

# Scintillator Installation

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Fermilab

# Installation with MINOS

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- Receive materials - 3 FTE
- Stage materials - 7 FTE (3 surf, 4 u/g)
- Assemble / Install - 10 FTE
- Cable/test/survey/QA - 4 FTE
- Support Staff (Supervision, Admin., network, facilities technicians) - 6 FTE
- Comments
  - > At Surface can get rid of one crew
  - > Receiving, support, staging roughly constant for reasonable numbers of crew
  - > Can do in one very busy shift or two more reasonable shifts without significant cost impact (based on MINOS as realized costing)

# The plane model

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- There are 850 planes
- Want to install in 2+ years
- Try to make 2 planes per day & 3.5 10-hour days of productive work per week
  - > Building a brick takes one team of two assemblers one brick per hour (very conserv.)
    - Each station make 2 planes worth per week
    - Need 4 station crews making bricks @ 2 FTE per station
  - > Installing a brick takes a 3FTE crew
    - Each crew installs 5 planes worth per week
  - > Installing a module takes a 3FTE crew
    - Each crew installs 5 planes worth per week
  - > Need 3 installation station crews @ 3 FTE per station

# Labor FTE roll up

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17	Plane / brick builders
4	QA / cablers
6	Support / supervision
<u>6</u>	<u>Receiving / staging</u>
33	Total

- Very comparable to MINOS in FTEs and schedule
- Cost as construction trade instead of iron workers for large fraction of construction crew

# Impact of Containerization

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- Shifts much of the labor to factories but largely maintained in level
- More pieces make some some costs go up
- Reduces staging & receiving costs
- Guess at a wash in all but scintillator module labor