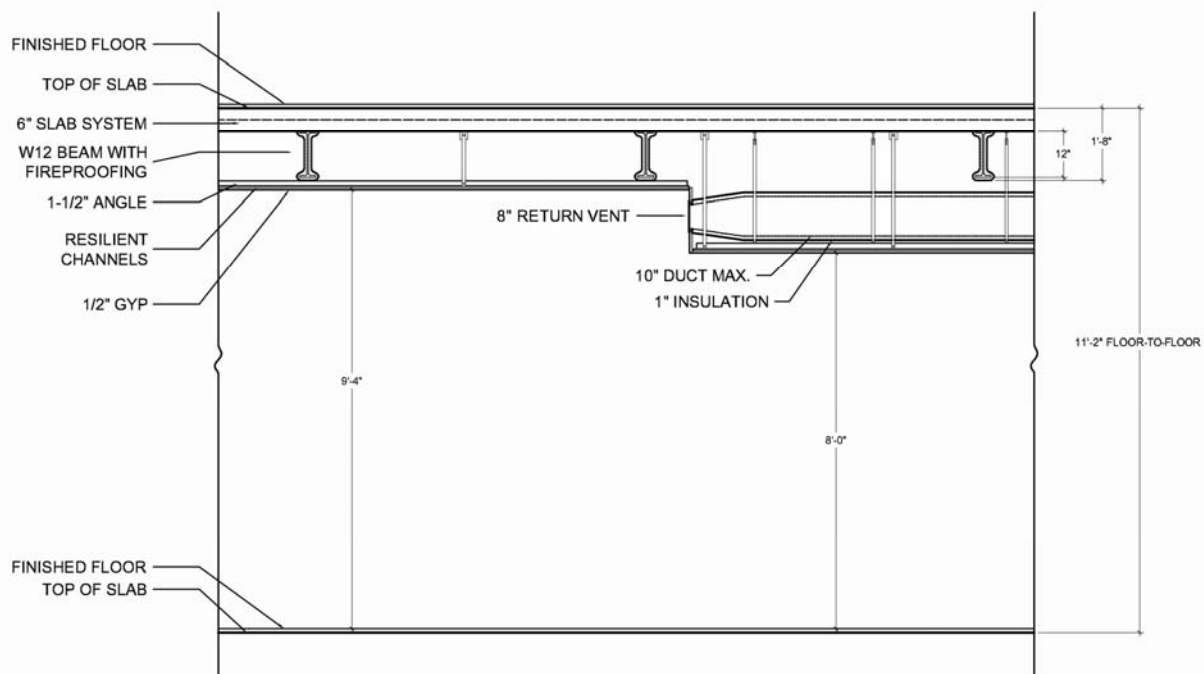


## Mechanical Breadth – HVAC Coordination

The conversion of a concrete flat plate slab to a steel system has some serious implications on the overall floor system thickness. On the new stories where this change takes place, the floor system went from being a uniform thickness of 8” due to the flat plate slab to a maximum thickness of 20” due to the slab-on-deck, steel beams, and fireproofing (see Figure 21 below). In the current design, the HVAC system is able to maneuver freely in the interstitial space between the top of the ceiling and the underside of the slab; in the proposed design, the HVAC system is confined to 10” in depth for ductwork that must pass underneath the steel beams before reaching the plenum area.

