CONSTRUCTION SAFTY DESIGN SOLUTION #10
DESIGN CATEGORY: ROOF/ENVELOPE
HAZARD: FALLS FROM HEIGHT
DESIGN SOLUTION: PRE-FABRICATION AND ASSEMBLY AT GROUND LEVEL TO REDUCE OVERALL TIME EXPOSURE AT HEIGHT

This design solution reduces the risk of serious falls from a height during the construction and maintenance during the life of a building. Falls from height can result in death or serious injury – about 22 fatalities per year [BLS , 2008] are reported.

SOLUTION

This design solution reduces the total exposure to falls from heights by a factor of greater than 70% when installing the large duct and attachments typical to coal plant air quality projects by pre-fabricating and assembling the duct sections on the ground.

The duct goes through an assembly line set-up where insulation and insulation covering is installed from a scaffold inside a large tent. The duct then has catwalks, permanent lighting, handrails and miscellaneous attachments installed while at ground level. When the duct is lifted into place very little high work is then required to join the sections. The scaffolding is much safer and able to be easily maintained inside the tent than if the scaffold had to be built from the ground up to insulate the duct if it was installed without insulation. The permanent lighting, handrails, cable trays installed at ground level greatly reduce the exposure to heights that would be required otherwise.

Figure 1-This photo shows the C Section of duct going into the tent.

Figure 2 – This photo shows work inside the tent.

Figure 3- Insulated before raising into place

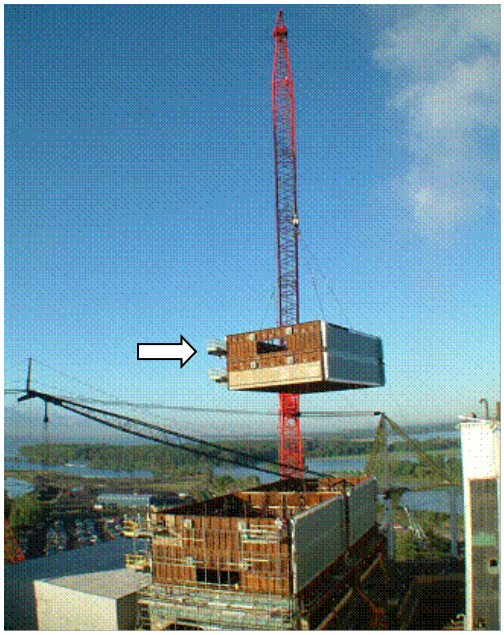

Figure 3 - Different piece, but see the permanent catwalk on left side installed before lift.

BACKGROUND INFORMATION

Applicable US Safety Regulations

1926.501 Duty to have fall protection

Link:
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10757

OTHER CONSIDERATIONS

The method is appropriate for many situations in heavy construction. In addition to prefabricating fall prevention measures eliminating much of the need the need for fall protection, productivity is greatly enhanced by installing components at ground level. Working at heights is not only more hazardous, but is also slower than working at ground level. When the guardrails, cable trays, lights or other components are installed with the duct on the ground, if some elevated work is required it's usually brief and performed from an aerial lift which is inherently safer than working from a scaffold 100 or more feet in the air.

LIFE CYCLE SOLUTION BENEFITS

By installing permanent catwalks, guardrails, and handrails future maintenance costs are reduce since personal fall protection would not be needed and the units would be more assessable.

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