



TEX-225-F

Random Selection of Bituminous Mixture Samples



Why

Random sampling and testing of asphalt binder, mixture, and roadway cores is required for acceptance and payment.

Quality Control/Quality Assurance (QC/QA) specifications require random sampling for testing. This is in compliance with Code of Federal Regulations (CFR) and ensures the material tested in the laboratory is representative of what is placed in the field.



When

Random sampling of asphalt binder and loose bituminous mixtures happens during plant production. Random sampling of roadway cores is after the placement of each subplot or the entire lot, which may be the day of or the next day after completion.



How

- The Engineer generates all random numbers at the beginning of the project using an automated Microsoft Excel worksheet.
- Random numbers are between 0.001 through 0.999 for both production and placement.

Random Production Tonnages

- Production random numbers are used to determine the random tonnages for sampling loose plant-produced mixtures and asphalt binder at the hot mix asphalt plant.
- The Engineer will provide all random production numbers to the Contractor at the beginning of the project with exception to those used for blind samples.

Random Production Example

- Lot Size = 2,000 Tons
- Four Sublots in the Lot
 - Sublot Size: $2,000 / 4 = 500$ Tons
- Sublot Tonnage:
 - *Random Number x Sublot Size*
- Production Tonnage is cumulative addition of subplot tonnages.

Sublot Number	Sublot Size (A)	Random Number (B)	Sublot Tonnage (A x B)	Production Tonnage
1	500	.515	258	258
2	500	.969	485	985
3	500	.532	266	1,266
4	500	.709	355	1,855

QUICK FACTS: LEVEL 1B

Random Placement Locations

- Random numbers are used to determine the random location for taking roadway cores.
- They are used to determine the length and width offset for each subplot location.
- The Engineer will provide the placement random numbers to the Contractor only after completion of each subplot.

Random Placement Example

- Station Numbers
 - Horizontal measurement along the centerline of a project.
 - One highway station is 100 feet. First station is 0+00, next station is 1+00 (100 ft.), and next is 2+00 (200 ft.).
 - 46.8 feet is Station Number 0+46.8
 - 821.1 feet is Station Number 8+21.1
 - 2,549.5 feet is Station Number 25+49.5
- Measure the length and width of the subplot after the subplot is constructed.
 - Beginning Station = 0+00 feet
 - Lot Size (Total Length) = 6,560 feet
 - Sublot Size (Length) = 1,640 feet (Four Sublots in the Lot is 6,560/4 = 1,640)
 - Lot Width = 12 feet

Sublot Number	Sublot Length (A)	Random Number (B)	Sublot Location (A x B)	Station Number
1	1,640	.035	57.4	0 + 57.4
2	1,640	.392	642.9	22 + 82.9
3	1,640	.970	1,590.8	48 + 70.8
4	1,640	.932	1,528.5	64 + 48.5

Station Number for Sublot 2

Sublot 1 Length + Sublot 2 Location
 $1,640 + 642.9 = 2,282.9$ feet

Station Number for Sublot 3

Sublot 1 Length + Sublot 2 Length +
 Sublot 3 Location

$1,640 + 1,640 + 1590.8 = 4,870.8$ feet

Station Number for Sublot 4

Sublot 1 Length + Sublot 2 Length +
 Sublot 3 Length + Sublot 4 Location

$1,640 + 1,640 + 1,640 + 1,528.5 = 6,448.5$ feet

Sublot Number	Sublot Width (A)	Random Number (B)	Width Offset (A x B)
1	12	.175	2.1
2	12	.694	8.3
3	12	.692	8.3
4	12	.206	2.5

- Measure the width offset from the right side of the subplot facing the direction of paving.
- When the Width Offset is less than 2.0 feet, adjust it to 2.0 feet from the longitudinal joint or pavement edge.
 - Roadway cores must be taken two feet or more from the joint or edge.
 - Two-foot diameter starts at 2.0 feet from the joint or edge.