Performance Characteristics: As follows, tested in accordance with ASTM E 84 and complying with ASTM E 1264 for Class A products.

1. Flame Spread: 25 or less.
2. Smoke Developed: 50 or less.

D. Fire-rated ceilings shall be rated in accordance with American Society for Testing and Materials ASTM E 119 and bear an Underwriters Laboratories Inc. (UL) Time Design number applicable to the proposed installation.

1. Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
2. Provide copy of Underwriters' Laboratories, Inc. certification for tested, labeled and listed steel grid members and acoustical panels to meet time-design fire endurance rating of one hour, or more as indicated on Drawings, for combined suspended acoustical ceiling and floor or roof assemblies shown.
3. Assembly shall have been approved by State Fire Marshal.

E. Sustainable Design:

1. VOC Limits for field-applied adhesives, sealants, fillers, coatings and primers shall comply with limits specified in Section 01 6116.

2.3 ACOUSTICAL CEILING PANELS

A. Manufacturer: Armstrong World Industries, Inc. as specified and the basis of design, or equal. Products specified are by Armstrong, unless otherwise noted.

B. Acoustical Ceiling Panel - Type 1: School Zone Fine Fissured, No. 1714.

1. Surface Texture: Medium.
2. Composition: Mineral Fiber.
3. Color: White.
4. Size: 2 feet x 4 feet x 3/4 inches.
5. Edge Profile: Square Lay-In for interface with specified suspended ceiling system.
6. Performance Characteristics:
    a. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, 0.70.
    b. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton, 40.
    c. Articulation Class (AC): ASTM E 1111; Classified with UL label on product carton N/A.
    d. Emissions Testing: Protocol specified in Section 01 3543, Environmental Procedures; less than 13.5 ppb of formaldehyde when used under typical conditions required by ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality."
    e. Flame Spread: ASTM E 1264 Classification.
        1) Type III, Form 2, Pattern C E.
        2) Class A (UL).
    f. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.85.
    g. Dimensional Stability: Panels shall be resistant to humidity and sag at temperature is between 32°F and 120°F and can be installed under conditions where the area is not enclosed or the HVAC systems is not functioning; “HumiGuard Plus.”
    h. Antimicrobial Protection: Paint finish shall contain a special biocide to inhibit or retard the growth of mold or mildew in accordance with ASTM D 3273, and provides resistance against gram positive and gram negative odor and stain causing bacteria; “BioBlock Plus.”

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation of the work of this Section, carefully examine and verify that installed work of other trades is complete to the point where this installation may properly commence.

1. Wet work, including plastering and concrete, shall be complete and cured prior to installation of the acoustical ceilings.

B. Verify that suspended acoustical ceiling may be installed in accordance with the original design, codes and regulations, and the reviewed shop drawings.

1. In event of discrepancy, immediately notify Architect.
2. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION OF CEILING PANELS

A. Acoustical Ceiling Panels:

1. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.
2. For panels with a directional pattern, install with grain in same direction unless otherwise approved by Architect.
3. Cut and rabbet edges of tegular edge acoustical panels, at border areas and vertical surfaces to exactly match factory cut tegular edge.

B. Demolition of Existing Suspended Ceiling System and Panels:

1. Where existing suspended acoustical ceilings are indicated to be removed, unless otherwise noted, this includes the acoustical panels, ceiling grid, accessories and trim, hanger wires, bracing wire, compression struts, and any other components that are a part of the existing ceiling system. Components for the specified ceiling system are to be new.

3.3 CLEANING

A. Upon completion, clean soiled and discolored surfaces so that installation is free from defects. Remove and replace damaged or improperly applied material, as directed.

B. Acoustical ceiling panels, acoustical ceiling tile and suspended ceiling system shall be free of scratches, stains, smudges, fingerprints, discolorations, breaks, chips or other damage. Finished ceilings shall be uniform in appearance, including uniform color and texture.

C. If cleaning is required, comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.4 PROTECTION

A. Protect work and suspended acoustical ceiling materials prior to and during installation, and protect the installed work and materials of other trades.

B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 INCLUSION OF OTHR CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions nd Division 1 are fully applicable to this Section, as if repeated herein.

1.2 RELATED SECTIONS

A. Section 03 3000, Cast-in-Place Concrete.

B. Potential Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

C. Section 01 8113, Sustainability Design Requirements.

1.3 REFERENCES

A. ASTM C579, Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.

B. ASTM D2240, Standard Test Method for Rubber Property—Durometer Hardness.

C. ASTM D2369, Standard Test Method for Volatile Content of Coatings.

D. ASTM D4060, Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.

E. ASTM D4541, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.

F. For additional standards please refer to Product Data Sheets

1.4 SUBMITTALS

A. Comply with Section 01 33 00 - Submittal Procedures.

B. Product Data: Submit manufacturer's product data, including physical properties and colors available.

C. Manufacturer’s Safety Data Sheet for each product being used.

D. Product Samples: Submit Architectural Standard samples representative of the final finish, as applied. The Standard shall be approved in writing by the Architect and shall be the final standard of acceptance of the finish.

