



**FORM DQP 2.01-1
LEVEL 1 CHECK PRINT SIGN-OFF SHEET**

Client Name: Ohio Department of Transportation

Job Title: Cleveland Innerbelt Design-Build Contract

Job Number: CUY-90-14.90

Document Title: Navigation light stem length

- Check Level (Mark One):
- 1A 100% Document Check
 - 1B 100% Input Check

Enter description below:

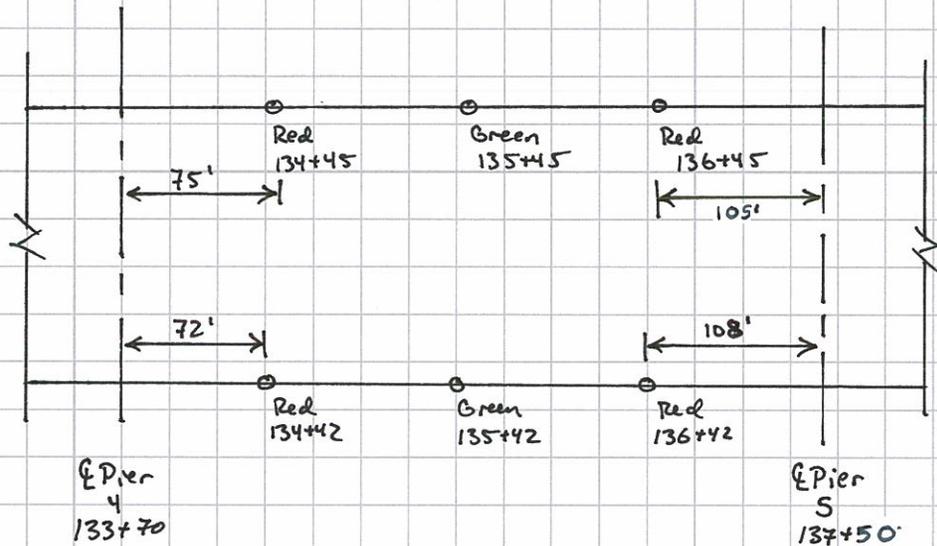
	Print Name	Signature	Date
<input checked="" type="checkbox"/> Originator	<u>Kolbe Gravatt</u>	<u>[Signature]</u>	<u>6-25-12</u>
<input checked="" type="checkbox"/> Checker	<u>LJ DICKENS</u>	<u>[Signature]</u>	<u>7/5/12</u>
<input checked="" type="checkbox"/> Backchecker	<u>Kolbe Gravatt</u>	<u>[Signature]</u>	<u>7-15-12</u>
<input checked="" type="checkbox"/> Updater	<u>Kolbe Gravatt</u>	<u>[Signature]</u>	<u>7-15-12</u>
<input checked="" type="checkbox"/> Validator	<u>LJ DICKENS</u>	<u>[Signature]</u>	<u>7/20/12</u>

Insert an "X" in the box to indicate a required QC activity.

FOR: Cleveland Innerbelt	JOB NO: 49633	SHEET NO:
MADE BY: KDG	CHECKED BY: LJD	BACKCHECKED BY: KDG
DATE: 6-25-12	DATE: 7/5/12	DATE: 7-15-12



