

Attachment E

Structure Type Studies

Mr. Sean Creighton, PLA, LEED AP
Project Manager
Great Parks of Hamilton County
10245 Winton Road
Cincinnati, OH 45231

Re: Great Parks of Hamilton County – Oasis Corridor
B&N Bridge Assessment – Collins Ave

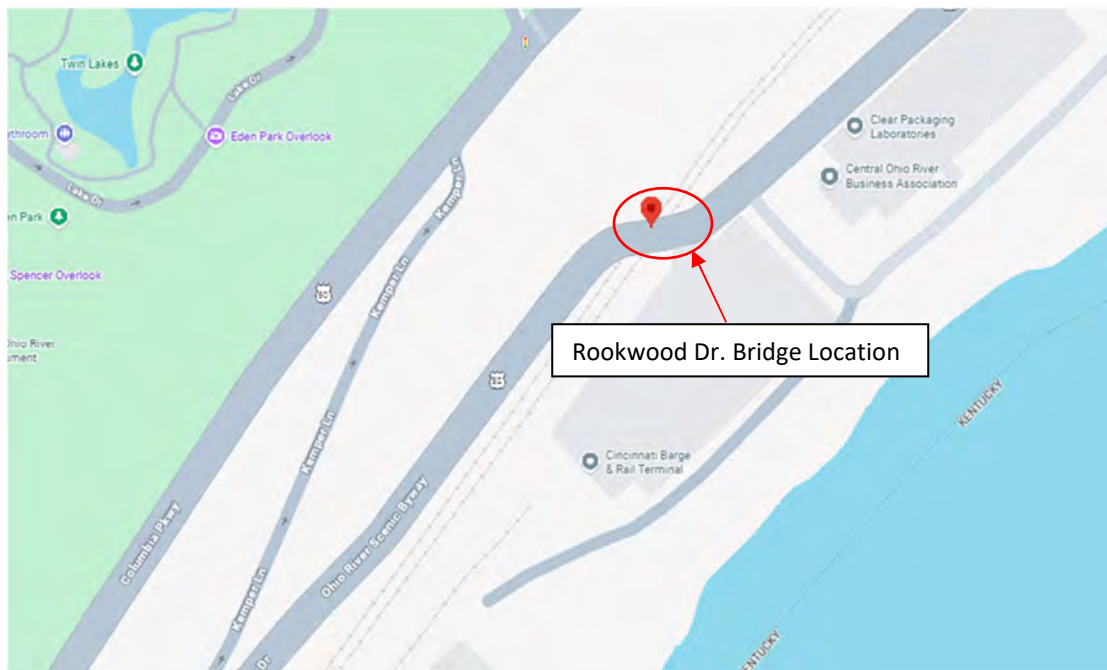
April 2, 2026

Dear Mr. Creighton:

Burgess & Niple (B&N) performed a bridge assessment of the steel twin girder bridge carrying the Indiana & Ohio RR over Rookwood Drive on January 13th & 15, 2026. The girders are numbered from left to right looking upstation (north to south). Beams and pier columns are numbered from left to right looking east. The steel pier cap and abutment bearings were inspected from a ladder. A cursory inspection of the concrete substructure elements and tracks was also completed.

The intent of this assessment is to determine areas of deficiency that need to be repaired for conversion of the north railroad track to a trail. Detailed dimensions of existing bridge members and geometry were not obtained. There are existing repair plans developed for SORTA in 2024, these areas of deficiency have designed rehabilitations already in these plans. The rehabilitations in these plans had not been constructed prior to B&N's inspection.

LOCATION MAP



Bridge Assessment:

Indiana & Ohio RR over Rookwood Drive (OH52) *(see Appendix A for deficiency table and layout)*

Deck Condition Summary:

There is no deck on this structure. The steel deck pans hold up the fill and ballast under the rails (**photos 3 & 4**).

Superstructure Condition Summary:

Bridge girders and beams have surface corrosion throughout. Multiple corrosion holes exist in the web and bearing stiffeners at all four corners (**photo 12**) (rehabilitations for these deficiencies are included in the prior mentioned plan set developed for SORTA). Corrosion is heaviest on the exterior girders bottom flanges and in the bottom of webs near the abutments (**photo 10**). Strap/splice plate on the top flange of both girders over the pier exhibit a full width crack (**photo 14**) (rehabilitations for these deficiencies are included in the prior mentioned plan set developed for SORTA). Bearing seats exhibit pack rust between the top of the bearing seat and the underside of the girders (**photo 11**).

Substructure Condition Summary:

Both abutments exhibit water staining and multiple isolated moderate width vertical and horizontal cracks (**photo 6**). The concrete crash barrier exhibits isolated major spalls at the top of the barrier (**photo 7**). Exposed portions of the steel pier columns exhibit extensive section loss to the vertical angles and batten plates (**photos 8 & 9**) (rehabilitations for these deficiencies are included in the prior mentioned plan set developed for SORTA).

Recommendations:

- Proceed with rehabilitation plans developed for SORTA in 2024.
- Replace the missing manhole cover at the northwest approach
- Remove debris from girder abutment bearing seats at all four corners.
- Abrasively clean, paint, and remove pack rust between bearing seat and underside of the girders at abutments.
- The City of Cincinnati has requested a load rating of the bridge since the structure will carry railroad loads and there is not documentation on the load carrying capacity of the bridge.

Photographs



Photo 1 – Elevation looking south.



Photo 2 – Elevation looking north.



Photo 3 – End view looking east.



Photo 4 – Looking east at the typical top of rail condition. Note: checking and some splitting throughout rail road ties.



Photo 5 – Looking north at the underside of span 1. Note: moderate surface rust throughout with isolated locations of section loss.



Photo 6 – Looking northeast at the west abutment elevation. Note: some minor to moderate width cracks to the abutment wall. Cracking is heaviest in the cap directly under the bearing seat.



Photo 7 – Looking northeast at the west face of pier 1. Note: spalling around the base of the pier columns. Concrete repairs at the base of the columns is included in the repair plans.



Photo 8 – Looking west at an overall of the east face vertical angle legs at the pier wall exhibit up to 75% section loss to angle legs over a 1" tall x full width area.



Photo 9 – Looking west at an overall of the east face vertical angle legs at the pier wall exhibit up to 75% section loss to angle legs over a 1" tall x full width area.



Photo 10 – Looking southwest at girder 1, east end. Note: heavy laminating corrosion and corrosion holes through bottom of outboard vertical stiffeners. First 3 stiffeners from end exhibit corrosion holes up to 5" tall, full width.



Photo 11 – Looking west at west abutment steel bearing seat under floor beam 15. Note: pack rust up to 1" thick causing deformation to bottom flange



Photo 12 – Looking southwest at girder 1 at the west abutment. Note: heavy soil and debris accumulation. Active pitting, 1/16" average, to girder web and bearing stiffeners.



Photo 13 – Looking south at the open manhole at the southwest approach.



Photo 14 – Looking northwest at top flange strap/splice plate at midspan of girder 1. Note: full width crack in plate. Similar at same location, girder 2. Appears intentional.

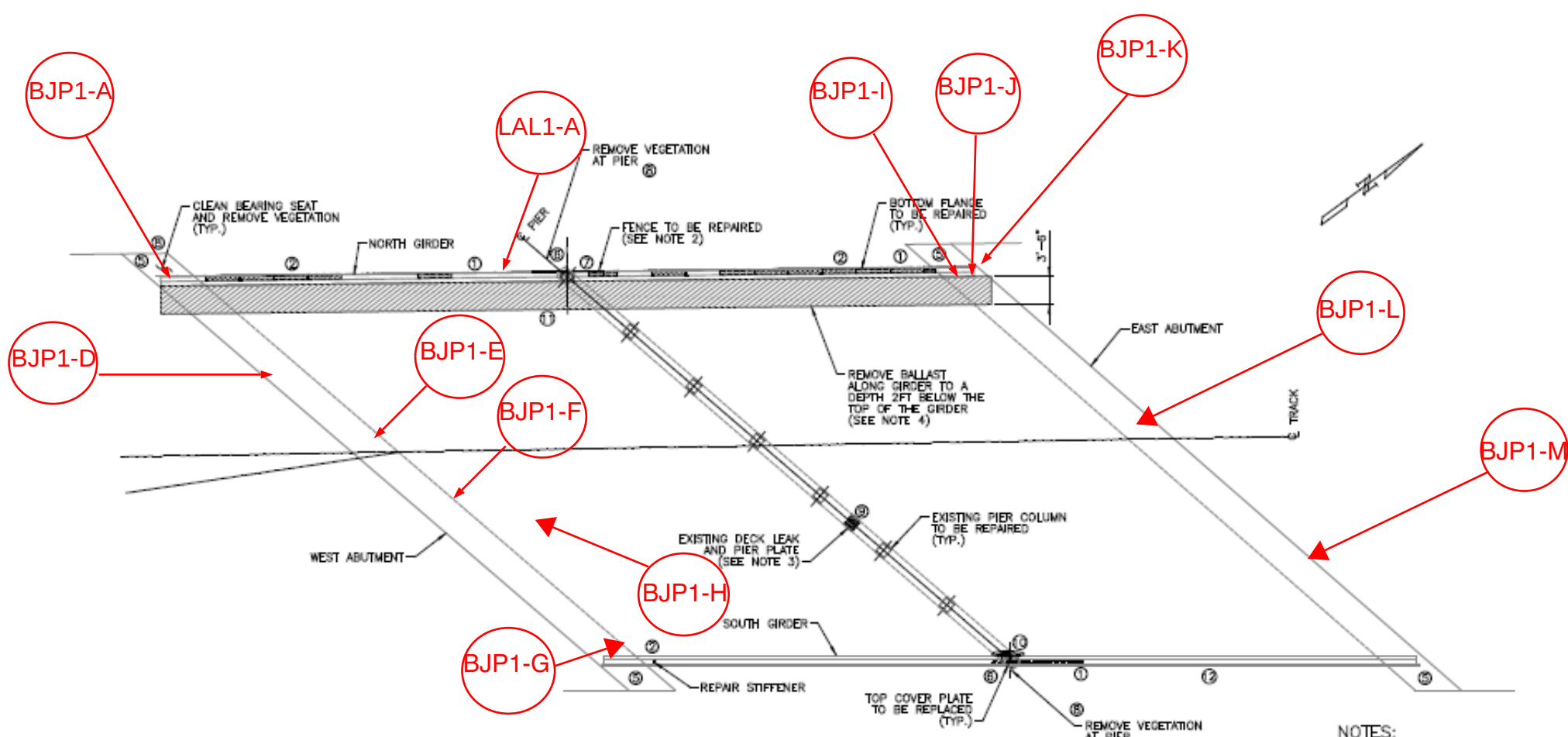
Appendix A: Deficiency Table

Photo	Call Out #	Comment
BJP1-1	1-BJP-A	Girder 1 at the west abutment. Note: heavy soil and debris accumulation. Active pitting, 1/16" average, to girder web and bearing stiffeners.
BJP1-3	1-BJP-B	Girder 1 bearing at the west abutment. Note: heavy soil and debris accumulation. Active pitting, 1/16" average, to bearing assembly.
BJP1-4	1-BJP-C	Girder 1, span 1 from the west abutment. Note: typical through hole section loss to web stiffeners.
BJP1-5	1-BJP-D	North end of west abutment bearing seat adjacent to girder 1. Pack rust up to 1" thick between built up plates causing top flange to be distorted. Corrosion holes through some vertical stiffeners.
BJP1-6	1-BJP-E	West abutment steel bearing seat between floor beams 9-10. Note: pack rust up to 1" thick causing deformation to bottom flange.
BJP1-7	1-BJP-F	West abutment steel bearing seat under floor beam 15. Note: pack rust up to 1" thick causing deformation to bottom flange.
BJP1-9	1-BJP-G	Girder 2 bearing at the west abutment. Note: heavy soil and debris accumulation. Active pitting, 1/16" average, to girder web and bearing stiffeners.
BJP1-11	1-BJP-H	West abutment and southwest wingwall. Note: wide transverse cracks some with efflorescence, abutment are generally sound. Heavier efflorescence along wingwalls.
BJP1-13	1-BJP-I	Girder 1, east end. Note: heavy laminating corrosion and corrosion holes through bottom of outboard vertical stiffeners. First 3 stiffeners from end exhibit corrosion holes up to 5" tall, full width.
BJP1-16	1-BJP-J	East end of girder 1, outboard face. Note: 1/16" average pitting along bottom 12" of girder web. Bottom flange exhibits laminating corrosion throughout with up to 1/16" section loss.
BJP1-17	1-BJP-K	North end of the steel bearing seat at the east abutment. Note: end stiffener exhibits 100% section loss. Pack rust up to 1" exists between built up sections causing distortion.
BJP1-20	1-BJP-L	East abutment beam seat between floor beams 27 and 29. Note: heavy section loss up to through holes along top flange of bearing seat. Heavy laminating corrosion along bottom flange. Underside of floor beam 28 exhibits 16" section loss full width of bottom flange. Area of likely water intrusion.
BJP1-24	1-BJP-M	Floor beam 39 at the east abutment Note: pack rust up to 1 1/2" between floor beam bottom flange and bearing seat. Common along floor beams 37-41.
LAL1-6	1-LAL-A	Typical floorbeam to south girder connection condition. West side of floorbeam 26 shown. Girders and beam end show heavy surface corrosion with negligible section loss.
LAL1-8	1-LAL-B	Overall of the north nose of the concrete pier wall. Note: multiple scrapes and impact damage along with adjacent shallow spalling and scaling.
LAL1-9	1-LAL-C	Overall of the bottom of the pier columns at the pier wall.

