Fatigue and Fracture Bridge Inspection Plan, Forbes Avenue over Fern Hollow and 9 Mile Run, Prepared for City of Pittsburgh Department of Public Works via Pennsylvania Department of Transportation Engineering District 11, CDM Smith, January 2016

Pittsburgh, PA

HWY22MH003

(33 pages)

FATIGUE AND FRACTURE BRIDGE INSPECTION PLAN

STRUCTURE BMS NUMBER:	02 7301 0000 3033
BRIDGE NAME:	FORBES AVENUE OVER FERN HOLLOW AND 9 MILE RUN
LOCATION:	CITY OF PITTSBURGH, ALLEGHENY COUNTY, PENNSYLVANIA
PREPARED FOR:	CITY OF PITTSBURGH D.P.W. VIA PENNSYLVANIA DEPARTMENT OF TRANSPORTATION, ENGINEERING DISTRICT 11-0
DATE PREPARED:	JANUARY 2016

CDM Smith

503 MARTINDALE STREET,
PITTSBURGH, PENNSYLVANIA 15212
412.208.2424 *F* 412.231.0301
WWW.CDMSMITH.COM

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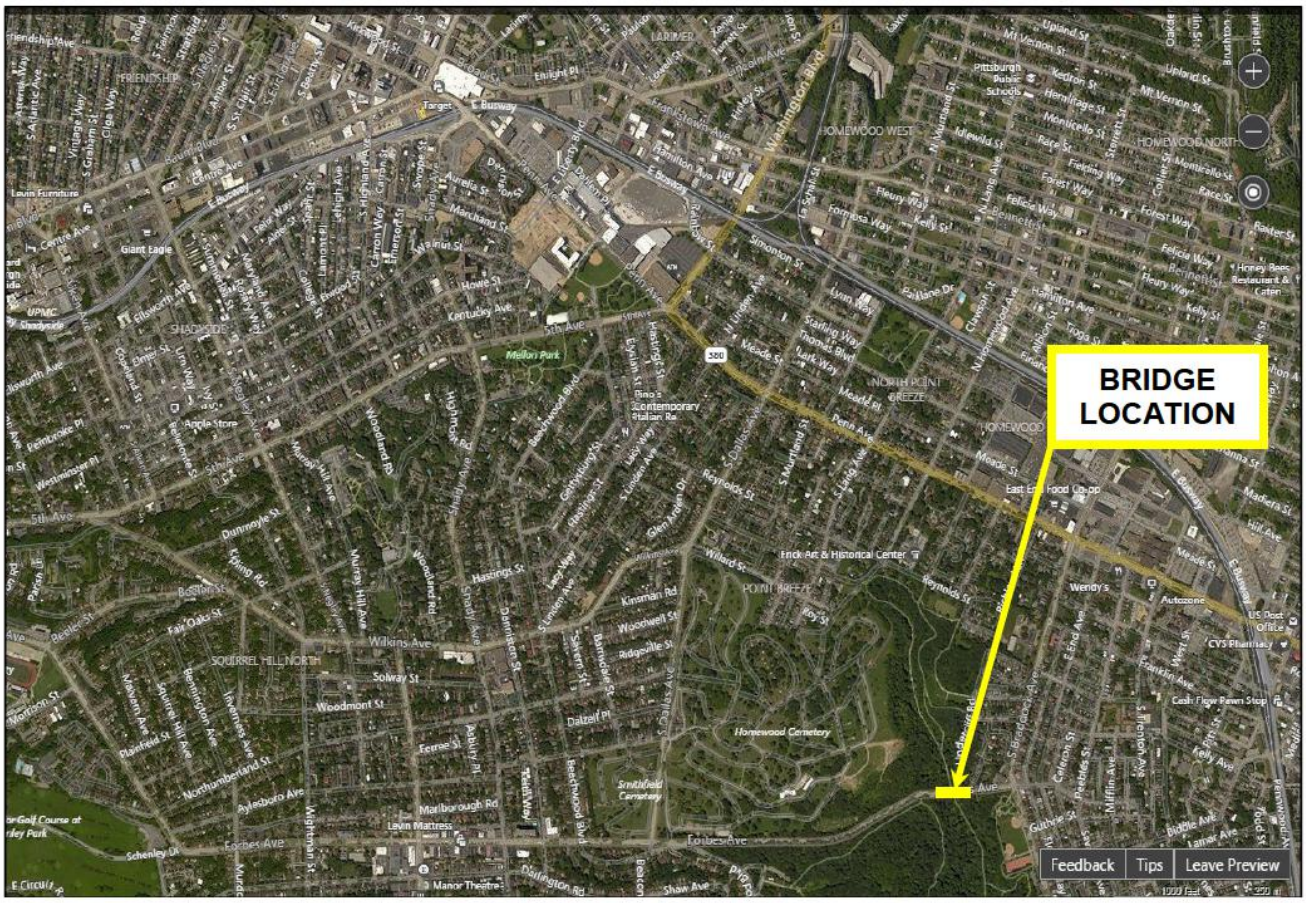
RIGHT ELEVATION

NEAR APPROACH

FAR APPROACH



Forbes Avenue
Over
Fern Hollow and Nine Mile Run

BMS No. 02-7301-0000-3033

City of Pittsburgh,
Allegheny County,
Pennsylvania

SUMMARY

STRUCTURE DESCRIPTION:

The bridge is a three-span continuous rigid frame with a total structure length of 447'-0". The superstructure consists of two variable depth welded weathering steel girders, welded steel floorbeams, and rolled steel stringers, supported by two welded steel frames. The entire superstructure is weathering steel. The reinforced concrete deck, measuring 64'-0" out-to-out, is topped with a bituminous wearing surface. The four (4) lane undivided roadway measures 50'-0" curb-to-curb with a 7'-0" wide reinforced concrete sidewalk on each side. A pedestrian railing, 3'-6" in height including a 20" high single rail tubular steel bridge rail is mounted on top of each sidewalk and curb. The substructure consists of two (2) original stone masonry abutments with reinforced concrete caps, and weathering steel frame legs supported by reinforced concrete thrust blocks.

The bridge is located in the City of Pittsburgh and carries Forbes Avenue over Fern Hollow and Nine Mile Run which are located within Frick Park. The bridge is owned and maintained by the City of Pittsburgh.

INSPECTION PROCEDURE:

An Underbridge inspection crane with a 62' horizontal reach was used to access the underside of bridge and frame legs. Traffic was maintained in accordance with Publication 213, Figure PATA 18 between the hours of 8:00 AM and 3:00 PM.

GENERAL FATIGUE/FRACTURE NOTES:

The following is a detailed Fatigue and Fracture Inspection Plan created in accordance with Publication 238 including Strike Off Letter 431-09-12 and District 11-0 directives. The following report outlines the locations of Fracture-Critical Members (FCM), AASHTO Fatigue Categories, and general descriptions of all of the fatigue (AASHTO Category C and lower) and fracture-critical properties present on the structure. Appendix A contains photos depicting fracture-critical members and details. Appendix B contains framing plans highlighting the locations of the fracture-critical members. Appendices C through F contain supporting documentation.

The Fracture-Critical Members of the bridge include the welded, weathering steel girders and floorbeams.

The girders experience positive and negative moment and contain intersecting welds (AASHTO Fatigue Category E (Equivalent), and web gap out-of-plane bending at the stiffener / connection plate locations. In 2015, five (5) cracks (Type ST) were found at the top of the floorbeam connection plate-to-girder web weld (AASHTO Fatigue Prone Detail).

The welded, weathering steel floorbeams, spaced at greater than 14'-0", are also fracture-critical members. Short, welded attachments for the lateral bracing are present at the center of all floorbeams (AASHTO Fatigue Category E). The top and bottom flanges are cut short at the ends (AASHTO Fatigue Category E (Equivalent).

SUMMARY AND RECOMMENDATIONS:

RETROFITS:

None in place.

Crack-arrest holes should be drilled at the ends of the Type ST cracks located at five (5) locations at the top of the floorbeam connection plate-to-girder web welds on the Left Girder negative moment regions at Floorbeams 5, 11 and 13.

BRIDGE TESTING RECOMMENDATIONS:

Consideration should be given to an in-depth Non-Destructive Examination (NDE) of problematic details due to out-of-plane bending in the girder tension zones currently resulting in cracks at the top of the floorbeam connection plate-to-girder web welds in the Left Girder negative moment regions at Floorbeams 5, 11 and 13.

Monitoring of intersecting welds on the girder webs between the butt splices and longitudinal stiffener welds should continue. The intersecting welds located in Floorbeams 9 and 11 at the center transverse stiffener and lateral bracing connection plates (Hoan-like Detail) should also continue to be monitored.

APPENDIX A

PHOTOS OF FRACTURE-CRITICAL MEMBERS

Photo 1 – Location of Fracture-Critical Members.

