

**City of Columbia Heights  
Gateway Pedestrian Bridge  
Scoping Report  
May 2009**

## **Introduction**

Central Avenue serves as the primary transportation corridor linking the City of Minneapolis to the northern suburbs. The corridor is characterized by strip commercial developments, high traffic volumes, and extensive public transportation.

The intersection of 49th and Central Avenues serves as a gateway to the northern portion of the corridor, where big-box commercial land use transforms into neighborhood commercial and residential development. The intersection also plays a critical role in pedestrian and bicycle circulation within the larger context of the City, as 49th Avenue is designated as a primary City loop trail that connects the eastern and western portions of Columbia Heights to Central Avenue.

## **Need for Study**

The Gateway pedestrian bridge located just south of the Central Avenue and 49th Avenue intersection and provides a psychological "safe" crossing of this busy and congested roadway for citizens of the community.

The existing pedestrian bridge is deteriorating due to many years of service. The existing bridge was constructed in 1970 and consists of a concrete deck supported by steel beams. The concrete steps require ongoing maintenance to repair chipping and erosion. At times, the bridge is not accessible in the winter due to ice and snow pack. The bridge steps include a steel "rail" to accommodate a rolling bicycle, but it can be difficult to maneuver bikes within the rail.

Pedestrians with limited mobility must cross TH 65 one block north, at 50th Avenue, where an at grade crossing is located.

## **Bridge Users**

The 49th and Central Avenue intersection serves to provide a safe and direct access to:

1. Nearby schools (Columbia Heights High School, Highland Elementary School, Central Middle School and Valley View Elementary School)
2. Convenient shopping along Central Avenue
3. Neighborhood and community parks
4. Public transportation
5. Adjacent residential neighborhoods

The bridge is on the alignment of a proposed city bike and pedestrian loop identified in a report prepared by the City in 1998 in response to a recommendation by the Minnesota Design Team.

## **Study Objectives**

The purpose of this study is to perform conceptual analyses of the bridge type, end treatment types and aesthetic features. The results of our analyses were presented to the City at a workshop on April 13, 2009. Graphics presented at the City Council workshop are referenced throughout this report.

## **Bridge Type Analysis**

### Existing Bridge Condition

Reconstruction of the existing bridge was considered; however, this option was determined not to be feasible. Reuse of the steel beams is not economically feasible due to the deterioration of the steel beams in combination with the labor intensive work (and therefore costly) that would be required to separate the deck concrete from the shear studs attached to the top flange of the steel beams. Also, the paint on the bridge contains lead, further increasing the costs associated with bridge reconstruction.

Reuse of the concrete substructures was also considered. In considering their reuse, the condition of the substructures as well as the configuration and geometry of a new bridge must be considered. A wider walkway deck on the pedestrian bridge is preferred for both accessibility and maintenance. Also, intersection improvements consisting of widening the street and/or improving the signal lights are possible, therefore it is beneficial for the bridge to be moved a short distance from its current location to accommodate either intersection improvements or ADA compliant approaches to the bridge. Lastly, Mn/DOT prefers a single span structure over a State Trunk Highway like Central Avenue (TH 65). The existing dual span bridge creates a safety hazard by placing a column in the roadway median.

### Bridge Type Options:

We initially considered 4 types of structures for use in construction of a new pedestrian bridge.

- A. Steel Truss
- B. Steel Girder with Concrete Deck
- C. Pre-Stressed Concrete Girder with Concrete Deck
- D. Pre-Stressed Concrete Girder with Inset Concrete Deck

The Steel Girder with Concrete Deck and Pre-Stressed Concrete Girder with Concrete Deck options were eliminated due to the structure depth. The increased depth associated with these options creates a need for longer bridge approaches to reach the higher deck elevations. Due to the confined area at this location, these options were eliminated.

The remaining options include a Steel Truss and Pre-Stressed Concrete Girder with Inset Concrete Deck. The following characteristics were considered for these options:

#### **A. Steel Truss**

1. Reduced weight of structure = reduced foundation costs
2. Minimized impacts to traffic during construction
3. Shortened construction time = cost savings
4. Factory manufactured under controlled conditions
5. Structure costs are approximately \$350,00 to \$450,000

#### **B. Pre-Stressed Concrete Girder with Inset Concrete Deck**

1. Minimizes structure depth
2. Simplistic appearance and clean horizontal lines
3. Structure costs are approximately \$375,00 to \$475,000

## **Bridge Approaches**

### General Considerations

A key project component is to make the bridge compliant with current ADA requirements. In considering various approach ramp alternatives, ramp lengths were determined based upon ADA requirements. Maximum grades of 8.33% were considered, along with intermediate platforms

after 2.5 feet of rise. We also considered a bridge deck elevation of 20 feet above the existing ground to meet a required height of 17' – 4" from the low member of the bridge to the surface of Central Avenue.

