Stone Consulting & Design, Inc.

The Kenosha Transit Electric Streetcar Circulator Project

Harvey H. Stone, P.E., President

How exciting it is to watch someone's dream come true!

That is exactly what happened on June 17, 2000 when Joe McCarthy, Director of Transportation for the City of Kenosha, watched the first run in revenue service of his newly refurbished PCC streetcars.

All of us at Stone Consulting who have been involved in the project from design through construction and start-up certification have felt a part of the Kenosha family.

We will eagerly observe the goings-on in the City of Kenosha to see the continuing changes that will be accomplished with the help of this street-car system. It will bring people together. People who ride the streetcars feel an immediate affinity to one another, they talk to each other and the motorman while the ride takes place. They get off with a smile on their face. This is public transportation as it should be!

Stone Consulting & Design is proud to be a part of this exciting project for the City of Kenosha and its residents.

Putting a smile on the face of community transit!

Kenosha schoolchildren riding an ex-Toronto PCC car painted as a 'Pittsburgh'.

Restored PCC cars running in regular service, painted as 'Cincinnati', 'Pittsburgh', 'Chicago' and 'Johnstown'.

Harvey Stone, President, SC&D and Joe McCarthy, Director of Transportation, Kenosha Transit

All of us at Stone Consulting & Design mourn the loss of Joe McCarthy who passed away August 19, 2000

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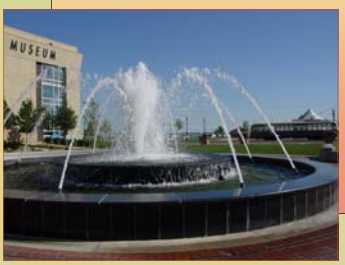
Harborpark is a new community on the shores of Lake Michigan

This redeveloped 69-acre site of a former Nash Engine Plant, has approximately 450 residential units consisting of condominiums, townhouses, and garden apartments, and

- Pike Creek Plaza offers shops, outdoor cafes, and a seasonal farmers' market
- Celebration Place is a 12-acre major gathering place
- Fountain Plaza is a major water feature which serves as Harborpark's focal point
- Harborwalk Promenade – an 8'-wide walkway along the water's edge
- A mile-long multi-purpose trail with a 7-acre recreational area;
- A natural history museum was completed in 2001.



Stone Consulting & Design, Inc. is proud to have been chosen by Stanley Consultants, Inc. and the City of Kenosha to provide the preliminary and final design for the trackage, overhead wire, auxiliary power supply and the rectifier package for this two-mile historic trolley system connecting the harborfront with the commuter rail station.

The two-mile trolley is an intermodal urban connector providing transportation for both tourists and residents. It connects Harborpark into the existing central city area, the METRA commuter rail station, and the city bus transfer station. The presence of the streetcars enhances the character of the area and adds tourist value, while providing needed mobility and reliability. Kenosha is the first city in Wisconsin to reintroduce an electric trolley system for public transportation

SC&D also provided basic design for two sidings and the maintenance pit and provided design assistance for the trolley car barn.

February 5, 1998

Our participation in this exciting project continues with the City of Kenosha on Phase II of the project, which will add an additional 3 miles to the route.

August 10, 1999

Removing the 6th Avenue overpass eliminated the isolation of Harborpark from other neighborhoods and re-established its connection with the rest of downtown.

April 3, 2000

Looking east on 54th Street, across 8th Avenue

It also affords several neighborhoods with an unobstructed view of Lake Michigan.

June 17, 2000

A little over two years and Opening Day brings quite a change!

SC&D designs track & overhead for the distinct purpose of supporting a historic streetcar system.

The Kenosha Streetcar Circulator Project incorporates a typical embedded track design with a new "turf" track design developed by Stone Consulting & Design, Inc. that hides the track in grass-seeded areas on median strips & throughout the landscaped Harborpark.

Turf track construction consists of new continuous welded rail fastened to concrete ties, laying on a compacted crushed concrete subgrade section, secured with typical railroad ballast between and on the ends of the ties. The track section is surrounded by geotextile filter fabric and has a layer of topsoil over the ties and up to the rail to facilitate vegetation growth.

Electric flash-butt welding of rail to provide cost effective continuous welded rail (CWR)

Embedded track construction in existing streets was coordinated with street resurfacing projects to compensate for slight differences between track profile and existing pavement without excessive costs incurred.

Embedded track construction with new continuous welded rail wrapped in the Ironhorse "Boot"®, fastened to steel ties.

The system is constructed using all new 115# welded rail and concrete & steel ties which will result in lower maintenance costs & increased longevity.

Working on this unique project has been a challenging learning experience for all involved. The requirement that we integrate our streetcar track design with the new street design by Stanley Consultants resulted in using the Internet for the transfer of drawings & specifications as we moved forward through the design phase of the project. Our capability to format drawings from MicroStation to AutoCad enabled SC&D to provide a 'quick turnaround' in completing design changes. Costly modifications to the existing infrastructure were avoided. The trolley route was kept within the existing right-of-way throughout the project route.

Facing west toward downtown, the new "turf" track construction.

The track route avoided existing utilities whenever possible. Where conflicts could not be avoided, utility manholes and valves were located next to and between the rails. Only one manhole had to be adjusted during track construction. Kenosha will provide temporary bus service if the trolley must be taken out-of-service for utility repairs.

Looking west on 56th Street toward the downtown from Harborpark.

Roadway design parameters were very tight due to the presence of the trolley track. Each roadway adjustment triggered an accompanying trolley track adjustment. The trolley is highly sensitive to grade changes, therefore, elevation adjustments must be made gradually.

By using steel ties where track runs through pavement, the cost of the in-street track was reduced.

"Stringing wire" ~ April 2000

Frederick J. Perry

Historic Trolley Specialist

Stone Consulting & Design is pleased to be associated with Fred Perry, renowned in the trolley industry for his vast and varied experience which includes trolley projects in the United States, Canada and Europe.

Fields of expertise include:

- Installation of mainline overhead line & poles
- Heavy rigging & highway transportation of historic cars
- Rehabilitation of historic trolley cars – total tear down, reassembly and refurbishing of all components
- Recondition trucks (wheel assemblies)

SC&D produced final plans and standardized on four typical pole designs, reducing the types of poles from 26 to 4. Harvey Stone and Fred Perry prepared a plan sheet for each pole and a materials list which were provided to Pieper along with catalogue cuts for each part required.

When all of the poles and overhead materials were received and stored at the trolley barn, Stone and Perry met with Pieper Electric and, over a period of several weeks, instructed them in preparation of the poles and pole hardware, and in the installation of the trolley wire. Most of the trolley wire was hung on a Sunday when downtown traffic was at a minimum.

A preliminary overhead wire design and substation specification was prepared by SC&D and the overhead wire system was bid as a design/build project to give the contractors flexibility in pole numbers and locations.

When bids were received from only one contractor and the bid was twice the estimate, SC&D was called upon to negotiate with the only bidder, Pieper Electric of Milwaukee to try and reduce costs.

With the concurrence of Kenosha Transit, SC&D agreed to provide a complete final design, pole design and materials list for the overhead wire system.

We also were requested to provide field assistance and advice during the installation of the overhead wire system. Pieper agreed to reduce their bid price by almost 50%.

The end result was a project that was brought in at the original estimated cost. The entire 2 miles of overhead wire system was installed over a period of four weeks.