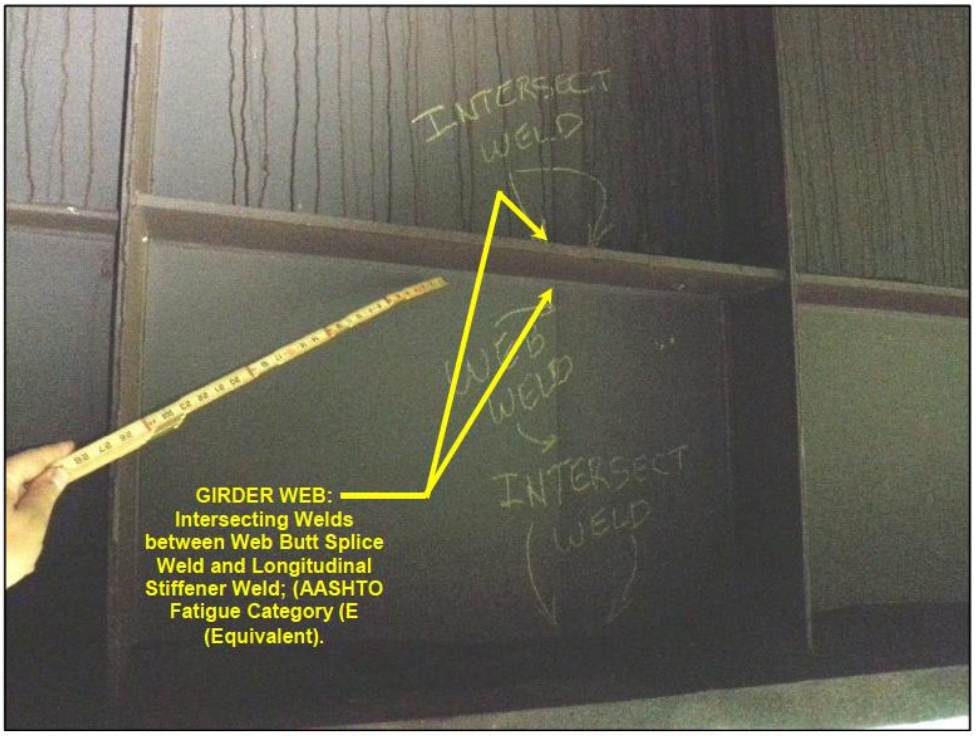


Photo 2 – Location of Fracture-Critical Members.

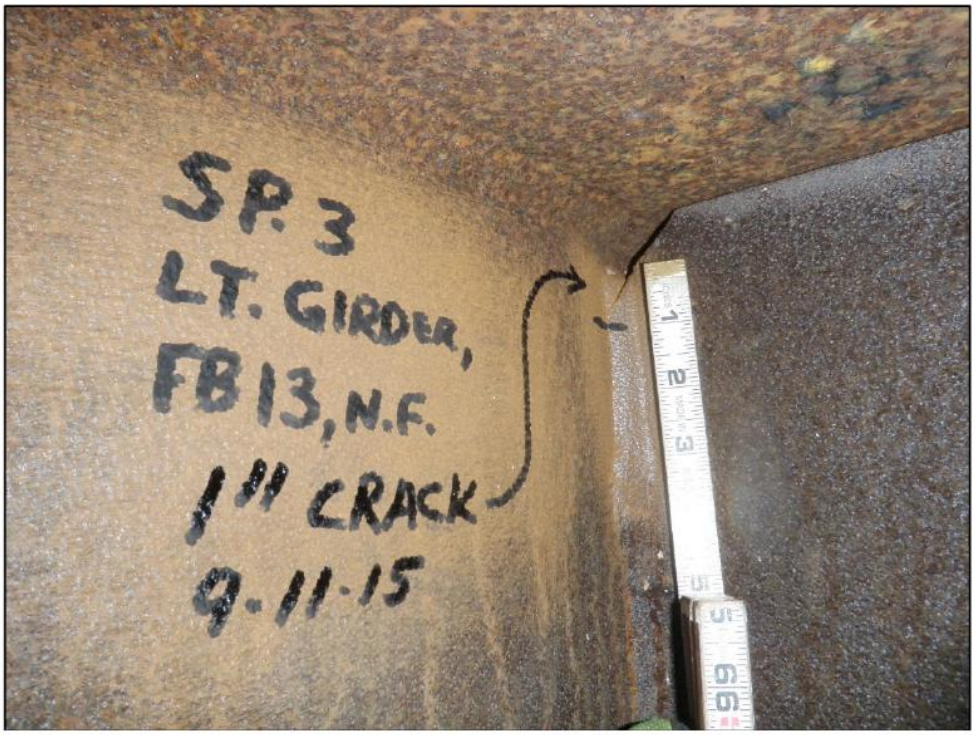


Photo 3 – Location of Fracture-Critical Members. Type ST crack at top of floorbeam connection plate-to-girder web weld (AASHTO Problematic Detail).

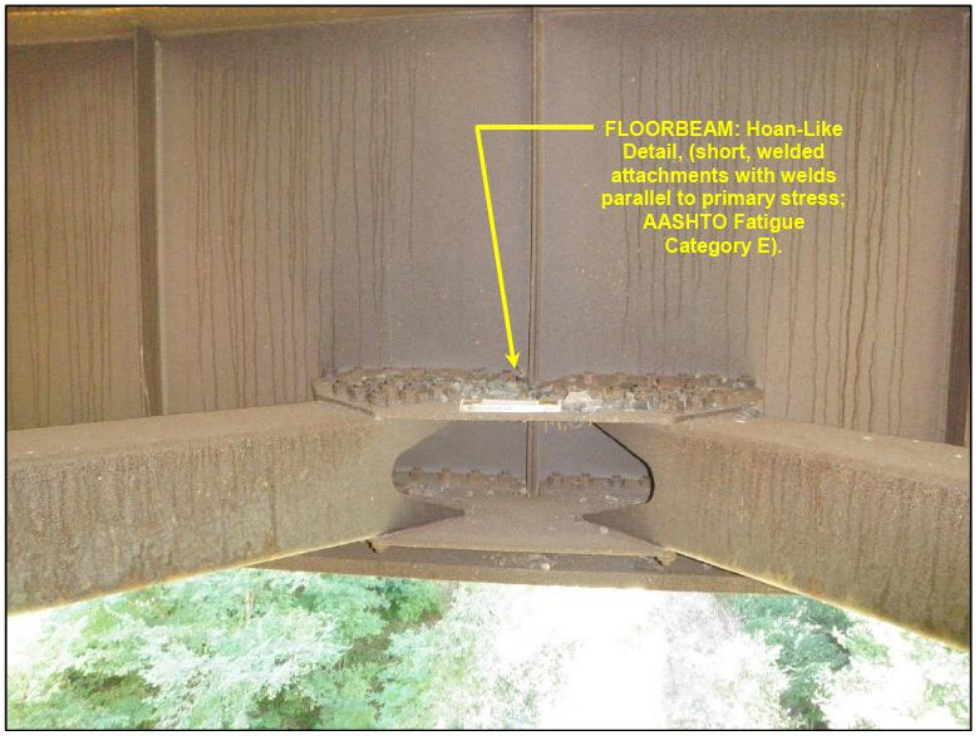


Photo 4 – Location of Fracture-Critical Members.

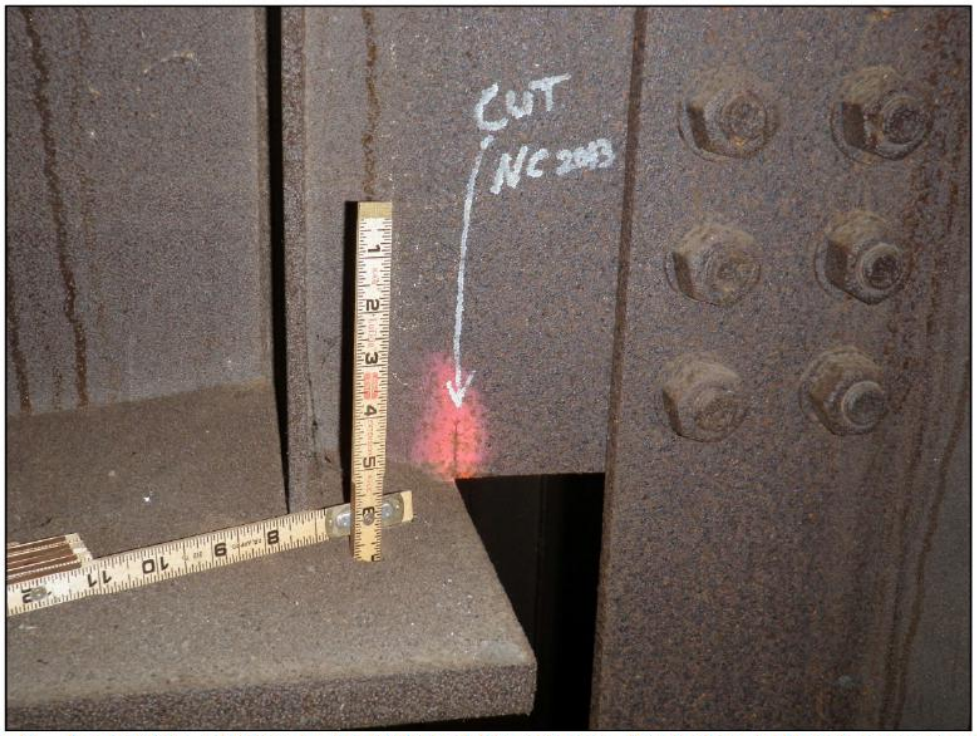


Photo 5 – Location of Fracture-Critical Members. Cut-short floorbeam flange at girder connection (AASHTO Fatigue Category E (Equivalent). Floorbeam was over-cut when fabricated).

