Cooperation and Compromise
Yields Award Winning Streetscape Project in Beaver, PA

By John J. Rudiak, Traffic Systems Control Specialist Pennsylvania Department of Transportation

The Beaver Borough signal project began with simple orders: revise and design a closed-loop system of five signalized intersections while working within the criteria established by the Beaver Borough Streetscape Committee. Previously, John Rudiak, the Project Design Manager, designed several such signal projects working with municipal representatives to incorporate their ideas and suggestions into a comprehensive plan. The committee presented Beaver Borough’s already complete architecturally designed streetscape plans, including conceptual traffic signalization illustrating old-fashioned style traffic signal mast arm supports. A lamppost pedestal design for street lighting was also part of the plans but these would have to be modified for the attachment of pedestrian signals. These lampposts were exact replicas of an 1880 gas lamp found in the Borough years before.

The architectural firm of Edward J. Hancock was the primary contact person to approve any design modifications to the plans. However, from the initial contact the committee was informed that their conceptual ideas regarding signalization would be taken into consideration and incorporated into the final signal designs but all design work must be done in accordance with current laws and regulations. Signal design criteria is governed by various regulations including: the Manual on Uniform Traffic Control Devices (MUTCD), PA Title 67 (Pennsylvania Regulations for the Design, Location and Operation of all Official Traffic Signs, Signals and Markings), PA Title 75 (Vehicle Code), PA Publication 149 (Traffic Signal Design Handbook), TC 7800 (PA Traffic Signal Standards, and PA Publication 408 (PENNDOT Specifications). This would mean compromises to the architectural signal designs and multiple source competitive bidding on all material.

In this article the term "PENNDOT" refers to those employees and contractors working for and on behalf of the PA Department of Transportation on this

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project. During the design and construction of this project almost every aspect required the input and concurrence of the architect and the streetscape committee. As a result of this interaction, each entity became responsible for the final outcome.

Traffic Signal Supports: Since these would be the largest visual forms of "street art" on the project, the main concerns were the aesthetics of the traffic signal supports and mast arms. The supports must appear as they would have at the turn of the century, i.e. 1900, had there been traffic signals at that time. The basic guidelines were that the supports must be black to match the lampposts and waste receptacles, the traffic signal bases must be a "federal style", the arm must have a sloping arc, and the supports must be fluted. From the committee's view the installations must be as unobtrusive as possible and blend into their streetscape scheme. In the end, this was achieved and the signalization lends to the ambiance of the hometown appearance. Although the streetscape committee had chosen the Union Metal "Nostalgia Series" traffic signal mast arms and combination lamppost/signal supports, specifications must allow multiple sources for competitive bidding. At least one, preferably several, pole manufacturers must have the opportunity to bid on supports and the specifications must be general but similar to the supports desired by the committee. A letter was sent to several pole suppliers including Union Metal Corporation, Spring City Electrical Manufacturing Company, Value Structures, Inc., Valmont Poles, Carlon Poles, and Value Structures, to determine if each could supply the type of pole similar to the one indicated. The response was overwhelmingly positive. In the end, Union Metal did supply the supports chosen by the committee at a cost of three times more than a standard galvanized signal support.

bases six inches below the actual finished sidewalk. This allowed the sidewalk finishers to install the sand and slurry mix to the exact height necessary to place the brick up to and around the anchor bolts, which allowed the decorative base to lie directly on the brick sidewalk hiding the actual foundation.

Interconnection: The architect decided early into the design that interconnection would be done by underground cable. No overhead wires would be allowed in the streetscape design. The preferred method of traffic signal interconnect was fiber optic cable. The architect was informed that Spread Spectrum interconnect has been used successfully elsewhere, but that was rejected because of antennae distracting from the stylish appearance of the supports and ornamental pole caps. Separating the fiber optic cable from the street lighting circuitry was imperative and would require a separate 2” conduit in the sidewalk for the entire project. The streetscape design plans done by the architect illustrated that at every intersection the lighting cable would be installed underground and spread out from a single corner to the other three

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corners, similar to a spider web. To avoid excessive trenching it was suggested that since the signalization also required trench and backfill from corner to corner throughout the intersection at all four streetscape intersections, PENNDOT would provide the trench, backfill and conduit utilizing its contractor and also provide additional conduits for the streetscape lighting. We would also supply and install the necessary corner junction boxes that would be shared by the street lighting circuitry. In return, the Borough would supply and install a separate 2" conduit for signal interconnection from intersection to intersection in their street lighting trench under the sidewalk.