Calculate length of Navigation light stem



Height of Web calculated from Unit 2 Str. Steel Sheet 25 of 84

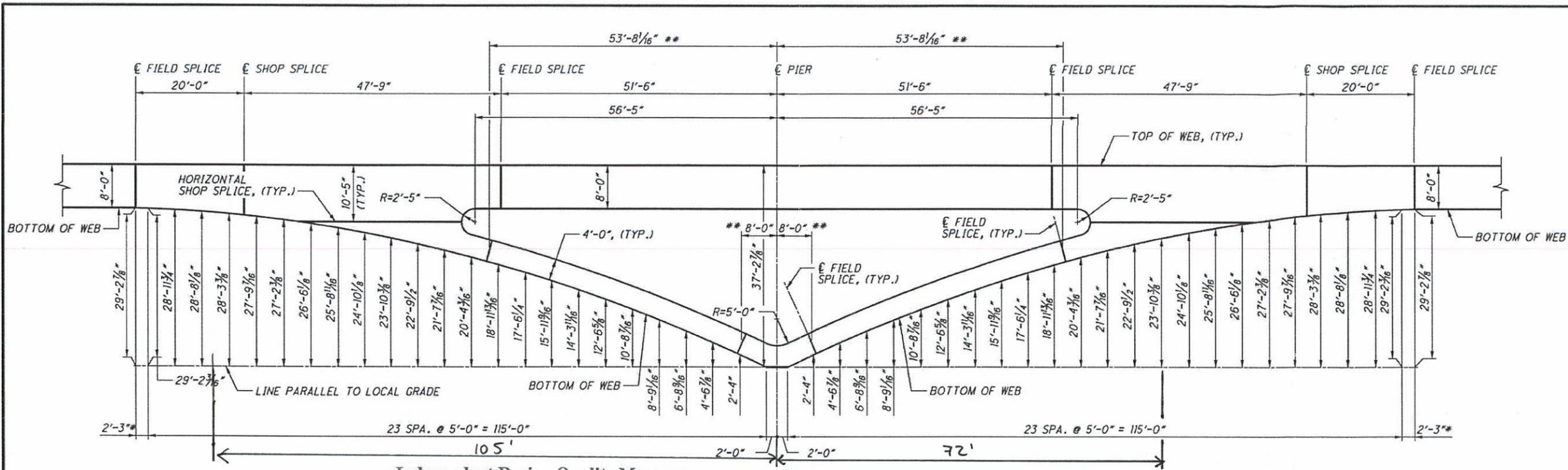
$$105' \text{ from Pier} = 29.2396 + 8.00 - 28.53 = 8.71'$$

$$72' \text{ from Pier} = 29.2396 + 8.0 - 23.865 = 13.37'$$

Say height of Stem equal to Distance from Bottom of overhang to Bottom of Bottom Flange.

	Web		Bot Flange	=	Total
Back Station Red	13.37'	+	2.5"/12	=	13.58'
Green	8.0'	+	2.75"/12	=	8.23'
Ahead Sta. Red	8.71'	+	2.75"/12	=	8.94'

