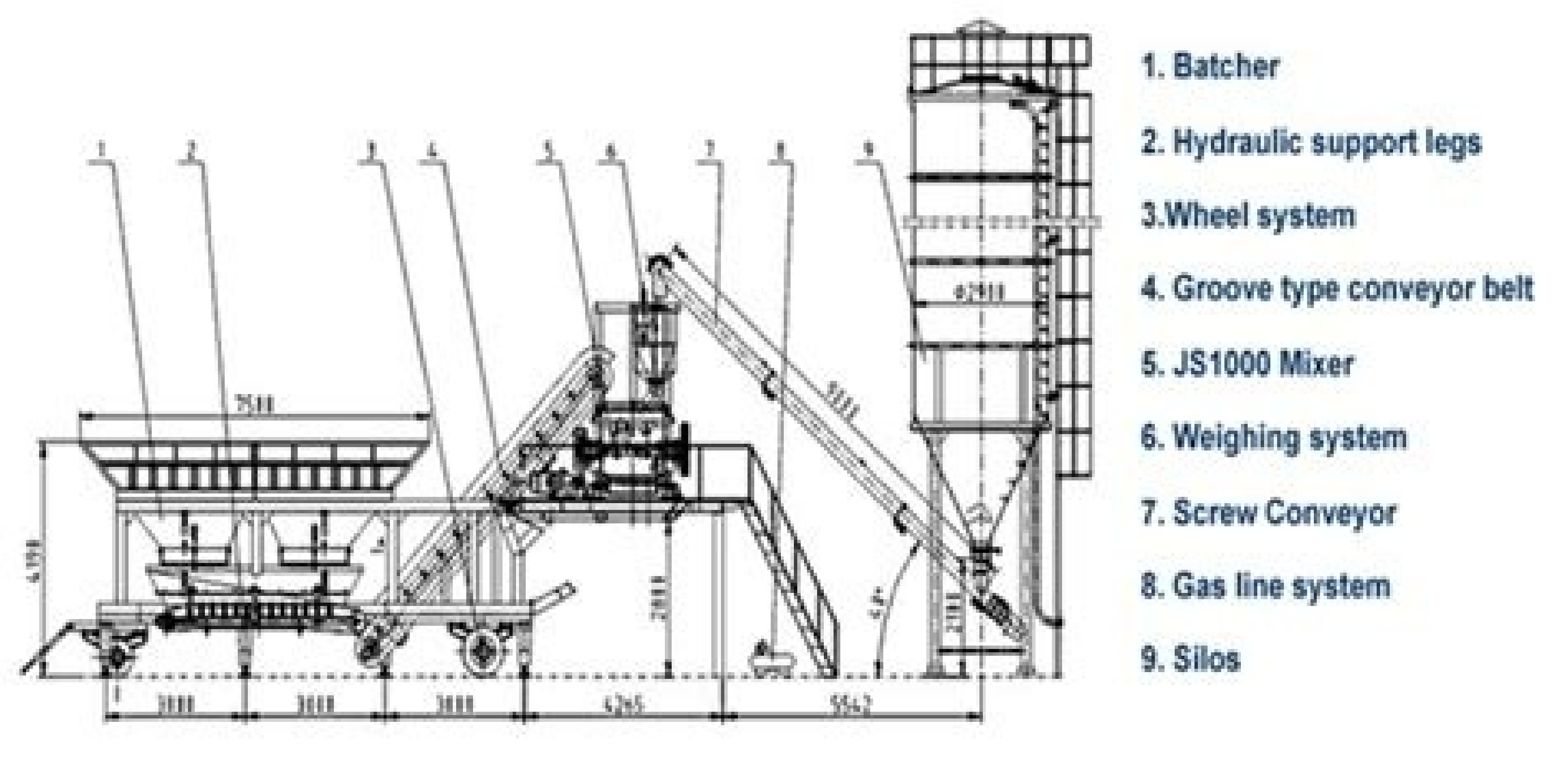
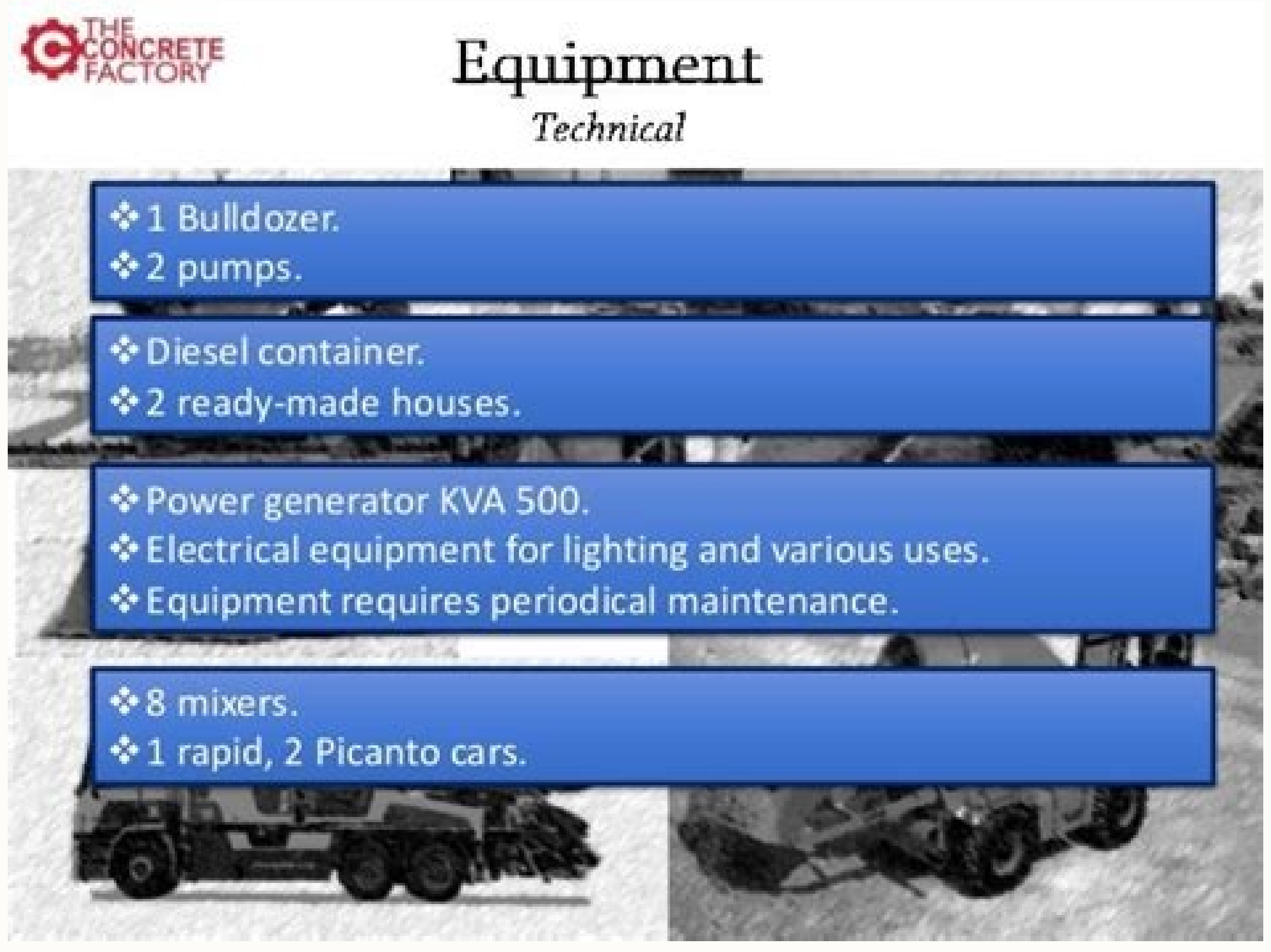
Ready mix concrete batching plant pdf





THE CONCRETE FACTORY

Equipment

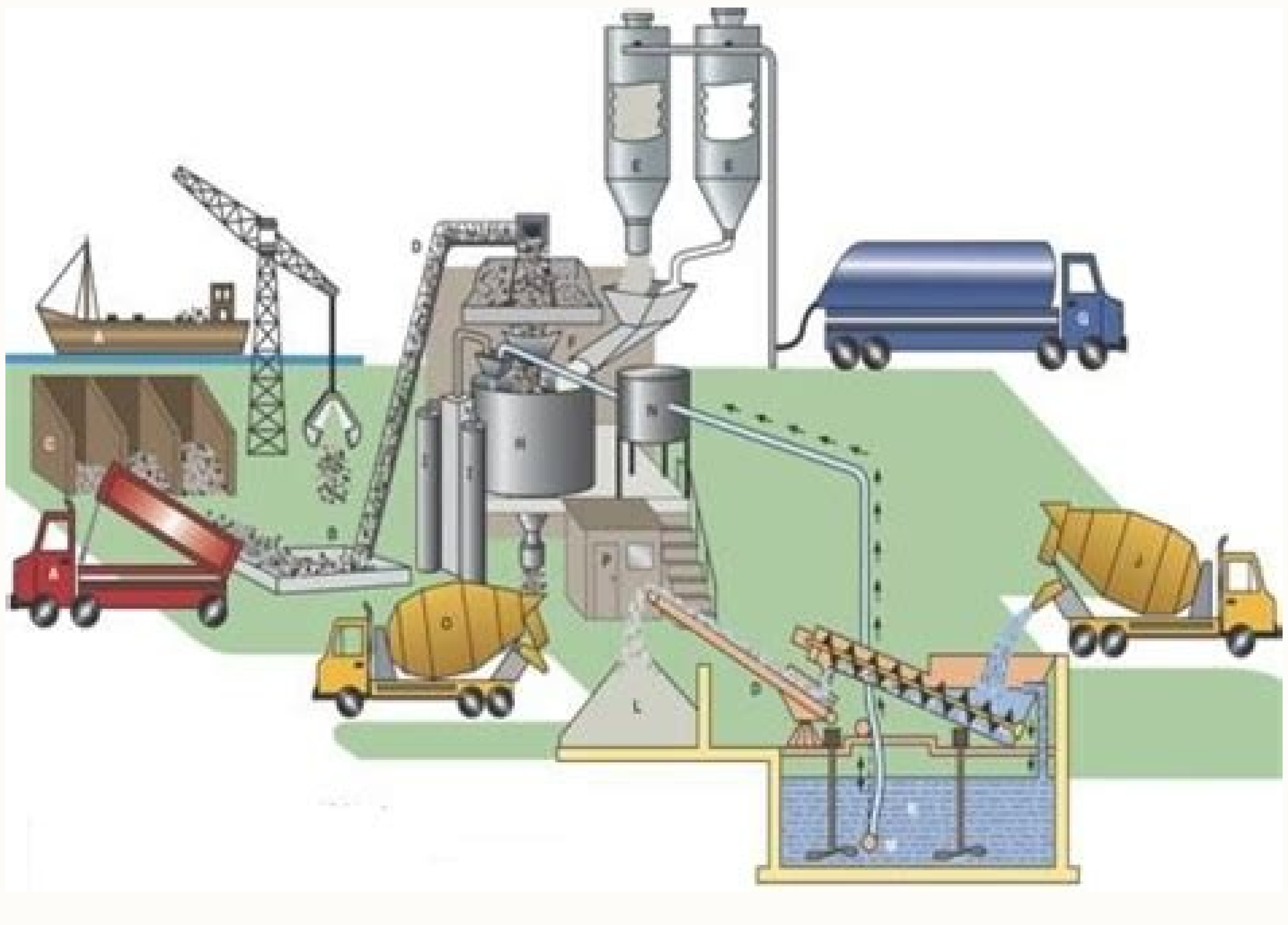
Technical

- ❖1 Bulldozer.
- ❖2 pumps.

- ❖Diesel container.
- ❖2 ready-made houses.

- ❖Power generator KVA 500.
- ❖Electrical equipment for lighting and various uses.
- ❖Equipment requires periodical maintenance.

- ❖8 mixers.
- ❖1 rapid, 2 Picanto cars.



Ready mix concrete batching plant design. Teravera corporation (ready-mix concrete batching plant). Ready mix concrete batching plant layout. Tudawe ready mix concrete batching plant. Ready mix concrete batching plant operator jobs in kuwait. Ready mix concrete batching plant manufacturers. Ready mix concrete batching plant business plan. Ready mix concrete batching plant operator jobs.

