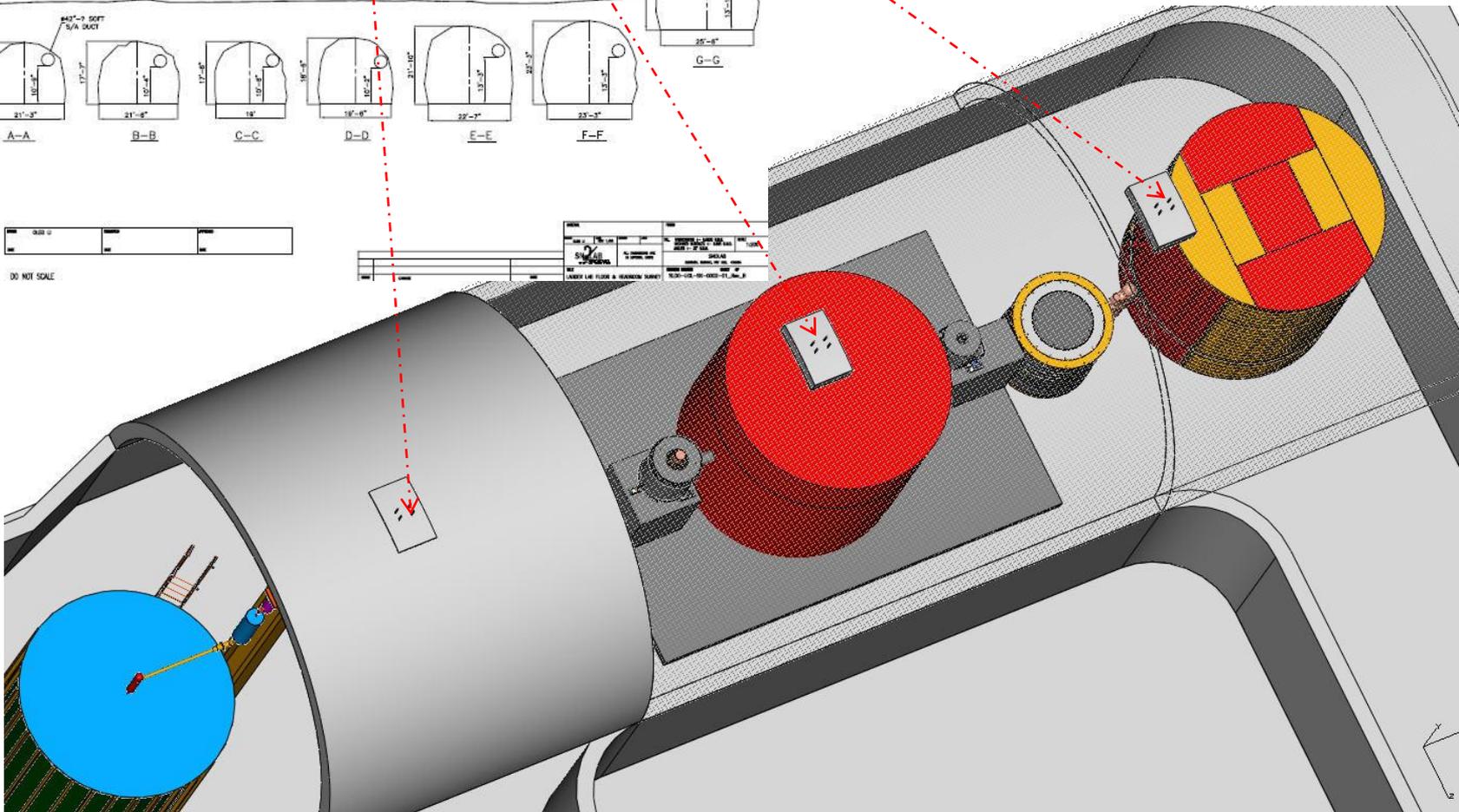