Anoka County has previously indicated that an additional 27 feet of Right-of-Way will be required along 49<sup>th</sup> Avenue for future roadway improvements. In locating the ramps, the structural components were placed outside of the future County Right-of-Way.

Anoka County and Mn/DOT clear zones (obstacle free areas) and intersection sight lines were also considered when analyzing approach options.

#### West Side Approach

The options considered for the west side of Central Avenue were limited due to the configuration of an existing business located in the southwest quadrant of Central Avenue and 49<sup>th</sup> Avenue. A switch-back, parallel to Central Avenue, was selected for the west approach.

#### East Side Approach

Three ramp options were considered for the east side of Central Avenue. The options, along with some considerations, are as follows:

- A. Spiral Option
  - 1. Impacts current parking use.
  - 2. Least number of support columns.
- B. Parallel to Central Avenue Option
  - 1. No parking lot impacts.
  - 2. Least obstructions for 49<sup>th</sup> Avenue traffic.
  - 3. Least permanent easement area required.
- C. Parallel to 49<sup>th</sup> Avenue Option
  - 1. No parking lot impacts.
  - 2. Greatest permanent easement area required.

### **Bridge Aesthetics**

The Gateway pedestrian bridge provides an opportunity to welcome motorists to the City of Columbia Heights. In considering potential aesthetic options and features, the following objectives were utilized to create several concepts for review by the City:

- 1. Create a gateway element welcoming people to the City
- 2. Create a look unique to Columbia Heights.
- 3. Utilize a palette of materials that have been incorporated in other City projects, such as Huset Park, to reinforce overall civic identity.
- 4. Establish a level of quality consistent with the urban design guidelines for the Central Avenue corridor.
- 5. Utilize low-maintenance materials in a creative and aesthetically pleasing manner.

Information related to the aesthetic design objectives is included in Appendix E of this report. Design examples are contained in Appendix F of this report. Sketches and colored renderings were prepared and reviewed with the City Council at a workshop on April 13, 2009. The concepts, and key elements of each, are described below:

### Bridge Concept A1

This concept consists of a bowstring steel truss. The structural design of the truss creates an arch, welcoming motorists to the City. The city logo is placed in the center of the arch, and the piers are simple square forms with a large limestone colored block. The railings and the body of the pedestrian walk would be combinations of galvanized architectural screens with steel pickets for the railings. The lighting could consist of low level walkway lighting for pedestrian safety; with accent lighting to highlight the arch and the logo.

### Bridge Concept A2

Similar to Concept A1, this concept utilizes a bowstring steel truss, with the structural design of the creating an arch, welcoming motorists to the City. In this variation, the City name is spelled out on the arch. The piers are simple square forms with a random ashlar limestone finish. The railings and the body of the pedestrian walk would be combinations of galvanized architectural screens. This concept also suggests a color be added to the structural supports through the walkway. As with Concept A1, the lighting could consist of low level walkway lighting for pedestrian safety; with accent lighting to highlight the arch and the City name.

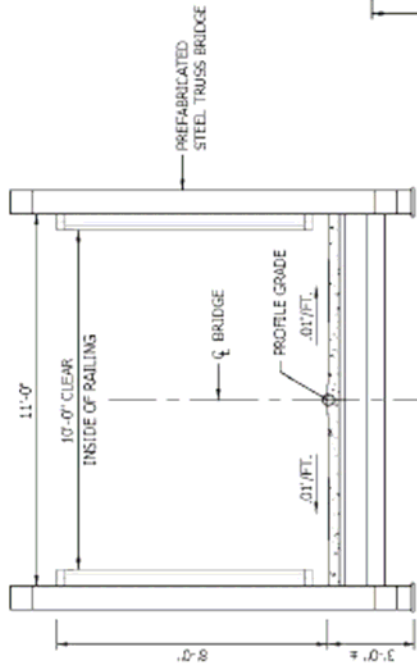
### Bridge Concept C1

Bridge Concept C1 utilizes a concrete girder and steel structure. This combination presents an elegantly simple rectilinear form. The center and ends of the structure are emphasized to create a focal point, break up the mass of the structure, and to frame the street. The body of the pedestrian walk is enclosed with a combination of black steel or galvanized primary supports and galvanized architectural screens. A welcoming arch is defined through overlapping architectural screens with varying densities. The city logo is placed in the center of the arch and the piers are simple tapered forms with a limestone colored block texture. The structural beam is painted burgundy to be consistent with the color of other civic improvements. The lighting could consist of low level walkway lighting for pedestrian safety; with accent lighting to highlight the vertical supports and city logo.