Also do not allow adding of water in excess of the amount listed in the approved mix design. Production requirements for minor concrete are contained in Section 90-2.02E, “Production,” of the Standard Specifications. Both cases leave little in the way of adjustment if problems are encountered and may result in significant delays if new mix designs are required. If the concrete’s temperature is 85 degrees F or above, or under other conditions contributing to quick stiffening of the concrete, ensure the discharge is completed within 45 minutes as specified. Refer to: Aggregate sources not on this list will impact cementitious material calculations as discussed in Section 4-9001A (2a).1, “Cementitious Material Content.” Verify with the district Materials Unit that current tests have been performed on aggregates as listed in Section 6-1, “Sample Types and Frequencies,” of this manual. Cementitious material content minimums and maximums will generally be found in the specifications covering that item of work and not in Section 90. When specified nominal values are exceeded, ensure the contractor makes adjustments. Sample concrete and fabricate test cylinders in accordance with Section 6-1, “Sample Types and Frequencies,” of this manual and specification requirements for acceptance sampling and testing. Review the sampling facilities to ensure they will deliver a sample in a safe manner that accurately represents the material. Review the current certifications of Caltrans field staff who will perform acceptance sampling and testing of the concrete. Ensure that volumetric mixers comply and operate with the requirements specified in Section 90-3.02B(3), “Mixer Requirements,” of the Standard Specifications. California Test 539, “Method of Test for Sampling Freshly Mixed Concrete.” California Test 540, “Method of Test for Making and Curing Concrete Test Specimens in the Field.” California Test 556, “Method of Test for Slump of Hydraulic-Cement Concrete.” California Test 557, “Method of Test for Temperature of Freshly Mixed Hydraulic-Cement Concrete.” Review specifications for specific concrete acceptance sampling and testing requirements and determine if additional certifications will be required for field staff performing acceptance sampling and testing. When concerns arise, accuracy checks can be made using the witness scale. Similarly, guidance contained in Section 4-9001, “General,” of this manual is applicable to self-consolidating concrete unless otherwise stated. Ensure certificates of compliance for cementitious materials and admixtures are provided. Specifications for shrinkage in Section 90-1.02A, “General,” of the Standard Specifications are not applicable to precast concrete. Perform California Test 518, “Method of Test for Density (Unit Weight) of Fresh Concrete,” to verify the unit weight, volume, and cementitious material content of concrete in accordance with the frequencies shown in Section 6-1, “Sample Types and Frequencies,” of this manual. Contact the district materials engineer for assistance in obtaining any specialty certifications. In the daily report, record any reasons for not taking initial samples. Notify the contractor when the test results do not confirm the correctness of the proportions being used. For tiers 1 and 2 members, the certificate is to be signed by the quality control manager. It is not sufficiently accurate to use the ordered batch weights. Also, check truck mixers to ensure they have the specified revolution counters. The SMR will typically verify this information for tiers 1 and 2 members. For aggregates, use the specific gravity at saturated surface-dry condition. These requirements include durability and cleanness testing requirements for coarse aggregates, and organic impurities and sand equivalent testing requirements for fine aggregates. When evaluating free water amounts, keep in mind that free water is defined as the amount of water in the mix excluding the amount of moisture in aggregates at their saturated surface dry condition. Ensure that concrete hauled in open-top vehicles is protected as specified. Identify the tier designations corresponding to the precast concrete members in the project, refer to Section 90-4.01D(1), “General,” of the Standard Specifications. Once the submitted mix design, including required supporting documentation and qualifications, has been reviewed and determined to comply with contract requirements, notify the contractor of mix design authorization for the specific intended use. Note that if liquid admixtures are used in a cumulative amount of more than 1/2 gallon per cubic yard, the amount of liquid admixture is to be considered free water. When the type or amount of concrete work doesn’t require furnishing the proposed gradation, advise the contractor and note such a decision in the daily report. Ensure truck mixers have the required metal plates containing the specified information. When applicable, ensure compressive strength test results are submitted with the mix design as specified in Section 90-2.01C, “Submittals,” of the Standard Specifications. This provision is not allowed for concrete pavements. If, because of the circumstances of long hauls or other reasons, such a calculation is not possible, you can ask the supplier for the schedule of time the drum will be operated at mixing speed. Review and document the results of acceptance testing in accordance with Chapter 6, “Sampling and Testing,” of this manual and specification requirements. Where such requests are authorized, ensure that the added water and cementitious materials do not exceed the specified ratio allowance. When concrete is being hauled in truck mixers or agitators, ensure the discharge is completed within 1-1/2 hours or 250 revolutions after introducing the cementitious material to the aggregates. Ensure the contractor will not use equipment with aluminum or magnesium components if these components will contact plastic concrete. Any difference in readings must be within the specified tolerance. Be aware that any moisture determination is calculated “as a percent of the dry aggregate.” Commonly used moisture meters measure the total moisture in the material being tested. Analyze the test results continuously and remain alert to any changes in the concrete’s uniformity or consistency. Concrete mixes should generally be designed with proportions that will produce concrete with the following qualities: The stiffest consistency (lowest penetration) that can be placed efficiently. Periodically check that the contractor is maintaining the cure through the curing period. Similarly, guidance contained in Section 4-9001, “General,” of this manual is applicable to RSC unless otherwise stated. Ensure aggregate material sources comply with Section 7-103H (2), “Surface Mining and Reclamation Act,” of this manual. You may omit initial sampling and testing if the specified aggregate is currently being used on another Caltrans contract with acceptable testing results. Ensure that withheld water is mixed as specified. Pay particular attention to concrete information, such as “cementitious material content,” “compressive strength,” “minor concrete,” “rapid strength concrete,” “precast concrete,” “self-consolidating concrete,” or “lightweight concrete.” Also, note the type of cement to be used and any special requirements for the aggregate and use of admixtures. Back to top Indicate whether oversized material will be crushed or if any special blends are contemplated. The number of revolutions at mixing speed is not considered to be as important as the total number of revolutions of mixing. Observe the cementitious material storage facilities to ensure cementitious materials are protected from moisture. The resident engineer should contact Materials Engineering and Testing Services (METS), and the district materials engineer for additional guidance on specialty concretes. Refer to: If special requirements exist for the cementitious materials, initial testing should be considered. As a part of the Material Plant Quality Program (MPQP), the district weights and measures coordinator will have completed a safety inspection of the plant facilities frequented by the Caltrans plant inspector for the plant in question. Ready-mix trucks can be verified to be empty by spinning the mixing drum in reverse immediately prior to loading. Check that the entry of water into the mixer is timed to ensure that some water is introduced in advance of aggregate and cement. The method of curing must be authorized before starting construction. Periodically check the recording of data on weighmaster certificates for truck mixers or agitators to ensure that the required information is being entered, refer to Section 90-1.01C(7), “Concrete Delivery,” of the Standard Specifications. Ensure that certificates of compliance are provided for each delivery of aggregate, cementitious material and admixtures used in calibration tests and that the material sources are the same as those that will be used for the planned work. Use the results of California Test 533, ASTM C143, and California Test 529, “Method of Test for Proportions of Coarse Aggregate in Fresh Concrete,” to determine the uniformity of concrete. Note that the SCM content requirements in Section 90-1.02B(3), “Supplementary Cementitious Materials,” of the Standard Specifications do not apply to precast concrete. However, specifications for moisture content in the fine aggregate and batch proportion calculations are based on the free moisture rather than the total moisture content. 