LAL1-10	1-LAL-D	Pier 1, column 2 west face at pier wall has up to 1/8" section loss to angle legs and batten plate. Adjacent pier wall cover concrete is spalled. This defect is included in the upcoming repair project.
LAL1-12	1-LAL-E	Pier 1, column 6, west face at pier wall exhibits heavy section loss including up to 1/8" loss over a 1/2" tall x full width section loss at the column to pier wall interface to column web. The angle legs exhibit up to 1/8" section loss over a 1/2" tall area.
LAL1-14	1-LAL-F	Pier 1, column 8, west face at pier wall exhibits heavy section loss including up to full loss to vertical angle legs at the column to pier wall interface.
LAL1-24	1-LAL-G	Overall of the 3SF area of delaminated concrete below the east face of column 5 of pier 1.
LAL1-25	1-LAL-H	Overall of the east face vertical angle legs at the pier wall exhibit up to 75% section loss to angle legs over a 1" tall x full width area.

FILENAME: C:\pwworking\oasis\1\3105733\3105733-01.dgn
SCALE: 1/4" = 1'-0"
DATE: 08/20/2024
DRAWN: NME
CHECKED: JH

- REPAIR 01: INSTALL BOTTOM FLANGE PLATE
REPAIR 02: INSTALL STIFFENERS ANGLE
REPAIR 03: INSTALL STEEL COLUMNS PLATE
REPAIR 04: PATCH SPALLED CONCRETE
REPAIR 05: CLEAN BEARING SEATS
REPAIR 06: REPLACE TOP FLANGE PLATE
REPAIR 07: REPLACE MISSING FENCING SECTIONS
REPAIR 08: REMOVE FLORA
REPAIR 09: PIER PLATE
REPAIR 10: PATCH CONCRETE ON INSIDE FACE OF THE TYP
REPAIR 11: REMOVE BALLAST AND PROVIDE BLOCKING AT BACKWALL
REPAIR 12: BLAST CLEAN AND PAINT STEEL



PLAN
SCALE: 1/4" = 1'-0"

CONSTRUCTION PLAN SET

HR
HAMILTON COUNTY
CINCINNATI, OH 45202
FILE: NO. 3105733-GP01.dgn

ENGINEERING DEPARTMENT CINCINNATI, OHIO			
REVISIONS		BRIDGE NO. 3105733 CROSSING RIVERSIDE DRIVE GENERAL PLAN	
		HAMILTON COUNTY	CINCINNATI, OH
		ZONE:	SUBDIVISION:
		SCALE: AS SHOWN	VAL. SEC.
		DATE: 08/20/2024	DRAWING NO.
		DESIGN: RCV	NO. 3105733-07
		DRAWN: NME	
		CHECKED: JH	

***47 total floorbeams numbered from left to right looking east

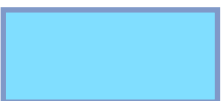
###-# Note



Spall



Delam



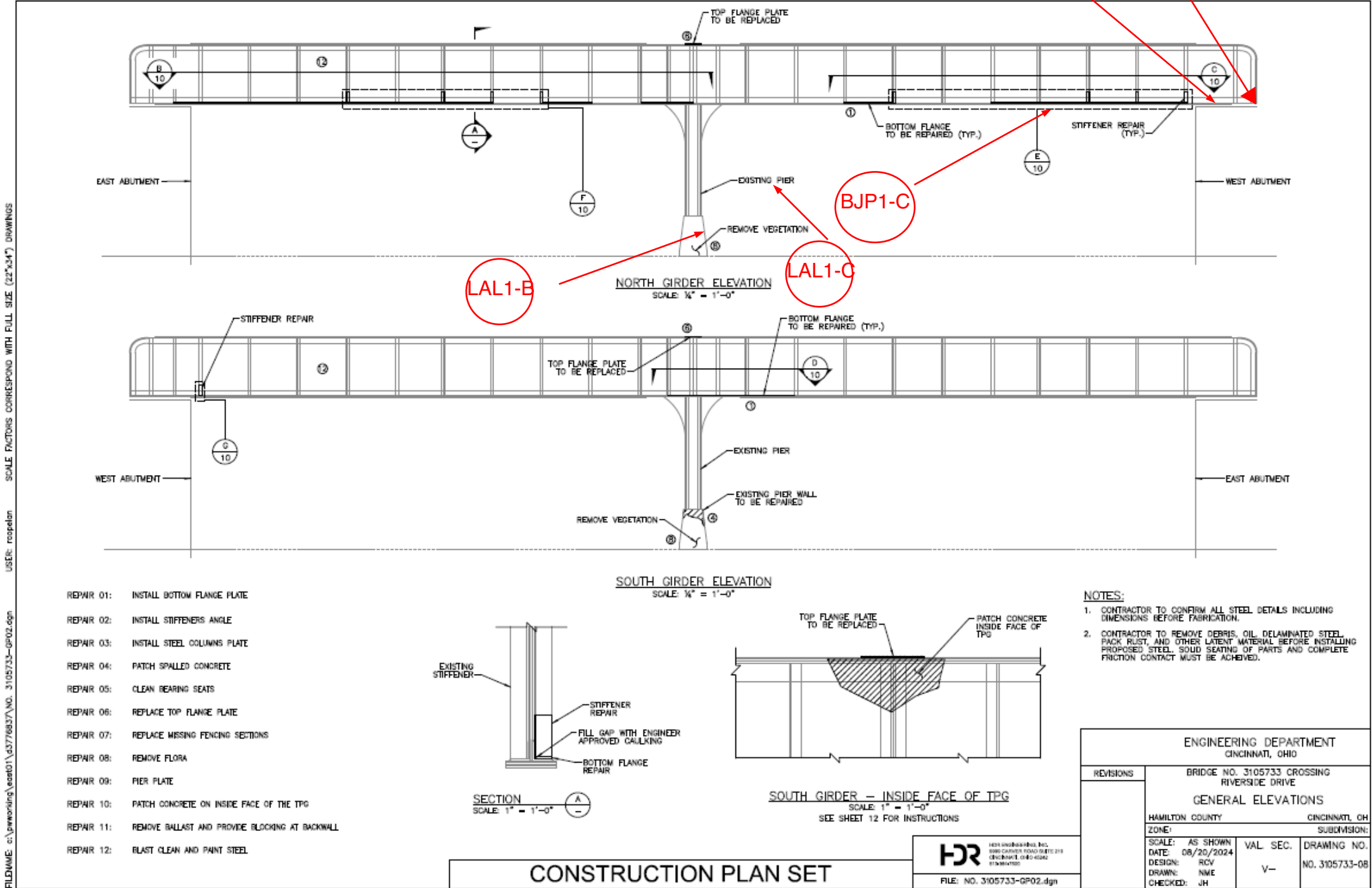
Patch



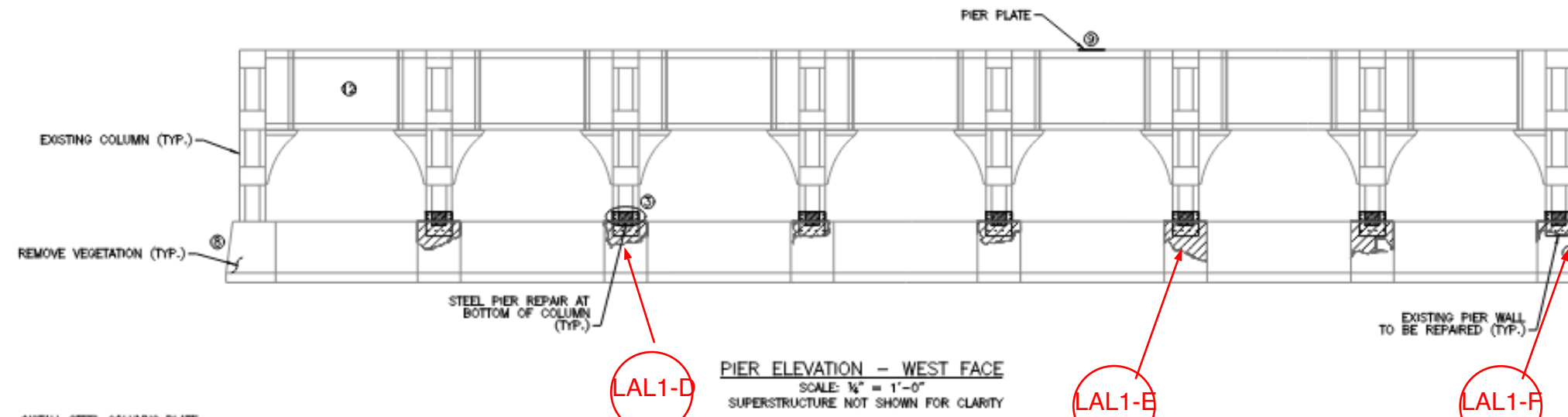
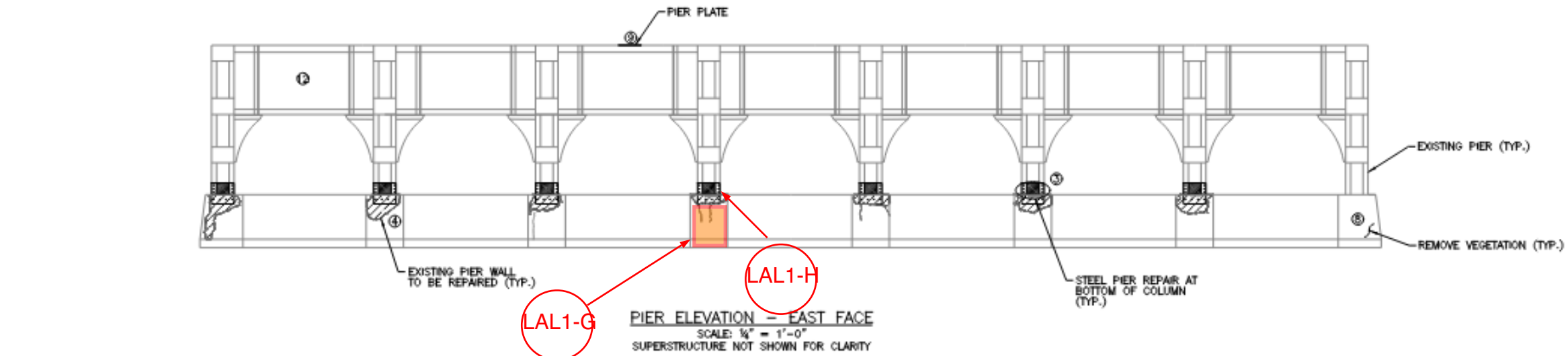
Cracks



Crack



FILENAME: C:\WORKING\438101\4377683\NO. 3105733-GP03.dgn
USER: HENDERSON
SCALE: FACTORS CORRESPOND WITH FULL SIZE (22'x34') DRAWINGS



- REPAIR 03: INSTALL STEEL COLUMNS PLATE
REPAIR 04: PATCH SPALLED CONCRETE
REPAIR 08: REMOVE FLORA
REPAIR 09: PIER PLATE
REPAIR 12: BLAST CLEAN AND PAINT STEEL

