



(Below) Sully-Miller Contracting Co. overexcavating and preparing a section of I-710 Freeway for new long life pavement course.

SULLY-MILLER CONTRACTING CO.

Puts Quality First on I-710 Long Beach Freeway Phase 3 Project

WRITTEN BY: BRIAN HOOVER

The Long Beach Freeway (I-710) is a vital transportation artery, linking the ports of Long Beach and Los Angeles to major Southern California distribution centers and rail facilities. It is of course an essential component of the regional, statewide and national transportation system, and serves both commuters and industry each and every day. As the population has continued to grow, so has the cargo container volume at the ports of Los Angeles and Long Beach. The increased traffic volumes over the years have taken a toll on the already aging road infrastructure, particularly on the I-710 Freeway.

The California Department of Transportation (Caltrans) has been working to rehabilitate the Long Beach Freeway (I-710) pavement in both directions for the past decade. Constructed in stages, the first phase extended from the Pacific Coast Highway (State Route 1) to the San Diego Freeway (I-405) and was completed in 2003. Phase 2 was finally completed in 2010 and stretched from the I-405 to the I-105, and then Phase 3 continued on from I-105 to Firestone Boulevard. Now in Phase 4, Caltrans is continuing similar work to remove the existing pavement and replace it with up to 10 1/2 inches of Long Life Asphalt Concrete.

Sully-Miller Contracting Co. won the bid and was responsible for construction of Phase 3 of the I-710 Rehabilitation Project, which came in at approximately \$32 million. On any Caltrans project, there is always a heavy emphasis on quality control. This was especially true on the I-710 Rehabilitation project, which as a QC/QA project puts a large amount of responsibility on

the contractor to comply down to the finest detail. Travis Clausen, Project Manager, Sully-Miller Contracting Co. explains, "Our portion of the I-710 Project was Phase 3, which began in July of 2009 and was completed in March of 2011. We originally planned and scheduled to fully complete Phase 3 of the I-710 project in ten 55-hour weekends. However, due to our emphasis on pre-planning and our continuous communication with Caltrans, the work was completed on all of the Northbound and Southbound lanes a full 3-weeks early and in only seven 55-hour weekends. On all seven weekends, the freeway was open to traffic earlier than scheduled for the Monday morning commute. Our Phase was located just North of the 105 Freeway and extended to Firestone Boulevard. It encompassed around a 1-mile stretch of North and Southbound freeway and a large portion of the job was focused on the rehabilitation of the center median and the outside shoulders of the freeway. There was also quite a bit of concrete pavement removal involved, followed by asphalt paving on the mainline for that stretch of the freeway. In addition, the plan called for the over-excavation of tons of earth and concrete at the ramp locations, which included up to 3-feet in some areas. It was necessary to utilize Geogrid, a flexible, synthetic mesh used for earth stabilization and retention, in some areas, followed by base material and hot mix asphalt. We also were responsible for reconstructing the approach slabs to the Los Angeles River Bridge, which required us to work on both sides of the LA River."



(Left) Sully-Miller Contracting Co. paving the outside shoulders of the I-710 Freeway with their Terex paving machine being fed by their Roadtec Shuttle Buggy. All of the hot mix was provided by Blue Diamond Materials. (Right) Aerial view of one section of Long Beach Freeway rehabilitation.

According to Clausen, the overall thickness of the new pavement, in the areas where concrete and soil were removed, was approximately 14 to 15 inches. The bottom layer was made up of six-inches of PG 70-10 Type A rich bottom hot mix material, followed by a 9-inch layer of PG 70-10 Type A regular mix and then 3-inches of PG 64-28 Type A polymer modified hot mix asphalt. Finally a 1-1/2" rubberized asphalt cap was applied, which will serve as a sacrificial layer that will be ground off and replaced as needed. This long life asphalt pavement design is meant to be financially more economical than concrete and offers a much smoother ride. In all, approximately 9 major locations were removed and replaced over the north and south 1-mile pavement section, which amounts to around 1/3 of the overall project. In other areas of the freeway, the existing concrete was cracked and sealed to form a stabilized base upon which 10 to 12 inches of hot mix asphalt was placed. The fracturing of the concrete also served the purpose of filling in voids where the freeway had settled over the years. During mainline removal and replacement, it was necessary to shutdown one side of the 710 Freeway and divert all traffic to the other side. Although this many times can create tremendous traffic nightmares, in this case, according to Clausen, it went off without any major issues.