4-9001A (2a) 1 Cementitious Material Content The cementitious material content is limited, and the design must conform to the specified limited amounts and requirements of Section 90-1.02B, “Cementitious Materials,” of the Standard Specifications. Associated guidance may be found in this manual in the corresponding section (for example, Section 4-51, “Concrete Structures,” of this manual) or Bridge Construction Records and Procedures manual. When nonagitating equipment is used, ensure the discharge is completed within 1 hour as specified. 4-9001A (2a) 5 Volume Verify that individual mix design constituent volumes total to a cubic yard by using the weights and specific gravities of the constituents. Concrete subject to these exposure areas will be designated in the contract. Concrete exceeding maximum specified values is not to be used in the work. Similarly, guidance contained in Section 4-9001, “General,” of this manual is applicable to precast concrete unless otherwise stated. Verify that proposed “X” values are within allowable ranges for each sieve size. Periodically determine the concrete’s temperature to ensure it falls within the specified values. 4-9001A (2) Check of Mix Design Before use of any concrete, the contractor is required to submit in writing a copy of their mix designs. 4-9001D Payment Measurement and payment must comply with the applicable sections of this manual and the special provisions, Standard Specifications, and Bridge Construction Records and Procedures manual. Note that for concrete aggregate to be considered innocuous, both coarse aggregate and fine aggregate sources must be listed on the Authorized Material List. 4-9001A (1c) Admixtures Before work begins, do the following for admixtures: Ensure admixtures are a type allowed by the Standard Specifications or special provisions. Following are common test methods: California Test 125, “Methods of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections.” California Test 504, “Method of Test for Determining Air Content of Freshly Mixed Concrete by the Pressure Method,” if air entrainment in concrete is required. Ensure that the contractor measures aggregate moisture under California Test 223, “Method of Test for Surface Moisture in Concrete Aggregates by the Displacement Method (Field Method),” every 2 hours during production and that the information is being submitted at the end of each production shift. Record all tests and keep them in the project files. Once the precast quality control plan has been submitted and prior to production, hold a quality control meeting with the SMR and contractor to discuss. Ensure the plant or mixer has the specified automatic timing device. Where more than one admixture is proposed in the mix design, remind the contractor that admixtures must be compatible with each other to realize effectiveness of the admixtures. 4-9004A Before Work Begins Review precast concrete specification requirements and note any special requirements including specified exceptions to those of general concrete. If the concrete is designated by compressive strength, obtain certified test data or trial batch test results in advance of the concrete use to avoid delays. Examine mixers to ensure that blades are not worn. However, a minimum of 70 revolutions is a good rule of thumb. For more details about cementitious materials sampling and testing, refer to Chapter 6, “Sampling and Testing,” of this manual. Refer to Section 90-2, “Minor Concrete,” of the Standard Specifications for additional information on minor concrete. Be sure to review any contract item specifications that require minor concrete as they may have additional or modified concrete requirements. Note that these requirements specifically exclude certain sections of proportioning, mixing, and transporting concrete requirements in Section 90-1, “General,” of the Standard Specifications. Certain concrete or exposure areas may also specify water to cementitious material ratio requirements on the concrete. When automatic batching is used, the timing device must be interlocked with the mixer discharge mechanism as specified. Be aware that if the submitted mix design uses an authorized water-reducing admixture at the authorized dosage, the specified cementitious material content may be reduced up to 5 percent by weight under Section 90-1.02E(2), “Chemical Admixtures,” of the Standard Specifications. Contact the district’s weights and measure coordinator to witness the accuracy checks, recalibrations, and spot calibrations (cement proportion system only). 4-9003C Payment Where volumetric mixer calibration is performed more than 100 miles from the project limits, ensure that the specified deduction amount is taken for each calibration session. Also, refer to the corresponding Sections 4-40, 4-41, 4-50, 4-51, 4-72, and 473 of this manual. Ensure that aggregate moisture test results, log of production data and test samples of freshly mixed concrete for uniformity testing are submitted. Review the data and results for contract compliance. 4-9001A (1b) Aggregates From the contractor, obtain in writing the primary aggregate nominal sizes to be furnished and their source pit locations. When authorized, water withheld during batching can be added at the delivery point to truck mixers. See that mixers are free of accumulations of hard concrete or mortar. Ensure that the aggregate gradations to be used are provided as an informational submittal. Do not allow anyone to drive or place equipment or loads on the pavement when those loads are greater than those allowed by the contract. Determine whether the stockpiled aggregate is similar to material upon which the mix design was based. When concrete has a described 28-day compressive strength greater than 3600 psi or a minimum concrete compressive strength is specified as a prerequisite to applying loads or stresses to a concrete structure or member or as specified, the contractor must prequalify the concrete before its use in the work. The concrete must arrive with a weighmaster certificate that contains the specified information. Prohibit theoretical or target batch weights as substitutes for actual scale weights. As the concrete is placed, ensure that it is homogeneous and thoroughly mixed and that no lumps or evidence of undispersed cementitious material exists. 4-9001A (5) Compressive Strength If the 28-day compressive strength described is 3600 pounds per square inch (psi) or greater, the concrete is designated as compressive strength. When differences exceed specified values, require the contractor to improve the mixing operation. Ensure that the minor concrete mix design contains at least the minimum amount of cementitious materials specified. Similarly, guidance contained in Section 4-9001, “General,” of this manual is applicable to minor concrete unless otherwise stated. Ensure the proportioning is corrected if constant mixing is necessary at the discharge point. Reject (based on penetration or slump) excessively wet batches discharged from mixers and do not use in the work. Ensure a trial batch test report is submitted including test results for the tests specified in Section 90-5.01D(2)(c), “Prequalification of Mix Design,” of the Standard Specifications. Ensure that production data is provided at the end of each production shift in the format specified. If aggregate test data is not available, obtain initial samples of aggregate to be used and have them tested for all specified attributes. Note that the contractor controls a portion of the gradation requirements by proposing the “X” values within a specified allowable range for certain sieve sizes. Adequate mortar content to provide the required finish. California Test 533, “Method of Test for Ball Penetration in Fresh Portland Cement Concrete.” ASTM C143, “Standard Test Method for Slump of Hydraulic-Cement Concrete,” if specified in the applicable concrete application. Recycled concrete includes use of plastic concrete combined with fresh concrete, use of reclaimed concrete materials from unhardened concrete, and use of materials from crushed concrete. Ensure that mix designs for minor concrete are submitted and authorized prior to use on the contract. However, in many instances, a simple calculation based on the total number of mixing revolutions and the hauling time will verify compliance with the specifications. When arranging for concrete plant inspection for these elements it is important to discuss both relative importance of the element and associated sampling and testing frequencies with the plant inspector. 