APPENDIX B

FATIGUE / FRACTURE DETAILS

FATIGUE/FRACTURE DETAILS

Reference Symbol	Fatigue/Fracture Detail Description
★	Out-of Plane: Short (< 2") full-penetration and groove welded attachments; shear studs
‡	Bending: floorbeam connection-to-girder web
■	Out of Plane: Flange-to-web continuous fillet weld
●	Out-of-Plane: Web gap at stiffener, diaphragm or floorbeam connection
▼	Longitudinal stiffener end/butt weld
♦	Coped/cut-short flanges
+	Groove welded floorbeam beam knee brace attachment to girder bottom flange
IW	Intersecting welds
▲	Short, fillet welded attachments with welds parallel to primary stresses

Reference Symbol	AASHTO Fatigue Category	Inspection Crack Types
★	C, C'	N/A
‡	D	N/A
■	E (Equivalent)	W, W_O
●	E (Equivalent)	ST, ST_C, SB
▼	E	L,A
♦	E (Equivalent)	T,B,E
+	E	F
IW	E (Equivalent)	
▲	E	GT, GB

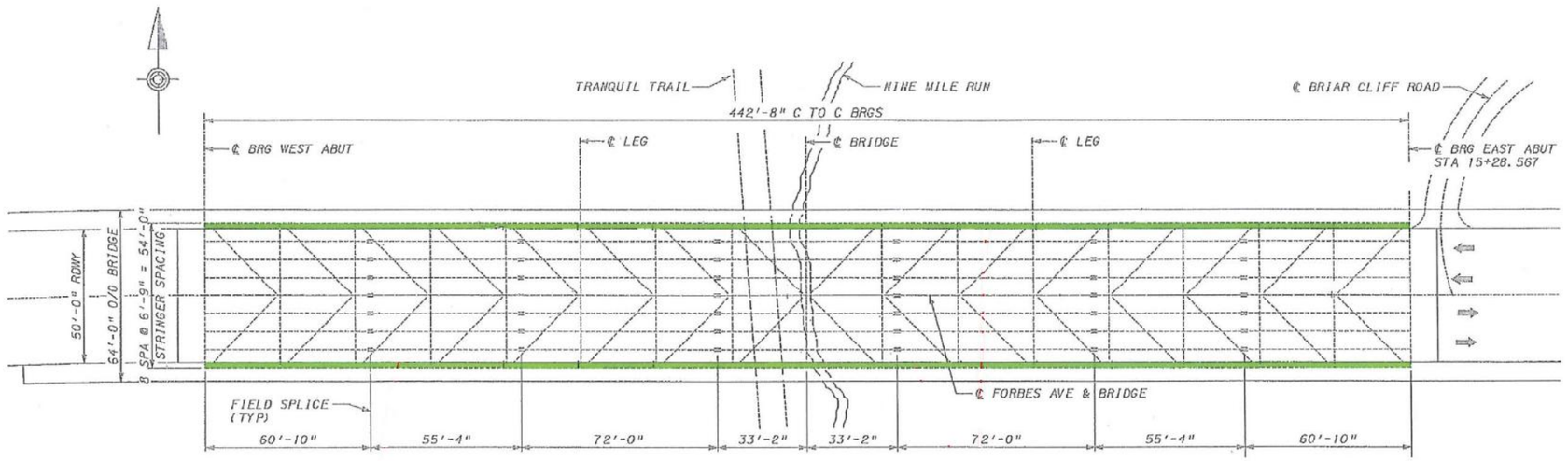
RETROFITS

Retrofit Letter	Retrofit Detail Description
CA	Crack arrest hole drilled at tip
R_G	WT13.5x89 bolted between girder top flange and floorbeam connection plate
R_H	Welded bracket added to outside face of girder and bolted to girder top flange and web, opposite floorbeam connection plate
R_F	Welded tab plate replaced with new bolted connection plate between floorbeam knee brace and girder bottom flange
R_T	15/16" diameter drilled hole filled with an A325 high strength bolt and washers under both head and nut adjacent to end floorbeam top flange
R_B	15/16" diameter drilled hole filled with an A325 high strength bolt and washers under both head and nut adjacent to end floorbeam bottom flange
R_X	Removed cracked tack weld
R_Z	Back-up bar butt weld splice removed
R_L	Crack arrest hole drilled or connection plate replaced at intersecting welds between lateral or shear bracing gusset plate and girder web
R_K	8" angles installed on each side of floorbeam connection plate to girder top flange

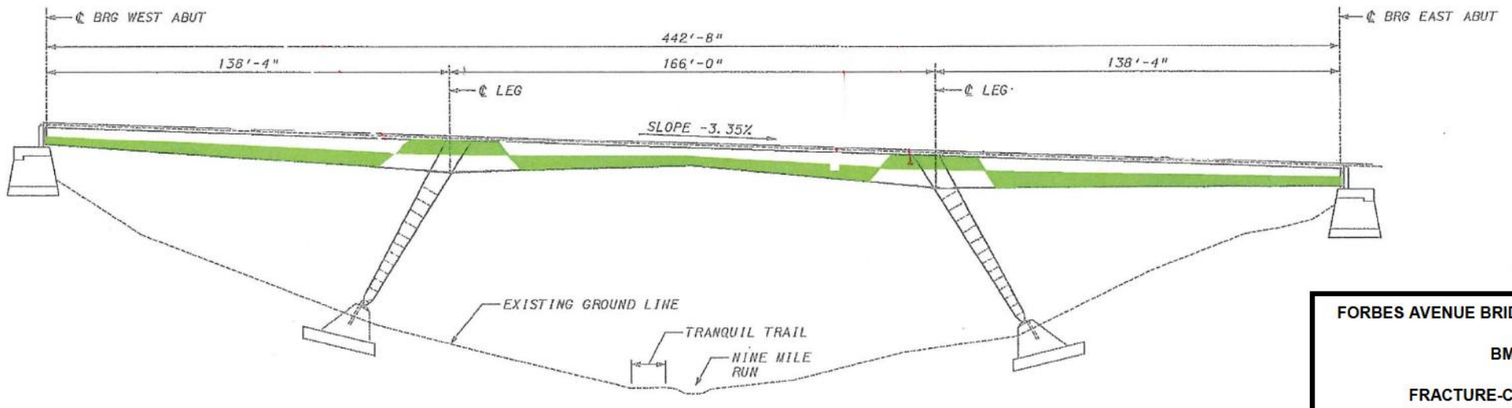
SPAN	LOCATION	REFERENCE SYMBOL	FATIGUE/FRACTURE DETAIL DESCRIPTION	AASHTO FATIGUE CATEGORY	INSPECTION CRACK TYPES (IF PRESENT)	RETROFIT YES/NO	RETROFIT LETTER	ADDITIONAL RETROFIT DETAIL DESCRIPTION
1	Girders	IW	Intersecting welds.	E (Equivalent)		NO		
1	Girders	★	Welded transverse stiffeners.	C		NO		
1	Floorbeams	▲	Short, welded attachment with weld parallel to primary stress.	E		NO		
1	Floorbeams	●	Web gap at floorbeam-to-girder web connection.	E (Equivalent)	ST	NO		
1	Floorbeams	◆	Cut-short flanges (top & bottom).	E (Equivalent)		NO		
2	Girders	IW	Intersecting welds.	E (Equivalent)		NO		
2	Girders	★	Welded transverse stiffeners.	C		NO		
2	Floorbeams	▲	Short, welded attachment with weld parallel to primary stress.	E		NO		
2	Floorbeams	●	Web gap at floorbeam-to-girder web connection.	E (Equivalent)	ST	NO		
2	Floorbeams	◆	Cut-short flanges (top & bottom).	E (Equivalent)		NO		
3	Girders	IW	Intersecting welds.	E (Equivalent)		NO		
3	Girders	★	Welded transverse stiffeners.	C		NO		
3	Floorbeams	▲	Short, welded attachment with weld parallel to primary stress.	E		NO		
3	Floorbeams	●	Web gap at floorbeam-to-girder web connection.	E (Equivalent)	ST	NO		
3	Floorbeams	◆	Cut-short flanges (top & bottom).	E (Equivalent)		NO		

APPENDIX C

FRACTURE-CRITICAL MEMBER IDENTIFICATION FRAMING PLAN



PLAN



DENOTES FRACTURE-CRITICAL MEMBER

FORBES AVENUE BRIDGE OVER NINE MILE RUN & FERN HOLLOW

BMS NO. 02-7301-0000-3033

FRACTURE-CRITICAL MEMBER IDENTIFICATION

FRAMING PLAN

Prepared by: _____

Date: _____

APPENDIX D

BMS FORM “IF”; iforms – FORM F

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BMS2

2 logout

INSPECTION - FRACTURE CRITICAL 09/11/2015 C - ROUTINE/CRANE

Hide Quick Links

5A01 SR ID: 02730100003033 GO **5A03 BRKEY:** 2410 GO **Agency ID:** GO **Go To:** Inspection - Fracture Critical

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Inspection Information

7A03 Primary Insp Type: C - Routine/crane **7A09 Freq:** 24 months **Inspection Status:** 9 - Accepted

Main

6A44 Group: 2 - Group 2 **6A45 - 6A48 CRF:** 1001 **6A49 Total CRF:** 2 **6A26 - 6A29 Dept Struc Type:** 16322