NOTES:

1. CONTRACTOR TO CONFIRM ALL STEEL DETAILS INCLUDING DIMENSIONS BEFORE FABRICATION

SORTA Southwest Ohio Regional Transit Authority		ENGINEERING DEPARTMENT CINCINNATI, OHIO	
BRIDGE NO. 3105733 CROSSING RIVERSIDE DRIVE		CINCINNATI, OH	
HAMILTON COUNTY		SUBDIVISION:	
SCALE: AS SHOWN	VAL. SEC.	DRAWING NO.	
DATE: 08/20/2024	V-	NO. 3105733-09	
DESIGN: RCV			
DRAWN: NME			
CHECKED: JH			

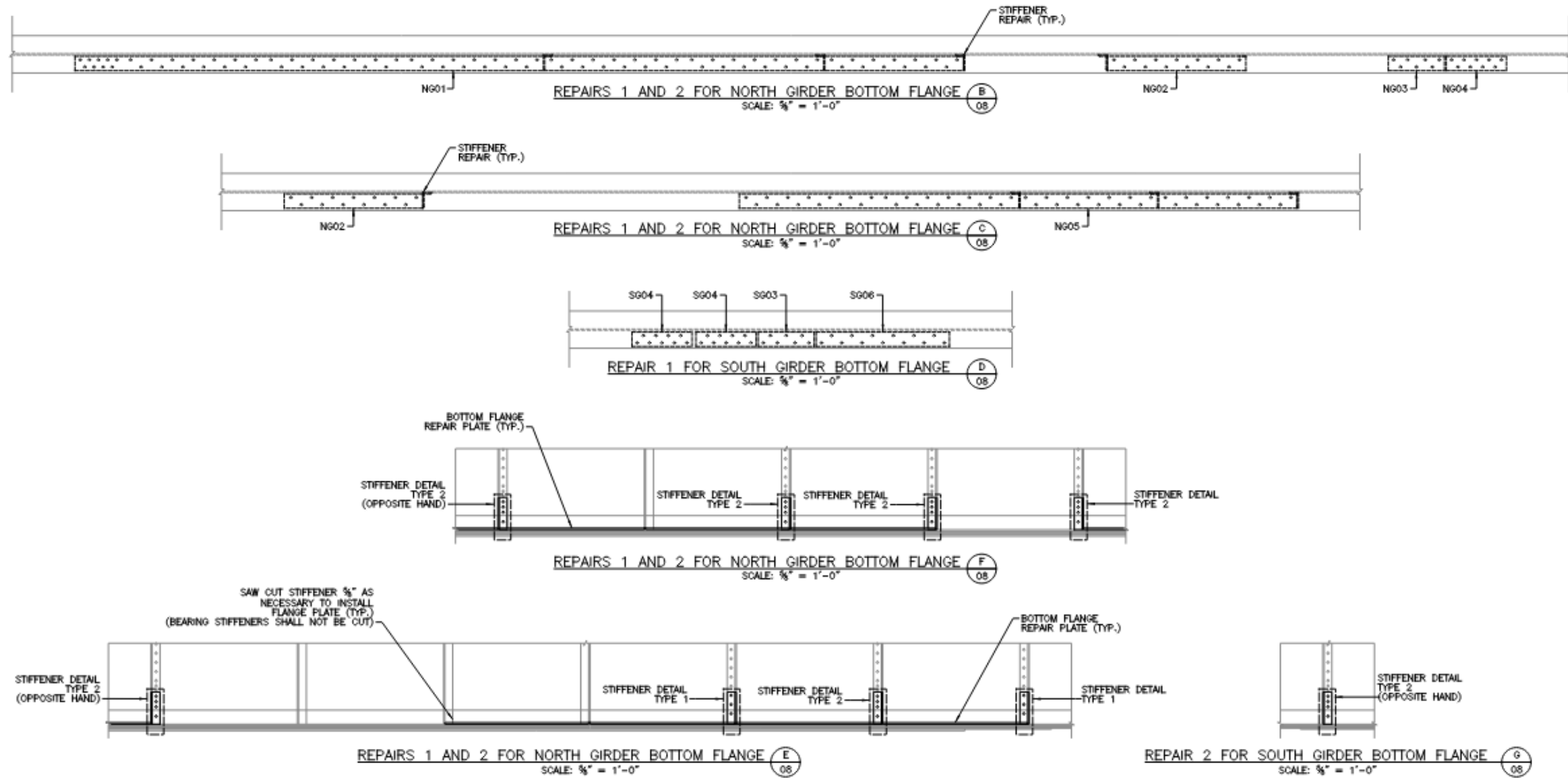
CONSTRUCTION PLAN SET

HDR
HDR ENGINEERING, INC.
1000 CHURCH ROAD SUITE 210
CINCINNATI, OH 45242
(513) 441-1100
FILE: NO. 3105733-GP03.dgn

###-# Note

	Spall		Delam		Patch		Cracks		Crack
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- NOTES:
- CONTRACTOR TO CONFIRM ALL STEEL DETAILS INCLUDING DIMENSIONS BEFORE FABRICATION

CONSTRUCTION PLAN SET



HDR
HDR ENGINEERING, INC.
8000 CHURCH ROAD SUITE 210
CINCINNATI, OH 45242
914.684.1100
FILE: NO. 3105733-GD01.dgn

SORTA
Southwest Ohio Regional
Transport Authority

ENGINEERING DEPARTMENT
CINCINNATI, OHIO

REVISIONS

BRIDGE NO. 3105733 CROSSING
RIVERSIDE DRIVE

GIRDER REPAIR DETAILS

HAMILTON COUNTY

CINCINNATI, OH

ZONE:

SUBDIVISION:

SCALE: AS SHOWN

DATE: 08/20/2024

DESIGN: RCV

DRAWN: JL

CHECKED: JH

VAL. SEC.

V-

DRAWING NO.

NO. 3105733-10

NG01
SCALE: 1½" = 1'-0"

NG02
SCALE: 1½" = 1'-0"

NG03
SCALE: 1½" = 1'-0"
NG03 SHOWN, SG03 SAME

NG05
SCALE: 1½" = 1'-0"

SG06
SCALE: 1½" = 1'-0"

STIFFENER DETAIL - TYPE 1
SCALE: 1½" = 1'-0"

STIFFENER DETAIL - TYPE 2
SCALE: 1½" = 1'-0"

TOP FLANGE PLATE
SCALE: 1½" = 1'-0"

PIER PLATE PLAN
SCALE: 1½" = 1'-0"

NOTES:

- CONTRACTOR TO CONFIRM ALL STEEL DETAILS INCLUDING DIMENSIONS AND RIVET HOLE DIAMETER BEFORE FABRICATION.
- CONTRACTOR TO REMOVE RIVETS AND FIELD DRILL HOLES AS NECESSARY TO ATTACH PLATE TO CROSS GIRDER TOP FLANGE AT DECK LEAK LOCATION.

SORTA ENGINEERING DEPARTMENT
CINCINNATI, OHIO
BRIDGE NO. 3105733 CROSSING RIVERSIDE DRIVE
STEEL REPAIR DETAILS
HAMILTON COUNTY CINCINNATI
ZONE: SUBDIV:
SCALE: AS SHOWN VAL. SEC. DRAWING

CONSTRUCTION PLAN SET



HDR ENGINEERING, INC.
1000 CAMPUS RD. SUITE 210
CINCINNATI, OHIO 45242
616-988-1800

FILE: NO. 3105733-SD01.dgn

SORTA
Southwest Ohio Region
Transit Authority

ENGINEERING DEPARTMENT
CINCINNATI, OHIO

REVISIONS	BRIDGE NO. 3105733 CROSSING RIVERSIDE DRIVE		
	STEEL REPAIR DETAILS		
	HAMILTON COUNTY	CINCINNATI, OH	
	ZONE:	SUBDIVISION:	
	SCALE: AS SHOWN DATE: 08/20/2024	VAL. SEC.	DRAWING NO.
	DESIGN: RCV	V-	NO. 3105733-1
	DRAWN: JL		
	CHECKED: JH		

Mr. Sean Creighton, PLA, LEED AP
Project Manager
Great Parks of Hamilton County
10245 Winton Road
Cincinnati, OH 45231

Re: Great Parks of Hamilton County – Oasis Corridor
B&N Bridge Assessment – Collins Ave

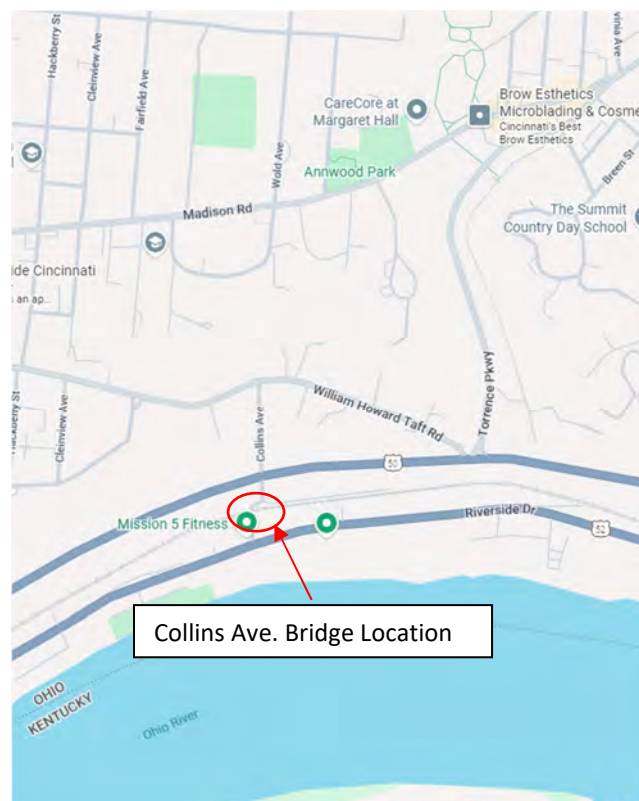
April 2, 2026

Dear Mr. Creighton:

Burgess & Niple (B&N) performed a bridge assessment of the thru girder bridge carrying the Indiana & Ohio RR over Collins Ave on January 13th & 15, 2026. The assessment focuses on the north half of the superstructure under the inactive tracks; this includes girders 1 & 2. Girders are numbered from left to right looking east (up station). A cursory inspection of the substructure and tracks was also completed.

The intent of this assessment is to determine areas of deficiency that need to be repaired for conversion of the north railroad track to a trail. Detailed dimensions of existing bridge member and geometry were not obtained.

LOCATION MAP



Bridge Assessment:

Indiana & Ohio RR over Collins Ave., SFN 3160300

Summary:

Widespread painted over section loss, up to 1/8" deep, exists to the bottom flanges and the bottom 4" of the web on girders, floorbeams, and stringers. Section loss is heaviest on the end 5' of girders near the abutments. Heavy painted over section loss exists to the bottom flange of floorbeam 0 with up to 25% section loss. Multiple corrosion holes exist in the bottom of girder stiffeners and in the web of girder 1. Girder 2 (middle girder) exhibits isolated locations of painted over section loss up to 1/8" deep. Girder 2 is generally in better condition than girder 1.

Corrosion holes in girder 1 exist at the following locations:

Girder	Bridge Location	Corrosion hole dimension	Photos
Girder 1	East end girder web between 2 nd and 3 rd stiffeners from east abutment.	4 ½" x 1 ½"	Photos 9 & 10
Girder 1	East end girder web between 2 nd and 3 rd stiffeners from east abutment.	2 ½" x 1 ½"	Photo 10
Girder 1	East end girder web between 3 rd and 4 th stiffeners from east, adjacent to 4 th stiffener.	½" diameter	Photo 11
Girder 1	West end girder web over west abutment bearing.	4" x 4" with two adjacent ½" diameter through holes	Photo 12
Girder 1	West end girder web adjacent to the 3 rd stiffener from west end.	1 ¼" diameter	Photo 13
Girder 1	West end girder web adjacent from the 4 th stiffener from west end	7" wide x 4" tall	Photo 14

Recommendations:

- If reused, existing railroad ties should be assessed for deficiencies, including rot, checking and splits which may affect strength and serviceability of the bridge.
- Areas of girder, floorbeam, and stringer web section loss should be monitored. If corrosion does reinitiate, additional welded steel plates should be added in the high shear areas at abutments.
- Clearance signs and headache bars should be added below and/or on Collins Avenue north and south of the bridge to deter over height vehicles from driving below the bridge.
- The City of Cincinnati has requested a load rating of the existing structure that is planned to remain in place and carry railroad live load because there is no information on the load carrying capabilities of the bridge.