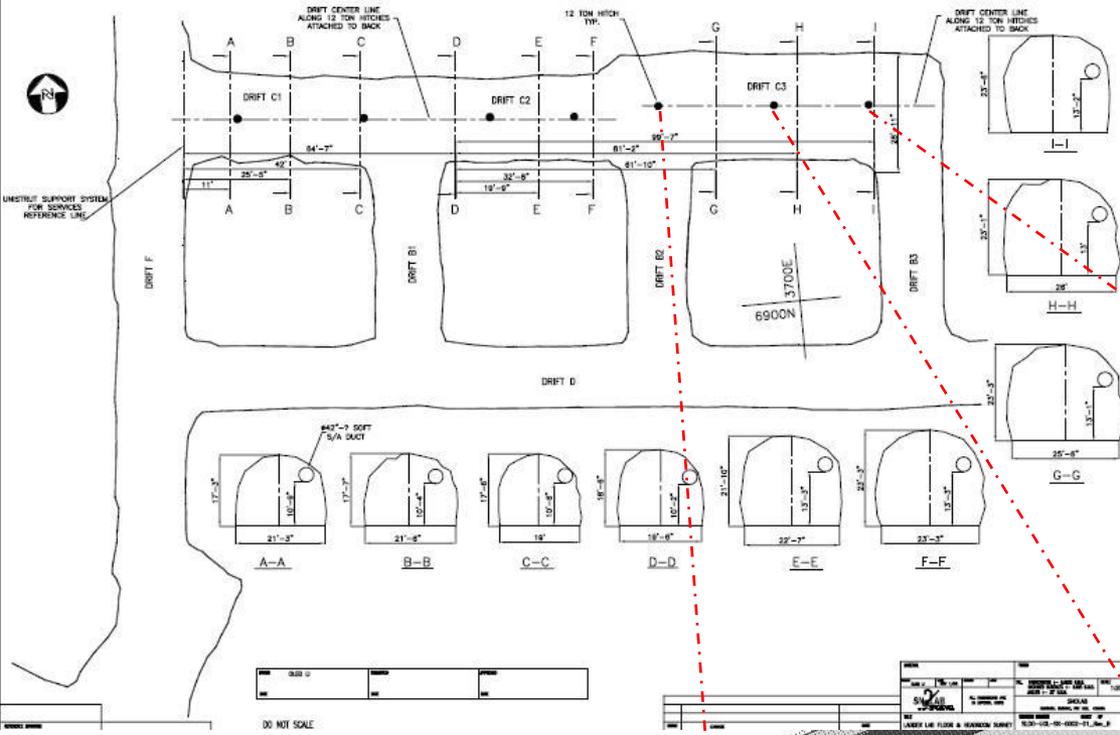