4-9001B (3) Curing Concrete Ensure the contractor applies the proper cure method in accordance with the specifications. Where necessary, ensure the contractor revises the mix design and submits for approval. Make a list of the various mix designs the contractor will need to submit and a note of the concrete that needs to be prequalified before use. The structural materials representative (SMR) from the Office of Structural Materials within METS will assist with review of this quality control plan, be knowledgeable of the authorized facility audit, arrange any inspections at the plant location, and monitor the contractor’s compliance with their quality control plan. Similarly, guidance contained in Section 4-9001, “General,” of this manual is applicable to lightweight concrete unless otherwise stated. Discuss these requirements with the contractor early in the contract. These proposed “X” values complete the individual gradation limit requirements of Sections 90-1.02C(4)(b), “Coarse Aggregate Gradation,” and 90-1.02C(4)(c), “Fine Aggregate Gradation,” of the Standard Specifications. The district weights and measures coordinator is responsible for the MPQP acceptance process. Require the plant operator to demonstrate the function of interlock devices. For transit-mixed concrete, you cannot determine directly from the revolution counter the requirements for minimum and maximum revolutions of mixing at the mixing speed. Refer to the specifications for these requirements. Ensure that staff is certified for sampling and testing required for items of concrete work included in the project. When various sizes are to be stored separately, require physical separation, either by space between stockpiles or some type of wall that will provide positive separation. Use caution in authorizing submittal of this information in electronic media as access to this information is needed in the field as the material is delivered and placed. During proportioning and mixing operations, do the following: Obtain and ensure that the certificates of compliance for cementitious materials are signed as specified. Examine the plant to determine whether weighing equipment matches the testing results. Review concrete washout procedures as they apply to the water pollution control plan. For example, Section 51-1.02B, “Concrete,” of the Standard Specifications contains a table for general cementitious material content requirements for structures, though special provision requirements may modify these requirements for particular concrete structural elements. Check the batch size to ensure it does not exceed the specified capacity or the limit to which the scales were tested during the MPQP. If RSC is proportioned volumetrically, the following additional guidance will apply: 4-9003A Before Work Begins Ensure that each volumetric mixer is calibrated prior to beginning production work. For reference, refer to the table in Section 6-1 of this manual. Note that Section 90-2.02C, “Aggregate,” of the Standard Specifications includes aggregate requirements for minor concrete and specifically excludes certain aggregate requirements in Section 90-1, “General,” of the Standard Specifications. Examples of these areas include concrete in corrosive environments under Section 90-1.02H and concrete in freeze-thaw areas under Section 90-1.02I of the Standard Specifications. Check for uniformity by measuring penetration with California Test 533, “Method of Test for Ball Penetration in Fresh Portland Cement Concrete.” Ensure penetration comparisons are made on two test samples of mixed concrete from the same batch or volumetric mixer load. Do not allow trucks to exceed the weight limits, especially for bridges, given in Section 5-1.37B, “Load Limits,” of the Standard Specifications, for additional information refer to Section 3-519B, “Load Limits,” of this manual. However, at very low mixer rpm and at the minimum number of revolutions, it is possible that inadequate mixing will result. Obtain samples of the aggregate in accordance with California Test 125, “Methods of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections,” and test them for the specified properties in accordance with the frequencies shown in Section 6-1, “Sample Types and Frequencies,” of this manual. Should an apparent problem with the weighing or measurement systems exist, contact the district weights and measures coordinator for the method of correcting the problem. For the surface moisture content of fine aggregate, vary the testing frequency depending on the uniformity of supply. Observe the addition of admixtures to ensure they are as shown on the authorized mix design and are dispensed in the specified manner. Attention must be paid to concrete requirements within the plans and specifications because, on most projects, there will be a need for multiple concrete mix designs for different uses, locations, and exposures. Finally, see that no leakage exists that would affect the proper water content. Note that Section 90-2.02D, “Water,” of the Standard Specifications includes water requirements for minor concrete and specifically excludes certain water requirements in Section 90-1, “General,” of the Standard Specifications. 4-9001A (2a) Checking Proportions Structure Construction’s Concrete Technology Manual contains multiple examples of concrete mix design reviews. 4-9002 Minor Concrete The general provisions of Section 90-1, “General,” of the Standard Specifications apply to minor concrete unless otherwise specified. There are multiple gradation requirements (coarse aggregate, fine aggregate, and combined aggregate) that the mix design must be checked against. Pay particular attention to which precast items will receive source inspection as opposed to those which will be inspected in the field. Therefore, ensure the moisture meter is calibrated for the absorption of the aggregate upon which it is to be used. Obtain certificates of compliance for each admixture product. If the concrete exceeds the nominal or maximum penetration or slump allowed under Section 90-1.02G(6), “Quantity of Water and Penetration or Slump,” of the Standard Specifications, take appropriate action. 4-9001B (4) Protecting Concrete Anticipate adverse weather conditions and discuss options with the contractor. There may be specific provisions concerning water allowance for the contract item that will govern. Check truck agitators to determine whether they are being operated at the speed designated by the manufacturer. Check the following when the concrete to be produced is for concrete pavement: Ensure that the plant has a moisture meter. Check additional individual gradation requirements at this time, including limitations on differences between total percentage passing adjacent sieve sizes. 4-9001A (4) Curing Concrete Review the various methods of curing concrete contained in Section 90-1.03B, “Curing Concrete,” in the Standard Specifications, and discuss with the contractor the proposed methods. 4-9001A (1a) Cementitious Materials Cementitious materials are normally accepted based on certificate of compliance, so initial samples are not taken. Use caution when reviewing and authorizing concrete mix designs that indicate maximum nominal penetration or slump values or have used the maximum amount of allowable free water within the mix design. 