E. Maintenance Instructions: Submit manufacturer's maintenance instructions.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:
   1. Acceptable Manufacturer: Sika Corporation, 201 Polito Drive, Lyndhurst, NJ 07071
      a. No request for substitution shall be considered that would change the generic type of system specified. Equivalent materials of other manufacturers may be substituted only on approval of the Architect or Engineer. Requests for substitution will be considered only if submitted 10 days prior to bid date. Requests shall include the respective manufacturer's technical literature for each product giving the name, generic type, descriptive information, recommended dry film thickness (DFT), Material Safety Data Sheet (MSDS), and certified test reports showing results to equal performance criteria of products specified herein.

B. Applicator Qualifications:
   1. Pre-Qualification: Each bidder for this project shall be pre-qualified and approved in writing by the material manufacturer.
   2. Applicator Experience: Each bidder must have a minimum 5 years experience in the application of the type of system specified. Contractor shall submit a list of five projects of similar size, scope and complexity.

C. Mock-Up:
   1. Construct one 100 sq.ft. (10 sq.m.) mock-up of each type and color of resinous flooring in location acceptable to Architect/Engineer to demonstrate quality of finished system, complying with manufacturer's instructions.
   2. Arrange for Architect/Engineer's review and acceptance, obtain written acceptance before proceeding with Work.
   3. Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section. Mock-up shall be left in place for the duration of the work.

D. Pre-application Meeting: Convene a pre-application meeting two (2) weeks before start of application of floor coating. Require attendance of parties directly affecting work of this section, including Contractor, Architect, applicator, and manufacturer's representative. Review surface preparation, priming, application, curing, protection, and coordination with other work.

1.6 DELIVERY, STORAGE AND HANDLING

A. Delivery:
   1. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, batch or lot number, and date of manufacture.
   2. Material should be delivered to job site and checked for completeness and shipping damage prior to job start.

B. Storage:
   1. Store materials in accordance with manufacturer's written instructions.
   2. Keep containers sealed until ready for use. Material should be stored in a dry, enclosed, protected area from the elements.
   3. Do not subject material to excessive heat or freezing.
   4. Shelf life: Established based on manufacturer's written recommendation for each material being used.

C. Handling: Protect materials during handling and application to prevent damage or contamination.

D. Condition materials for use accordingly to manufacturer's written instructions prior to application.

E. Record material lot number and quantity delivered to jobsite/storage.

1.7 SITE CONDITIONS

A. Do not install the Work of this Section outside of the following environmental ranges with Manufacturers' written acceptance:
   1. Material Temperature: Precondition material for at least 24 hours between 65° to 75°F (18° to 24°C)
   2. Ambient Temperature: Minimum/Maximum 50˚/85˚F (10˚/30˚C)
   3. Substrate Temperature: Minimum/Maximum 50˚/85˚F (10˚/30˚C). Substrate temperature must be at least 5˚F (3˚C) above measured Dew Point.
   4. Mixing and Application attempted at Material, Ambient and/or Substrate Temperature conditions less than 65˚F (18˚C) will result in a decrease in product workability and slower cure rates.
   5. Relative Ambient Humidity: Minimum ambient humidity 30%, maximum ambient humidity 75% (during application and curing)
   6. Measure and confirm Substrate Moisture Content, Ambient Relative Humidity, Ambient and Surface Temperature and Dew Point.

B. Substrate moisture:
   1. Moisture content of concrete substrate must be ≤ 4% by mass as measured with a Tramex® CME/CMExpert type concrete moisture meter.
   2. Additionally, relative humidity tests may be conducted per ASTM F2170 and values must be ≤ 85%.
   3. If moisture content of concrete substrate is > 4% by mass as measured with Tramex® CME/CMExpert type and/or if relative humidity tests per ASTM F2170 exceed values > 85%, consider moisture mitigation systems or moisture tolerant primer.

C. Utilities, including electric, water, HVAC and permanent lighting to be supplied by General Contractor

D. Maintain constant ambient room temperature of plus or minus 15ºF (plus or minus 7ºC) with a minimum temperature of 50ºF (10ºC) and maximum temperature of 85ºF (30ºC). Maintain constant ambient room temperature for 48 hours before, during and after installation, or until cured. Do not apply while ambient and temperatures are rising.

E. Erect suitable barriers and post legible signs at points of entry to prevent traffic and trades from entering the work area during application and cure period of the floor.

F. Protection of finished floor from damage by subsequent trades shall be the responsibility of the General Contractor.

G. Insure adequate ventilation and air flow.

1.8 WARRANTY

A. Manufacturer's warranty covering the resinous flooring against defects in materials for one year from date of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturer shall be certified under ISO 9001: 2008 All liquid materials, including primers, resins, curing agents, finish coats, and sealants are manufactured and tested under an ISO 9001:2008 registered quality system.

B. Approved Manufacturer shall be Sika Corporation, Industrial Flooring, 201 Polito Avenue, Lyndhurst, NJ 07071, Phone 201.933.8800, Fax 201.933.6225, www.sikafloorusa.com, Or accepted Equal.

2.2 SYSTEM

A. Resinous flooring system: Sikafloor Multidur Coating System is a solid color, high gloss, smooth, resin rich, seamless, epoxy based floor coating. Typically applied between 24 to 30 mils (0.7 to 1.5 mm) thick. System to consist of the following components:
   1. Primer: Sikafloor 161 applied between 8 – 10 mils.
   2. Top coat: Sikafloor 264 applied between 8 - 10 mils.
   3. Optional top coat: Sikafloor 316 N applied between 3 – 3.5 mils.
   4. Optional top coat: Sikafloor 264 Thixo Lite applied at 8 - 10 mils.

