



Breadth Topic 2 - Incorporating a Mechanical Chase Surrounding the Production Area & Relocating the Basement Mechanical Room.

Background & Problem

Incorporating a Mechanical Chase Surrounding the Production Area

The Production Area is a highly mechanically driven area of the building. A huge part of the sequencing and schedule delays was due to all of the rough-ins that had to occur in the slab-on-grade before pouring. This held up shoring, which held up structural slab that intern kept continuously pushing the schedule back for the Production Area. Additionally, the same situation occurred in the above structural slab area, although the rough-ins in this area contained an added factor. Due to the vast amount of conduit, pipes, and penetrations a close watch had to constantly be kept on the coverage and structural integrity of the concrete structural slab. All of this work was performed with the idea to keep the least amount of piping exposed in the Production Area itself. Thus, keeping the least amount of exposed piping hanging in the ceiling, the less of a chance there is for bacteria, etc. to grow up there. In spite of their efforts of the design to achieve this there still ended up being a significant amount of piping exposed in the Production Area's ceiling. Also, all of the mechanical and electrical piping running in the Production Area ceiling meant that there needed to be time allowed in the schedule for this work to be done before flooring could begin. Intern, equipment installation, connections, and start-up can't begin until flooring is complete. Refer to the picture below showing a portion of the ceiling in the Production Area while current installation and construction in the area is not even complete.

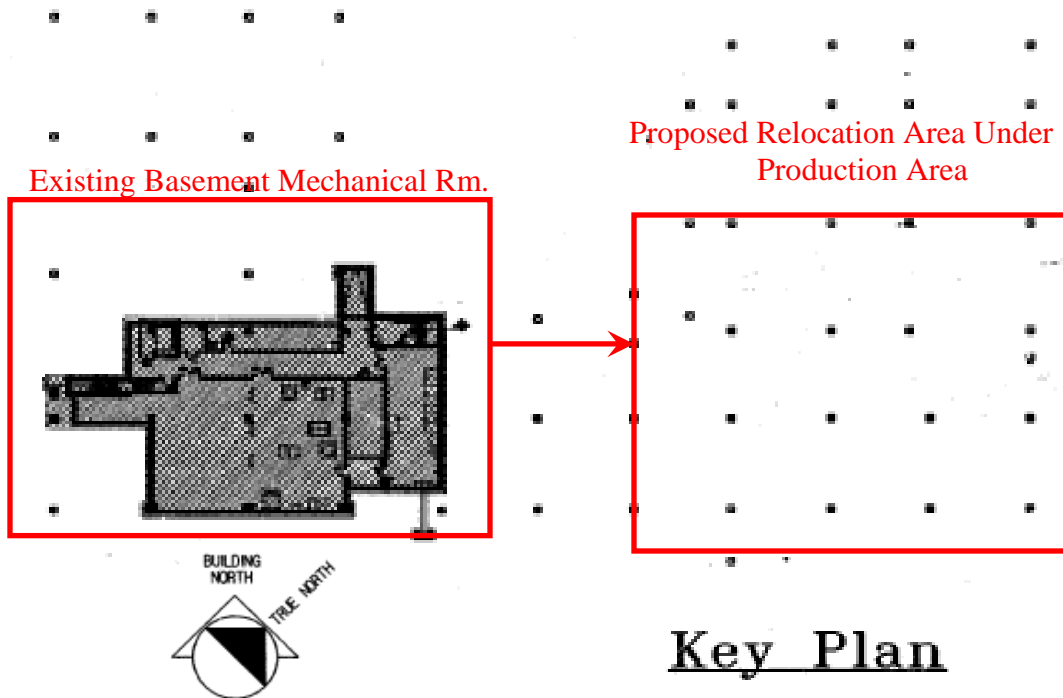




Relocating the Basement Mechanical Room

The Food Science Building contains a partial basement level; meaning that only the west side of the building has a basement level below the first floor level. This basement area serves solely as the buildings mechanical and electrical rooms. A majority of the services coming from this mechanical and electrical room serve the Production Area which is located at the opposite end of the building on the east side. Therefore, a lot of mechanical and electrical coordination was necessary to route all of the piping through the building to get it to where it was needed. As well, a good deal of extra piping was necessary to make these runs.

