

June 3, 2016



GOLDEN GATE BRIDGE  
PHYSICAL SUICIDE DETERRENT SYSTEM  
FEDERAL-AID PROJECT: BHLS-6003(051)  
and  
WIND RETROFIT  
FEDERAL-AID PROJECT: BHLS-6003(052)

Contract No. 2016-B-1

To: Prospective Bidders

RE: **Response to Bidders' Question No. 189 through 193**

Ladies and Gentlemen:

The following are the responses to questions submitted by prospective bidders and designated as Bid Question No. 189 through 193:

**BID QUESTION No. 189:**

Please clarify if the west side sidewalk railing from PP0 to 45 and 45' to 0' is to be repainted?

**RESPONSE:**

*See response to Bid Question 116. The west sidewalk railing from Panel Point 0 to Panel Point 45 and from Panel Point 45' to Panel Point 0' is not required to be cleaned and painted.*

**BID QUESTION No. 190:**

With regards to galvanizing of steel structures, will bolt holes remain 'galvanized only', or, will the bolt holes also receive the paint system after galvanizing?

**RESPONSE:**

*In accordance with Section 59-2.03B(2)(c), Cleaning, Preparing and Painting Bolt Holes and Connection Surfaces, bolt holes of new galvanized structural steel do not need to be painted, the holes are to remain galvanized only.*

*Field drilled bolt holes and holes resulting from removing existing fasteners must be cleaned and painted with 1 coat of zinc primer by brush methods in accordance with Section 59-2.03B(2)(c).*

**BID QUESTION No. 191:**

With regard to addendum No. 5 drawing S006 and Q&A No. 72:

- a. Please confirm that the existing bottom traveler trolley beam is continuous between panel points 127 and 127'.
- b. Please confirm that the new side traveler trolley beam and crane rail are continuous between panel points 128 and 128' through the weather station.

**RESPONSE:**

*See Addenda 5 and 6 for revised Contract Drawings. For the traveler travel limits, see S004 to S008, for traveler rail and trolley beam removal and replacement limits, see S302.*

- a. *Yes, as shown on revised Contract Drawing S302, the existing bottom traveler trolley beam and the interior traveler crane rail are continuous between panel points 127 and 127'.*
- b. *No, as shown on revised Contract Drawing S302, the new side traveler trolley beam and crane rail are not continuous. They stop 3 feet south of panel point 129 and 3 feet north of panel point 129.*

**BID QUESTION No. 192:**

REFERENCE DRAWING SHEET NO. 157 AND 170.

The provided gantry equalizer pin interfaces in the sill beam of the interior traveler consists of a hole approximately 3" diameter thru a 3/8" thick web plate that is reinforced with 1/4" thick boss plates on each side of the web, for a total bearing thickness of 7/8".

The web is parallel with the gantry rail below. The pin axis is horizontal and oriented perpendicular to the gantry rail, and located about 18" or so above the top of rail. For the loads involved, this arrangement is considered to be unstable and may collapse if the only interface between the equalizer assembly pin and the structural system occurs at the web and boss plates of the sill beam.

It is our position that the structural system needs to be modified to provide significant moment resistance and stiffness about an axis parallel to the rail at the pin location. This modification will be considered the responsibility of the structural designer, and any service required to remedy the situation is not presently included in scope of the bridge traveler Supplier.

**RESPONSE:**

*See Addendum 8 for revised Contract Drawings. Revised Contract Drawings S405 and S408 include revisions to the traveler leg connections and the truck beam details, including increasing the truck beam web plate from 3/8" to 1", to provide moment continuity, stiffness and stability to the truck beam. The hub is a part of the mechanical system to be designed by the Contractor. The hub must be designed to be matched with the Contractor designed pivot pin as shown on revised Contract Drawing M453.*

**BID QUESTION No. 193:**

**SPECIFICATION SECTION 60-2.01D (1)(b) MAINTENANCE TRAVELER PROTOTYPES**

The specification requires that a prototype of the bottom and interior travelers be constructed and tested prior to erection. One of the tests is a forced skew of 5 degrees (item 10). Note that the rail gage for the bottom and interior travelers is 45 feet. A 5 degree skew angle would offset in the gantry system alignment by 3.94 feet. The center of each gantry system would be located 1" inboard of the rail centerline.

For the bottom traveler, it's gantry system hangs from tension link bars that are at 12'-8" on center . That means the lower end of the gantry links are at +/- 6.6" from the gantry center, so one is 7.6" laterally offset from the support truck, and the other is 5.6" laterally offset from its support truck.

The link bars are 52.5" long between pins, so the worst angle would be  $\text{asin}(7.6/52.5) = 8.4$  degrees. A DC-150 fender restrains the link bar at 17" above the bottom link pin, with a nominal 1/2" gap. Since  $17 \text{ atan}(8.4) = 2.5$ ", the fender will need to compress about 2".

Per the fender design, a 2" displacement will produce a reaction of about 5 kips, which results in a truck beam lateral design force of about 1.6 kips. Additionally, the truck beam connection to the link-bar has only a 1/4" gap, which will force the truck beam to rotate at least 6.6 degrees . Given that the nominal truck design as shown has exterior side plates, this amount of rotation will lift one side/set of wheels up off the rail, thus doubling the load in the wheel set in contact with the rail.

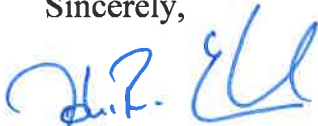
Complicating matters is that the truck system will be rotated 5 degrees from the link bar about a vertical axis. This results in the lower link bar connection having a rotation capacity of only about 3 degrees, well under the 8.4 degrees required, so binding of the structural system will likely occur well before the 5 degrees of slew is obtained.

For the interior traveler, the gantry system sits on posts at 8'-4" on center. At a 5 degree skew angle, these posts will be offset from the rail by 5.4" and 3.4" (leading/trailing main equalizer pin locations). Some "cushion" exists in the rubber snubber system of detail 3 on S408. However, this is a very stiff system, at 550 lbs./0.09" displacement. And because it is rubber, the stiffness increases the more it is compressed. Given this situation, some sort of rotational capacity (about a vertical axis) will be needed in the truck assembly, along with the ability to slide laterally. We suggest a re-design may need to be considered. However, if the 5 degrees is maintained, it could lead to additional skew issues since there will be very little remaining stiffness to resist skew forces. It seems this issue is counter-productive to the design of a system that wants to track straight. Therefore, please re-consider the amount of skew that the traveler may be subjected to, or modify the design to accommodate the 5 degree requirement.

**RESPONSE:**

*See Addendum 8 for revised Section 60-2.02D(2)(b). The forced skew amount has been changed from 5 degrees to 0.5 degrees.*

Sincerely,



John Eberle, P.E.  
Deputy District Engineer