2.3 MATERIALS

A. Primer: Sikafloor 161 is a two part, epoxy resin for priming and leveling mortars with the following properties:
   1. Pull-off Strength (ASTM D4541): > 400 psi (2.7 MPa) with 100% concrete failure.
   2. Shore D Hardness (ASTM D2240): 76 at 7 days.

3. Solid Content: ~ 100% (by volume) / ~ 100% (by weight).
4. VOC Content (ASTM D2369): ≤ 50 g/L.
5. Permeability (ASTM E96): 9.0 g/m² (24 hours / +75°F).
6. Water Absorption (ASTM D570): 0.14 g/h - m2.
7. Viscosity (approximately) of Components A + B: 775 (SP2/100).

B. Top Coat: Sikafloor 264 Thixo Lite is a pigmented two part, low viscosity, thixotropic topcoat in [*Refer to Sikafloor color chart*] color with the following properties:
1. Pull-off Strength (ASTM D4541): > 400 psi (2.7 MPa) with 100% concrete failure.
2. Shore D Hardness (ASTM D2240): 76 at 7 days.
3. Solid Content: ~ 100% (by volume) / ~ 100% (by weight).
4. VOC Content (ASTM D2369): ≤ 50 g/L.
5. Compressive Strength (ASTM C579): 7,250 psi (50 N/mm²) at 28 days.
6. Flexural Strength (ASTM C580): 2,900 psi (20 N/mm²) at 28 days.

C. Cove base: Epoxy mortar cove based.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive flooring system. Notify Architect/General Contractor/Owner/Owner's representative if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected. Do not apply to substrate treatments for moisture, repair, or leveling not of the same Manufacturer.

B. Surface must be clean, sound and dry. Remove dust, laitance, grease, curing compounds bond inhibiting impregnations, waxes and any other contaminants. All projections, rough spots, etc. should be dressed off to achieve a level surface prior to the application.

C. Concrete substrate to have a minimum compressive strength of 3,500 psi (24 MPa) at 28 days and a minimum of 215 psi (1.5 MPa) in tension at time of application.

D. Substrate moisture:
1. Measure and confirm Substrate Moisture Content, Ambient Relative Humidity, Ambient and Surface Temperature and Dew Point.
2. Confirm and record above values at least once every 3 hours during installation, or more frequently whenever conditions change (e.g. Ambient Temperature rise/fall, Relative Humidity increase/decrease, etc.).

E. Ensure concrete substrate conforms to the minimum requirements of the flooring manufacturer.

F. Flooring system shall not be applied to sand-cement setting beds. Sand-cement beds shall be removed to structural concrete substrate and re-leveled/sloped as necessary to achieve grade and/or adequate drainage.

G. Flooring system shall not be applied to asphaltic or bitumen membranes, soft wood, aluminum, copper or fiberglass reinforced polyester/vinyl ester composites.

H. Application to glazed or vitrified brick and tile, structural wood, steel shall only be permitted with Manufacturer's written recommendation.

3.2 SURFACE PREPARATION

A. Prepare surface to receive flooring systems in accordance with manufacturer's written instructions.

B. Remove dirt, oil, grease, wax, laitance, curing compounds, water-soluble concrete hardeners, and other surface contaminants. Remove sealers, finishes, and paints. Remove unsound concrete by appropriate mechanical means.

C. Concrete: Shall be cleaned and prepared to achieve laitance-free and contaminant-free, open textured surface by shot blasting or equivalent mechanical means (CSP level as per ICRI guidelines and manufacturer's written recommendation).

D. Chemical Surface Preparation: Chemical surface preparation (acid etching) is unacceptable and will void Manufacturer's warranty.

E. Control joints and cracks: Provide repair and treatment of control joints and surface cracks utilizing manufacturer's standard materials and installation details.

3.3 APPLICATION

A. Mix and apply material with strict adherence to manufacturer's written installation procedures and coverage rates.

B. Follow Manufacturer's written recommendations on terminations and connections to walls, drains, doorways, columns and floor-to-floor transitions.

C. Do not apply while ambient and substrate temperatures are rising.

D. Apply resinous flooring with care to ensure that no laps, voids, or other marks or irregularities are visible, and with an appearance of uniform color, sheen and texture, all within limitations of materials and areas concerned.

E. Match colors and textures of approved samples.

F. Install cove base in accordance with manufacturer's written instructions. Match (E) adjacent cove base in height and radius.

G. Do not add thinners to materials; no thinner shall be approved or allowed.

3.4 CLEAN UP

A. Disposal of this product, solution and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

B. Empty containers should be taken to an approved waste handling site for recycling or disposal.

3.5 PROTECTION

A. Freshly applied material should be protected from dampness, condensation and water for at least 72 hrs.

B. Beware of air flow and changes in air flow. Introduction of dust, debris, and particles, etc. may result in surface imperfections and other defects.

C. Follow manufacturer's written recommendation with respect to cure, wait time and return to service.

- END OF SECTION -

PART 1 - GENERAL

1.1 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 4500, Testing Lab Services.