Approach

Group: _ **CRF:** **Total CRF:** 0 **Dept Struc Type:** ____

Fracture Critical Members

IF01 FC Location	IF02 FC Member Type	IF03 FC Member	IF04 Member Detail	Action
1 - 1	01 - Girder	FRAME GIRDERS (ALL SPANS)	INTERSECTING WELDS	
1 - 1	11 - Floorbeam	FLOORBEAMS (ALL SPANS)	HOAN-LIKE DETAIL	
1 - 1	11 - Floorbeam	FLOORBEAM (ALL SPANS)	CUT-SHORT FLANGES	
1 - 1	01 - Girder	FRAME GIRDERS (ALL SPANS)	TRANSVERSE STIFFENERS	

Records 1 to 4 of 4 Records Per Page: 5

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INSPECTION - FRACTURE CRITICAL 09/11/2015 C - ROUTINE/CRANE

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FRACTURE CRITICAL DETAIL

IF01 FC Location: 1 - 1

IF02 FC Member Type: 01 - Girder

IF03 FC Member: FRAME GIRDERS (ALL SPANS)

IF04 Member Detail: INTERSECTING WELDS

IF05 Fatigue Stress Cat: E

Inspection Status: 9 - Accepted

IF06 Member Detail Condition: FATIGUE CATEGORY E (EQUIVALENT). WEB BUTT SPLICE / LONGITUDINAL STIFFENER WELDS. NO VISIBLE CRACKS

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INSPECTION - FRACTURE CRITICAL 0021

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FRACTURE CRITICAL DETAIL

IF01 FC Location:	1 - 1	**IF02 FC Member Type:**	11 - Floorbeam
IF03 FC Member:	FLOORBEAMS (ALL SPANS)	**IF04 Member Detail:**	HOAN-LIKE DETAIL
IF05 Fatigue Stress Cat:	E	**Inspection Status:**	9 - Accepted
IF06 Member Detail Condition:	CENTER LATERAL BRACING CONNECTION PLATES. NO VISIBLE CRACKS.		

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FRACTURE CRITICAL DETAIL

IF01 FC Location: 1 - 1
IF02 FC Member Type: 11 - Floorbeam
IF03 FC Member: FLOORBEAM (ALL SPANS)
IF04 Member Detail: CUT-SHORT FLANGES
IF05 Fatigue Stress Cat: E
Inspection Status: 9 - Accepted
IF06 Member Detail Condition: FATIGUE CATEGORY E (EQUIVALENT). NO VISIBLE CRACKS.

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FRACTURE CRITICAL DETAIL

IF01 FC Location:	1 - 1	**IF02 FC Member Type:**	01 - Girder
IF03 FC Member:	FRAME GIRDERS (ALL SPANS)	**IF04 Member Detail:**	TRANSVERSE STIFFENERS
IF05 Fatigue Stress Cat:	C	**Inspection Status:**	9 - Accepted
IF06 Member Detail Condition:	NO VISIBLE CRACKS.		

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Version no : 004.005

5A01 **SR ID:** 02730100003033 5A03 **BR Key:** 2410 7A01 **Inspection Date:** September 11, 2015

Main

6A44 **Group:** 2 - Group 2

6A45 - 6A48 **Critical Rating Factor:** 1001

6A49 **Total Critical Rating Factor:** 2

Structure Type (Dept)

6A26 **Material Makeup:** 1 - Steel

6A27 **Physical Makeup:** 6 - Rolled sections

6A28 **Span Interaction:** 3 - Continuous, non-comp

6A29 **Structural Config:** 22 - Rigid frame

Approach

6A44 **Group:**

6A45 - 6A48 **Critical Rating Factor:**

6A49 **Total Critical Rating Factor:** 0

Structure Type (Dept)

6A26 **Material Makeup:**

6A27 **Physical Makeup:**

6A28 **Span Interaction:**

6A29 **Structural Config:**

5A01 **SR ID:** 02730100003033 | 5A03 **BR Key:** 2410 | 7A01 **Inspection Date:** September 11, 2015

Fracture Critical Details

IF01 **Location:** M - 1 | IF02 **Type:** 01 - Girder | IF05 **FC Stress Category:** E

IF03 **Member:** FRAME GIRDERS (ALL SPANS)

IF04 **Member Detail:** INTERSECTING WELDS

IF06 **Notes:** FATIGUE CATEGORY E (EQUIVALENT). WEB BUTT SPLICE / LONGITUDINAL STIFFENER WELDS. NO VISIBLE CRACKS

IF01 **Location:** M - 1 | IF02 **Type:** 11 - Floorbeam | IF05 **FC Stress Category:** E

IF03 **Member:** FLOORBEAMS (ALL SPANS)

IF04 **Member Detail:** HOAN-LIKE DETAIL

IF06 **Notes:** CENTER LATERAL BRACING CONNECTION PLATES. NO VISIBLE CRACKS.

IF01 **Location:** M - 1 | IF02 **Type:** 11 - Floorbeam | IF05 **FC Stress Category:** E

IF03 **Member:** FLOORBEAM (ALL SPANS)

IF04 **Member Detail:** CUT-SHORT FLANGES

IF06 **Notes:** FATIGUE CATEGORY E (EQUIVALENT). NO VISIBLE CRACKS.

IF01 **Location:** M - 1 | IF02 **Type:** 01 - Girder | IF05 **FC Stress Category:** C

IF03 **Member:** FRAME GIRDERS (ALL SPANS)

IF04 **Member Detail:** TRANSVERSE STIFFENERS

IF06 **Notes:** NO VISIBLE CRACKS.

APPENDIX E

FCM DATA SHEET

FCM DATA SHEET

Prepared By: DJB **BMS No:** 02-7301-0000-3033

Date: 1/4/2016 **Structure Type:** Three-span Continuous Weathering Steel Rigid Frame

Deck Type: Reinforced Concrete

MAIN SPANS		
Number of Spans: 3	**Group Number:** 2	**Critical Rank Fact:** 1001 = 2

APPROACH SPANS		
Number of Spans: 0	**Group Number:** N/A	**Critical Rank Fact:** N/A

FCM-Component-Details	Crit Rank Fact	Locations
1. Frame Girders (Category E)	1001 = 2	Girder Web Butt Splice / Longitudinal Stiffener Welds.
2. Welded Steel Plate Floorbeams: Hoan-Like Detail; Short Welded Attachments with welds Parallel to Primary Stress (Category E).	1001 = 2	All Floorbeams at Floorbeam Mid-span.
3. Welded Steel Plate Floorbeams (Category E)	1001 = 2	All Floorbeams at Girder Connection; Top & Bottom Flange.
4. Welded Steel Plate Girders (Category C)	1001 = 2	Welded Transverse Stiffeners / Floorbeam Connection Plates.

Remarks:

Main Spans: – Pony Truss, Simple

1st Digit: 1 Welded/ Direct Tension.
2nd Digit 0 Intersecting Welds
3rd Digit 0 Intersecting Welds
4th Digit 1 High, <10 Years Remaining Fatigue Life

Other Pertinent Information:

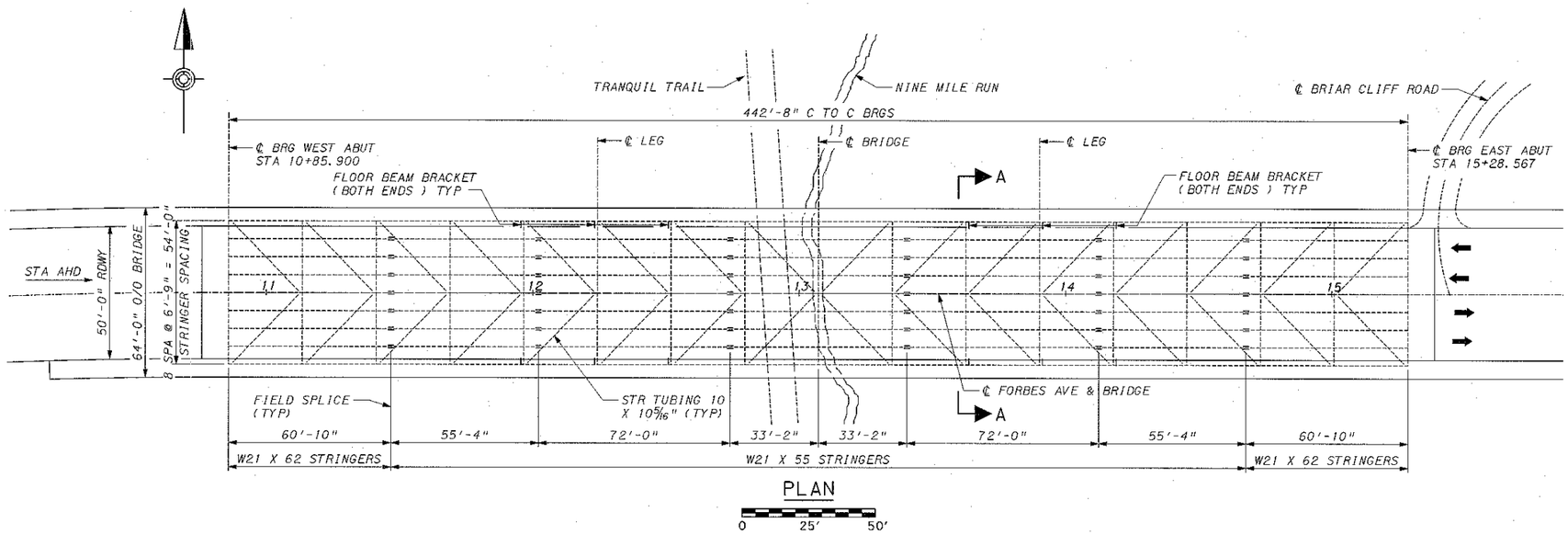
Year Built:	1970	**Year Reconstructed:**	N/A	**Type of Reconstruction:**	N/A
ADTT:	High	**ADTT Year:**		**Cum Truck Traffic (6A52):**	
Estimated Cum Truck Fatigue Life (6A53):				**Estimated Rem Fat Life:**	
Recommended Inspection Frequency:			12 Months		