Date: 9/21/2011
 Model: Sheet1
 File: 49633-S-BR-CRD08-U2S1Steel.dgn

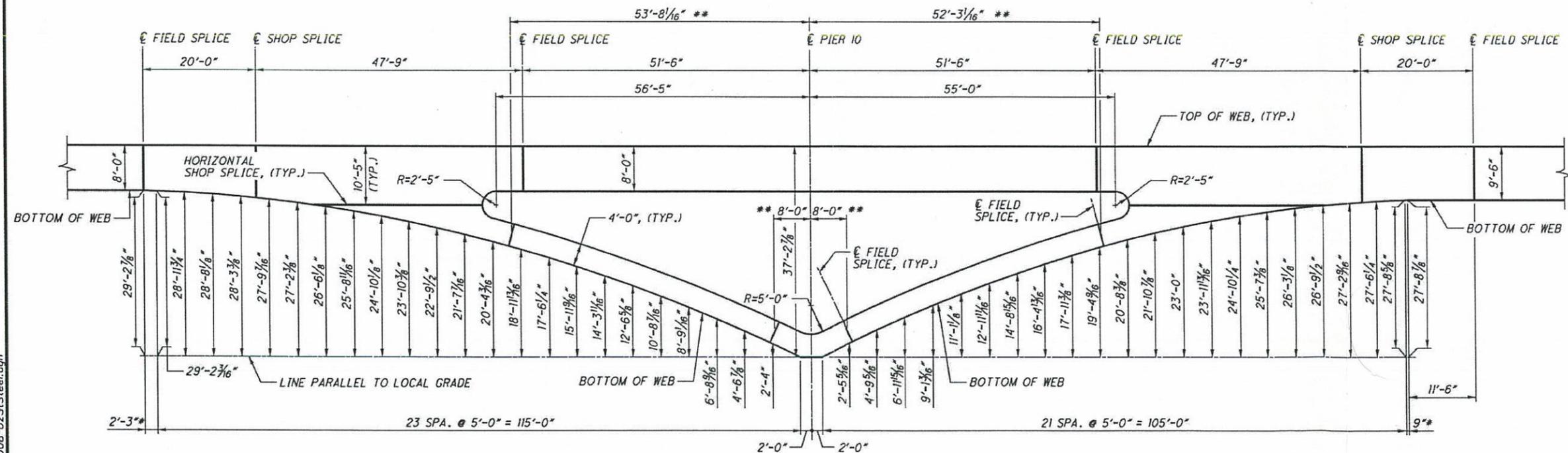


$$y = -0.001938x^2 - 0.02215x + 29.2396$$

$$y = -0.001938x^2 + 0.4766x$$

Independent Design Quality Manager
Released For Construction
 PIERS 3 THRU 9
 (IF LANGES NOT SHOWN)

Kenneth J. Wright 9/23/11
 Name Date



$$y = -0.001938x^2 - 0.02215x + 29.2396$$

$$y = -0.0022468x^2 + 0.4999x$$

PIER 10
 (IF LANGES NOT SHOWN)

* TERMINATION OF PARABOLIC CURVE
 ** DIMENSIONS ARE TO € WEB AT € SPLICE



NO.	REVISIONS	DATE
B	FINAL SUBMITTAL - REVISED	04/14/11
C	FINAL SUBMITTAL - REVISED	06/09/11
D	FINAL SUBMITTAL - REVISED	08/09/11
1	APPROVED FOR CONSTRUCTION	09/21/11

DESIGN AGENCY
WALSH HNTB
 WALSH HNTB CONSTRUCTION

CLYDEMAN'S
ANNENBERG BRIDGE
 30
 GIRDER ELEVATIONS
 BRIDGE NO. CUY-90-1532
 I-90 WEST BOUND

MAIN SPAN
UNIT 2
 STRUCTURAL STEEL

DESIGNED	DRAWN	REVIEWED	DATE
DJC	FWG	HRH	09/21/11
CHECKED	CHECKED	CHECKED	STRUCTURE FILE NUMBER
HRH	LJD	HRH	1809431

CUY-90-14.90
 PID No. 77332/85531
 25/84

Title 33, Chapter 1, Part 118



The owner of a bridge which constitutes a hazard to aerial navigation should maintain, in addition to the lights prescribed in this part, such lights as may be prescribed by the Administrator, Federal Aviation Administration.

[40 FR 24898, June 11, 1975, as amended by CGD 75-046a, 42 FR 56954, Oct. 31, 1977]

§ 118.50 Inspection.

Lights and other signals required or authorized under this part are subject to inspection at any time by Coast Guard personnel or authorized agents.

[CGD 84-022, 51 FR 16313, May 2, 1986]

§ 118.55 Periods of operation.

(a) Lights shall be displayed from sunset to sunrise and at other times when the visibility is less than one mile.

(b) Operators shall not be required to exhibit the prescribed lights during seasons when vessels are unable to navigate in the vicinity of the bridge.

(c) The operation of signals other than lights shall be as prescribed by the District Commander. Each case shall be considered individually.

§ 118.60 Characteristics of lights.

All lights required or authorized under this part must be securely attached to the structure and of sufficient candlepower as to be visible against the background lighting at a distance of at least 2,000 yards 90 percent of the nights of the year. Lights must meet the requirements of this part. Lights shall be fixed lights excepting as provided in §§118.95, 118.110 and 118.150 of this part. Color specifications are not prescribed for bridge lights, however, the chromaticity standards for navigation lights in 33 CFR Part 84—Annex I are recommended.

[CGD 84-022, 51 FR 16313, May 2, 1986, as amended by USCG-1998-3799, 63 FR 35530, June 30, 1998]

§ 118.65 Lights on fixed bridges.

(a) Each fixed bridge span over a navigable channel shall be lighted so that the center of the navigable channel under each span will be marked by a range of two green lights, and each margin of each navigable channel will be marked by a red light: *Provided*, That when a margin of a channel is limited by a pier, only those lights prescribed in paragraph (b) of this section shall be required to mark such channel margin. The green lights shall each show through a horizontal arc of 360°; they shall be securely mounted just below the outermost edge of the bridge span structure so as to be visible from an approaching vessel. Each red light shall show through a horizontal arc of 180°, and shall be securely mounted just below the outermost edge of the bridge span structure to show 90° on either side of a line parallel to the axis of the channel so as to be visible from an approaching vessel.