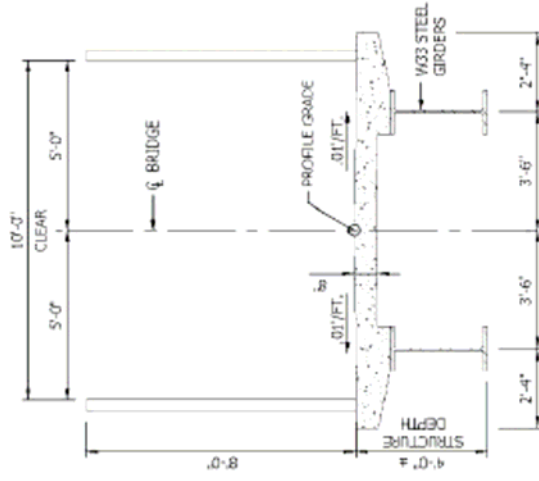
### Bridge Concept C2

Concept C2 is similar in basic style to Concept C1 with respect to structure and walkway type. In Concept C2, the City name is spelled out with backlit black lettering. The piers are simple tapered forms with a limestone block texture. The courses of block alternate in width. The structural beam is painted buff to be consistent with the color of the piers and to provide contrast for the lettering to read. As with Concept C1, the lighting could consist of low level walkway lighting for pedestrian safety; with accent lighting to highlight the vertical supports and lettering.

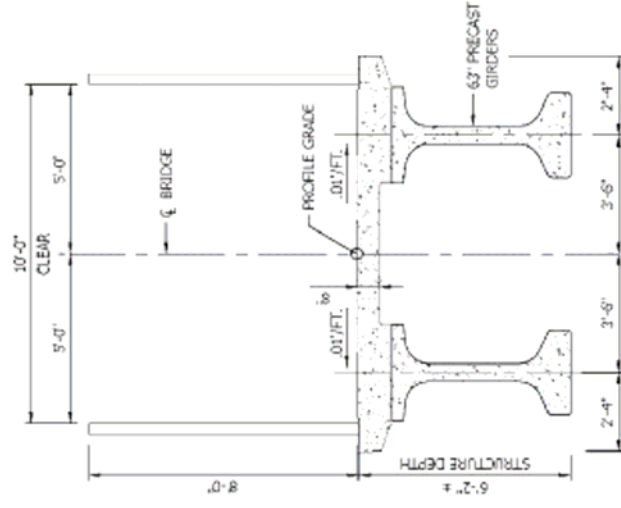
# Bridge Type Alternatives



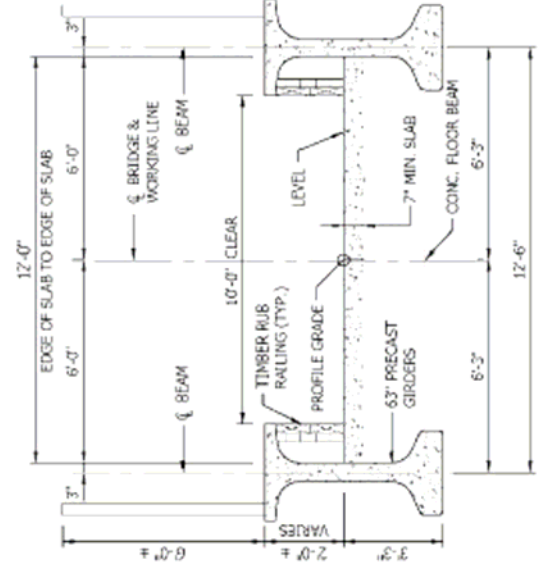
Alternative A - Steel Truss



Alternative B - Steel Girder with Concrete Deck



Alternative D - Prestressed Concrete Girder with Concrete Deck



Alternative C - Prestressed Concrete Girder with Inset Concrete Deck