1.3 QUALITY ASSURANCE

A. Use only new materials and products.

B. Use materials and products of one manufacturer whenever possible.

C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

D. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current project name and project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted

1.4 SUBMITTALS

A. Refer to Section 01 3300.

B. Manufacturer's Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

C. Materials list: Submit to the Architect a complete list of all materials proposed to be used in this portion of the work. Submitted items should include but are not limited to sand, gravel, admixtures, surface treatments, coloring agents, sealers, fibers, cast-in-place accessories, forming and curing products and concrete mix designs.

D. With concrete submittal, provide documented history of mix design performance.

E. Submit executed Guarantee of Contractor/Subcontractor per Article 1.05.

1.5 GUARANTEE

A. Refer to General Conditions and Section 01 3300.

B. Submit fully executed Guarantee with submittal package required by Article 1.04. See Part 3 of this specification regarding concrete finishing and defective concrete.

1.6 REFERENCES AND STANDARDS

A. California Building Code (CBC), current edition, as adopted by the Division of the State Architect.

B. ACI Standards, ACI 211.1, ACI 318-05, ACI 302, IR-04, ACI 301-16, ACI 305R-10, ACI 306R-16, ACI 308-16.

C. ASTM C-94, Specification for Ready-Mixed Concrete.

D. Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice (latest edition).

E. ACI 347 Recommended Practice for Concrete Formwork.

F. ASTM – American Society for Testing and Materials.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.

C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

D. Make delivery to job when notified by Contractor verifying that the job is ready to receive the work of this Section and that arrangements have been made to properly store, handle and protect such materials and work.

E. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.

F. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.8 TESTING

A. Cement and Reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Structural Engineer and DSA.

1.9 ADEQUACY AND INSPECTION

A. Design, erect, support, brace and maintain formwork and shoring to safely support all vertical and lateral loads that might be applied until such loads can be carried by concrete.

B. Notify Inspector, Architect and DSA at least 48 hours prior to placing of concrete.

1.10 PROTECTION

A. Finish surfaces shall be protected at all times from concrete pour. Inspect forming against such work and establish tight leak-proof seal before concrete is poured. Finish work damaged, defaced or vandalized during the course of construction shall be replaced by contractor at contractor expense.

1.11 FIELD MEASUREMENTS

A. Make and be responsible for all field dimensions necessary for proper fitting, slopes and completion of work. Report discrepancies to Architect before proceeding.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cement: Portland cement, ASTM C150, Type II, per ACI 318-14 Section 26.4.

B. Concrete Aggregates: Normal weight aggregates shall conform to ASTM C33, except as modified by this section. Combined grading shall meet limits of ASTM C33. Lightweight aggregate shall conform to ASTM C330, suitably processed, washed and screened, and shall consist of durable particles without adherent coatings.

C. Water: Clean and free from deleterious amounts of acids, alkalis, scale, or organic materials and per ACI 318-14 Section 26.4.1.3.1.

D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials (Class C is not permitted). Not more than 15% (by mass) may be substituted for portland cement.

E. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio, and ultimate shrinkage may be used. Provide WRDA 64 by Grace Construction Products or approved equal. Admixture shall conform to ASTM C494 and ACI 318-14 Section 26.4.1.4.19(a). Such admixture must receive prior approval by the Architect, Structural Engineer, and the Testing Lab, and shall be included in original design mix.

F. Air-entraining Admixture: Daravair 1000 by Grace Construction Products or approved equal. Admixture must conform to ASTM C260 and ACI 318-14 Section 26.4.1.4.

G. Surface Retarder (for exposed aggregate finishes): Rugasol-S by Sika Corporation or approved equal.

H. Surface Treatments and Coloring Agents:

1. Glare Reduction Colorant: “L10 Glare Reducer” as manufactured by Master Builders/L.M. Scofield or approved equal. Provide at all exterior concrete slabs, walks, ramps, stairs (including bleachers) and other exposed flatwork to eliminate glare. Omit glare reduction colorant where Color Hardener, Integral Color or Stain are utilized. Provide 2-pounds of colorant per cubic yard of concrete. This is a maximum amount

and Architect may adjust proportion to a lesser amount if desired. Add colorant to mix in accordance with manufacturer's printed instructions.

I. Form Material (Concrete Exposed to View): 5/8" (min) APA B-B Ply-form, steel or Sonotubes.

J. Form Material (Concrete concealed from View): 5/8" (min) APA B-B Plyform, steel or 1 x 8 DF. No. 2 or better.

K. Form Ties: Snap off metal of fixed length: leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than one-inch diameter; manufactured by Burke, Dayton Superior, or accepted equal.

L. Spreaders: Metal (no wood permitted).

M. Form Coating: Material which will leave no residue on concrete surface that will interfere with surface coating, as approved by the Architect.

N. Chamfer Strips: Rigid PVC, ¾" x ¾", in maximum possible lengths; manufactured by Burke, Greenstreak, Vulco, or accepted equal.

O. Expansion Joint Material: Preformed 3/8" fiber material, with bituminous binder manufactured for use as concrete expansion joint material, as accepted by the Architect.

P. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615 or ASTM A706; Grade 60. Dowels for installation through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or shall be sleeved on one end for slippage.