**The Design of the Monorails for
the Drift C3 Clean Room Area of
the Snolab Ladder Lab**

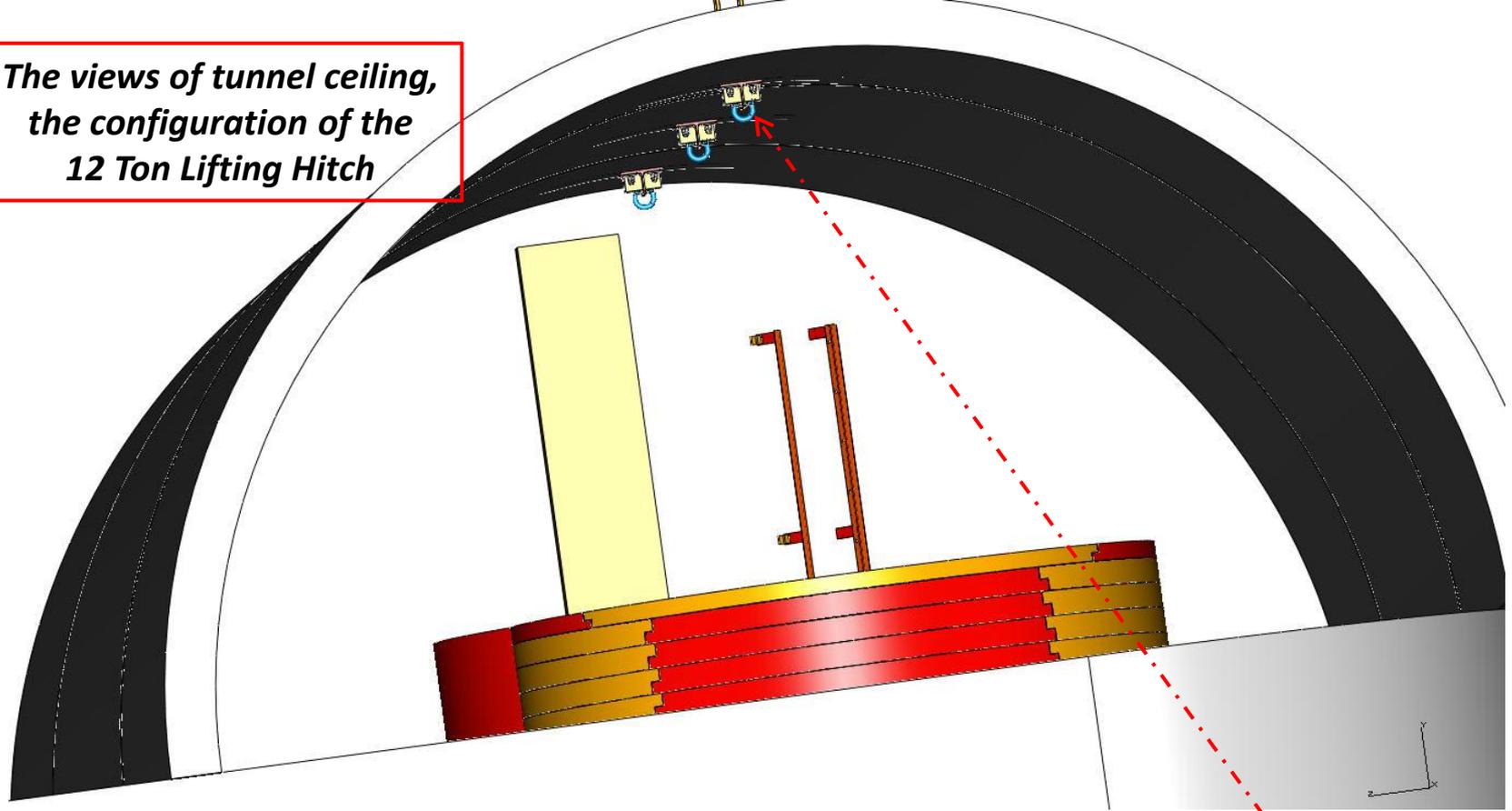
The Main Function and Design Criteria of the Monorails:

- *As a guide way for the clean room lifting hoist moving in the axial direction of the Monorail.*
- *As a structural support for the lifting hoist and the lifting objects within its lifting specifications.*
- *The individual parts must be accessible through inside of the cavern.*
- *The monorail mounted on the roof and connected with the existing threadbar which have 12 Ton lifting capacity for every 4 threadbars.*

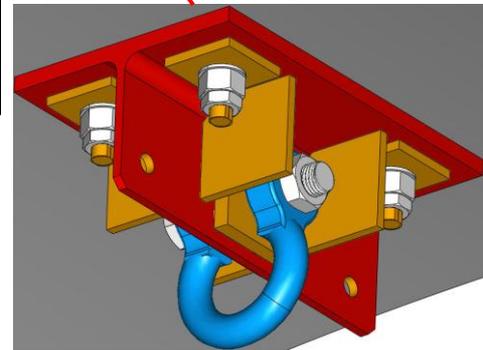
**Ladder Lab Floor
and Headroom Area**



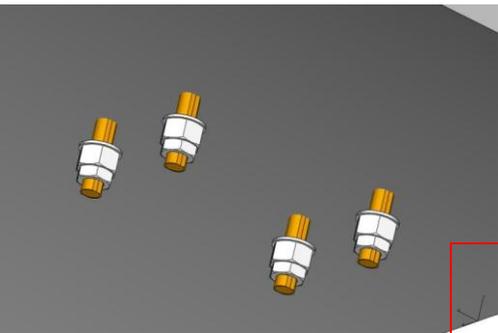
***The views of tunnel ceiling,
the configuration of the
12 Ton Lifting Hitch***



