

Introducton

There are approximately 3900 square feet of metal siding on the building. The intent for this analysis is changing the cladding system to either the glass panels or the brick that the remainder of the building is constructed with. A comparison between these replacement systems and the existing systems will consist of schedule comparisons, cost comparisons and cost of maintenance comparisons. Also it will be important to check that the structural system will remain the same or of a similar cost.

Material Cost

Name	Cost/ SF
Glass and aluminum supports	\$45
Brick	\$28.75
Metal Siding and aluminum supports	\$9.79

If you were to just look at the total system costs then you could come up with

Name	Cost
Glass	\$175,500
Brick	\$112,125
Metal Siding	\$35,244

But the metal siding will require approximately \$85,000 worth of repair work due to caulking issues. This repair work will come every seven years. With the building life being estimated at 49 years this could add significant cost to the metal siding. A present value for this will need to be calculated. I will be calculating the highest interest rate that will be required to choose the higher priced material. The table will show the present value of the maintenance at various interest rates the total column. This number must be higher than the difference in systems or else the original metal siding system will be cheaper.

The equation is $P=i(1+i)^{-n}$ or using interest tables it is $P=A(P/F, i, n)$ for each year payment is made.

i= the interest percentage in decimal

n = the number of years

	Year 7	Year 14	Year 21	Year 28	Year 35	Year 42	Year 49	Total
1%	\$79,280	\$73,950	\$68,969	\$64,328	\$60,002	\$55,964	\$52,199	\$454,692
2%	\$74,001	\$64,558	\$56,083	\$48,824	\$42,500	\$37,001	\$32,215	\$355,181
4%	\$64,592	\$49,088	\$37,298	\$28,348	\$21,539	\$16,371	\$12,436	\$229,670
6.75%	\$52,930	\$32,963	\$20,528	\$12,784	\$7,965	\$5,304	\$3,086	\$135,558
11.25%	\$40,299	\$19,108	\$9,061	\$4,293	\$2,040	\$969	\$459	\$76,228

Because the difference between the metal siding and the brick is \$76,881 it is cheaper to use the brick so long as the interest rate is lower than 11.75%. It is cheaper to use the glass only if the interest is less than 6.75 % due to the price difference between the two being \$140,256. (Although this chart only shows some numbers I solved for many to find the rate that yielded a material choice difference.)

This also assumes that the other systems will not need repaired in this time. Brick is used quite often at this campus and typically need very little work on it. The glass system is untested so although there may indeed be maintenance issues there can be no cost comparison using the maintenance data. Thus it will be assumed that with proper construction practices there will be no need for maintenance on this system.

Schedule Changes

The production for each system component is as follows:

Name	Daily Output
Metal Siding	775 SF/Day
Glass Panels	98 SF/Day
Metal Support	1020 SF/Day
Brick Face Cavity Wall	230 SF/Day

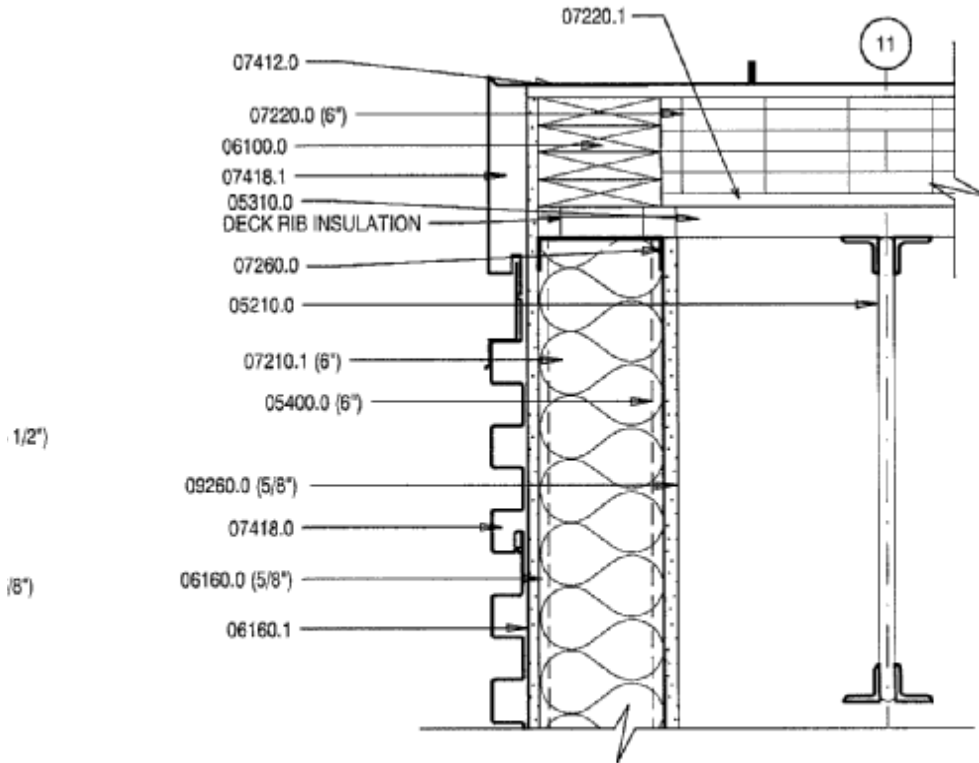
I will be assuming that the Metal Support will begin one day before the glass panels or the metal siding that it would support and then the work would continue concurrently. This means that the schedule for each of these items will have one day added to it for an entire system length.