Inspection Updates:

2015:	NBIS/FCM Inspection		

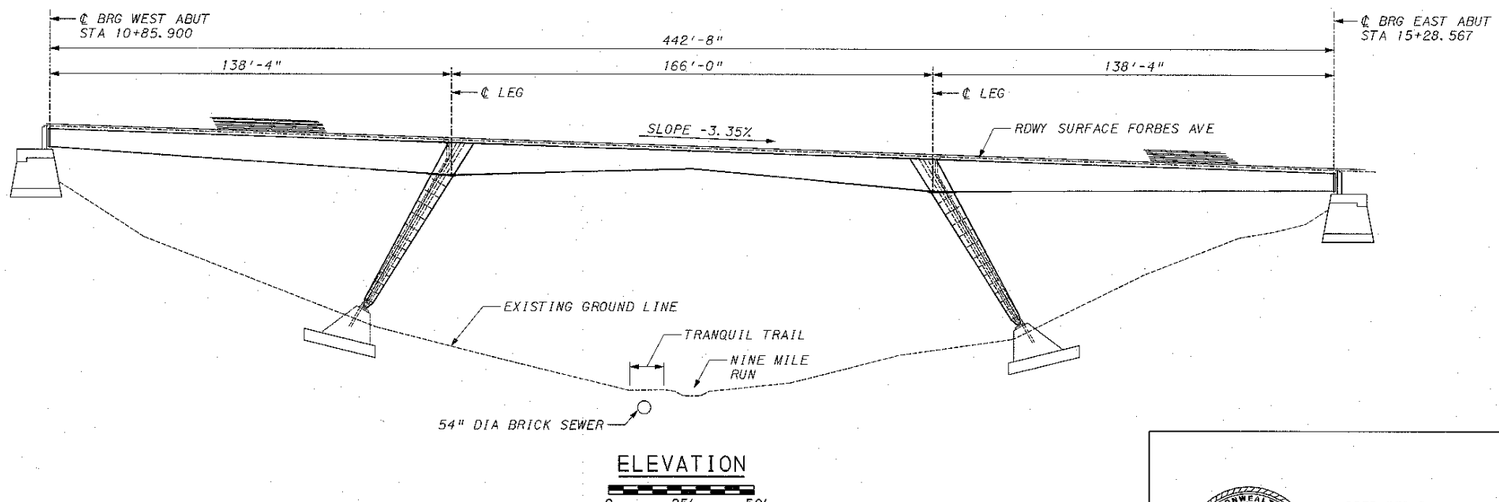
APPENDIX F

REFERENCE DRAWINGS



PLAN

0 25' 50'



ELEVATION

0 25' 50'

INDEX OF DRAWINGS

SHEET NO	TITLE
1	GENERAL PLAN AND ELEVATION
2	GENERAL NOTES AND APPROXIMATE QUANTITIES
3	TYPICAL SECTION AND KNEE BRACE REPAIR
4	FRAME LEGS AND BRACING RETROFIT
5	DOWNSPOUT REPAIRS

NOTES:

SHOP DRAWINGS MUST INDICATE THAT EXISTING DIMENSIONS THAT RELATE TO THE AFFECTED WORK HAVE BEEN FIELD VERIFIED BEFORE SHOP DRAWINGS CAN BE APPROVED. NO PAYMENT OR APPROVAL WILL BE GIVEN UNTIL ALL DIMENSIONS ARE FIELD VERIFIED.

FOR SECTION A-A, SEE SHEET 3.

STRUCTURE NO. 02730100003033

DESIGNED BY	GRL
CHECKED BY	RSC
DRAWN BY	RJK
CHECKED BY	GRL

$$--------DESIGN-FILE-NAME--------$$

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL RONALD S. CAPP ENGINEER PE 017251-E

Ronald S. Capp 10/10/08

PREPARED BY:

MICHAEL BAKER JR, INC.
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108

B.T.E. PROJECT NO. 07300-5

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF TRANSPORTATION AND ENGINEERING

FORBES AVENUE BRIDGE OVER FERN HOLLOW
AND NINE MILE CREEK, FRICK PARK

BRIDGE REHABILATATION

GENERAL PLAN AND ELEVATION

SCALE: AS NOTED	SHEET NO.	ACCESSION NO.
DATE:	1 OF 5	CASE NO.

J:\DESIGN\City of Pgh Open End Agmt\Work order no. 5\Revision_1\ForbesRehab_01.dgn

GENERAL NOTES

MATERIALS AND WORKMANSHIP

PROVIDE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH SPECIFICATIONS PUBLICATION 408/2003, ANSI/AASHTO/AWS/D1.5-95 BRIDGE WELDING CODE, 2002, AND CONTRACT SPECIAL PROVISIONS.

STRANDS FOR RETROFITTED CROSS BRACING DESIGNED FOR 50 PSF AS PER AASHTO STANDARD SPECIFICATIONS 15TH EDITION (1994).

GENERAL

SUPERSTRUCTURE DIMENSIONS ARE FOR A NORMAL TEMPERATURE OF 68 DEGREES F.

ALL DIMENSIONS ARE HORIZONTAL EXCEPT AS NOTED.

USE CARE WHEN REMOVING PORTIONS OF THE EXISTING STRUCTURE TO PREVENT DAMAGE TO THE REMAINING PORTIONS. REPAIR OR REPLACE ANY REMAINING COMPONENTS DAMAGED BY REMOVAL OPERATIONS AT NO ADDITIONAL COST TO THE DEPARTMENT.

VERIFY ALL DIMENSIONS AND GEOMETRY OF THE EXISTING STRUCTURE IN THE FIELD AS NECESSARY FOR PROPER FIT OF THE PROPOSED CONSTRUCTION PRIOR TO FABRICATION. ADJUST NEW STEEL MEMBERS ACCORDINGLY FOR PROPER FIT IF REQUIRED.

STRUCTURAL STEEL

PROVIDE STRUCTURAL STEEL CONFORMING TO AASHTO M270, GRADE 50 DESIGNATION EXCEPT WHERE NOTED OTHERWISE.

DO NOT USE FORM SUPPORT SYSTEMS THAT WILL CAUSE UNACCEPTABLE OVERSTRESS OR DEFORMATION TO PERMANENT BRIDGE MEMBERS.

THE CONTRACTOR IS RESPONSIBLE FOR SAFE ERECTION OF STEEL ITEMS. PROVIDE ALL NECESSARY BRACING FOR STRUCTURAL STEEL ELEMENTS UNTIL THE ELEMENTS ARE IN A STABLE (FINAL) ERECTED CONDITION. SUBMIT AN ERECTION PLAN TO THE ENGINEER FOR APPROVAL A MINIMUM OF 30 DAYS PRIOR TO ERECTION.

FOR RETROFITTED CROSS BRACING USE ⅞"ø ZINC-COATED STRUCTURAL STRANDS CLASS A COATING E=24000 KSI WITH A BREAKING STRENGTH OF 46.0 TONS AS MANUFACTERED BY WILLIAMSPORT WIREROPE WORKS 100 MARYLAND STREET WILLIAMSPORT, PA 17701, OR EQUAL.

PROVIDE GALVANIZED 1¾"ø THREADED RODS 60 KSI TENSILE STRENGTH, ASTM A307 FOR STRANDS LOWER END CONNECTIONS AND ADJUSTMENTS IN TENSION.

FASTENERS

FASTENERS ARE ⅞" DIAMETER MECHANICALLY GALVANIZED HIGH STRENGTH BOLTS, ASTM A325, EXCEPT AS NOTED.

USE NEW HIGH STRENGTH BOLTS FOR ALL WORK REQUIRING BOLTED CONNECTIONS. RE-USE OF EXISTING FASTENERS IS NOT PERMITTED.

FIELD CONDITIONS MAY DIFFER FROM THOSE INDICATED BY THE DESIGNATIONS FOR EXISTING BOLTS SHOWN ON THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF STEEL, AS INDICATED OR SPECIFIED, REGARDLESS OF FASTENER TYPE. REMOVAL OF EXISTING FASTENERS IS INCIDENTAL TO OR INCLUDED IN THE ITEMS OF WORK.

WELDING NOTES

REMOVE BY APPLICATION OF HEAT ANY MOISTURE PRESENT AT POINT OF WELD. PROVIDE WINDBREAKS FOR PROTECTION FROM DIRECT WIND.

PRIOR TO PLACING THE WELD, THOROUGHLY BLAST OR POWER TOOL CLEAN ALL PORTIONS OF NEW AND EXISTING SURFACES TO RECEIVE WELDS OF ALL FOREIGN MATTER, INCLUDING PAINT FILM, FOR A DISTANCE OF 2 INCHES FROM EACH SIDE OF THE OUTSIDE LINES OF THE WELD.

BRIDGE REHABILITATION NOTES

DO NOT CONSIDER ANY OF THE DATA ON THE EXISTING STRUCTURE SUPPLIED IN THE ORIGINAL DESIGN DRAWINGS OR MADE AVAILABLE TO YOU BY THE DEPARTMENT OR ITS AUTHORIZED AGENTS AS POSITIVE REPRESENTATIONS OF ANY OF THE CONDITIONS THAT YOU WILL ENCOUNTER IN THE FIELD.