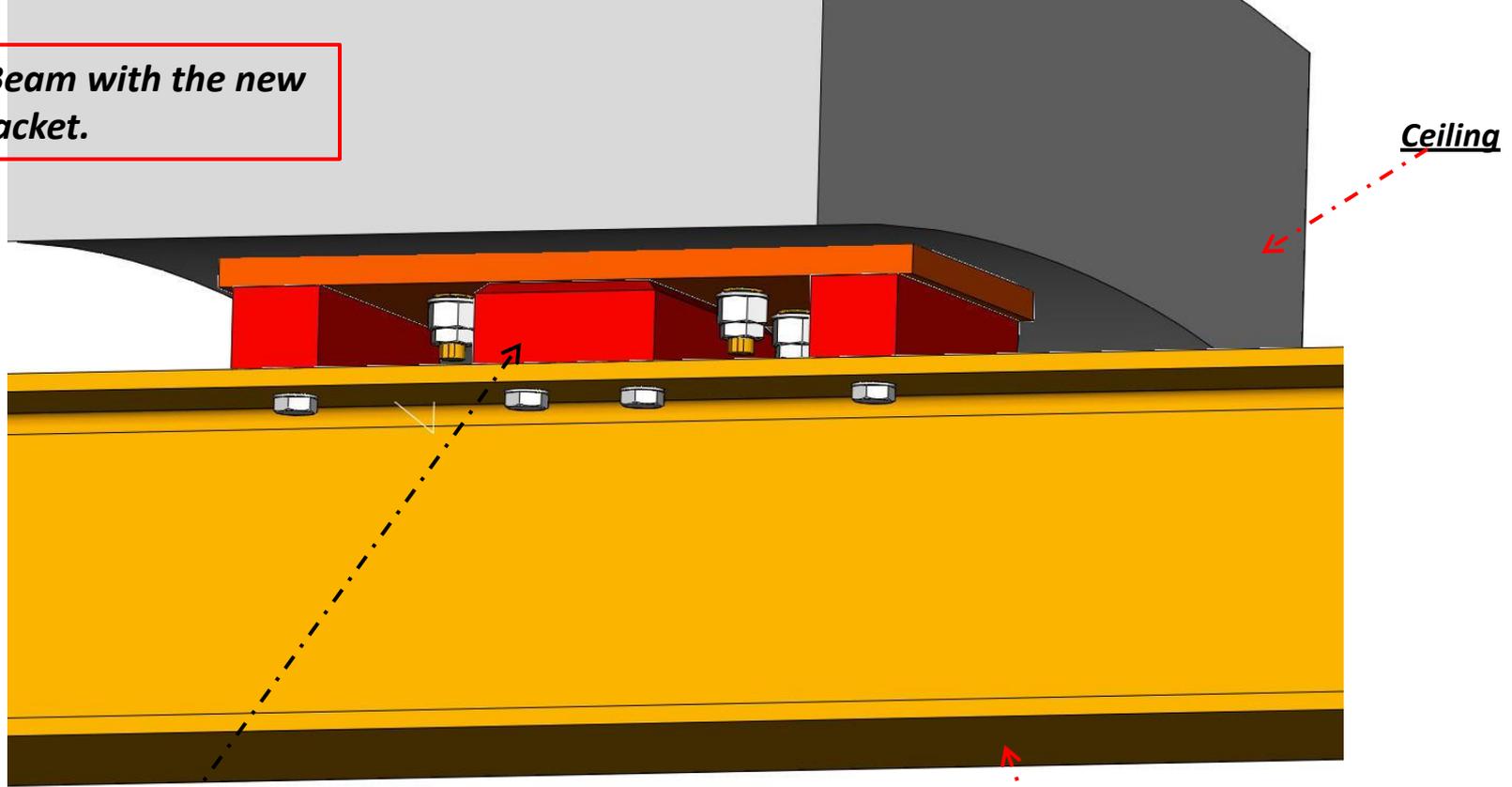
**The view of the existing
12 Ton Lifting Hitch mounted
on the ceiling**
(per dwg. #99-071-E-02649)



