

Introduction

The following report is a senior thesis project for the Architectural Engineering at The Pennsylvania State University. This report will focus on Human Genome Sciences' Large Scale Manufacturing Facility in Rockville, MD. The analysis performed is centered on the following four topics: value engineering, schedule reduction, constructability, and research of developing methods.

The initial part of this thesis will focus on the existing construction conditions, an analysis of key construction features, and alternate system and method analysis. This portion of the report will give a basic overview of the LSM Facilities' building systems, schedule, construction cost, project delivery method, owner information, and other basic project information.

The first research analysis focuses on implementing a 4D model to assist with project coordination. This model depicts the first floor of the LSM Facility and various construction sequences on that floor. These sequences include installation of metal wall panels and structural support, equipment pads and air handling units, metal studs and drywall, and epoxy flooring for the MER room and the "clean rooms". The purpose of the model is to assist with constructability and sequencing of crews and materials.

The second analysis deals with value engineering to reduce cost and or schedule for the exterior wall system. Three different systems were analyzed including the specified metal wall panels, an exterior insulation and finishes system, and architectural precast concrete panels. Each system was broken down into total cost and installation time, and then analyzed for the best option. A major consideration was to improve the aesthetic value as well as the schedule and cost. A heat transfer calculation was performed in order to see how much the heating and cooling load could be reduced in order to find additional cost savings.

The third analysis also deals with value engineering to reduce the total cost and or schedule for the floor covering for the "clean rooms". Three systems were analyzed including the specified quartzite epoxy, bonded conductive terrazzo, and conductive epoxy terrazzo. Each floor coating was split up into total cost and installation time, and once again analyzed to determine the best system.