

State of Nevada
Department of Transportation
Materials Division

METHOD OF TEST FOR SAMPLING FRESH CONCRETE

SCOPE

This test method covers the procedure for obtaining representative samples of fresh concrete as delivered to the project site, from stationary, paving and truck mixers, agitating and non-agitating equipment, or dump trucks.

SIZE OF SAMPLE

Make the sample size to be used for strength tests and unit weight tests a minimum of 0.028 m^3 (1 ft^3). Smaller samples may be permitted for routine temperature, slump test and air content.

SAMPLING CONCRETE USING RANDOM NUMBERS

Samples of concrete for test specimens shall be taken in accordance with the following:

When the testing frequency is based on volume, the location to be sampled shall be determined by the use of the Table of Random Numbers given in Figure 1. This method depends upon the volume of the material the sample represents and the capacity of the delivery vehicle. The vehicle to be sampled is determined by the following procedure:

From the table of random numbers select a number block 1 thru 35. Do not use the same number more than once per day. Multiply the random number by the volume of the material the sample will represent. Then divide the volume obtained by the volume of one delivery vehicle. This number will represent the vehicle to be sampled. Use standard practice for rounding off, unless the random number selected indicates the unit to be sampled to be less than one. Then the unit to be sampled will be considered to be number one.

Example: Sampling concrete using Ready mix delivery vehicles. Using random number block 1, column B, and random number .482. The sample frequency is one per 100 yd^3 . Multiply $.482 \times 100 \text{ yd}^3 = 48.2 \text{ yd}^3$. Ready Mix delivery vehicle's capacity is 10 yd^3 . Divide $48.2 \text{ yd}^3 / 10 \text{ yd}^3 = 4.82$, 4.82 rounded = 5. Samples would be taken from the 5th ready mix delivery vehicle.

PROCEDURE

1. The elapsed time between obtaining the first and final portions of the composite samples shall be as short as possible, but in no instance shall it exceed 15 minutes.
 - a. Fresh concrete tests such as temperature, slump, air content and unit weight are to be performed as close to the pour site as possible. The transporting of samples for these tests could alter the test results, and should be avoided. Samples for compressive strength cylinders may be transported, if deemed necessary, but must be remixed to ensure uniformity before using.
 - b. Tests for temperature, slump or air content shall be started within 5 minutes after the sampling is complete. These tests should then be completed as expeditiously as possible after the composite sample has been fabricated. Tests for unit weight and cylinders for strength testing must be started within 15 minutes after the sampling is complete. The elapsed time between obtaining and using the sample shall be as short as possible and the sample should be protected from the sun, wind, other sources of rapid evaporation, and from contamination.
2. Sampling should be performed as the concrete is delivered from the mixer to the conveying vehicle used to transport the concrete to the forms; however, specifications may require other points of sampling. The procedures used in sampling shall include the use of every precaution that will assist in obtaining samples that are truly representative of the nature and condition of concrete sampled as follows:
 - a. Sampling from Stationary Mixers (Except Paving Mixers) - Sample the concrete at two or more regularly spaced intervals during discharge of the middle portion of the batch. Take the samples, within the 15 minute time limit and composite them into one sample for test purposes. Do not obtain samples from the very first or last portions of the batch discharge. Perform sampling by passing a receptacle completely through the discharge stream, or by completely diverting the discharge into a sample container. If discharge of the concrete is too rapid to divert the complete discharge stream, discharge the concrete into a container or transportation unit sufficiently large enough to accommodate the entire batch and then accomplish the sampling in the same manner as given above. Take care not to restrict the flow of concrete from the mixer, container or transportation unit so segregation does not occur. These requirements apply to both tilting and nontilting mixers.



- b. Sampling from Stationary Mixers used for portland cement concrete pavement (PCCP) - Sample the fresh concrete after the contents of the mixer have been discharged into the conveying vehicle and moved to the testing platform. Obtain samples from at least five different portions of the batch and composite them into one sample for testing purposes.