It is the mix design that in the end determines the service life of a long life pavement project. This particular long life pavement or mechanistic design is designed to remain intact indefinitely, while the cap serves as a wear course that can be replaced every 12 to 15 years. Don Vivant, Director of Quality Control for

Sully-Miller Contracting comments, "The mix design process began almost a year prior to the start of the project. We had to get materials together and after creating the preliminary mix at our AASHTO accredited central laboratory in Irwindale, we sent it on to University of California - Berkeley, who tested each mix design for fatigue and shear compliance with the specifications. When you begin a project like this, you want to minimize your risk and expense and a big part of that is accomplished by starting out as early as possible, and in our case we began planning an entire year ahead of actual construction. The mix design process is very time consuming, but getting it right is imperative, as delays caused by mix design issues can be overwhelmingly costly. You have to get it right from the beginning, because before turning over a pavement section to traffic each Monday, each layer must be tested first. If the section does not pass inspection, it may have to be removed and completely repaved. We were even ready with contingency plans to handle any surprises that we might find under the Freeway. This paid off, as there were a couple of dig-out sections where the existing subgrade was pumping to the point where we could not obtain compaction. In these instances, we over-excavated 6-inches to 1-foot and then installed a base material and Geogrid. There was also a smoothness requirement, which required us to profile the pavement. We did not want to leave behind unsightly grind marks and that is why we elected to grind the pavement at intermediate lifts, particularly on the Type A PM Course, so that the surface is as smooth as possible, prior to placing the rubber cap. In the end,



(Left) Geogrid, a flexible, synthetic mesh used for earth stabilization and retention. (Below) Traffic continues to flow smoothly in both directions on southbound part of the I-710 freeway.



(Below) Compacting base material on Imperial Highway on-ramp.



due to our due diligence and assistance from Caltrans and UC Berkeley, we passed every test and were ready to open each section well before the Monday morning deadline.”

Mike Ramos is the Quality Control Manager for Sully-Miller Contracting Co. and he adds, “Preparation, planning, and communication were the keys to the project’s success. A portion of the Imperial Highway ramps had to be removed and replaced, which mimicked the mainline dig out sections. This provided us with the opportunity to test our construction, inspection, and testing processes to prepare for the mainline paving. It is necessary on all QC/QA projects that you test for certain aggregate and HMA properties at predetermined sample milestones. The results of these tests are directly tied into an incentive/ disincentive program or in our case, the HMA Pay program. As the performing contractor, we are rewarded for being consistent and meeting certain project specifications. Consequently there are also deducts if the job is not completed on time or for not meeting the requirements of the bonus program. This is why Sully-Miller holds so many internal meetings and puts such an emphasis on scheduling. For instance, this was a project that required us to core the pavement section prior to the next layer being applied. We were of course allowed to use nuclear density gauges and other surface testing equipment to monitor compaction, but for acceptance testing we had to physically take a drill and provide cores of each section. Remember, we only had 55 hours to construct an entire section of freeway and we were working with 14 to 15 inches of hot material. With this in mind,

we knew we had to be consistent with our rolling patterns for each mix to achieve the required compaction before turning the pavement over to the crews, all this while maintaining the overall production schedule. To accomplish this, we utilized the window of time between paving each lane, in conjunction with two core rigs and an enormous amount of dry ice to cool the pavement down rapidly prior to coring. By jobs end, we cored almost 500 samples over the 1-mile stretch of freeway for both Caltrans and our testing. That’s about three cores for every 750 tons, and we met our goal and passed each and every sample test.”

The California Department of Transportation (Caltrans) is continuing their work to rehabilitate the Long Beach Freeway (I-710) and the new long life pavement will result in less future maintenance, thereby minimizing traffic delays, cost and impact on surrounding communities and the environment. This is just another way that today’s innovative asphalt products are helping to lead the way to a better tomorrow.

Sully-Miller Contracting Co. maintains an AASHTO accredited laboratory, NAPA Diamond Achievement Commendations for all of their hot mix asphalt facilities, as well as several NAPA Quality in Construction Awards for their projects. For more information on Sully-Miller Contracting Co. and the I-710 Long Beach Freeway Project, log onto to www.sully-miller.com or call 714-578-9600. CAM



(Left) Excavation of I-710 median area. (Right) Paving under the LA River Bridge overpass.

