What does it take to build a fab?

An Intel semiconductor factory, or fab, is a manufacturing marvel. Every hour, every day of the year, the 70-foot-tall structure produces millions of computer chips. With many comparable in size to a football field, the chips are the most complex products on Earth. A fab — which includes 1,200 multi-million-dollar tools and 1,500 pieces of utility equipment — takes about three years, $10 billion and 6,000 construction workers to complete. Three of the fab’s four levels support the clean room, the only place where actual chip production occurs.

1. Intertellar and ten-deck (Sop level)
The top deck features systems that keep the fab cool in the dense, warm air of the clean room, particulates-free and precisely maintained at the right temperature and humidity for production. The interstellar is the highest level of the fab.

2. Clean-room level
A clean room is made up of more than 100 factory tools that bake, press, place silicon wafers and eventually turn them into millions of computer chips. Clean-room workers wear bunny suits to keep lint, hair and skin flakes off the wafers.

3. Clean subfloor level
The stairway to clean floor contains thousands of pumps, transformers, power cabinets and other systems that support the clean room, called “mainframe” servers, gauges, pipes, waste and exhaust to and from production tools, skid tanks that store water. They do wear hard hats, safety glasses, gloves and shoes.

4. Utility level
Control panels that support the fab are located here, along with the “main” large utility pipes and ductwork that feed up to the latest gases in the clean subfloor. These are in the air and compressor systems. Workers who monitor the equipment on this level wear street clothes, hard hats and safety glasses.

Fabs by the numbers

Intel has fabs in Arizona, Oregon, New Mexico, Ireland and Israel. Each fab is at least 250K square feet.

4 American football fields could fit inside the clean room.

Here are some examples of what it will take to complete one factory in Ireland.

- The heaviest delivery included chillers at 50K kilograms.
  That’s equivalent to 12 average-size African male elephants.

- The 5K on-site tradespeople recently surpassed 17K hours.
  That’s the equivalent of 1,255 calendar years.

- 35K tons of structural steel will be erected.
  That’s 5x the weight of the Eiffel Tower.

- More than 1M cubic meters of isoi and rock will be removed.
  That’s the equivalent of 400 Olympic swimming pools.

- 60K cubic meters of concrete will be poured plus 75K tons of steel reinforcement.
  This represents 2x as much used to build the Burj Khalifa in Dubai, the world’s tallest building.

- 9M meters of cable will be installed.
  That is the distance equal to 14 full transatlantic crossings.