THE INFORMATION SHOWN ON THE PLANS FOR THE EXISTING BRIDGE IS NOT PART OF THE PLANS, PROPOSAL, OR CONTRACT AND IS NOT TO BE CONSIDERED A BASIS FOR COMPUTATION OF THE UNIT PRICES USED FOR BIDDING PURPOSES. THERE IS NO EXPRESSED OR IMPLIED AGREEMENT THAT INFORMATION IS CORRECTLY SHOWN. THE BIDDER IS NOT TO RELY ON THIS INFORMATION, BUT IS TO ASSUME THE POSSIBILITY THAT CONDITIONS AFFECTING THE COST AND/OR QUANTITIES OF WORK TO BE PERFORMED MAY DIFFER FROM THOSE INDICATED. THE EXISTING BRIDGE REFERENCE DRAWINGS ARE AS FOLLOWS:

ORIGINAL DESIGN PLANS:

RECONSTRUCTION OF FORBES AVENUE BRIDGE
OVER FERN HOLLOW AND APPROACHES
(30 SHEETS) NOVEMBER 1970

CONN FABRICATING & ENGINEERING CO.
NEW CASTLE, PA
SHOP DRAWINGS (27 SHEETS)
JUNE 27, 1972

DRAINAGE DETAILS (SHEETS 32 & 33)
APRIL 18, 1973
DEPARTMENT OF PUBLIC WORKS
BUREAU OF TRANSPORTATION AND ENGINEERING
CITY-COUNTY BUILDING
414 GRANT STREET
PITTSBURGH, PA 15219-2455

CONSTRUCTION SITE ACCESS

BE ADVISED THAT THERE IS LIMITED ACCESS TO THE BRIDGE SITE FROM UNDERNEATH. FRICK PARK HAS A PEDESTRIAN TRAIL (TRANQUIL TRAIL) THAT RUNS UNDER THE STRUCTURE.

UTILITY NOTES

COORDINATE, LOCATE, AND CONDUCT ALL WORK RELATED TO PUBLIC AND PRIVATE UTILITIES IN ACCORDANCE WITH PUBLICATION 408/2003 SECTIONS 105.06 AND 107.12.

PRIOR TO ANY EXCAVATION OR DEMOLITION WORK, CONTACT THE PA ONE CALL SYSTEM, INC. AT 1-800-242-1776 AND COMPLY WITH THE PROVISIONS OF PA ACT 287 OF 1994 AS AMENDED BY ACT 187 OF 1996. IDENTIFY ALL OVERHEAD LINES AND NOTIFY AND COMPLY WITH THE APPLICABLE UTILITY COMPANY'S CLEARANCE REQUIREMENTS. DESIGNER'S SERIAL NUMBER FOR THE CITY OF PITTSBURGH IS #0180500.

SUMMARY OF REHABILITATION ITEMS

1. DRAINAGE SYSTEM

REMOVAL OF EXISTING AND INSTALLATION OF DOWNSPOUTING PIPES AND BRACKETS. THESE EXTEND FROM THE BRIDGE DECK SCUPPERS AND CONNECT TO THE EXISTING UNDERGROUND DRAINAGE SYSTEM. THIS WORK WILL ALSO INCLUDE CLEANING OF THE EXISTING SCUPPERS AS WELL AS CLEANING OF THE UNDERGROUND DRAINAGE PIPE SYSTEM INTO WHICH THE DOWNSPOUTING WILL BE RECONNECTED.

2. CRACK IN KNEE BRACE OF FLOORBEAM #6 AT NORTH GIRDER

REPAIRS TO THIS CRACK WILL CONSIST ONLY OF DRILLING A HOLE AT THE END OF THE CRACK, INTENDED TO ARREST FURTHER PROPAGATION OF THE CRACK. THIS WORK WILL INCLUDE PERFORMANCE OF A MAGNETIC PARTICLE INSPECTION OR DYE PENETRANT TEST TO VERIFY THE END OF THE CRACK.

3. CROSS BRACING RETOFIT

RETROFITTING OF THE CROSS BRACING BY THE ADDITION OF ZINC COATED STRUCTURAL WIRE ROPE ATTACHED TO THE TOP AND BOTTOM FOR BOTH THE EAST AND WEST LEGS.

APPROXIMATE QUANTITIES

DESCRIPTION	UNIT	TOTAL
DOWNSPOUTING	LF	272
CROSS BRACING RETROFIT	LS	1
FABRICATED STRUCTURAL STEEL	LBS	850
CRACK REPAIR	EA	1

DESIGNED BY	GRL
CHECKED BY	RSC
DRAWN BY	RJK
CHECKED BY	GRL

$$--------DESIGN-FILE-NAME--------$$

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
RONALD S. CAPP
ENGINEER
PE 017251-E

STRUCTURE NO. 02730100003033

B.T.E. PROJECT NO. 07300-5

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF TRANSPORTATION AND ENGINEERING

FORBES AVENUE BRIDGE OVER FERN HOLLOW
AND NINE MILE CREEK, FRICK PARK

BRIDGE REHABILATATION
GENERAL NOTES
AND APPROXIMATE QUANTITIES

SCALE: AS NOTED | SHEET NO. 2 OF 8 | ACCESSION NO.
DATE: | CASE NO.

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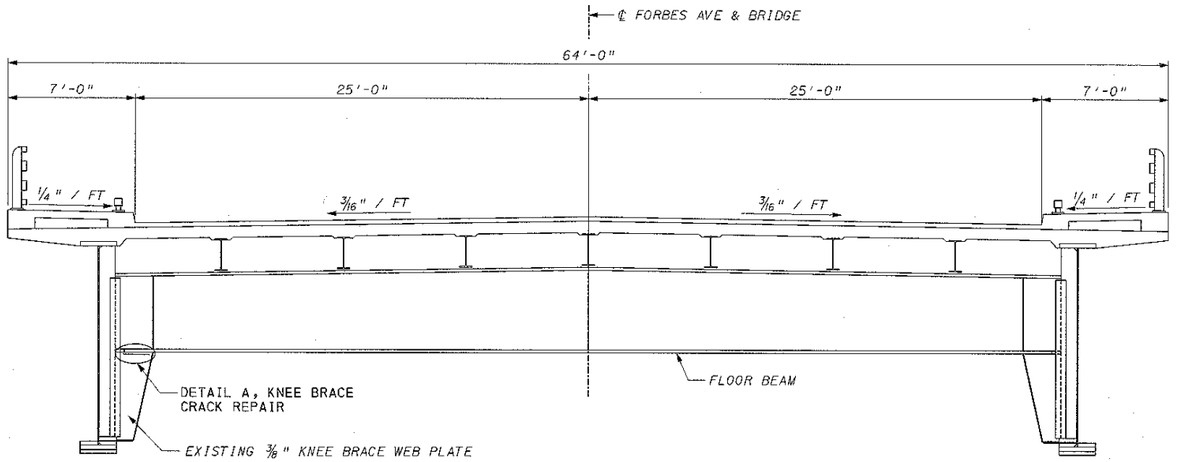
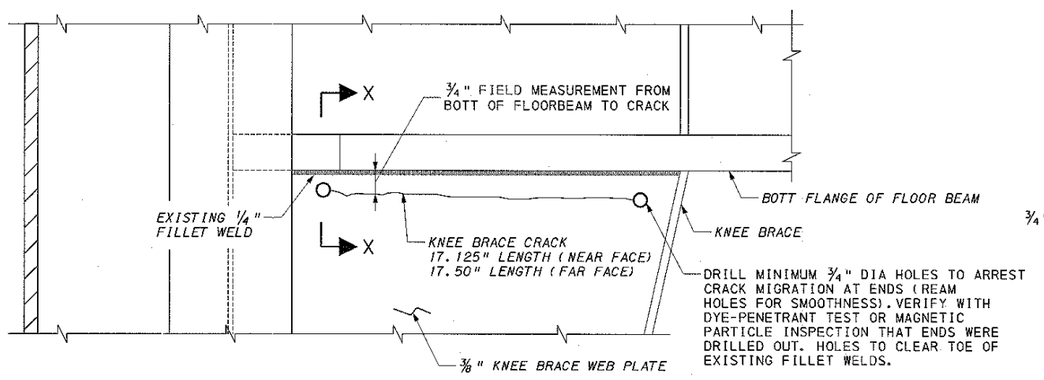


SECTION A-A

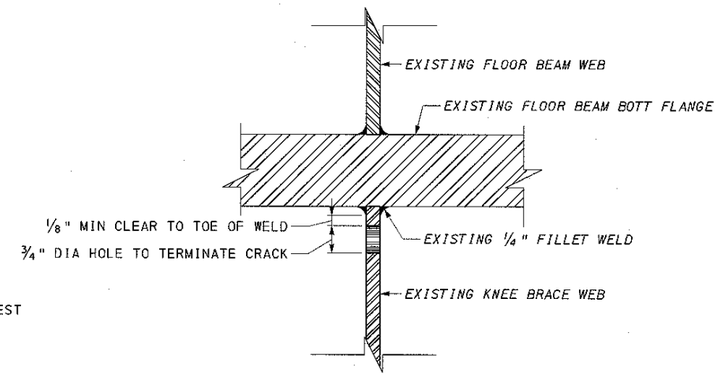
0 1' 2' 3' 4' 5' 6'



DETAIL A

KNEE BRACE REPAIR

0 1 2 3 6 9 1'



SECTION X-X

NO SCALE

NOTES:

SHOP DRAWINGS MUST INDICATE THAT EXISTING DIMENSIONS THAT RELATE TO THE AFFECTED WORK HAVE BEEN FIELD VERIFIED BEFORE SHOP DRAWINGS CAN BE APPROVED. NO PAYMENT OR APPROVAL WILL BE GIVEN UNTIL ALL DIMENSIONS ARE FIELD VERIFIED.