Q. Reinforcing supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3'-0" O.C.E.W. Staggered and each support securely fastened to steel reinforcement in place. Bottom bars in footings may be supported with 3" concrete blocks with embedded wire ties. Concrete supports without wire ties will not be allowed.

R. Curing Compound (for exterior slabs only): Burke Aqua Resin Cure by Burke by Edoco, 1100 Clear by W.R. Meadows or accepted equal. Water based membrane-forming concrete curing compound meeting ASTM C 309 and C1315.

S. Concrete Bonding Agent: Weld-Crete by Larson Products Corp., Daraweld C by Grace Construction Products or accepted equal.

T. Patching Mortar: Meadow-Crete GPS, one-component, trowel applied, polymer enhanced, shrinkage-compensated, fiber reinforced, cementitious repair mortar for horizontal, vertical and overhead applications as manufactured by W.R. Meadows or accepted equal.

U. Non-shrink Grout: Masterflow 713 Plus by Master Builders or approved equal. Premixed, non-metallic, no chlorides, non-staining and non-shrinking per CRD-C621, Corps of Engineers Specification and ASTM C 1107, Grades B and C.

V. Aggregate Base: Class 2 AB per Caltrans specification section 26-1.02A.

W. Joint sealant for expansion joints: Single component silicone sealant, Type S, ASTM D5893.

1. Reference Standard: ASTM C920, Grade P, Class 25, Use T.
2. Dow Corning 890-SL (self-leveling) Silicone, or accepted equal.
3. Dow Corning 888-NS (non-sagging) Silicone, at slopes exceeding 5%. May not be used at asphalt surfaces.
4. Color: Custom color as selected by Architect.

X. Pre- Formed plastic Expansion Joint; W.R. Meadows 3/8" "Snap Cap", Tex-Trude expansion joint cap, or an approved equal.

Y. Adhesive Anchoring (Epoxy): Hilty HIT-HY 200 Safe Set, or approved equal.

2.2 CONCRETE DESIGN AND CLASS

A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.

1. Class "B": Concrete shall have 1" max. size aggregate, shall have 3000 psi min. at 28 day strength with a maximum water to cementitious ratio no greater than 0.50. Use for exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb & gutter and other concrete of like nature.
2. Class "D" concrete of 1" max. size aggregate shall have 3500 psi 28 day strength with a maximum water to cementitious materials ratio of 0.55. Use for footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".

B. Slump Limits: Provide concrete, at point of final discharge, of proper consistency determined by Test Method ASTM C143 with a slumps of 4" plus or minus 1".

C. Mix Design: All concrete used in this work will be designed for strength in accordance with provisions of ASI 318-14 Section 26.4. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review. Fly ash may be used in concrete to improve workability in amounts up to 15% of the total cementitious weight.

D. Air Entrainment; Provide at concrete paving / flatwork, including concrete ramps and stairs, per the Local Jurisdiction minimum requirements, but no less than 3%.

2.3 MIXING OF CONCRETE

A. Conform to requirements of CBC, Chapter 19A.

B. All concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.

C. Concrete shall be Ready-mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94 and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3.1, when approved by Structural Engineer and DSA.

1. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
2. Licensed Weighmaster to positively identify materials as to quantity and to certify to each load by ticket.
3. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt and will transmit two copies of record to DSA.
4. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished conforms in every particular and to proportions established by mix designs.
5. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
6. Water may be added be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded. In no case shall more than 10 gallons of water shall be added to a full 9 yard load, or 1 gal. per yard on remaining concrete within the drum providing load tag indicates at time of mixing at plant will allow for additional water.

2.4 MATERIALS TESTING

A. Materials testing of concrete and continuous batch plant inspection may be waived in accordance CBC Sections 1705A.3.3 when approved by Structural Engineer and DSA.

B. Testing of concrete shall be performed per article 3.12 of this specification.

2.5 EQUIPMENT

A. Handling and mixing of concrete: Project Inspector may order removal of any equipment which in his opinion is insufficient or in any way unsuitable.

PART 3 - EXECUTION

3.1 APPROVAL OF FORMS AND REINFORCEMENTS

A. Forms and reinforcements are subject to approval by the Project Inspector, and notice of readiness to place first pour shall be given to DSA, Architect and Structural Engineer 48 hours prior to placement of concrete. Before placing concrete, clean tools, equipment and remove all debris from areas to receive concrete. Clean all reinforcing and other embedded items off all coatings oil, and mud that may impair bond with concrete.

B. All reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.

C. All reinforcing bar lap splices shall be staggered a minimum of 5 ft.

D. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.

1. The bars shall be placed so that there will be a minimum of 1 ½" clearance and a maximum of 3" clearance. The reinforcing steel shall be placed mid-depth of concrete slab.

E. At all right angles or intersections of concrete walks, additional 2'x2' #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2" from concrete forms and supports at mid-depth of slab.

3.2 PROTECTION

A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.

B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.3 CLEANING

A. Reinforcement and all other embedded items at time of placing concrete to be free of rust, dirt oil or any other coatings that would impair bond to concrete.

B. Remove all wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.

3.4 FORMING

A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.

B. Build forms to shapes, lines, grades and dimensions indicated. Construct form work to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.

C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.

E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.