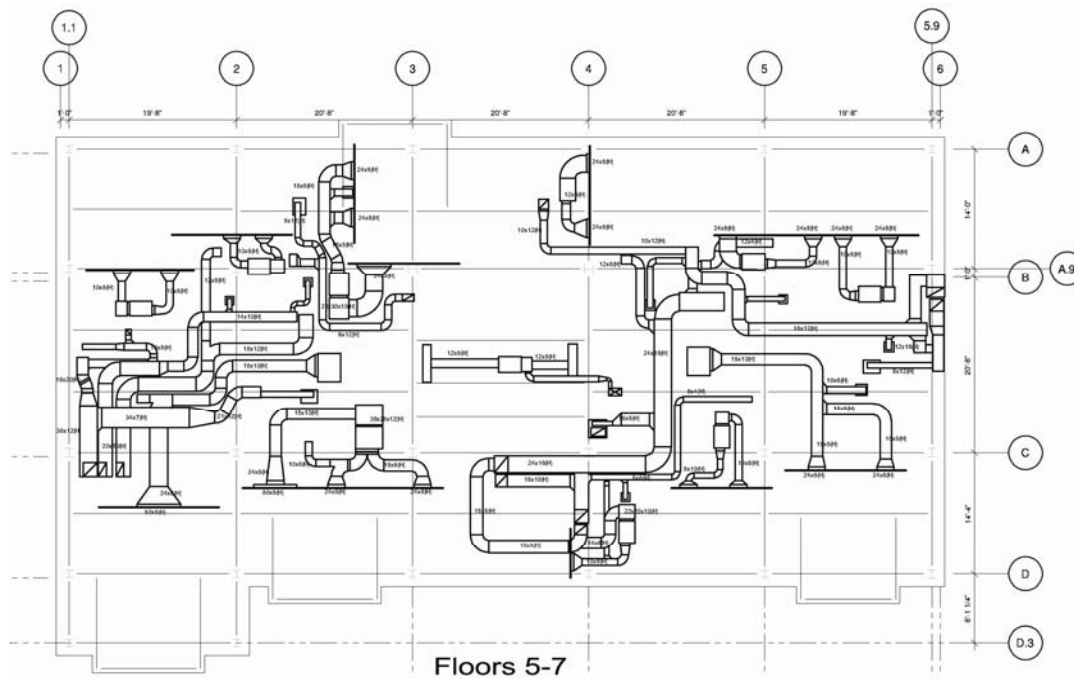


**Figure 21:** Typical floor section showing HVAC duct placement and ceiling heights

To compensate for this limited clearance, many of the existing ducts needed to be resized and redirected. New ducts were kept to a 4-to-1 width-to-depth ratio to limit the effects of frictional drag, while any new layouts took into consideration the location of the return and supply vents. Figure 22 at right shows the duct sizes that were determined to work with the typical new floor system and subsequent duct depth restriction.

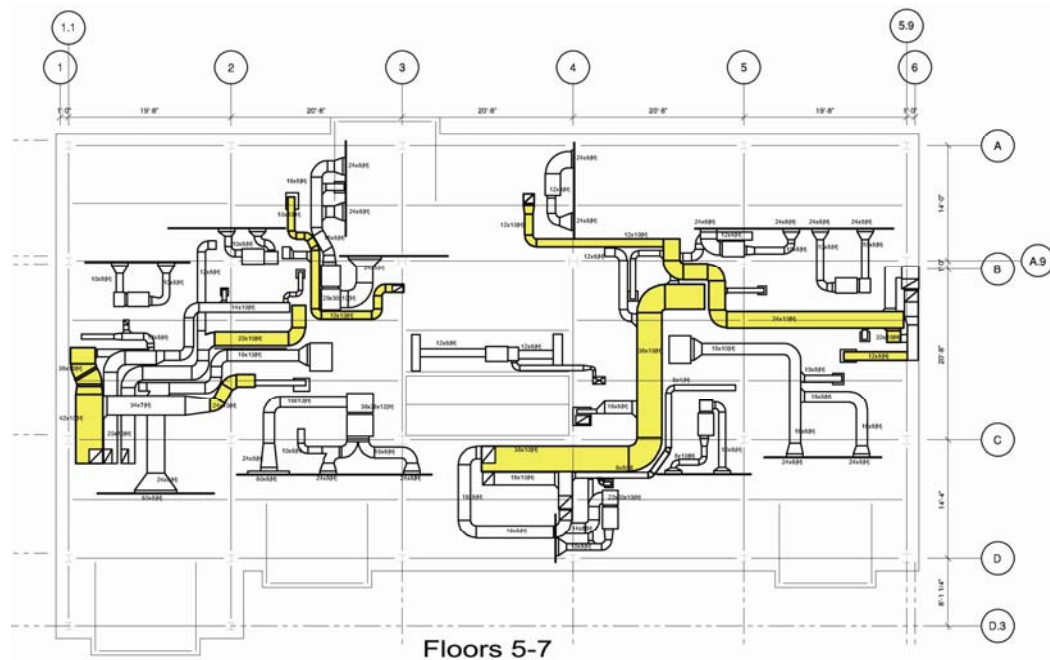
Comparable Mechanical System Duct Sizes [inches]	
Current Size	Proposed Size
36x12	42x10
24x16	36x10
21x12	24x10
18x16	32x10
16x20	36x10
16x12	20x10
8x12	10x10 or 12x8

**Figure 22:** Proposed duct sizes



**Figure 23:** Current HVAC layout and sizes on typical floor

Figure 23 (above) shows the current HVAC layout for a typical floor. Figure 24 (below) shows the proposed HVAC layout. Ducts highlighted in yellow are those that were resized and/or redirected. For detailed views of these plans, see Appendix C.



**Figure 24:** Proposed HVAC layout and sizes on typical floor