Refer to the figures below of the building layout to show the locations of the basement level mechanical room and the location of the Production Area.





Proposed Solution

The following studies of the mechanical systems of the building along with the redesign and relocation will add value to the building while reducing and accelerating the schedule.

Incorporating a Mechanical Chase Surrounding the Production Area

Alternative: To build a 3' or 4' corridor around the entire Production Area that will be used only as a mechanical chase to run all of the main mechanical, electrical, and refrigeration lines through.

Proposed Benefit: From this chase you could stub through the wall where necessary to make your connection, thus eliminating multiple runs across the Production Area ceiling. Additionally, this would provide easier operation and maintenance in the future. All of the piping will be run orderly around the chase supported from the walls making locating lines and repairs easier and quicker. Also, the maintenance workers would not have to enter the clean Production Area when performing ordinary maintenance. Along with the above benefits the largest benefit would be the schedule savings during construction. By placing all of the main pipe runs in an area other than the Production Area you will save a huge amount of time in the schedule. You can have your mechanical, electrical, and refrigeration trades working in the chase while at the same time having the flooring trade working in the Production Area an entire trade earlier.

Relocating the Basement Mechanical Room

Alternative: Relocating the basement of the building, which contains the mechanical and electrical rooms, from the west side of the building where it currently stands to the east side of the building under the Production Area.

Proposed Benefit: By relocating the basement mechanical and electrical rooms from the existing west side of the building to the east side under the Production Area it will improve constructability, coordination, and maintenance. It will shorten a majority of your pipe runs while also reducing



the conflicts that may occur along the way. Though, the most noteworthy benefit that will arise from relocating the basement will be that all of the rough in that had to go in the slab-on-grade below the Production Area could now be run overhead in the basement and stub-upped through the first floor

slab. This will greatly ease constructability and future maintenance along with a huge schedule savings. The huge schedule savings will come because now the progress of the structural slab above is no longer in conflict with anything below! Additionally, the layout for all of the stub-ups for equipment that won't even be on-site for months to come is insignificant because you can now stub-up through the basement ceiling anytime, anywhere creating perfect layout the first time!

Solution Method – Tasks and Tools

The redesign and relocation of these lines and rooms will require input from experienced professionals. There are many contacts I have developed through the project that I will utilize to aid myself in this manner. The main contact I will use is Tom Burger whom is the engineer/project manager in charge of the equipment in the Production Area. Tom has built production facilities for twenty years therefore I will hope to gain as much insight as possible from him.

In addition, I will involve the architect to get their professional opinion along with the owner so that I may still adhere to their requirements. A preliminary list of tasks necessary to redesign these alternative systems is as follows:

Alternative – Incorporation of a Mechanical Chase

- a) Calculate square footages for all of the rooms in the Production Area, so that I make sure I keep the same size rooms as necessary in my layout redesign.
- b) Determine how to relocate and reorganize the rooms keeping this to a minimal while adding in the space for the mechanical chase.
- c) Figure the piping lengths and routing that should be in the chase.
- d) Determine where what pipes will need stubbed through the wall and where.



- e) Determine the additions or savings to the piping lengths and associated costs.
- f) Determine whether or not any added turns in the piping affect sizing, flow, etc.

Alternative – Relocating the Basement Mechanical Room

- a) Determine if new layout relocation will meet necessary size requirements.
- b) Determine a general layout of how to reroute all mechanicals and electricals.
- c) Determine if the general lengths of piping have changed.
- d) Determine if any resizing of piping is necessary due to run lengths, turns, etc.