4-9001B During the Course of Work During the work, the resident engineer must do the following: Sample the concrete within the requirements and frequencies of Section 90, “Concrete,” and item of work sections of the Standard Specifications, and Chapter 6, “Sampling and Testing,” of this manual. Ensure any such requirements are evaluated during the mix design review. When cementitious content designates the concrete, ensure the contractor adjusts the design to compensate for any significant differences within the nominal sizes the contractor proposed. The tier designation will invoke specified requirements for those precast concrete elements. Request from the district weights and measures coordinator the material plant approval report. Measure the temperature of the concrete periodically. Ensure a copy of the authorization letter is filed in the project records. Additional information on concrete is available in Structure Construction’s Concrete Technology Manual and the Bridge Construction Records and Procedures manual: Regardless of the type of concrete to be used, recycled concrete may not be used on Caltrans contracts unless specifically allowed by the specifications. Require the contractor to submit a written plan on methods to protect the concrete if adverse weather sets in or is anticipated. Levels of plant inspection may also vary depending on prior performance of the mix, weather conditions, and uniformity history of constituents. To prevent unnecessary expense and delay, send samples that can be evaluated against the specification gradation without further processing. 4-9004 Precast Concrete The general provisions of Section 90-1, “General,” of the Standard Specifications apply to precast concrete unless otherwise specified. Note that in evaluating equation 1, for aggregate to be considered innocuous, all aggregates must be innocuous. 4-9001A (2a) 2 Water Content Section 90-1.02G(6), “Quantity of Water and Penetration or Slump,” of the Standard Specifications provides the general requirements for maximum free water allowed in concrete mix designs. Also, note that concrete in certain exposure areas will have special cementitious material requirements that need to be verified. The county sealer of weights and measures tests and seals weighing and metering devices at commercial plants. Projects in corrosive environments or freeze-thaw areas will contain additional concrete requirements. The mix design submittal needs to include written verification that arrangements have been made for obtaining test samples of these aggregates. Check that delivery trucks are completely empty, including washout water, prior to loading. Do not allow water to be added after the start of concrete discharge. While it is the contractor's responsibility to design their concrete mixes using ingredients in compliance with contract requirements, it is critical that any submitted mix design that does not meet contract requirements be brought immediately to the contractor's attention. Record the results on the daily report. Ensure that unit weight testing of lightweight concrete is performed as prescribed throughout production operations. When test results indicate, ensure the contractor makes corrections in the production operation. Revised mix designs must be approved prior to use. Ensure that RSC is properly cured. 4-9005A Before Work Begins Ensure that placement procedures are included with the proposed mix design submittal before placement of SCC. Obtain samples of the completed concrete mixture and perform tests in accordance with Section 6-1, “Sample Types and Frequencies,” of this manual. Ensure that the proper mix design is being batched and arrives at the job site. Ensure the contractor complies with their quality control plan where specified and review quality control information in a timely manner. Actual batch weights are available from the weighmaster certificate for each delivery load. SCC may only be used where the specifications allow, such as for precast concrete. For tier 3 members, the certificate is to be signed by the quality control inspector. If using a cement other than portland cement, the RSC is to be cured as recommended by the cement manufacturer. 4-9005B During the Course of Work Ensure the contractor is performing specified quality control sampling and testing for the SCC throughout production operations. Printable Version (PDF) Published: July 2019 Section 90 Concrete 4-9001 General Section 90, “Concrete,” of the Standard Specifications provides material requirements for concrete with the following descriptions: General Minor concrete Rapid strength concrete Precast concrete Self-consolidating concrete Lightweight Concrete For a complete discussion on various items using concrete, refer to Sections 40, “Concrete Pavement”; 41, “Existing Concrete Pavement”; 50, “Prestressing Concrete”; 51, “Concrete Structures”; 72, “Slope Protection”; and 73, “Concrete Curbs and Sidewalks,” among other sections of the Standard Specifications. Refer to Section 90-1.01D(5)(b), “Prequalification,” of the Standard Specifications for additional information. In general, a wood platform or hard surface, as specified in Section 90-1.02F(2), “Storage of Aggregates,” of the Standard Specifications is required for storage of the aggregate stockpile. Verify the specified information is actually on the weighmaster certificate. Obtain a certificate of compliance for the curing compound prior to its use. 4-9005 Self-Consolidating Concrete Self-consolidating concrete (SCC) is defined as flowing concrete that is capable of spreading to a level state without segregation and without the use of internal or external vibration. 4-9003B During the Course of Work Ensure that weighmaster certificates are provided for cement as required in Section 90-3.01C(4), “Weighmaster Certificate,” of the Standard Specifications. You can use California Test 223, “Method of Test for Surface Moisture in Concrete Aggregates by the Displacement Method (Field Method),” or the oven-dry method, in which case you must consider an adjustment for absorption. Ensure that the system contains the specified proportioning interlocks. During proportioning and mixing of materials, ensure the following occur in the quantities and by the methods specified: At least twice during each shift, ensure scales are balanced at zero load and inspect them for signs of sluggishness, inaccuracy, or damage. Where the contract specifies, ensure that an acceptable mock-up is placed and evaluated in accordance with Section 90-5.01D(2)(d), “Mock-up,” of the Standard Specifications prior to placing SCC for production work. 4-9001A (1) Materials Before work begins, verify that Form CEM-3101, “Notice of Materials to Be Used,” includes concrete materials such as cement, fly ash, and aggregate. The weighmaster certificate must also show the actual scale weights (pounds) for the ingredients batched. Refer to “Concrete Admixtures,” in Chapter 2 of Structure Construction’s Concrete Technology Manual for additional information on admixtures. If there are questions concerning Caltrans’ acceptance of precast concrete members, contact the SMR. Levels of field inspection of concrete elements should be addressed within the corresponding section of Chapter 4, “Construction Details,” of this manual. Whenever California Test 518 is performed, the data for batch weights must be the actual weights as observed for the batch to be tested. The curing compound must be of the type specified by the special provisions, Standard Specifications, or both. 4-9001A (2a) 3 Aggregates Aggregates for concrete must conform to Section 90-1.02C “Aggregates,” of the Standard Specifications unless specified otherwise. 4-9001A (2a) 4 Admixtures Verify that dosage amounts for each admixture within the mix design are within those listed on the Authorized Material List. Take appropriate remedial action or deductions for failing results on acceptance tests. Likewise, revisions in proportions of a previously authorized mix design will require a new mix design submittal. Compare the test results with the data upon which the design was based, and ensure the contractor takes any necessary corrective actions. For additional details, refer to Section 6-305D (2), “Trial Batches,” of this manual; the Bridge Construction Records and Procedures manual; Concrete Technology Manual; and Section 90-1.01D(5), “Compressive Strength,” of the Standard Specifications. A change of 1 percent in the moisture content of sand, if not compensated for during batching, may change the penetration of concrete as much as 3/4 inch and the compressive strength as much as 300 psi. 4-9001A Before Work Begins In general, the Standard Specifications require the contractor to determine the mix proportions for all concrete. Ensure that a certificate of compliance is provided for minor concrete and that each load is accompanied by a weighmaster certificate with the specified information. To determine the consistency of the concrete, perform California Test 533, “Method of Test for Ball Penetration in Fresh Portland Cement Concrete,” or ASTM C143, “Standard Test Method for Slump of Hydraulic Cement Concrete,” depending on the type of work identified in Section 90-1.02G(6), “Quantity of Water and Penetration or Slump,” of the Standard Specifications. With this method, you can also detect erratic weighing