Random Number Sampling Plans

A random number generator is to be used to help select random frequencies and locations for materials. Random number charts are published in a variety of publications and available on scientific calculators and computers. Other published random number charts and electronic generators are approved to use in order to generate a random sampling plan. ***Random Number Chart FDOT 2006*** is published and available at the State Materials Office Web page. *Asphalt plant and roadway quality control and verification sample random number locations are generated by the Composite Pay Factor worksheet.*

Suggestions for using Random Number Chart FDOT 2006

Determine the number of samples you plan on obtaining using the project documents.

1. Pick a number between 1 and 100. This is the row number you selected.
2. Pick another number between 1 and 7. This is the column number.
3. Enter the chart using the row and column numbers you selected.
4. Assign a unique random number from the chart for each sample you plan to obtain. You may go right to left, up or down, or left to right from the row and column you entered in step 3. If you come to a random number that does not generate a valid location for sampling, skip that number and move on to the next number in the sequence.
5. The random numbers can be used as a percentage or individual digits to select sample frequencies or locations.

Examples:

i.   Concrete

Plan for a 230 cy placement with a sample frequency of 1 per lot, 50 cy lot size.

Expect 5 lots, 1 sample for each 50 cy lot.

Pick 63 and 4 as row and column numbers to enter chart. Pick five numbers reading left to right. (0.5589, 0.4663, 0.7511, 0.6722, 0.4335)

Using the percentage method:
Lot 1 : 50 cy x 0.5598 = 27.99 , select the truck at the 29 cy point

Lot 2 : 50 cy x 0.4663 = 23.32 , select truck at the 73 cy point (23 + 50 for ***Lot 1*** = 73)
Lot 3: 50 cy x 0.7511 = 37.56, select truck at 138 cy point. (38 + 100 for lots 1&2=138)
Lot 4: 50 cy x 0.6722 = 33.61, select truck at 184 cy point. (34 + 150 for lots 1,2&3=184)
Lot 5: 30 cy x 0.4335 = 13.05, select truck at 213 cy point. (13 + 200 for lots 1 thru 4)

ii.   Earthwork Stabilized Subgrade

Contractor completes stabilization and compaction operations for a subgrade section of 1400 lineal feet with a width of 24 feet. Three ***Lots*** of stabilized subgrade. You plan for 3 density tests (1 location per ***Lot)*** and 9 stabilizing mixing depth (3 locations per ***Lot).***

Density locations:

Pick 18 and 2 as row and column numbers to enter random number chart.
Reading left to right: 0.8130, 0.3498, 0.1588, 0.1767, 0.0882, and 0.8458. Note 6 random numbers are selected as you need random distance locations from the beginning of the lot station and random width locations from the edge of the stabilized area.

Lot 1: Length, 500 x 0.8130 = 407
          Width, 24 x 0.3498 = 8.4
 Select location 407' from beginning station of ***Lot 1*** and 8.4' from the right side of the stabilized area.

Lot 2: Length, 500 x 0.1588 = 79
          Width, 24 x 0.1767 = 4.2
 Select location 79' from beginning station of ***Lot 2*** and 4.2' from the right side of the stabilized area

Lot 3: Length, 400 x .0882 = 35
          Width, 24 x .0858 = 20.6
 Select location 35' from beginning station of ***Lot 3*** and 20.6' from the right side of the stabilized area

Mixing depth check locations can be selected in a similar manner using 3 locations per **Lot.**

Tips :

1. Enter the chart at a unique location each time it is used. Avoid starting at the top, (row 1, and column 1). And reading to the right like a book each for successive chart uses.

2. Keep it simple! Close your eyes and point to a spot on the page to start if you can't decide which numbers between 1 and 100 or 1 and 7 are good starting points.
3. Avoid the temptation to pick new random numbers just because you don't agree with the random selection. You can always use Independent verification (IV) testing if the random selection is obviously missing an area of particular concern.
4. Record all the test data for every test conducted.