DESIGNED BY	GRL
CHECKED BY	RSC
DRAWN BY	RJK
CHECKED BY	GRL

$$--------DESIGN-FILE-NAME--------$$

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL RONALD S. CAPP ENGINEER PE 017251-E

STRUCTURE NO. 02730100003033

B.T.E. PROJECT NO. 07300-5

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF TRANSPORTATION AND ENGINEERING

FORBES AVENUE BRIDGE OVER FERN HOLLOW AND NINE MILE CREEK, FRICK PARK

BRIDGE REHABILATATION

TYPICAL SECTION & KNEE BRACE REPAIR

SCALE: AS NOTED	SHEET NO. 3 OF 5	ACCESSION NO.
DATE:		CASE NO.

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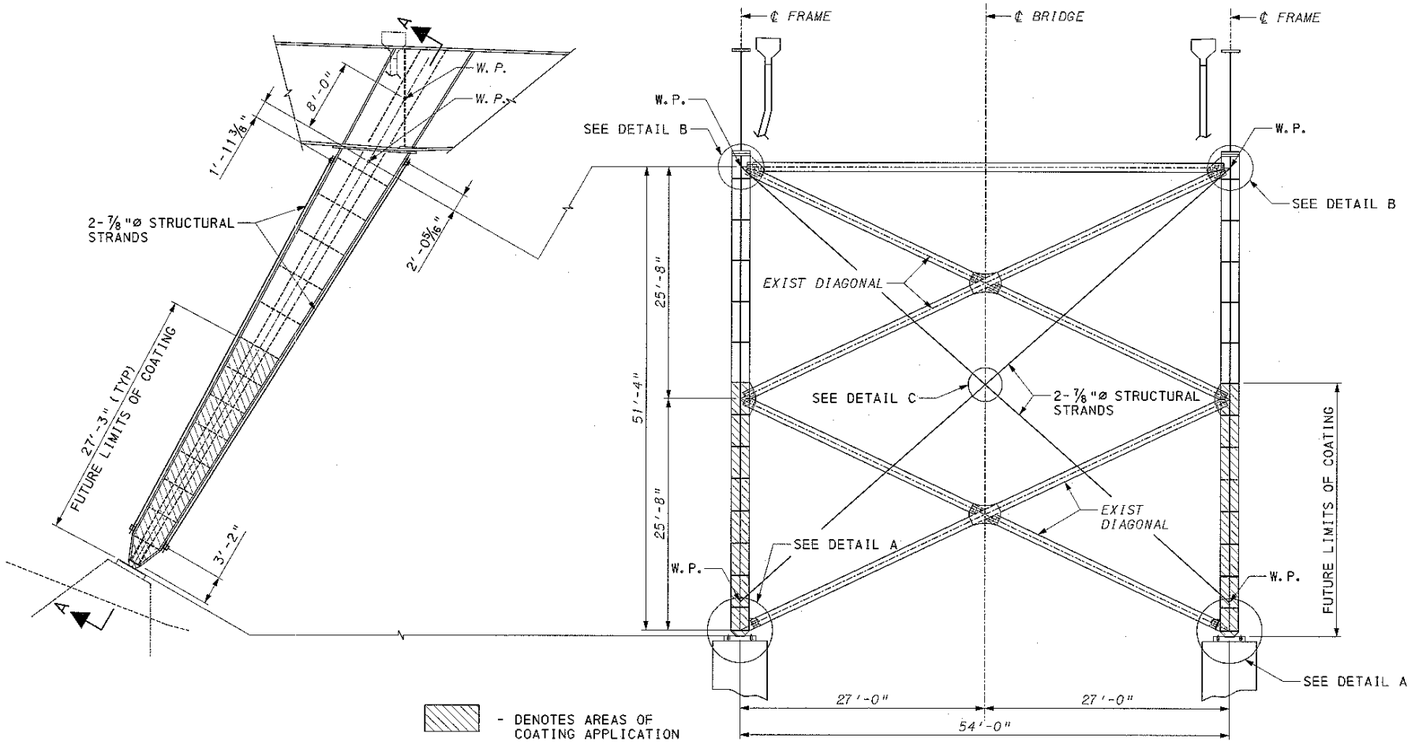
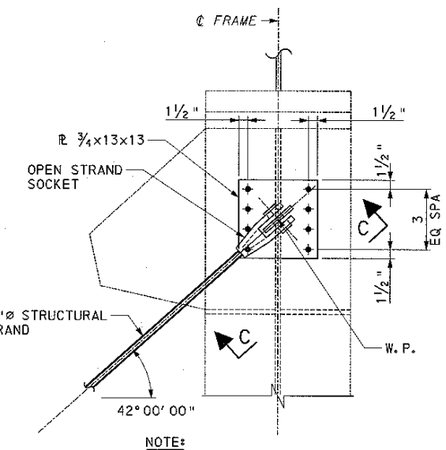


TYPICAL FRAME LEG ELEVATION

0 8′ 16′

ELEVATION A-A

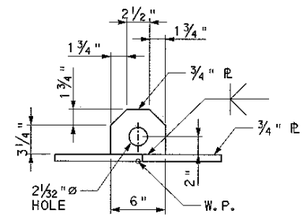
0 8′ 16′



NOTE:
HORIZONTAL AND DIAGONAL BRACING NOT SHOWN FOR CLARITY.

DETAIL B

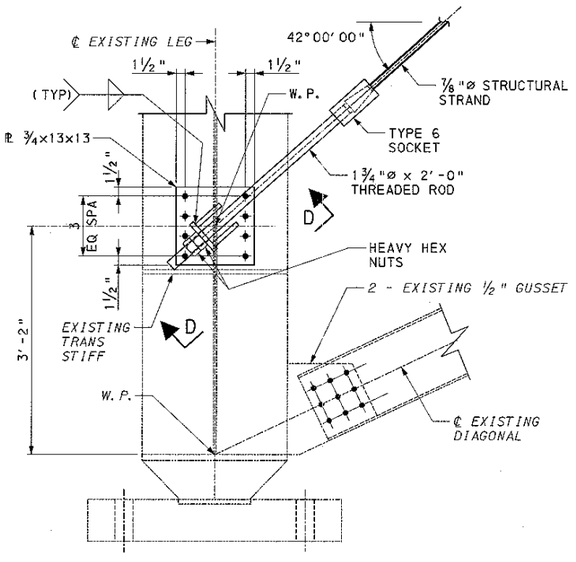
0 3 6 9 1′ 2′



NOTE:
OPEN STRAND SOCKET NOT SHOWN FOR CLARITY.

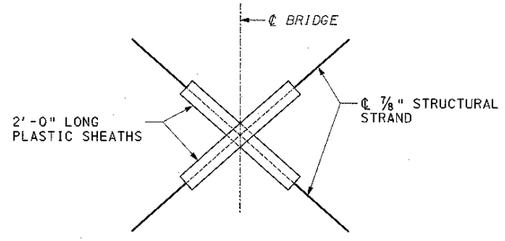
SECTION C-C

0 3 6 9 1′



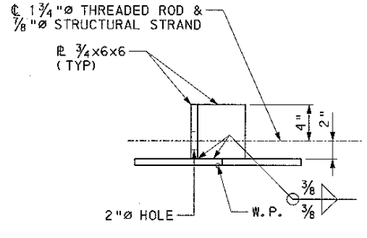
DETAIL A

0 3 6 9 1′ 2′



NOTE:
FASTEN SHEATHS TO STRANDS AS PER MANUFACTURER RECOMMENDATIONS

DETAIL C
NO SCALE



SECTION D-D

0 3 6 9 1′

NOTES:

SHOP DRAWINGS MUST INDICATE THAT EXISTING DIMENSIONS THAT RELATE TO THE AFFECTED WORK HAVE BEEN FIELD VERIFIED BEFORE SHOP DRAWINGS CAN BE APPROVED. NO PAYMENT OR APPROVAL WILL BE GIVEN UNTIL ALL DIMENSIONS ARE FIELD VERIFIED.

FOR DOWNSPOUT REPAIRS, SEE SHEET 5.

ALL WELDS MIN UNLESS NOTED OTHERWISE.

STRUCTURE NO. 02730100003033

DESIGNED BY	GRL
CHECKED BY	RSC
DRAWN BY	RJK
CHECKED BY	GRL

$$-------DESIGN-FILE-NAME--------$$

DOWNINGTOWN, PA REGISTERED PROFESSIONAL RONALD S. CAPP ENGINEER PE 017251-E PENNSYLVANIA

B. T. E. PROJECT NO. 07300-5

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF TRANSPORTATION AND ENGINEERING

FORBES AVENUE BRIDGE OVER FERN HOLLOW AND NINE MILE CREEK, FRICK PARK

BRIDGE REHABILATATION

FRAME LEGS AND BRACING RETROFIT

SCALE: AS NOTED	SHEET NO.	ACCESSION NO.	
DATE:	4 OF 5	CASE NO.	