because of binding scales. Ensure that scales and meters have been sealed or tested as required. Admixtures must be on the Authorized Material List maintained by METS, available at: Accept admixtures by certificate of compliance from the admixture manufacturer. For sampling requirements, refer to California Test 125, “Methods of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections.” Before use for Caltrans projects, the plant scales and meters must have a current MPQP Acceptance Sticker. These are typically based on the weight of free water to the weight of cementitious materials in the mix. For proper mixing, verify that the concrete delivered in truck mixers or agitators has received the minimum number of revolutions recommended by the manufacturer. California Test 518, “Method of Test for Density (Unit Weight) of Fresh Concrete.” California Test 521, “Method of Test for Compressive Strength of Cylindrical Concrete Specimens.” California Test 523, “Method of Test for Flexural Strength of Concrete (Modulus of Rupture).” California Test 524, “Method of Test for Flexural Strength of Rapid Strength Concrete,” if using rapid strength concrete in pavement applications. You can obtain the temperature of the fresh concrete from a sample withdrawn from the mixer just before discharge or from within the forms during or immediately after discharge from the mixer. Refer to Section 6-202, “Responsibilities for Acceptance of Manufactured or Fabricated Materials and Products,” of this manual for additional information. Ensure that a trial batch and prequalification of the materials, mix proportions, mixing equipment and procedures are performed if precast concrete is not manufactured at an established precast concrete plant. Advise the contractor accordingly. Ensure that the contractor maintains a witness scale at the production site throughout the production period. Before the contractor places any concrete, the district Materials Unit will need an authorized copy of the mix design for the unit’s plant inspectors. The general provisions of Section 90-1, “General,” of the Standard Specifications apply to self-consolidating concrete unless otherwise specified. 4-9004C Payment Review payment provisions within the specifications based on the contract item number of the precast concrete element. 4-9001A (3) Proportioning The following is primarily a guide for the Caltrans plant inspector, but anyone who needs to verify that plant operations are contract compliant can also use this guide: Ensure that storage of aggregates conforms to specification requirements. Also, check that all water has been introduced by the end of the first one-fourth of the specified mixing time. For concrete used in pavement, or when required for other types of concrete, ensure that automatic devices perform the proportioning operation as specified. The lowest water demand consistent with the aggregate specified. When the unit weight or cement factor varies considerably for no apparent reason, check the accuracy of the scales. Coordinate aggregate sampling with the district materials engineer and METS. Tier 1 and tier 2 members must be produced at an authorized facility and the quality control plan must supplement the information from the authorized facility audit. Cementitious materials are required to be on the Authorized Material List at the time of mix design submittal. Ensure that prequalification data or reports and proposed mix design are submitted far in advance of placing lightweight concrete. Such materials include rugs, a water supply, or acceptable curing compound. When a specific form is not used for recording test results, such as California Test 533, record the results including a cross reference to weighmaster certificate’s load number in the daily report. Review placement, protection, curing, and staging. In the daily report, note the concrete’s temperature and decisions relating to that measurement. Review specifications and this manual concerning precast concrete items of work to determine method of acceptance. Before concrete work begins, ensure the contractor has the required curing materials and equipment onsite. Therefore, even though the county sealer has sealed the scales and meters, the interlocks must be tested and approved as for noncommercial plants in accordance with Chapter 3, Section II, “Testing and Accepting Weighing and Measuring Devices,” of the MPQP manual. 4-9001B (1) Proportioning and Mixing Operations This section is primarily a guide for the Caltrans plant inspector, but can be used by anyone who may need to verify that plant operations comply with the contract. 4-9004B During the Course of Work Ensure certificates of compliance, signed by the concrete manufacturer, are submitted for cementitious materials used in purchased precast concrete products. 4-9001C Level of Inspection Levels of inspection for concrete material operations are highly dependent upon the concrete element being constructed. When chemical admixtures are used in combination with supplementary cementitious materials (SCM), the chemical admixture manufacturer’s written instructions must include a statement of compatibility for the types and quantities of SCM being proposed. Prohibit indiscriminate additions of water to the mixer solely to increase the flow of already workable concrete. Determine whether the proportioning system is capable of full automatic operation. Also, check for sticking materials that do not discharge. At the end of that time, the operator can reduce drum speed to agitating range. Concrete mixes requiring prequalification under Section 90-1.01D(5)(b), "Prequalification," of the Standard Specifications require either certified test data or trial batch reports that include penetration or slump information. 4-9006B During the Course of Work Ensure that lightweight concrete acceptance sampling and testing are performed for penetration, air content, and compressive strength. Once the mix design’s cementitious material content has been verified, ensure that equations 1 and 2 of Section 90-1.02B(3), “Supplementary Cementitious Materials,” of the Standard Specifications have been met. Concrete needs time to attain sufficient strength to carry loads. Ensure that the contractor submits a proposed combined aggregate gradation unless this requirement is waived by the resident engineer. When adverse or difficult conditions affect concrete placement, the contractor may request that the specified penetration and free-water content limitations be exceeded under Section 90-1.02G(6), “Quantity of Water and Penetration or Slump,” of the Standard Specifications. For additional details, refer to Section 3-902E, “Weighing Equipment and Procedures,” of this manual. Refer to Sections 90-4.01C(3), “Precast Concrete Quality Control Plan,” and 90-4.01D(2), “Quality Control,” of the Standard Specifications for additional information as they pertain to tiers 1 and 2 precast concrete members. Ensure that nonagitating hauling equipment does not leak and selfcleans during discharge. Ensure that expansion test data is submitted with the mix design when required under Section 90-4.02, “Materials,” of the Standard Specifications. To determine the various types of concrete that will be required, review the contract provisions. The following narrative identifies key elements to consider during the mix design review process. 4-9001B (2) Mixing and Transporting During the work, do the following: Ensure that concrete is transported in accordance with the applicable specifications. When the concrete is designated by compressive strength, ensure the contractor takes immediate corrective action for any significant deviations in production operations from those used during the production of trial batches. When reviewing the mix design, ensure that the SCM content requirements for precast concrete meet those specified in Section 90-4.02, “Materials,” of the Standard Specifications. Recalibration of proportioning devices may also be performed with the witness scales. Check the mixer operation to ensure that the automatic timing device is interlocked as specified and that the mixing time is as specified. 