F. Slope tie-wires downward to outside of wall.

G. Brace, anchor and support all cast-in items to prevent displacement or distortion.

H. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.

I. Concrete paving, Curbs, Curb and Gutters, Ramps:

1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20' for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required. Expansion joints shall not exceed ¼ inch depth measured from finish surface to top of felt or sealant, and ½ inch width.
2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60' on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
3. Isolation Joints: 3/8" felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
4. Exterior Concrete Paving: Install expansion joints at 20' on center maximum, both directions, unless shown otherwise on plans.

3.5 FORM COATING

A. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.

B. Before re-using form material, inspect, clean thoroughly and recoat.

C. Seal all cut edges.

3.6 INSTALLATION

A. General: Reinforcement shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC. Keep a person on the job to maintain position of reinforcing as concrete is placed. Reinforcement must be in place before concreting is begun. Install dowels as shown on drawings. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences. All expansion and construction joints in concrete shall have dowels of size and spacing as shown, or as approved by Architect.

B. Placing Tolerances:

1. Per ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
2. Clear distance between parallel bars in a layer shall be no less than 1", the maximum bar diameter not 1 ½ times the maximum size of coarse aggregate.

C. Splices:

1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports and stagger splices at adjacent splices 5 foot minimum. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:

   a. Lap splices in concrete: Lap splice lengths shall not be less than 62 bar diameter for No. 5 bar, 56" minimum for No. 6 bars. No. 4 bar shall have a minimum of 24" splice. 93 bar diameters for No. 7 bars and larger.
   b. Lap splices in CMU: Lap splice lengths not less than 75 bar diameters; 40" minimum, unless otherwise shown. Bars of size #8 and larger shall be spliced by welding or by approved mechanical connectors. Mechanical connectors shall develop 125% of the specific yield strength of the bar in tension. See Article 3.02D.1.c for welded splice requirements.
   c. All splices shall be staggered at 5 feet minimum.

3.7 INSPECTION

A. Approval of reinforcing steel, after installation, must be received from Inspector. Architect, Structural Engineer and DSA must be notified 48 hrs. in advance of beginning of concrete placement operations.

3.8 PLACING OF CONCRETE

A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to the owner.

B. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.

C. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.

D. Remove form spreaders as placing of concrete progresses.

E. Place footings as monolithic and in one continuous pour.

F. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.

G. Compacting: All concrete shall be compacted by mechanical vibrators. Concrete shall be

thoroughly worked around reinforcement and embedded fixtures and into corners of forms. Vibrating shall not be applied to concrete which has already begun to initially set nor shall it be continued so long as to cause segregation of materials.

H. Concrete Paving:

1. All concrete paving shall be formed and finished to required line and grades. Concrete paving shall be true and flat with a maximum tolerance of 1/8" in 10'for flatness. Concrete paving which is not flat and are outside of the maximum specified tolerances shall be made level by the Contractor at no additional expense to the Owner.
2. Thoroughly water and soak the concrete paving subgrade as required to achieve required moisture content prior to the concrete pour. Provide damming as required to keep water within the formed area and to allow for proper saturation of the subgrade.
3. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.

I. Placing in hot weather: Comply with ACI 305R-10. Concrete shall not exceed 85 degrees F at time of placement. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.

J. Placing in cold weather: Comply with ACI 306R-16. Protect from frost or freezing. No antifreeze admixtures are permitted. When deposited concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

K. Horizontal construction joint: Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.9 CONCRETE FINISHES

A. Concrete Paving Finishing: Finish surface as required by ACI 302.1R. Use manual screeds, vibrating screeds to place concrete level and smooth. Use “jitterbugs” or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness. After tamping the concrete, wood float surface to a true and even plane. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface. While concrete is still wet but sufficiently hardened to bear a persons weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel. Surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8" in 10'. Provide final finish as follows:

1. Flatwork, medium broom finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
2. Under no circumstances can water be added to the top surface of freshly placed concrete.

B. Curb Finishing: Steel trowel.

C. Joints and Edges: Mark-off exposed joints, where indicated, with ¼" radius x 1" deep jointer or edging tool. Joints to be clean, cut straight, parallel or square with respect to concrete walk edge. Tool all edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.

1. The expansion joints shall be full depth as shown in the plan details. Failure to do so will result in non-compliance and shall be immediately machine cut by the contractor at his expense.

D. Exposed Concrete Surface Finishing (not including top surface of flatwork): Remove fins and rough spots immediately following removal of forms from concrete which is to be left exposed. Damaged and irregular surfaces and holes left by form clamps and sleeves shall be patched with grout. Tie wires are to be removed to below exposed surface and holes pointed up with neat cement paste similar to procedure noted under "Patching" below. Removal of tie wires shall extend to distance of 2" below established grade lines. Ends of tie wires shall be cut off flush at all other, unexposed locations. Care shall be taken to match adjacent finishes of exposed concrete surface. After patching, all concrete that is to remain exposed, shall be sacked with a grout mixture of 1-part cement, 1 1/2- parts fine sand and sufficient water to produce a consistency of thick paint. After first wetting the concrete surface, apply mixture with a brush and immediately float entire surface vigorously using a wood float. Keep damp during periods of hot weather. When set, excess grout shall be scraped from wall with edge of steel trowel, allowed to set for a time, then wiped or rubbed with dry burlap. Entire finishing operation of any area shall be completed on the same day. This treatment shall be carried to 4" below grade, and all patching and sacking shall be done immediately upon removal of the forms.