Photographs



Photo 1 – Elevation looking north.



Photo 2 – Elevation looking southwest.



Photo 3 – End view looking west.



Photo 4 – End view looking east. Note: large amounts of debris and old railroad ties piled at west end.



Photo 5 – Looking west at the typical underside between girders 1 and 2. Note: one missing and one bent lower lateral bracing bar.



Photo 6 – Looking southeast at the east abutment. Note: moderate abrasion on the north end of the east abutment. Multiple moderate width horizontal cracks in the north end with minor efflorescence.



Photo 7 – Looking west at the west abutment. Note: minor algae growth on the bottom half of the abutment wall under girder 1.



Photo 8 – Looking south at the missing lower lateral bracing bar in bays 1-2.



Photo 9 – Looking southeast at the outboard face of girder 1 at east end between the 2nd and 3rd stiffeners from east. Note: 4 1/2 inch x 1 1/2-inch and 2 1/2 inches x 1 1/2 inch through hole in web plate with adjacent pitting down to knife edge.



Photo 10 – Looking southeast at the outboard face of girder 1 at east end between the 2nd and 3rd stiffeners from east. Note: 4 1/2" x 1 1/2" and 2 1/2" x 1 1/2" through hole in web plate with adjacent pitting down to knife edge.



Photo 11 – Looking south at outboard face of girder 1 at east end between 3rd and 4th stiffeners from east, adjacent to 4th stiffener. Note: 1/2" diameter corrosion hole through web with adjacent 1/8" deep painted over pitting.



Photo 12 – Looking south at outboard face of girder 1 at the west abutment. Note: 4" x 4" painted over through hole in web plate between the first and second web stiffener from the end.



Photo 13 – Looking south at outboard face of girder 1 adjacent to 3rd stiffener from end. Note: 1 1/4" painted over corrosion hole on web.



Photo 14 – Looking south at outboard face of girder 1 adjacent to 4th stiffener from west end. Note: 7" wide x up to 4" tall painted over through hole in web plate adjacent to stiffener.



Photo 15 – Looking southeast at the outboard face of girder 1 bottom flange angle at east half of girder. Note: 1/8" average, 3/8" max painted over pitting along bottom flange angle. All bottom flange angle rivets exhibit painted over section loss, half of which are 50% or greater.



Photo 16 – Looking southwest at the outboard face of girder 1 bottom flange angle at east half of girder. Note: 1/8" average, 3/8" max painted over pitting along bottom flange angle. All bottom flange angle rivets exhibit painted over section loss, half of which are 50% or greater.



Photo 17 – Looking west at the bottom flange of girder near mid-span. Note: Multiple impact scrapes and gouges along bottom flange plates. Minor deformation of bottom flange.



Photo 18 – Looking northwest at the inboard face of girder 1. Note: Inboard face of girder 1 bottom flange angle. 1/8" average, 3/8" max painted over pitting along bottom flange angle. All bottom flange angle rivets exhibit painted over section loss, half of which are 50% or greater.



Photo 19 – Looking southwest at stringer 3 in floor beam bay 2-3. Note: Widespread 1/16" deep painted over pitting along bottom 4" of web.



Photo 20 – Looking southwest at East face of floor beam 2 between stringers 2 and 3. Note: Typical 1/16" deep painted over pitting along bottom 4" of web and bottom flange angles.

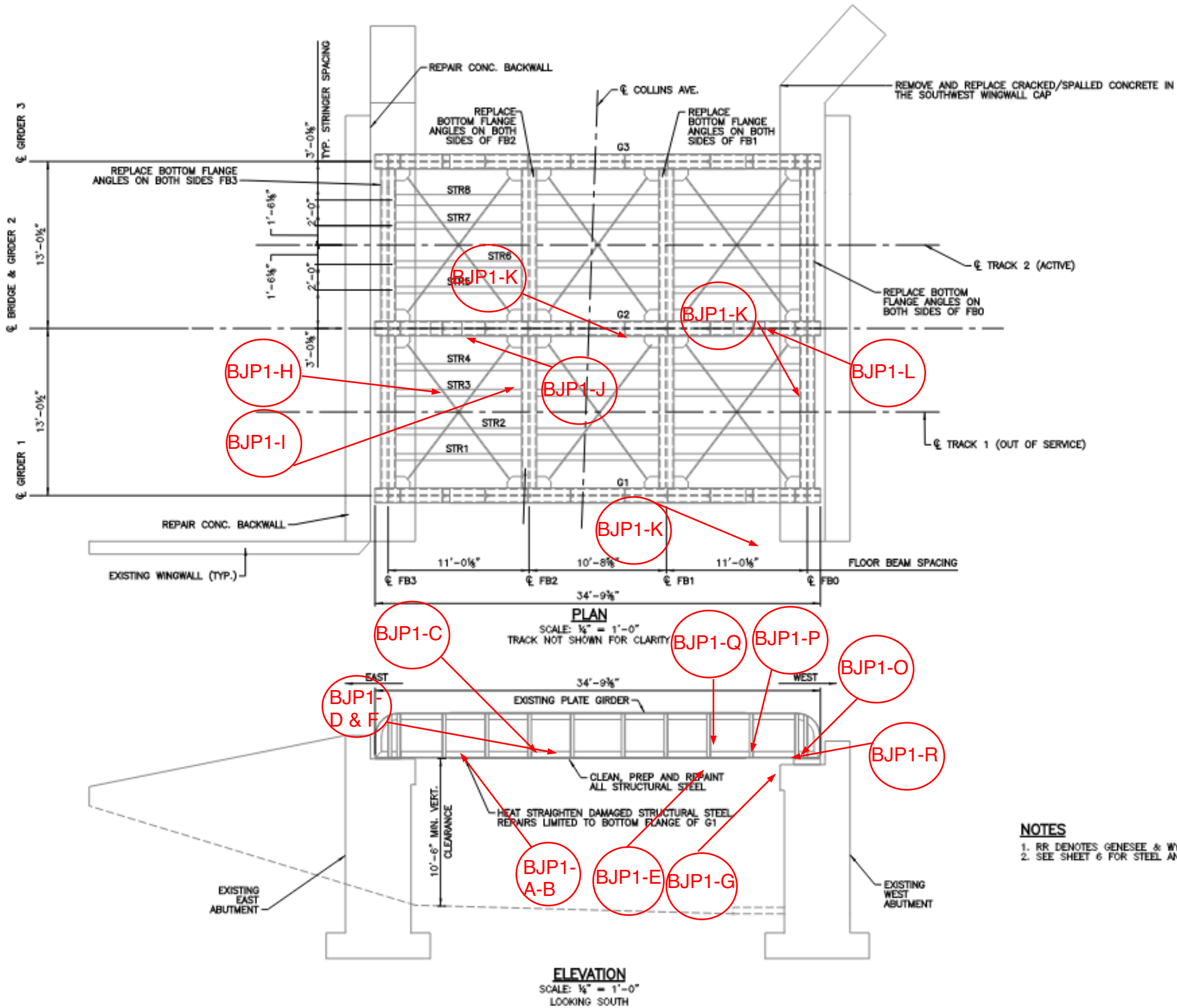
Appendix A: Deficiency Table

Photo #	Call Out #	Comment
BJP1-26	BJP-A	4 1/2" x 1 1/2" and 2 1/2" x 1 1/2" through hole in web plate with adjacent pitting down to knife edge.
BJP1-28	BJP-B	1/8" average, 3/8" max painted over pitting along bottom flange angle. All bottom flange angle rivets exhibit painted over section loss, half of which are 50% or greater.
BJP1-31	BJP-C	1/2" diameter corrosion hole through web with adjacent 1/8" deep painted over pitting.
BJP1-32	BJP-D	Most/all vertical stiffeners exhibit large painted over through holes along bottom 7" of stiffener. Similar on inboard face.
BJP1-33	BJP-E	Multiple impact scrapes and gouges along bottom flange plates. Minor deformation of bottom flange.
BJP1-36	BJP-F	Inboard face of girder 1 bottom flange angle. 1/8" average, 3/8" max painted over pitting along bottom flange angle. All bottom flange angle rivets exhibit painted over section loss, half of which are 50% or greater.
BJP1-37	BJP-G	Missing one lower lateral bracing bar.
BJP1-38	BJP-H	Typical 1/16" deep painted over pitting along bottom 4" of web.
BJP1-39	BJP-I	Typical 1/16" deep painted over pitting along bottom 4" of web and bottom flange angles.
BJP1-40	BJP-J	Thru holes along base of vertical stiffeners repaired with welded angles.
BJP1-42	BJP-K	Painted over thru hole in stiffener adjacent to floor beam 1.
BJP1-46	BJP-L	Corrosion hole through base of stiffener, typical 1/16" painted over pitting along bottom flange angle.
BJP1-47	BJP-M	Typical 1/16" painted over pitting along stringer web.
BJP1-48	BJP-N	Painted over pitting along bottom flange, 25% section loss to be plates (knife edging at edges). 1/16-1/8" painted over pitting along upstanding leg of bottom flange angle.
BJP1-50	BJP-O	4" x 4" painted over through hole in web plate between the first and second web stiffener from the end. Two 1/2" diameter painted over through holes on east side of second stiffener with adjacent 1/8" deep average painted over pitting along bottom 10" of web/bottom flange angle.
BJP1-51	BJP-P	1 1/4" painted over corrosion hole on web.
BJP1-52	BJP-Q	7" wide x up to 4" tall painted over through hole in web plate adjacent to stiffener.
BJP1-53	BJP-R	Outstanding leg for bottom flange angle is essentially gone due to previous section loss.

SCALE FACTORS CORRESPOND WITH FULL SIZE (22"x34") DRAWINGS

USER: cnyberg

FILENAME: c:\pwworking\east01\dt136520\MP2.58-GF01.dgn



FINAL CONTRACT PLANS



DESIGN: CHN
DATE: 7/25/20
DRAWN: TS
DATE: 7/25/20
CHECKED: JSM
DATE: 7/25/20

GENERAL PLAN AND ELEVATION

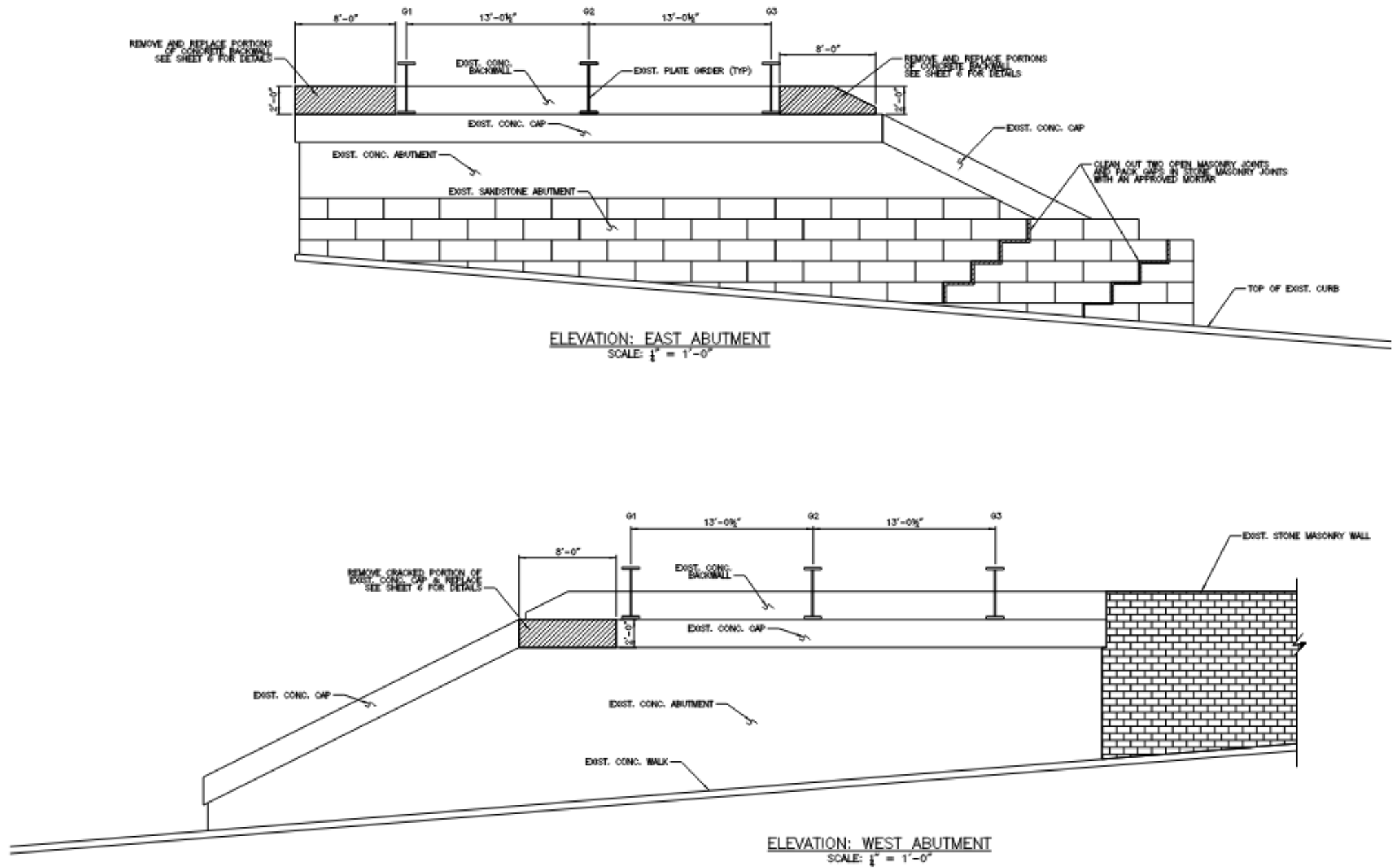
BRIDGE MP 2.58
CROSSING COLLINS AVENUE
INDIANA AND OHIO RAILROAD CORP.
OASIS LINE