The system construction length assuming the work area is 3,900 SF is as follows:

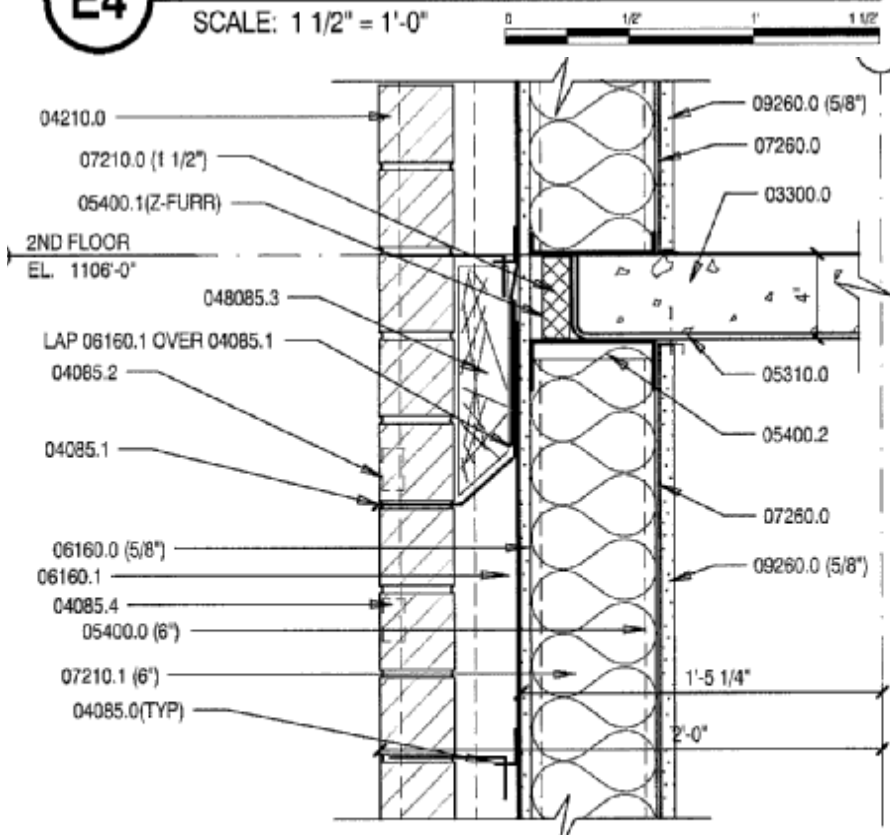
Name	Construction Length
Metal Siding	6 days
Glass Panels	41 days
Brick Face Cavity Wall	17 days

The changing from Metal Siding to Glass Panels will result in a 35 Day, or 7 weeks, schedule addition. Like wise changing from the metal siding to the Brick wall will only change the schedule by 11 days, or just over 2 weeks. This will not affect the building enclosure so interior work will be able to proceed. Also since on the CPM schedule the exterior work does finish well before the building does a delay in the schedule will not be a huge problem even though work will end up continuing through early winter.

Structural System Cost

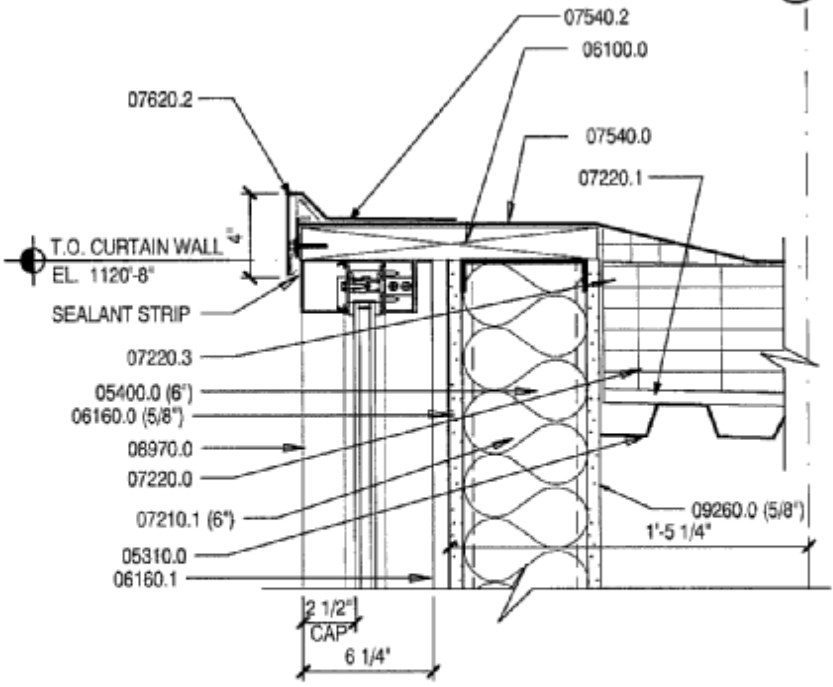


E4 ROOF - SECTION
 SCALE: 1 1/2" = 1'-0"