Junction Boxes: In sidewalk areas when mast arm supports, underground wiring, and conduit is used. PENNDOT prefers using a 36" x 24" concrete box with a concrete lid (PENNDOT JB-12). The gray concrete aesthetics of this junction box did not appeal to the committee but was reluctantly accepted. However, early into construction PENNDOT suggested that the Borough might want to utilize a plastic, concrete polymer, junction box and lid that could be color matched to the adjacent brick sidewalks. The box was supplied by Quazite Strongwall Company and measured 30" x 48", slightly larger but acceptable. The choice and use of this junction box was a resounding success.

Pedestal Traffic Signal Poles / Street Lighting Lampposts: The streetscape contractor was to install conduit, electrical wiring and street lighting lampposts with foundations for the entire project. The PENNDOT contractor was to install conduit, pedestal traffic signal poles with foundations, mast arm supports with foundations, and junction boxes. Both contractors could not be in the same place at the same time and coordinating activities of the two were necessary. The streetscape construction coordinator, Mr. Charles Copeland, together with the PENNDOT Construction Project Manager, Mr. John Zamosky, decided on a division of labor. Whereas, while the streetscape contractor would install the pedestal and lamppost foundations with the necessary sidewalk conduit, trench and brick work, the PENNDOT contractor would install the mast arm foundations with the necessary conduit, junction boxes, and the conduit from the street to the boxes. This worked out fine with few conflicts but did require the PENNDOT contractor to work out of his construction phasing plan to install the foundations and junction boxes in the first part of the streetscaping work.

Signal Heads: The committee preferred black signal heads in lieu of the standard yellow. Yellow is the preferred color because it brings attention to the signals. However, in different locales including the City of Pittsburgh, black has been permitted in the CBD streetscape project. In a review of the MUTCD and PENNDOT regulations it was found that black could be used but within certain criteria. This was a downtown business district with very low speeds where a motorist would expect signals. In addition, the yellow signal heads were to have black backplates and an approaching motorist would see only a small portion of the signal even if it remained yellow. In addition, in a CBD business district a motorist would expect to see signals. Permission was granted to allow black signals head for this one project only in the CBD.

Pedestrian Signal Heads: The Blind Association and one of the streetscape committee members desired audible pedestrian devices. These devices, 2" x 3" in size and painted black, were manufactured by IDC Indicator Controls, Model APS-10, and were to be mounted on top of the signal units. The committee thought that the devices distracted from the old-fashioned appearance of the signal head hardware. A compromise was achieved by placing the device, inside the signal head but with a one-inch hole drilled at the bottom of the signal housing, the hole covered and sealed with a plastic screen, and the device's speaker mounted over the hole. The sound emitted can be heard throughout the intersection by all pedestrians. Additionally, at each intersection a leading 3-second pedestrian interval was added for each phase. This leading pedestrian interval has been used at several other intersections in the District and has been very successful in reducing pedestrian/vehicle conflicts.

Controller Cabinets: Because the controller cabinet was designed to be a Type 170 base mounted cabinet, the Borough took advantage of this and requested that they be moved away from the intersection. The Safetran Control Cabinets, Type 332, are large measuring 66"H x 30"D x 24"W silver aluminum. Each cabinet was relocated in the field and they are all but invisible, thanks to careful landscaping and view.