3.10 CURING

A. Cured Concrete in Forms: Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.

B. Concrete paving, Curb, Curb and gutter, Valley Gutter: Cure utilizing Curing Compound. If applicable, the Contractor shall verify that the approved Curing Compound is compatible with the approved colorant system. Upon completion of job, wash clean per manufacturer's recommendations.

1. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the owner.

C. No Curing Compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, run ways, etc.

3.11 DEFECTIVE CONCRETE

A. Determination of defective concrete shall be made by the Architect or Engineer. His opinion shall be final in identifying areas to be replaced, repaired or patched.

B. The Owner reserves the right to survey the flatwork, if it is determined to be outside of the maximum tolerance for flatness. If the flatwork is found to be out of tolerance, then the Contractor will be required to replace concrete. The Contractor will be responsible for reimbursing the Owner for any surveying costs incurred. Determination of flatwork flatness, surveying and any remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided and the new flatwork or flatwork repairs are properly cured.

C. As directed by Architect, cut out and replace defective concrete. All defective concrete shall be removed from the site. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.

D. Permission to patch any area shall not be considered waiver of right, by the Owner, to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.

E. Defective concrete is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Excessive Shrinkage, Traverse cracking, Crazing, Curling; or Defective Finish. Remove and replace if repair to an acceptable condition is not feasible.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Expansion joint felt that is not isolating the full depth of the concrete section, and recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.

F. Patching: Install specified Patching Mortar per manufacturer's recommendations. REPAIRS TO DEFECTIVE CONCRETE WHICH AFFECT THE STRENGTH OF ANY STRUCTURAL CONCRETE MEMBER OR COMPONENT ARE SUBJECT TO APPROVAL BY THE ARCHITECT AND DSA.

3.12 CONCRETE TESTING

A. Comply with CBC Section 1903A, 1905A.1.16, 1910A AND 1705A.3 and as specified in B. below. Costs of tests will be borne by the Owner.

B. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.

C. Strength tests will be conducted by the Testing Lab on one cylinder at seven (7) days and two cylinders at twenty-eight (28) days. The fourth remaining cylinder will be available for testing at fifty-six (56) days if the 28-day cylinder test results do not meet the required design strength.

D. On a given project, if the total volume of concrete is such that the frequency of testing required by paragraph B. above would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.

E. Cost of retests and coring due to low strength or defective concrete will be paid by Owner and back-charged to the Contractor.

F. Each truck shall be tested for slump before concrete is placed.

3.13 REMOVAL OF FORMS

A. Remove without damage to concrete surfaces.

B. Sequence and timing of form removal shall insure complete safety of concrete structure.

C. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.

1. Vertical forms of foundations, walls and all other forms not covered below: 5 days.
2. Concrete paving edge screeds or forms: 7 days.

D. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.

3.14 SEALANT

A. Sealant Application: Apply sealant in compliance with manufacturer's application instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant. Finished joints shall be straight, uniform, smooth, and neatly finished. Remove any excess sealant from adjacent surfaces of joint utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.15 WATER REPELLENT & ANTI-GRAFFITI COATING