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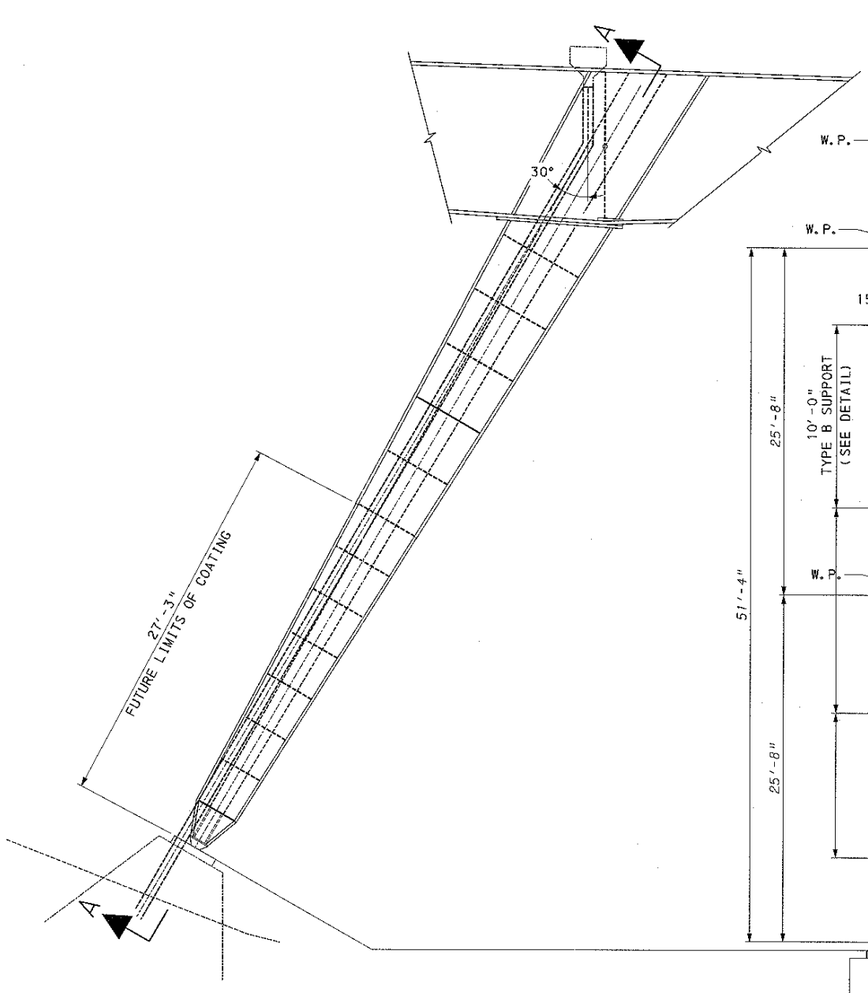
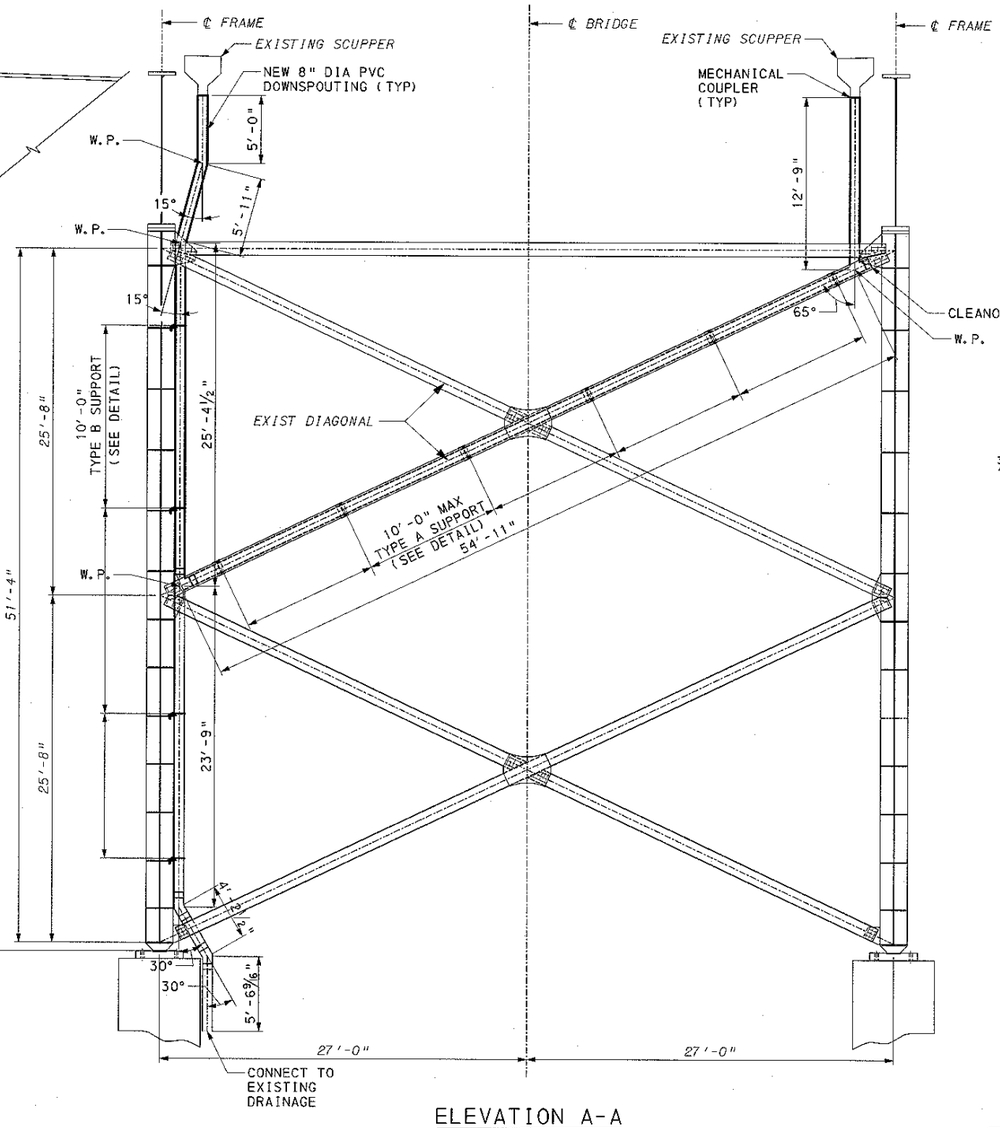


FRAME LEG ELEVATION

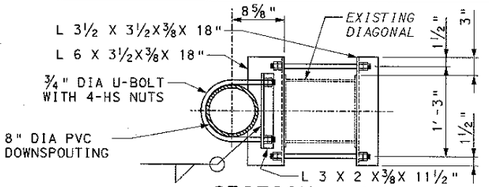
0 8' 16'



ELEVATION A-A

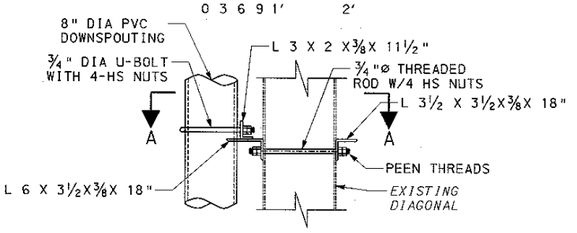
(2 LOCATIONS)

0 8' 16'



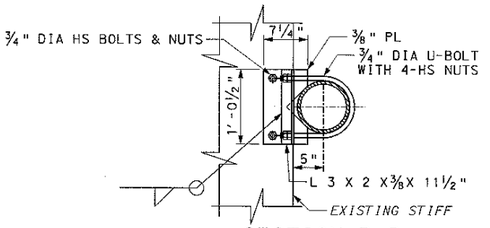
SECTION A-A

0 3 6 9 1' 2'



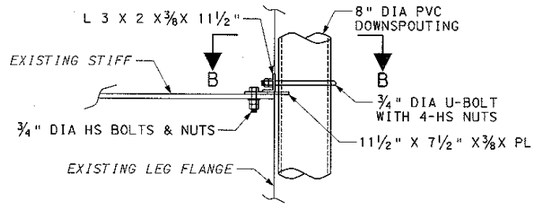
TYPE A SUPPORT DETAIL

0 3 6 9 1' 2'



SECTION B-B

0 3 6 9 1' 2'



TYPE B SUPPORT DETAIL

0 3 6 9 1' 2'

NOTES:

ALL NEW DOWNSPOUTING AND FITTINGS SHALL BE PVC IN ACCORDANCE WITH PENNDOT PUBLICATION 408 1051.2.

SEE PENNDOT STANDARD DRAWING BC-751M FOR DETAILS NOT SHOWN.

DESIGNED BY	GRL
CHECKED BY	RSC
DRAWN BY	RJK
CHECKED BY	GRL

$$--------DESIGN-FILE-NAME--------$$

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL RONALD S. CAPP ENGINEER PE 017251-E

STRUCTURE NO. 02730100003033

B.T.E. PROJECT NO. 07300-5

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF TRANSPORTATION AND ENGINEERING

FORBES AVENUE BRIDGE OVER FERN HOLLOW AND NINE MILE CREEK, FRICK PARK

BRIDGE REHABILATATION

DOWNSPOUT REPAIRS

SCALE: AS NOTED
DATE:

SHEET NO. 5 OF 5

ACCESSION NO.
CASE NO.

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