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Pedestrian indications: The pedestrian indications are a 12" LED Hand/Man overlay manufactured by Precision Solar Controls, Inc. Each pedestrian indication had to be precisely located and positioned on each pole before the manufacture of the support. This was because each signal was not being banded or clamped onto the pole, the attachment hardware was screwed into threaded couples welded at the specific height above the sidewalk while making space for the street lamp and crossbar at the top. In addition, on the tops and bottoms of each head's mounting hardware "Kaiser helmet points" were added for aesthetic purposes.

As one can see practically every aspect of this project required a "hands-on" approach and challenged all parties involved to cooperate and to compromise to the maximum extent possible. At the beginning of each week a progress meeting was held to discuss any problems or to consider any suggestions, and decisions were made quickly at that time. The finished product appears to all concerned to have just happened without problems. Truly the design of the entire project did not end with a signed plan, but evolved throughout the entire construction process.

One can best illustrate the community impact by understanding how this project was designed and constructed, and the enthusiastic conclusion. Although the reconstruction of the sidewalks and the new signalization created difficulties for businessmen, motorists and pedestrians, all were satisfactorily accommodated. In addition, because of the strong community support for this project, any difficulties and delays from unexpected construction modifications were accepted and understood. Even after a full year of construction during two construction seasons, there is not one empty storefront in the entire business district.

In addition, during this period one gas station property was sold and the property is now a new building with several new storefronts.

Although the PENNDOT traffic signal project of S.R. 0068, Section B19 was an integral part of the total Beaver Borough Streetscape concept, the entire streetscape programming, design, funding and construction was conceived and pursued by the Borough. PENNDOT's construction expertise complimented and refined the architectural renderings to make this a viable project. Acknowledgment must be given to all participants who made this project successful. The Beaver Borough Team included Mayor Robert Linn, Borough Manager John Barrett, Beaver Project Manager Coordinator Charles Copeland, Borough Architect Edward Hancock, and the Chairman of the Borough’s Design Committee Richard Shaw, the CEO of Michael Baker Corporation. The PENNDOT team included District Engineer Ray Hack, P.E., District Traffic Engineer Vic-

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tor DeFazio, P.E., Design Project Manager John Rudiak, and Construction Project Manager John Zamosky. The traffic signal contractor was Post Construction Company of New Castle, PA and the streetscape contractor was Baiano Construction of Pittsburgh, PA. Mr. Robert Durgin and Mr. Tom Miller of Traffic Control Products, Inc. of Willoughby, OH supplied the traffic signal materials and gave valuable technical assistance throughout the project. In March 2003 this project was awarded the Pennsylvania Partnership for Highway Quality Community Support/Customer Focus Award.

During any discussion involving the Borough’s residents and officials, the pride displayed in this streetscape project cannot be denied. The $3 million Beaver Borough Streetscape Project was conceived to replicate, as near as possible, the aesthetics of Beaver at the turn of the century and to showcase the Beaver Borough Bicentennial Celebration. The project was completed and dedicated on a sunny afternoon in late September 2002. The ceremony was held in the shadow of the beautiful forty-foot clock tower on the plaza at the corner of Third Street and College Avenue, which has become the symbol of the Beaver community. The clock tower is a faithful replica of the ornate Victorian tower that once adorned the Beaver County Courthouse from 1877 until 1932 and which now holds in its base the original 2,200-pound bell that served the community for 125 years. The historic clock tower features a clock with Westminster chimes that strike the quarter hours, and an electronic bell that tolls each hour throughout the day. On special occasions, the microchip system is also capable of playing appropriate seasonal music on the electronic carillon. Adding to the ambience of the clock tower plaza is a unique 110-year-old cast iron drinking fountain offering free-flowing fresh water that overflows from the primary source downward to a large basin for horses and ultimately to smaller basins for dogs and cats. Beaver Borough, the county seat of Beaver County, Pennsylvania, proudly invites one and all to visit their new award winning streetscape project.

Receiving their award on April 3 in Horsey, PA are John Naymover, President, Post Construction, Inc.; Raymond Hack, P.E., Engineer, PENNDOT District 11; Allen D. Biehler, Secretary, PENNDOT; and John J. Rudiak, Traffic Systems Control Specialist, PENNDOT.

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