A. General: Provide at exposed architectural concrete where indicated.

B. Surface Preparation: Concrete must be clean, dry, and free of efflorescence and dust.

C. Application: Apply over concrete as specified in Section 07180, Water Repellents & Anti-Graffiti Coatings.

D. Protect adjacent work from overspray as recommended.

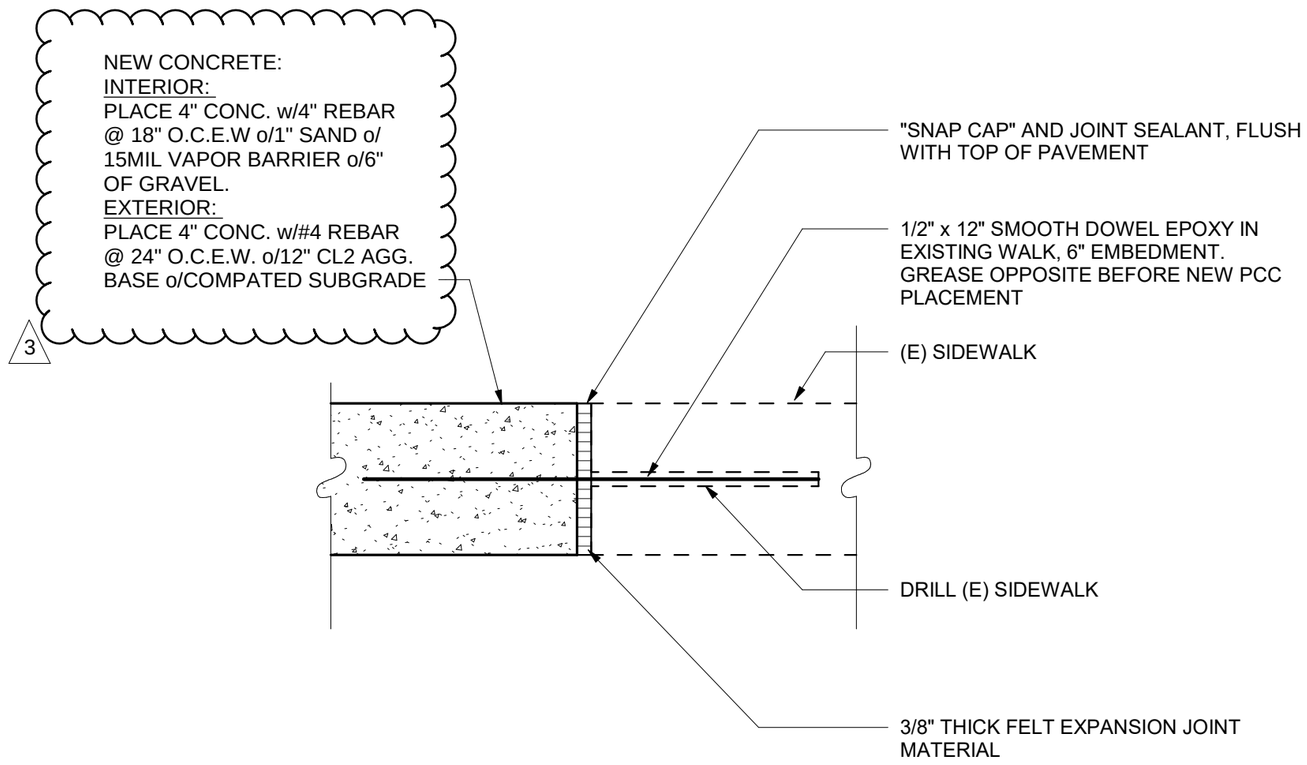
3.16 CLEANING

A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

B. Clean excess material from surface of all concrete walks and utility structures.

C. Power wash all concrete surfaces to remove stains, dried mud, tire marks, and rust spots.

END OF SECTION



10 CONNECTION TO (E) CONCRETE

3" = 1'-0"

LICENSED ARCHITECT
JEFFREY ALAN GRAU
C-14648
5/31/23
RENEWAL DATE
STATE OF CALIFORNIA

ADDENDUM 3

ALL FEATURES, NOTES AND DIMENSIONS NOT SPECIFICALLY SHOWN OR NOTED AS CHANGED SHALL REMAIN AS SHOWN ON PREVIOUSLY ISSUED DOCUMENTS.

rga+ A studio of HMC Architects

CONNECTION TO (E) CONCRETE

VILLALOVOZ ELEMENTARY SCHOOL - INC. 2

TRACY UNIFIED SCHOOL DISTRICT
TRACY, CA
DSA APP.02-120733

DATE: 02/10/23
PROJECT NO.: 1515
SHEET: AD3.01

PLUMBING FIXTURE SPECIFICATION & CONNECTION SCHEDULE

REFER TO PLUMBING SPECIFICATIONS AND INSTRUCTIONS TO BIDDERS FOR LIST OF FIXTURES THAT ARE DECLARED DISTRICT STANDARD ITEMS. THESE FIXTURES AND TRIM LABELED AS A DISTRICT STANDARD MAY NOT BE SUBSTITUTED.

ADA	SYMBOL	FIXTURE	FIXTURE MANUFACTURER AND MODEL No.	FAUCET OR VALVE MANUFACTURER AND MODEL No.	TRIM MANUFACTURER AND MODEL No.	REMARKS	VENT	WASTE		COLD WATER		HOT WATER	
								BRANCH	OUTLET	BRANCH	OUTLET	BRANCH	OUTLET
	WC-2	**WATER CLOSET** FLOOR MOUNTED FLUSH VALVE ACCESSIBLE	"KOHLER" HIGHLINE NO. K-96057-SS, FLOOR MOUNTED, ELONGATED, SIPHON JET ACTION 1-1/2" TOP SPUD, 16-7/8" RIM HEIGHT, 1.28 GPF	"SLOAN" ROYAL SFSM 111-1.28, ADA COMPLIANT, 1.28 GPF (BATTERY SIDE)	SEAT: "CHURCH" MODEL 255SSC OR "BEMIS" MODEL 3155SSCT. PROVIDE WITH SELF- SUSTAINING CONCEALED CHECK HINGES, ONE PIECE STAINLESS STEEL POST HINGES, WHITE COLOR.	WHERE USED FOR CBC ACCESSIBLE WATER CLOSETS, THE FLUSH VALVE HANDLE SHALL BE MOUNTED ON THE WIDE SIDE OF THE WATER CLOSET ENCLOSURE.	2"	4"	4"	1-1/4"	1"	--	--

3

ALL FEATURES, NOTES AND DIMENSIONS NOT SPECIFICALLY SHOWN OR NOTED AS CHANGED SHALL REMAIN AS SHOWN ON PREVIOUSLY ISSUED DOCUMENTS.

LICENSED ARCHITECT
JEFFREY ALAN GRAU
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5/31/23
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PLUMBING FIXTURE SCHEDULE A2.1.3-2

VILLALOVOZ ELEMENTARY SCHOOL - INC. 2

TRACY UNIFIED SCHOOL DISTRICT
TRACY, CA
DSA APP.02-120733

DATE: 02/10/23
PROJECT NO.: 1515
SHEET: **AD3.02**