###-#

Note

SCALE FACTORS CORRESPOND WITH FULL SIZE (22"x34") DRAWINGS



FINAL CONTRACT PLANS

HOR ENGINEERING, INC.
8800 CANTON RD., STE. 200
CANTON, OHIO 44705
614-884-4700

DESIGN: JMW
DATE: 7/25/20
DRAWN: TS
DATE: 7/25/20
CHECKED: JMW
DATE: 7/25/20

ABUTMENT REPAIR PLAN

BRIDGE MP 2.58
CROSSING COLLINS AVENUE
INDIANA AND OHIO RAILROAD CORP.
OASIS LINE

6
7

###-#

Note

BURGESS & NIPLE

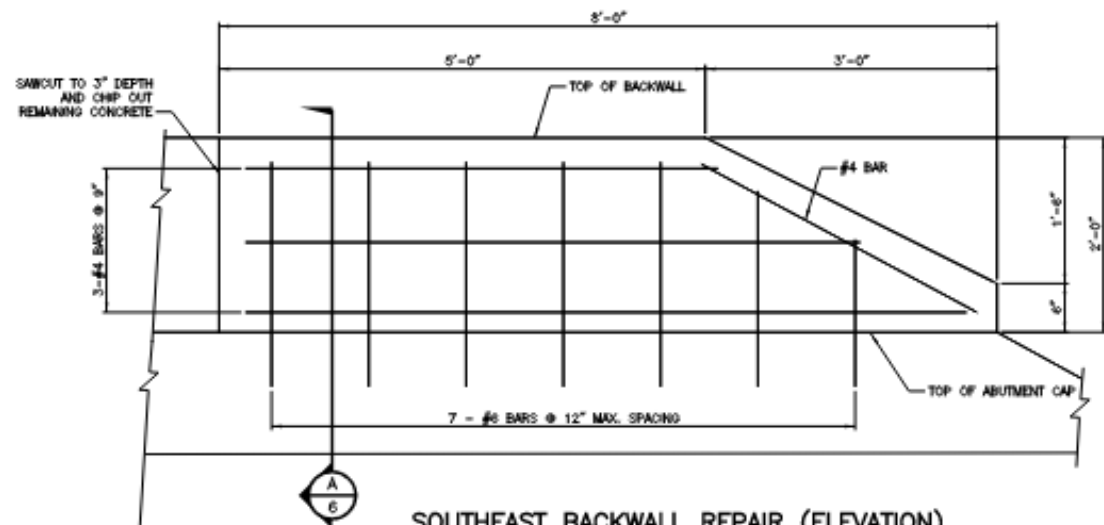
MP 2.58 BRIDGE OVER COLLINS AVENUE

OASIS TRAIL

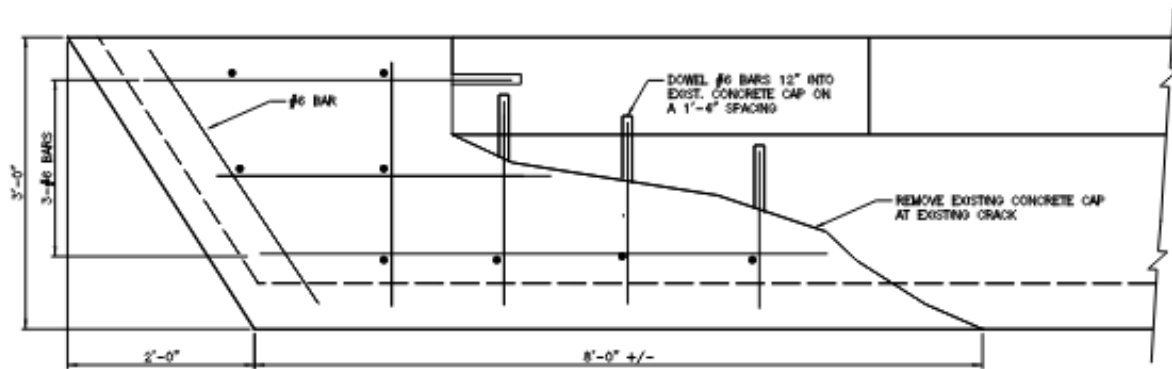
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DATE
PAGE 1 OF 1

###-# Note

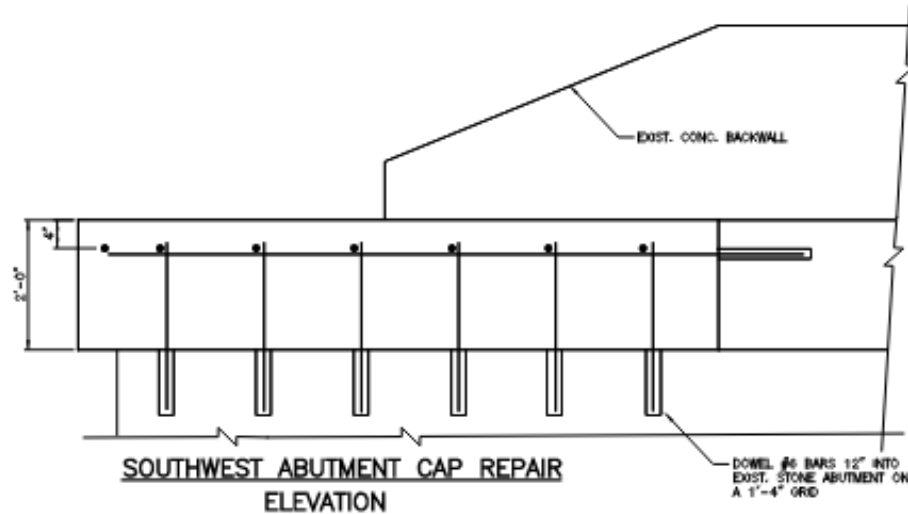
SCALE FACTORS CORRESPOND WITH FULL SIZE (22"x34") DRAWINGS



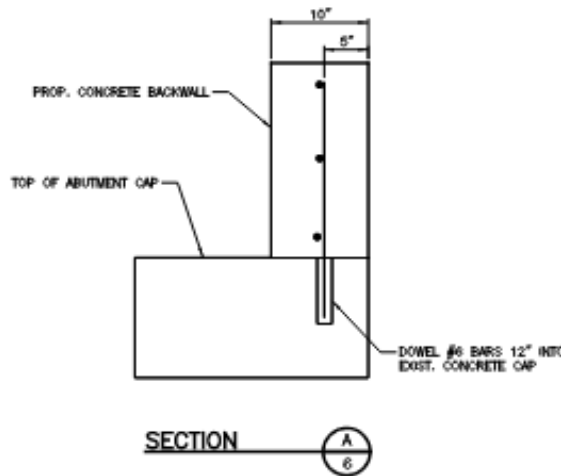
SOUTHEAST BACKWALL REPAIR (ELEVATION)
(NORTHEAST BACKWALL SIMILAR)



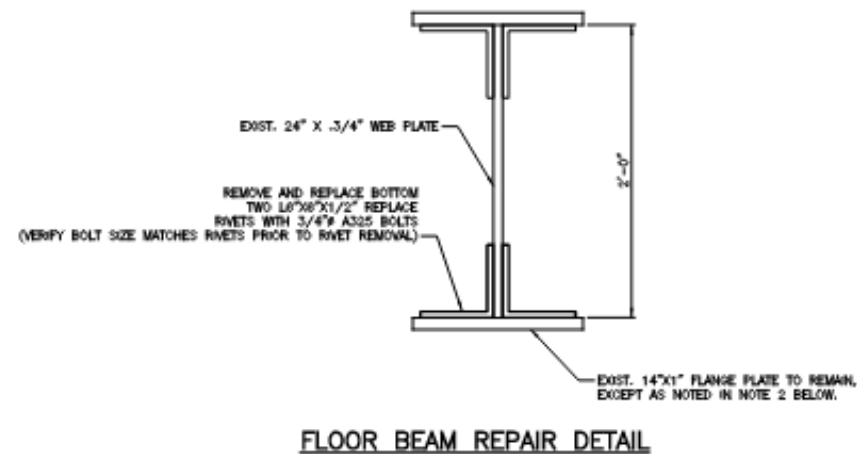
SOUTHWEST ABUTMENT CAP REPAIR
PLAN VIEW



SOUTHWEST ABUTMENT CAP REPAIR
ELEVATION



SECTION
A-6



FLOOR BEAM REPAIR DETAIL

REPAIR NOTES

1. REPLACE BOTTOM FLANGE ANGLES ON FLOOR BEAMS (FEB, FEB1, FEB2 AND FEB3). CONTRACTOR SHALL VERIFY BOLT SPACING AND ANGLE LENGTHS. APPROXIMATE LENGTH IS 13'-0" FEET.
2. AT CONTRACTOR OPTION, THE CONTRACTOR MAY REPLACE ENTIRE BOTTOM FLANGE ASSEMBLY (BOTTOM FLANGE ANGLES, 1/2" x 7/8" x 1/2" RIVETS) INCLUDING REMOVING BOTTOM PLATE AND REMOVING THE ASSOCIATED RIVETS IN THE FIELD. THE ASSEMBLY SHALL BE SHIP FABRICATED AS MEASURED IN THE FIELD BY THE CONTRACTOR. THE BOTTOM FLANGE ASSEMBLY SHALL BE FURNISHED AND INSTALLED AT THE CONTRACT UNIT PRICE FOR THE FLANGE ANGLE REPLACEMENT AS BID BY THE CONTRACTOR.
3. FLOOR BEAMS AND ASSOCIATED STRINGERS SHALL BE SUPPORTED BY TEMPORARY SHORING AND BRACING AS NECESSARY TO SUPPORT THE DEAD LOAD OF THE STRUCTURE SUPPORTED BY THE FLOOR BEAM. SHORING SHALL BE DESIGNED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. SHORING DESIGN AND INSTALLATION COSTS SHALL NOT BE PAID SEPARATELY, BUT INCLUDED IN THE CONTRACT UNIT PRICE FOR THE STEEL REPLACEMENT.
4. CONTRACTORS SHALL COORDINATE WITH THE RAILROAD TO VERIFY NO TRAIN LOADING WILL BE PLACED UPON BRIDGE DURING REPLACEMENT OF FLOOR BEAM COMPONENTS.