4-9006 Lightweight Concrete The general provisions of Section 90-1, “General” of the Standard Specifications apply to lightweight concrete unless otherwise specified. An integral part of quality assurance is the review of the submitted concrete mix designs for compliance with contract requirements. Nominal penetration and or slump requirements must also be considered during the mix design review. Check submitted gradations for coarse and fine aggregates and verify that gradations are within the specified operating range limits. Temperature requirements for specialty concrete may vary. When air-entraining agents are used, perform California Test 504, “Method of Test for Determining Air Content of Freshly Mixed Concrete by the Pressure Method,” to determine the air content of concrete in accordance with the frequencies shown in Section 6-1 of this manual. If more than one admixture is proposed for use, admixtures must be compatible with each other. Even when a contract specifically allows or requires admixtures, check the proposed dosage rate for each specific product other than airentraining agents. 4-9006A Before Work Begins Review contract requirements and determine which concrete elements require lightweight concrete. For tiers 1 and 2 precast concrete members, ensure the contractor submits a project-specific quality control plan for authorization prior to performance of any precast activities. Batch controllers that have the ability to provide an estimate of returned concrete for rebatching must have that feature disabled. Review the mix designs for compliance with the special provisions, Standard Specifications, and contract plans, or forward the mix designs to the district Materials Unit for review. Verify the uniformity of the concrete under Section 90-1.02A, “General,” of the Standard Specifications through California Test 533, ASTM C143, or California Test 529 as applicable for the use of concrete. Perform acceptance testing of SCC in conformance with specified requirements. To avoid potential project delays and aid in the review process, encourage the contractor to submit the mix designs early in the project. During the sealing of these plants, the county sealer does not test the interlocks. For tiers 3 and 4 precast concrete members, a project-specific quality control plan is not required. Using a combined analysis of the gradations in the proportions of the mix design, determine if the combined gradation meets the gradation limits shown in Section 90-1.02C(4)(d), “Combined Aggregate Gradation,” of the Standard Specifications. If the concrete temperature is 85 degrees F or above, determine the time (less than 1-1/2 hours) that will be allowed. Where allowed, observe the hand-mixing of concrete to ensure it is being mixed in the specified manner. Make appropriate arrangements for plant inspection. Do not allow hand spraying except as allowed under Section 90-1.03B(3)(d), “Application,” of the Standard Specifications. Determine whether the equipment is capable of accepting changes in proportions or sequence of weighing individual sizes without delay. Ensure that cementitious materials can be kept separate from the aggregate until they are discharged into the mixer. For concrete in pavement, approach slabs, and bridge decks, or when other concrete shrinkage limitations are specified, ensure shrinkage test data under AASHTO T 160 is submitted and reviewed with the mix design. For a quick method, weigh a loaded and unloaded truck on platform scales. 4-9003 Rapid Strength Concrete The general provisions of Section 90-1, “General,” of the Standard Specifications apply to rapid strength concrete (RSC) unless otherwise specified. Ensure that test samples of lightweight aggregates for each gradation are taken and evaluated. Pay particular attention to the method used to prevent contamination of the aggregate. Limit this check of proportioning interlock tolerances to a visual witnessing of the maximum tolerance settings in the batch computer.

Specifications Outline Dimension: 5226-2200*5460 mm - Motor Power: 17.25 kW - Speed of Mixing Drum: 13 r/min In order to furnish the variegated desires of our clients, we have brought forth an extensive consignment of Ready Mix Concrete Machine. Our London dedicated team has over 150 years’ experience in the concrete industry and has worked on some of London’s most prestigious and complex projects. We supply ready mix concrete for domestic & commercial projects. Ready-mix concrete (RMC) is concrete that is manufactured in a batch plant, according to each specific job requirement, then delivered to the job site "ready to use".. There are two types with the first being the barrel truck or in–transit mixers.This type of truck delivers concrete in a plastic state to the site. The second is the volumetric concrete mixer. 20/12/2021 · It is a type of concrete that is mixed and prepared in a dedicated factory or batching plant following the specification of the customer away from the site and delivered using a transit vehicle. This is, in fact, an on-demand and ready-to-use concreting solution manufactured according to a set recipe and under a tech-controlled environment to ... ERP Software Solution for Ready Mix Concrete Industries, Construction, Infra Structure and Real estate Industries with RMC Batching Plant Integration, get your real time material consumption grade wise as well as Project Wise - Fleet Management and More. Concrete Plant. Ready Mix Plant; Stationary Concrete Plant; Mobile Batching Plant; Small Concrete Plant; Portable Batch Plant; Container Concrete Plant; Belt Type Batching Plant; Hopper Batching Plant; Cement Silo. Horizontal Cement Silo; Large Silo For Sale; Concrete Mixer Truck. Concrete Transit Mixer; Concrete Mixers. Twin Shaft Concrete ... Leading manufacturers of ready mix batching plants in South Africa Provide Cross-border services Manufacture fully computerized batching plants Mobile Plants built to specification One of the leaders of mixer truck manufacturers in ... 42m^3 Namib Ready Mix Plant engnetwebadmin 2020-08-13T07:02:19+02:00. ... Concrete Buckets. Gallery ... 17/03/2020 · Ready-mix concrete (RMC) is a type of concrete that is manufactured in a cement factory or the batching plant to be very precise. Ready-mixed concrete (RMC) is manufactured according to concrete mix proportions or concrete mix ratio recommended by the civil contractor or construction contractor. SIMEM means Records. On December 23rd, 2009 SIMEM received the prestigious honor of providing the batching and mixing plants needed to construct one of the largest and most important engineering works ever planned: the widening of the Panama Canal through the construction of a new system of locks. MOBILE CONCRETE BATCHING PLANTS Mobile concrete batching plants are the best choice for ready-mix concrete production on temporary work sites. Combining the durability of stationary concrete mixing plants with the flexibility of the mobile design on wheels it becomes an unmatched solution for every professional seeking portable and easy to install mobile rmc plants. With ready mix concrete, on the other hand, quality is pretty much always guaranteed, since it is manufactured in a remote batching plant using state-of-the-art engineering and the least amount of manual labor. Ready mix concrete also makes for a time-optimized solution. Ready mix concrete is a special concrete mixer used for mass concrete construction with great quality control. Ready Mixed Concrete is a tailor – made concrete that is manufactured in a factory or within a batching plant based on the standard required specifications. The prepared concrete mixed is then taken to the work site within transit mixers mounted over a truck. Smith Ready Mix Inc. has been serving Northwest Indiana’s ready-mix concrete needs since 1949. We have nine INDOT approved locations supplying concrete to Northwest Indiana, Southwest Michigan and the South suburbs of Chicago, all equipped to accommodate any size job, any time of the year, whether it be residential, commercial, or industrial. Ready mix concrete prices are priced on average between £85 – £110 depending on the quality of the concrete. They are priced per cubic metre and it’s important to know how much concrete you need before getting a price. Ready mix concrete prices are priced on average between £85 – £110 depending on the quality of the concrete. They are priced per cubic metre and it’s important to know how much concrete you need before getting a price. Now more than 13 state-of-the art concrete batching plants are at different locations of Abu Dhabi and Dubai. The management is committed to provide the customers in the construction industry with high quality ready-mix concrete, in a mutually benefiting way, complying to the international standards and as per the regulative requirements of the ... 25/03/2017 · Merits of Ready-Mix ConcreteMerits of Ready-Mix Concrete · A centralized concrete batching plant can serve a wide area. Site Mix trucks can serve a larger area including remote locations that standard trucks cannot. · The plants are located in areas zoned for industrial use, and yet the delivery trucks can service residential districts or ...

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