- c. Sampling from Paving Mixers - Sample the concrete after the contents of the paving mixer have been discharged. Obtain samples from at least five different portions of the pile and composite them into one sample for test purposes. Avoid contamination with subgrade material or prolonged contact with an absorptive subgrade. To preclude contamination or absorption by the subgrade, sample the concrete by placing five shallow containers on the subgrade and discharging the concrete across the containers. Combine the samples obtained into one composite sample for test purposes. The containers shall be of a size that is in agreement with the maximum aggregate size. In some instances, the containers may have to be supported above the subgrade to prevent displacement during discharge.



- d. Sampling from Revolving Drum Truck Mixers or Agitators - Sample the concrete during discharge of the middle portion of the batch. Repeatedly pass a receptacle through the entire discharge stream or by completely diverting the discharge stream into a sample container. Take the samples obtained within the 15 minute time limit and combine them into one composite sample for test purposes. Do not obtain samples until after all of the water and admixtures have been added to the mixer. Do not obtain samples from the very first or last portions of the batch discharge. Regulate the rate of discharge of the batch by the rate of revolution of the drum and not by the size of the gate opening.



- e. Sampling from Open-top Truck Mixers, Agitators, Nonagitating Equipment, or Other Types of Open-top Containers - Take samples by whichever of the procedures described in a, b, c, or d is most applicable under the given conditions.

TABLE OF
RANDOM NUMBERS

A	B	A	B	A	B	A	B	A	B										
1	.576 .892 .669 .609 .971	2	.730 .948 .726 .482 .824	3	.430 .858 .501 .809 .902	4	.754 .025 .402 .140 .470	5	.271 .935 .231 .396 .997	6	.870 .114 .305 .025 .392	7	.732 .153 .009 .937 .892	8	.721 .508 .420 .310 .957	9	.998 .749 .517 .253 .640	10	.239 .291 .858 .761 .463
6	.053 .810 .081 .982 .095	7	.899 .159 .277 .468 .801	8	.554 .225 .035 .334 .576	9	.627 .163 .039 .921 .417	10	.427 .549 .860 .690 .251	11	.760 .405 .507 .806 .884	12	.470 .285 .081 .879 .522	13	.040 .542 .538 .414 .235	14	.904 .231 .986 .106 .398	15	.993 .919 .501 .031 .222
11	.509 .371 .165 .477 .788	12	.025 .059 .996 .535 .101	13	.794 .164 .356 .337 .434	14	.850 .838 .375 .155 .638	15	.917 .289 .654 .767 .021	16	.887 .169 .939 .187 .894	17	.751 .569 .815 .579 .324	18	.608 .977 .592 .787 .871	19	.698 .796 .348 .358 .698	20	.683 .996 .743 .595 .539
16	.566 .901 .470 .068 .874	17	.815 .342 .682 .242 .420	18	.622 .873 .412 .667 .127	19	.548 .964 .064 .356 .284	20	.947 .942 .150 .195 .448	21	.169 .985 .962 .313 .215	22	.317 .123 .925 .396 .833	23	.472 .086 .355 .460 .652	24	.864 .335 .909 .740 .601	25	.466 .212 .019 .247 .326
21	.897 .875 .190 .341 .846	22	.877 .969 .696 .688 .355	23	.209 .109 .757 .587 .831	24	.862 .843 .283 .908 .218	25	.428 .759 .666 .865 .945	26	.117 .239 .491 .333 .364	27	.100 .890 .523 .928 .673	28	.259 .317 .665 .404 .305	29	.425 .428 .919 .892 .195	30	.284 .802 .146 .696 .887
26	.882 .464 .123 .116 .836	27	.227 .658 .791 .120 .206	28	.552 .629 .503 .721 .914	29	.077 .269 .447 .137 .574	30	.454 .069 .659 .263 .870	31	.731 .998 .463 .176 .390	32	.716 .917 .994 .798 .104	33	.265 .217 .307 .879 .755	34	.058 .220 .631 .432 .082	35	.075 .659 .422 .391 .939
31	.636 .630 .804 .360 .183	32	.195 .673 .112 .193 .651	33	.614 .665 .331 .181 .157	34	.486 .666 .606 .399 .150	35	.629 .399 .551 .564 .800	36	.663 .592 .928 .772 .875	37	.619 .441 .830 .890 .205	38	.007 .649 .841 .062 .446	39	.296 .270 .602 .919 .648	40	.456 .612 .183 .875 .685

Figure 1