FINAL CONTRACT PLANS

DESIGN: CHN
DRAWN: JS
CHECKED: JSM
DATE: 7/25/20
DATE: 7/25/20
DATE: 7/25/20
HOB ENGINEERING, INC.
9907 CARVER RD, SUITE 200
CINCINNATI, OHIO 45242
513-488-7200

STRUCTURAL REPAIR DETAILS

BRIDGE MP 2.58
CROSSING COLLINS AVENUE
INDIANA AND OHIO RAILROAD CORP.
OASIS LINE

7

BURGESS & NIPLE

MP 2.58 BRIDGE OVER COLLINS AVENUE

CLIENT:

OASIS TRAIL

INSPECTED BY:
DATE:
PAGE 1 OF 1

BURGESS & NIPLE

525 Vine Street | Suite 1300 | Cincinnati, OH 45202 | 513.579.0042

Mr. Sean Creighton, PLA, LEED AP
Project Manager
Great Parks of Hamilton County
10245 Winton Road
Cincinnati, OH 45231

Re: Great Parks of Hamilton County – Oasis Corridor
B&N Bridge Assessment – Collins Ave

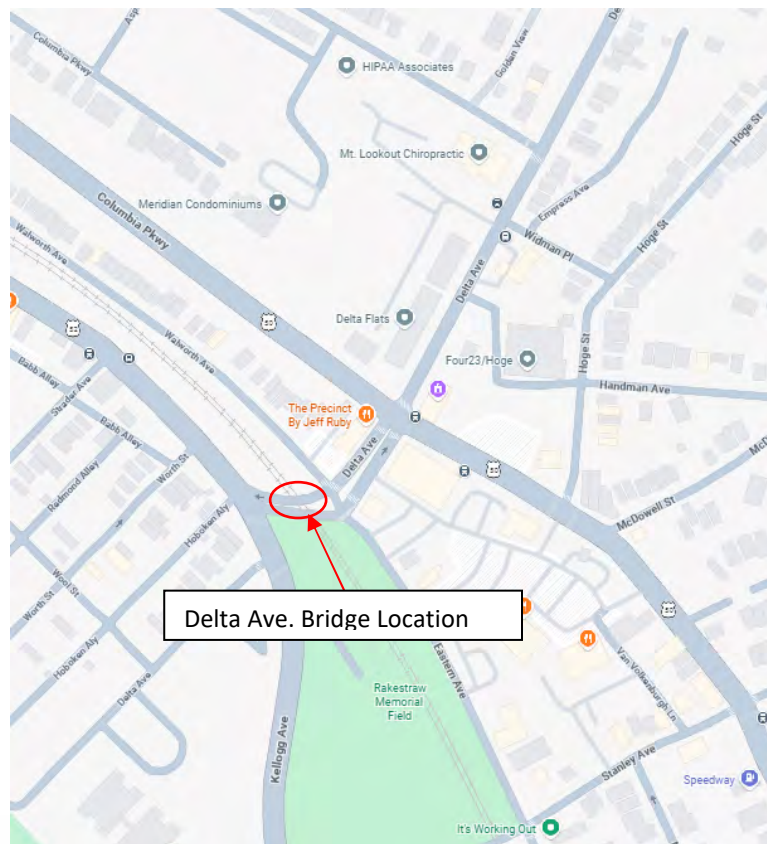
April 2, 2026

Dear Mr. Creighton:

Burgess & Niple (B&N) performed a bridge assessment of the steel twin girder bridge carrying the Indiana & Ohio RR over Delta Ave on January 14th & 15, 2026. The girders are named south and north girders (*Appendix B*). Beams and pier columns are numbered from left to right looking east. The steel pier cap and abutment bearings were inspected from a ladder. A cursory inspection of the concrete substructure elements and tracks was also completed.

The intent of this assessment is to determine areas of deficiency that need to be repaired for conversion of the north railroad track to a trail. Detailed dimensions of existing bridge members and geometry were not obtained.

LOCATION MAP



Bridge Assessment:

Indiana & Ohio RR over Delta Ave., SFN 3160653 *(see Appendix A for deficiency table and layout)*

Deck Condition Summary:

There is no deck on this structure. The steel deck pans hold up the fill and ballast under the rails **(photo 5)**.

Superstructure Condition Summary:

Multiple isolated locations of minor laminar corrosion with negligible section loss on girder and beam ends. Areas of worse corrosion exist along the length exterior face of girders and at girder and beam ends at abutments and over the pier. Section loss at these locations were negligible.

Substructure Condition Summary:

Both abutments exhibit water staining and multiple isolated moderate width vertical and horizontal cracks. Widespread shallow scaling and moderate width horizontal cracking exist on abutment caps. The concrete crash barrier exhibit

Notable Defects:

Pier 1 - Column 7 - concrete is in poor condition and appears to not contain any reinforcement and only appears to protect the underlying built up steel column. A small portion of the steel column is exposed and is in poor condition and exhibit section loss and pack rust between components up to 1/2". Full condition of steel column is unable to be determined due to encasement. Concrete is unsound throughout including portion of exposed core concrete **(photos 13-15)**. Column 1 is in similar condition **(photo 16)**.

Recommendations:

- Abrasively clean and spot paint areas of surface corrosion to steel superstructure and pier.
- Periodically inspect for loose concrete on abutment walls and pier protection. Remove any loose concrete that may pose a safety hazard to pedestrians and vehicular traffic.
- Monitor pier 1 column 7 for further spalling and steel section loss. Consider patching or replacing concrete encasement at this column.
- The City of Cincinnati has requested a load rating of the bridge since the structure will carry railroad loads and there is not documentation on the load carrying capacity of the bridge.

Photographs



Photo 1 – Elevation looking south.



Photo 2 – Elevation looking northwest.



Photo 3 – End view looking west.



Photo 4 – End view looking east.



Photo 5 – Looking south at the general underside condition of span 2.



Photo 6 – Looking northwest at the east face of the pier. Note: heavy spalling on column 7 and along the concrete pier protection.



Photo 7 – Looking northeast at overall elevation of the east abutment from south end. Note: isolated delaminations totally less than 20 SF. Horizontal and vertical moderate width cracking throughout abutment cap. Concreted is generally sound around cracks.



Photo 8 – Looking northwest overall elevation of the west abutment exhibits vertical and horizontal moderate width cracks in cap. Cracking is heaviest in south half of abutment.



Photo 9 – Looking northwest at the typical efflorescence and water staining on the bottom flange of beam 3 at the north girder in span 2.



Photo 10 – Looking west at south face of floorbeam 41 bearing at the west abutment exhibits pack rust peeling the horizontal angle leg with adjacent surface corrosion with negligible section loss.



Photo 11 – Looking south a typical painted over section loss to the steel backwall between beams 7 and 8 at the east abutment. This condition is typical at multiple locations.



Photo 12 – Looking northeast at an overall view of the partial height pier wall at column 4. Note: the pier wall exhibits heavy deterioration intermittently, full length. The concrete encasement extensions around base of columns exhibits minor crack, but are generally in good condition.



Photo 13 – Looking east at overall of column 7. Note: concrete is in poor condition and appears to not contain any reinforcement and only appears to protect the underlying built up steel column. A small portion of the steel column is exposed and is in poor condition and exhibit section loss and pack rust between components up to 1/2".

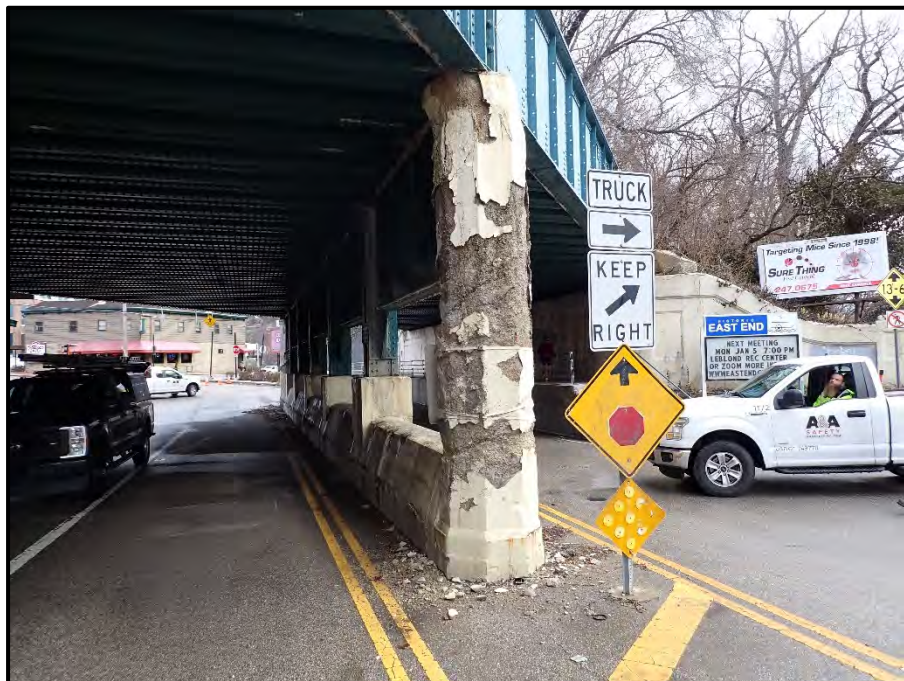


Photo 14 – Looking north at overall of column 7. Note: concrete is in poor condition and appears to not contain any reinforcement and only appears to protect the underlying built up steel column. A small portion of the steel column is exposed and is in poor condition and exhibit section loss and pack rust between components up to 1/2".



Photo 15 – Looking west at overall of the top half of column 7. Note: concrete is in poor condition and appears to not contain any reinforcement and only appears to protect the underlying built up steel column.

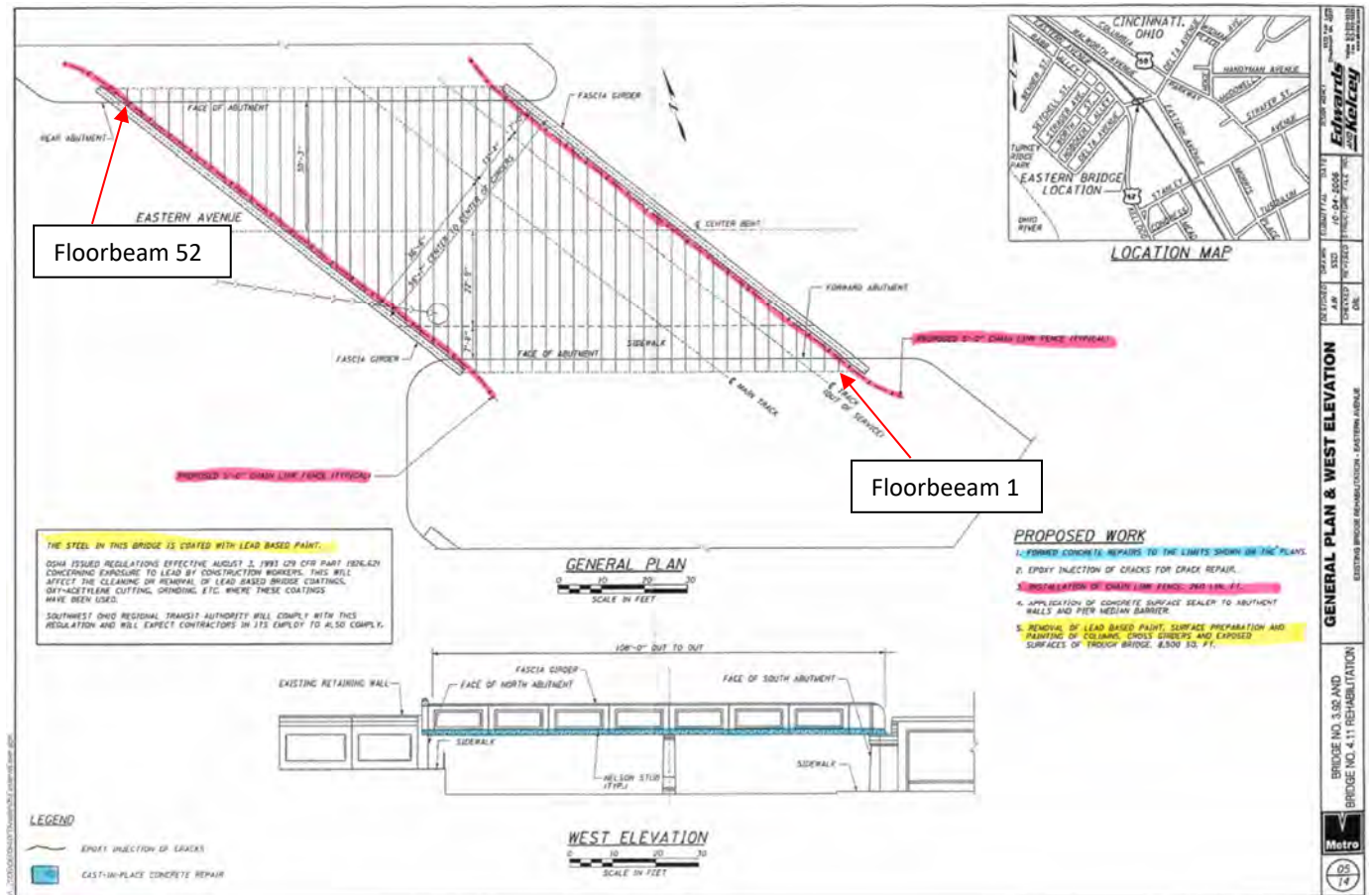


Photo 16 – Overall, of north column (column 1). Note: column is in similar condition to column 7. Steel frame is not exposed.