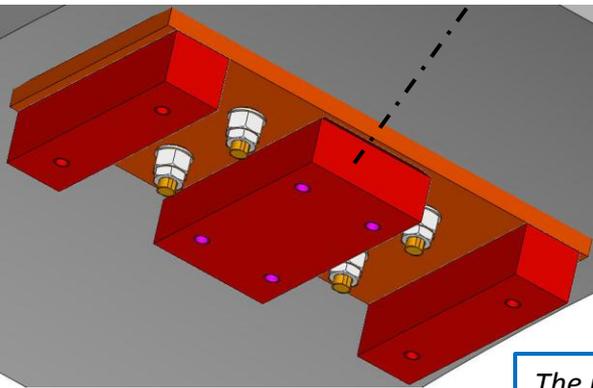
**The view of the existing 4
Dywidag Threadbar
From the tunnel ceiling**
(after removed the existing
mtg. bracket and the 12 Ton
anchor shackle)



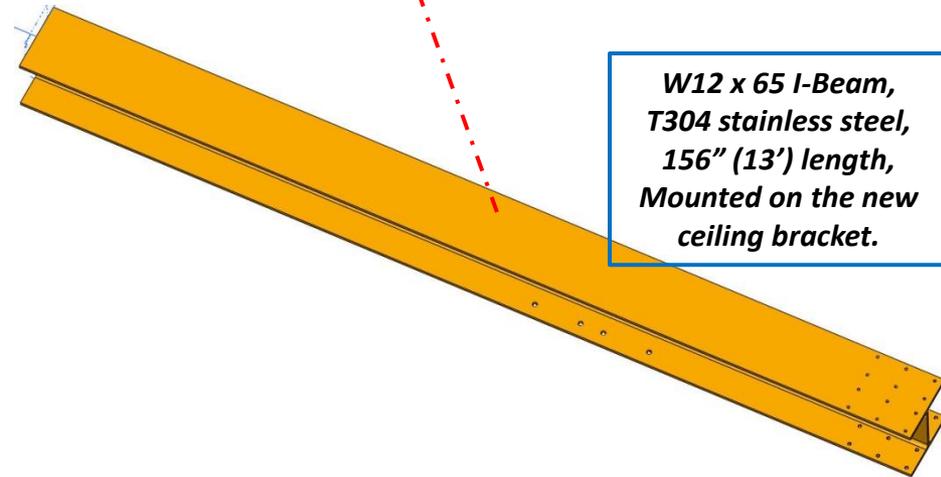
Install the I-Beam with the new mounting bracket.