Note: Until such time that major repairs to or replacements of existing fixed span navigation lights colored green are made, it is permitted that only one of these lights marking the centerline of the same channel under a span shall be visible to an approaching vessel. When major repairs to or replacement of such existing green lights are made they shall conform with this paragraph.

(b) *Pier lights.* When the navigable channel extends from pier to pier or when piers are located within the navigable channel, each end of such piers shall be lighted with a red light. Each such light shall show through a horizontal arc of 180°, and shall be securely fastened at the end of the pier as low as practicable but not lower than 2 feet above navigable high water to show 90° on either side of a line parallel to the axis of the channel so as to be visible from an approaching vessel.

(c) *Main channel.* When necessary, the District Commander may prescribe that fixed bridges having two or more spans over a navigable channel shall have the main channel span marked with a set of three white lights arranged in a vertical line directly above each green light on the main channel span. Each white light shall show through a horizontal arc of 180°, and shall be mounted so that 1/2 of the horizontal arc will show on either side of a line parallel to the axis of the channel. These three white lights shall be securely mounted on the bridge structure and spaced as nearly 15 feet apart as the structure of the bridge will permit, with a minimum spacing of 7 feet. The lowest white light in the line of three lights shall be placed not less than 10 nor more than 15 feet above each green light on the main channel span.

Note: Until such time that major repairs to or replacements of existing main channel lights showing white are made, it is permitted that these lights show through a horizontal arc of not less than 60° nor more than 180° with 1/2 of such arc showing either side of a line parallel to the axis of the main channel. When major repairs or replacement of such existing white lights are made, they shall conform with this paragraph.

[40 FR 24898, June 11, 1975, as amended by CGD 75-046a, 42 FR 56954, Oct. 31, 1977]

§ 118.70 Lights on swing bridges.



(a) *Swing span lights on through bridges.* Each swing span of every through swing bridge shall be lighted with three lanterns so that when viewed from an approaching vessel the swing span when closed will display three red lights on top of the span structure, one at each end of the span on the same level and one at the center of the span no less than 10 feet above the other two lights, and when open for navigation will display three green lights on top of the span structure in a line parallel to and directly above the long axis of the span, one at each end of the span on the same level, and one at the center of the span no less than 10 feet above the other two lights. Each lantern shall show through alternate red and green horizontal arcs of 60° each, the axis of adjacent arcs to be 90° from each other; each light shall be securely mounted with the axis of the green arcs parallel to the long axis of the swing span.

(b) *Swing span lights on deck and half-through bridges.* Each swing span of every deck, half-through, girder, or similar type swing bridge shall be lighted with four lanterns so that when viewed from an approaching vessel the swing span when closed will display one red light at each end, and when open to navigation will display two green lights from each end. Each lantern shall show through one red and two green horizontal arcs of 60° each, the axis of each green arc to be 90° from the axis of the red arc; each light shall be securely mounted at the floor level of the span as near to the side of the span as practicable with the axis of the red light normal to the long axis of the swing span and so that the red light will be visible from an approaching vessel when the span is closed.

(c) *Pier lights.* Every swing bridge shall be lighted so that each end of the piers adjacent to the navigable channel (draw piers) or each end of their protection piers (draw pier protection piers) and each end of the piers protecting the pivot pier (pivot protection pier) will be marked by a red light. Each of these lights shall show through a horizontal arc of 180° and shall be mounted as low as practicable below the floor level of the swing span to show 90° on either side of a line parallel to the axis of the channel so as to be visible from an approaching vessel.

(d) *Axis lights.* Every swing bridge shall be lighted so that the intersection of the bridge axis with each side of the pivot pier and the channel side of each draw pier which has a protection pier will be marked by a red light: *Provided,* That if the draw and draw protection piers are straight along their channel faces these lights shall not be required. Each such light shall show through a horizontal arc of 180°, and shall