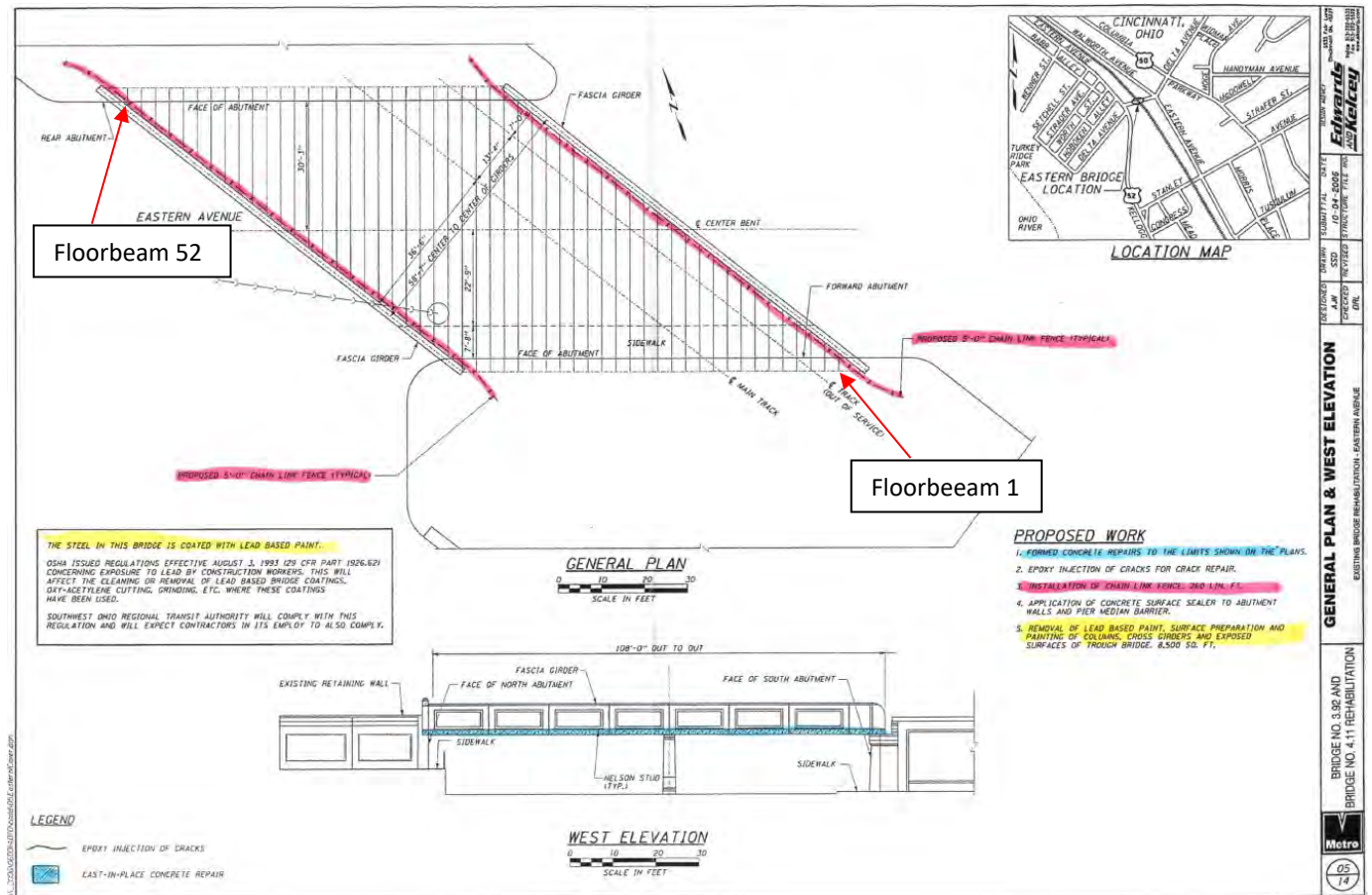
Appendix A: Floor System Layout

Photo #	Call Out #	Comment
LAL1-25	LAL-A	Typical efflorescence and water staining on the bottom flange of beam 3 at the north girder.
LAL1-26	LAL-B	Typical painted over section loss to the steel backwall between beams 7 and 8 at the east abutment.
LAL1-27	LAL-C	Underside of beam 10 bottom plate at the east abutment exhibits minor laminar corrosion with negligible section loss.
LAL1-28	LAL-D	East abutment cap under floorbeam 24 exhibits a 2' square area of delamination with an adjacent 9" x 9" x 1/2" deep corner spall.
LAL1-30	LAL-E	Overall of the south girder bearing at the west abutment. Note: heavy surface corrosion with negligible section loss to steel bearing assembly. Water drains onto bearing at this location.
LAL1-31	LAL-F	South face of floorbeam 41 bearing at the west abutment exhibits pack rust peeling the horizontal angle leg.
LAL1-32	LAL-G	5' long x 6" tall x 3" deep spall in the top of the west abutment cap between floorbeams 37 and 38. The top of the abutment cap is delaminated along a 5' long x 6" wide area (above the spall) that does not undermine the bearing.
LAL1-34	LAL-H	South face of the north girder bearing at the west abutment. Note: heavy water staining and minor surface corrosion with negligible section loss. Water drains off the corner of the bridge onto bearing.
LAL1-38	LAL-I	Surface corrosion and pack rust between the column 1 bearing plate and sole plate.