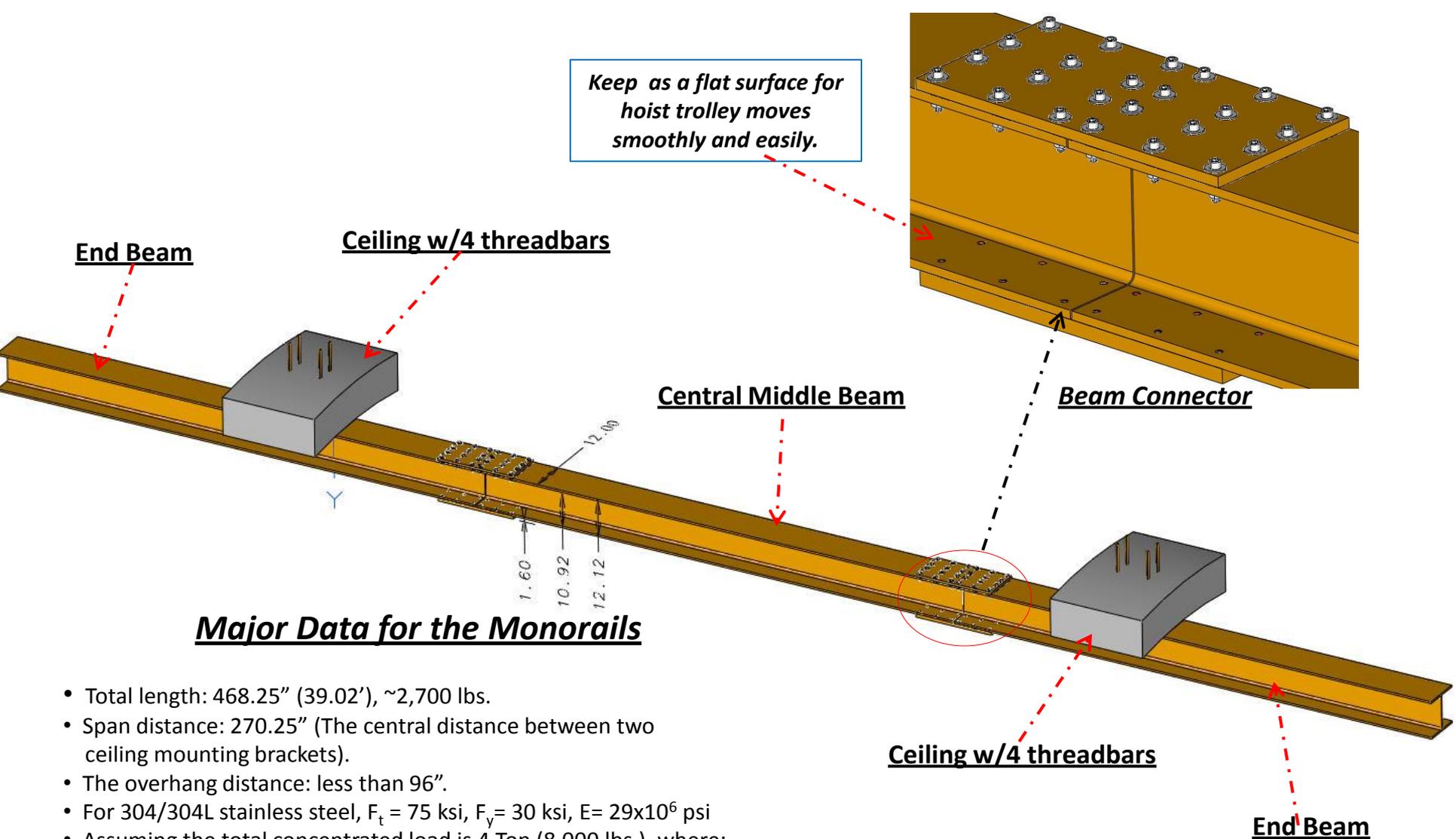
Ceiling



The new mounting bracket mounted on the ceiling with 4 existing threadbars.



***W12 x 65 I-Beam,
T304 stainless steel,
156" (13') length,
Mounted on the new
ceiling bracket.***



Keep as a flat surface for hoist trolley moves smoothly and easily.

End Beam

Ceiling w/4 threadbars

Central Middle Beam

Beam Connector

Major Data for the Monorails

- Total length: 468.25" (39.02'), ~2,700 lbs.
- Span distance: 270.25" (The central distance between two ceiling mounting brackets).
- The overhang distance: less than 96".
- For 304/304L stainless steel, $F_t = 75$ ksi, $F_v = 30$ ksi, $E = 29 \times 10^6$ psi
- Assuming the total concentrated load is 4 Ton (8,000 lbs.), where: 1,000 for the crane hoist, and 7,000 lbs below the hook.
- It is found that (per the above defined boundary condition):
 $F_b = 18$ ksi, $F_v = 12$ ksi (The allowable stresses)
 $f_{b@ctr} = 6.7$ ksi, $f_{b@end} = 9.021$ ksi, $f_v = 0.281$ ksi,
 $\Delta_{@ctr} = 0.237"$, $\Delta_{@end} = 0.1563"$

Ceiling w/4 threadbars

End Beam

Overall View of the Monorails