D1 MASONRY WALL - SECTION
 SCALE: 1 1/2" = 1'-0"

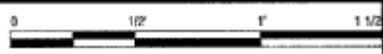
E 5

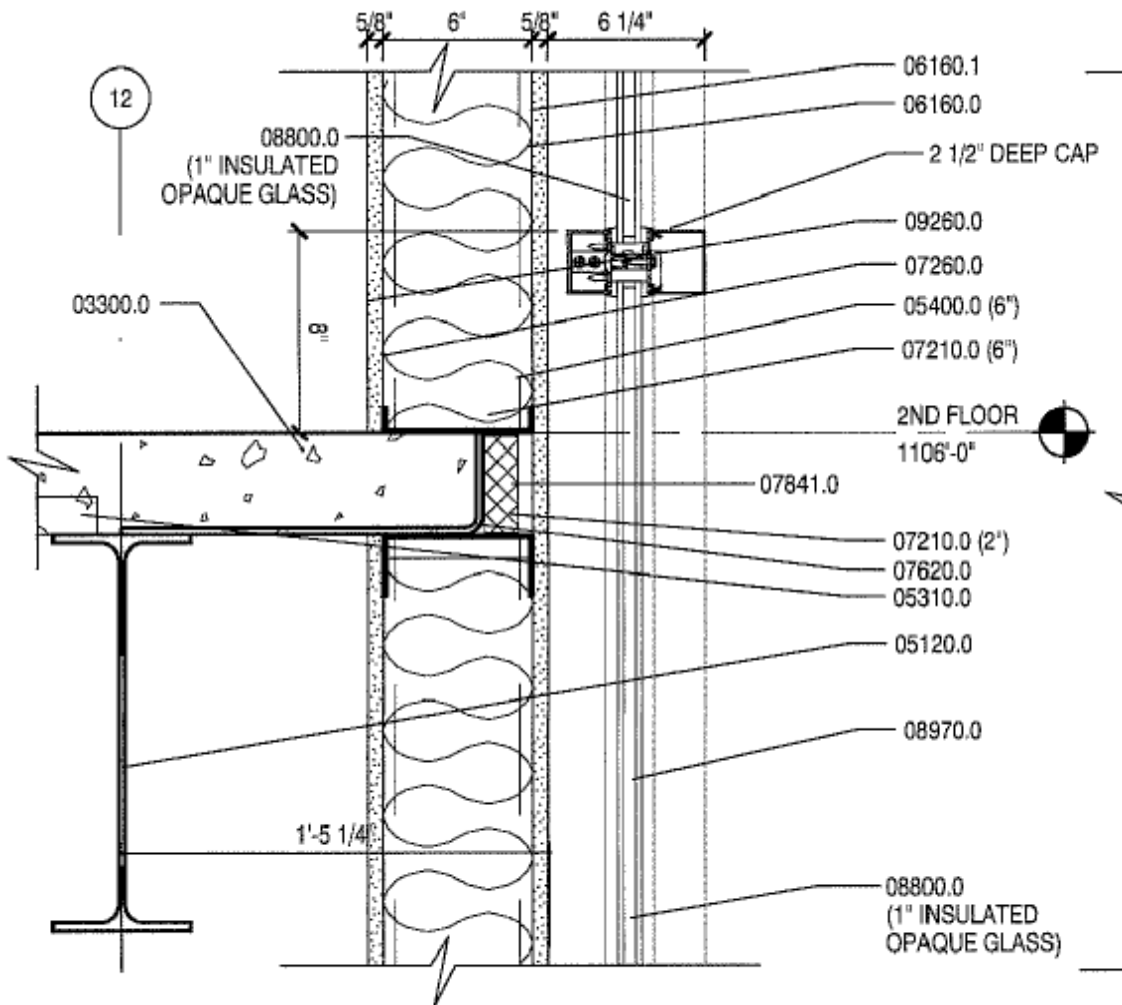


E6

PARAPET - SECTION

SCALE: 1 1/2" = 1'-0"





B2 CURTAIN WALL VENEER DETAIL

SCALE: 1 1/2" = 1'-0"

0 1/2" 1" 1 1/2"

These wall sections show that the support for the cladding material is the same for all three. This means that there will be no structural change between the glass, masonry, and metal siding walls, and no associated cost changes.