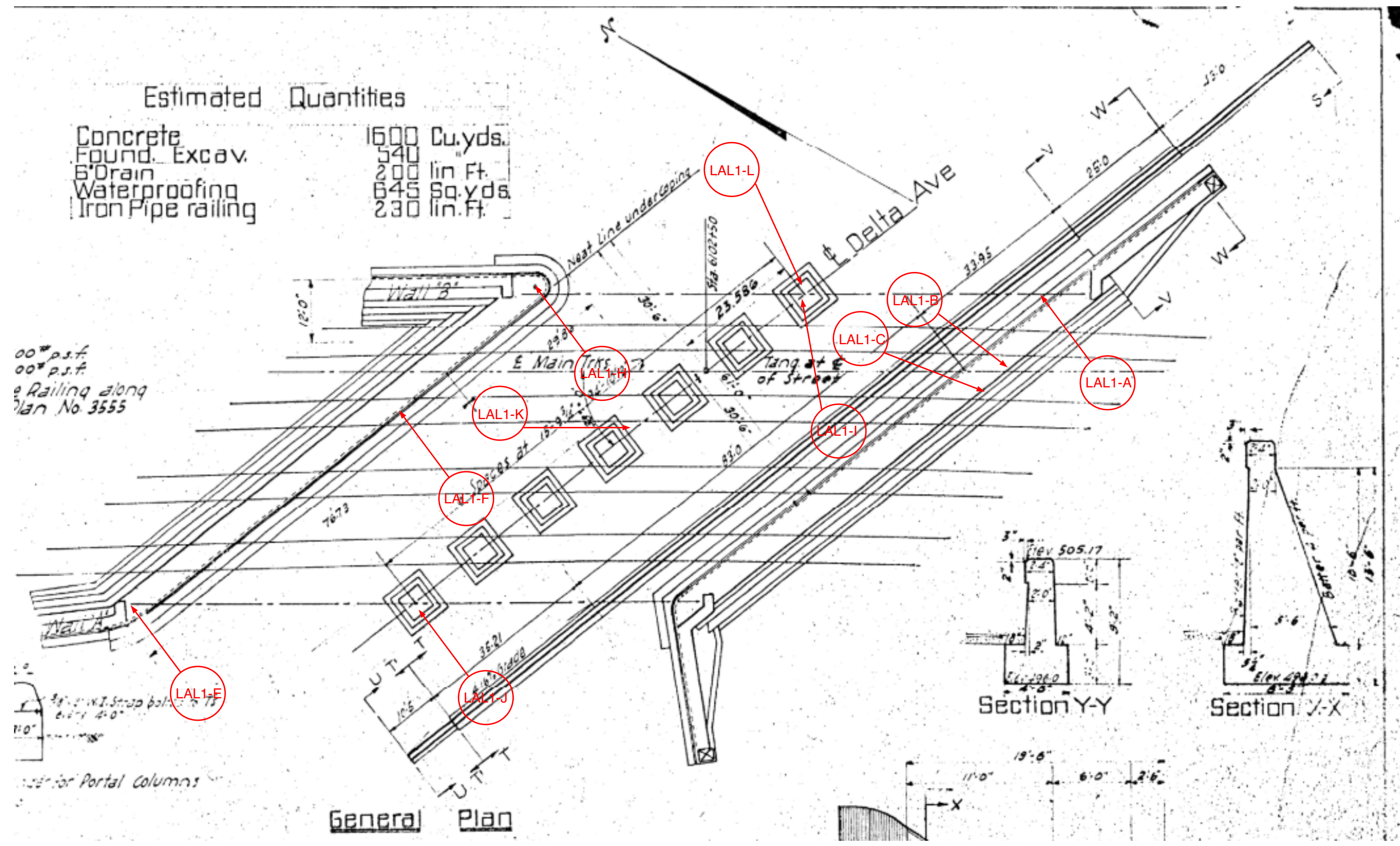
Appendix B: Floor System Layout



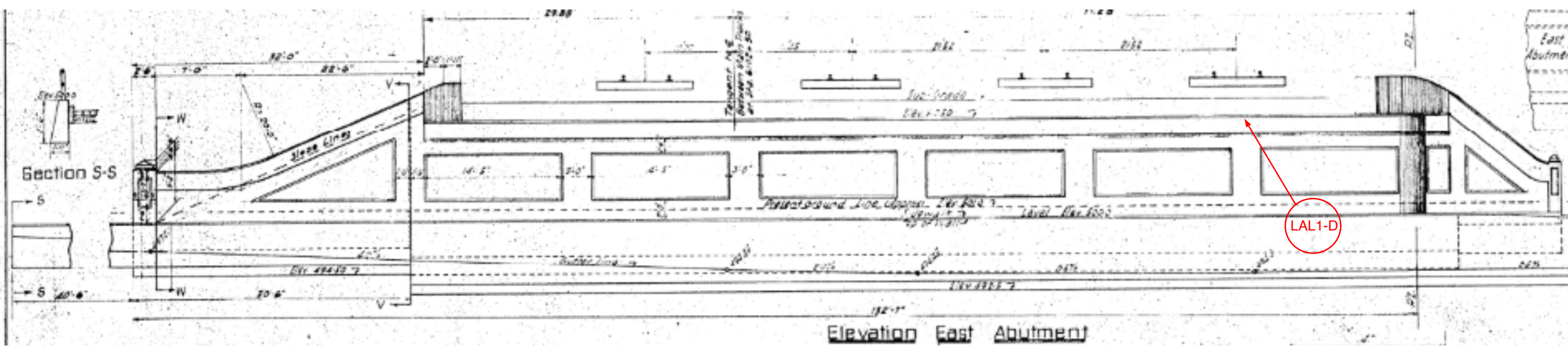
Appendix B: Floor System Layout



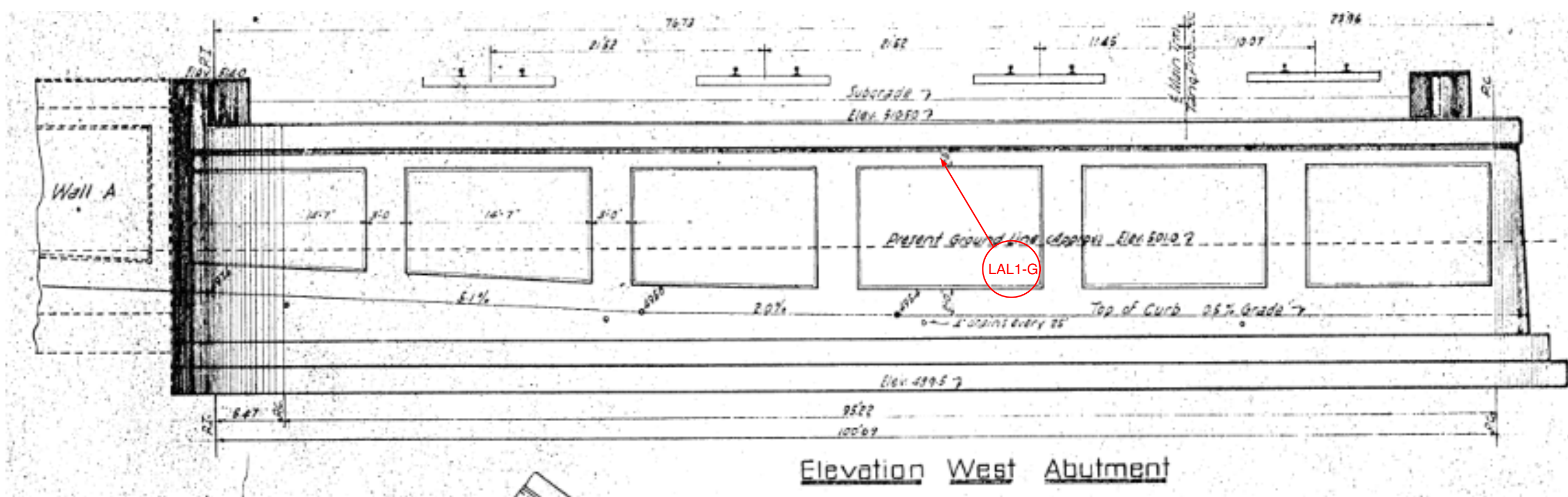
Estimated Quantities	
Concrete	1600 Cu.yds.
Found. Excav.	540 lin.Ft.
6" Drain	200 lin.Ft.
Waterproofing	645 Sq.yds.
Iron Pipe railing	230 lin.Ft.



###-# Note



Elevation East Abutment



Elevation West Abutment

###-# Note

BURGESS & NIPLE

525 Vine Street | Suite 1300 | Cincinnati, OH 45202 | 513.579.0042

Mr. Sean Creighton, PLA, LEED AP
Project Manager
Great Parks of Hamilton County
10245 Winton Road
Cincinnati, OH 45231

Re: Great Parks of Hamilton County – Oasis Corridor
B&N Bridge Assessment – Collins Ave

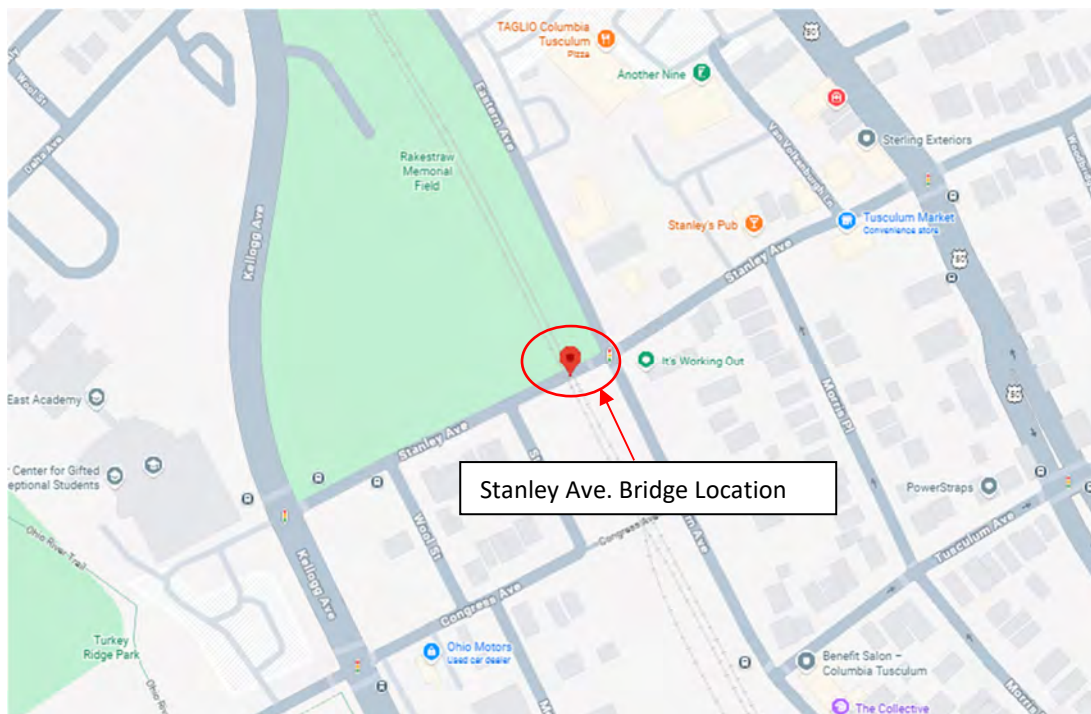
April 2, 2026

Dear Mr. Creighton:

Burgess & Niple (B&N) performed a bridge assessment of the steel box beam bridge carrying the Indiana & Ohio RR over Stanley Ave on January 14th & 15, 2026. Beams and pier columns are numbered from left to right looking east. The steel pier cap and abutment bearings were inspected from a ladder. A cursory inspection of the concrete substructure elements and tracks was also completed.

The intent of this assessment is to determine areas of deficiency that need to be repaired for conversion of the north railroad track to a trail. Detailed dimensions of existing bridge members and geometry were not obtained.

LOCATION MAP



Bridge Assessment:

Indiana & Ohio RR over Stanley Ave *(see Appendix A for deficiency table and layout)*

Deck Condition Summary:

There is no deck on this structure. The steel deck pans hold up the fill and ballast under the rail.

Superstructure Condition Summary:

Beam ends at abutments and pier exhibit water staining and isolated corrosion with section loss up 1/16" deep. The free lengths of the beams are in good condition with only isolated locations of paint failure. Bearing seats exhibit moderate freckling corrosion with negligible section loss.

Substructure Condition Summary:

Isolated insignificant width horizontal cracks in the top of the abutment walls with moderate efflorescence. Heavy concentration of minor width cracks in the abutment caps with isolated locations of moderate width cracks.

Recommendations:

- Consider spot cleaning and painting isolated locations of surface corrosion to beam ends.
- Add a plate or angle to the top of the steel backwall between beams 12 and 13 at the east abutment to prevent loss of ballast.
- The City of Cincinnati has requested a load rating of the bridge since the structure will carry railroad loads and there is not documentation on the load carrying capacity of the bridge.

Photographs



Photo 1 – Elevation looking south.



Photo 2 – Elevation looking north.



Photo 3 – End view looking east.



Photo 4 – End view looking west.



Photo 5 – Looking west at the underside of span 1. Note: isolated locations of surface corrosion with minor section loss.



Photo 6 – Looking northeast at the east abutment elevation.



Photo 7 – Looking west at the overall of the west face of pier 1.



Photo 8 – Looking south at typical water leakage and moisture staining at pier 1. Note: leakage between beams 10-11 shown. Water leaks through the span 1 to span 2 deck pan interface.



Photo 9 – Looking north at typical beam to bearing seat condition at pier 1. Photo from beam 9. Leakage is intermittent and heaviest in the end 4 beam bays.



Photo 10 – Looking east at typical bearing seat condition between beams 3 and 4 and the east abutment. Note: minor surface corrosion, water staining, and active leakage at bearing seat with negligible section loss.



Photo 11 – Looking east at underside of beam 3 at the east abutment. Note: minor surface corrosion and water staining on the bottom of beam with negligible section loss.



Photo 12 – Looking east at north web of beam 11 at the east abutment exhibits a 14" long x 4" tall area of up to 1/16" deep painted over section loss in the bottom of the web plate.



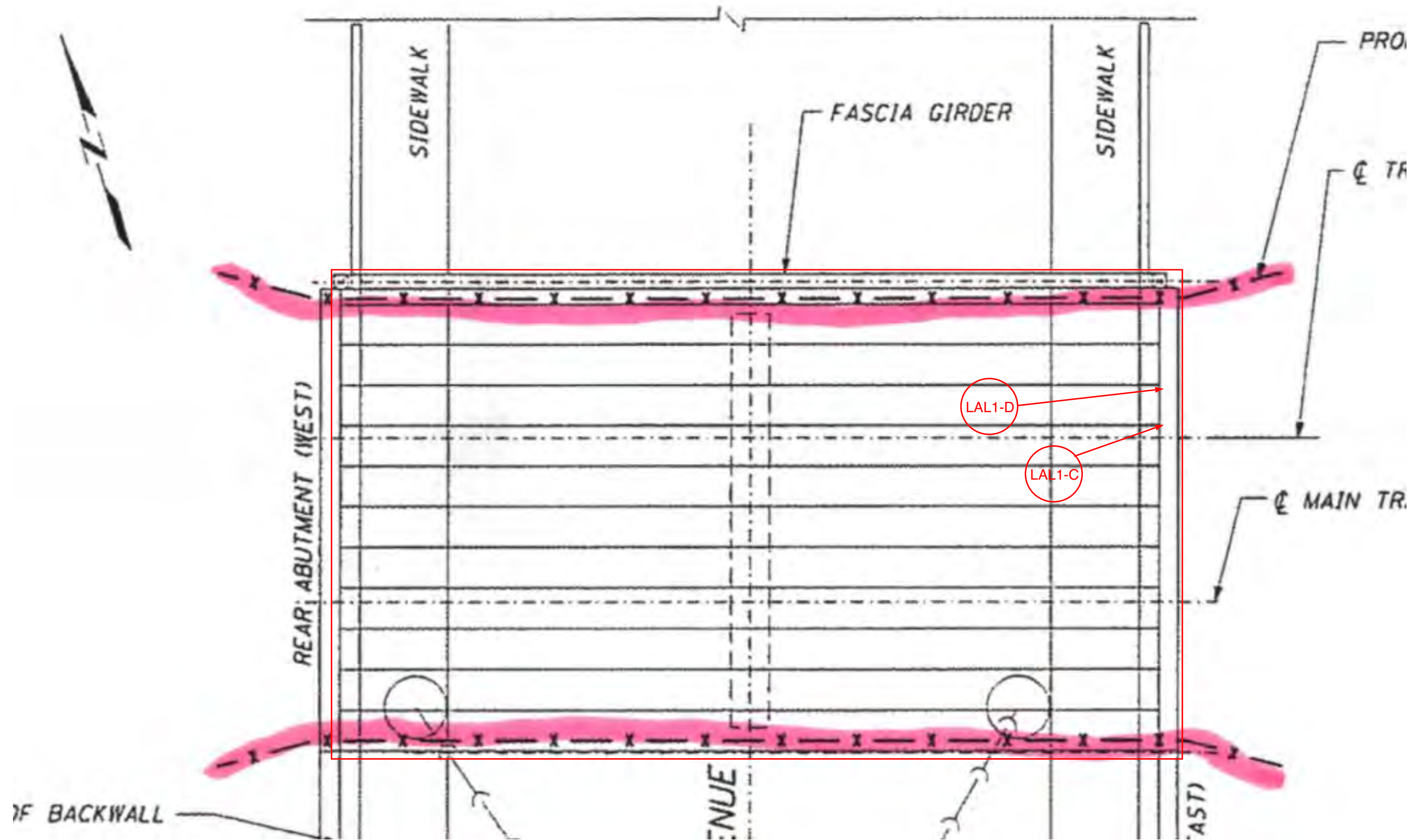
Photo 13 – Looking east at the north face of beam 13 bottom of web at the east abutment a 15" long x 3" tall area of active corrosion with up to 1/16" deep section loss.

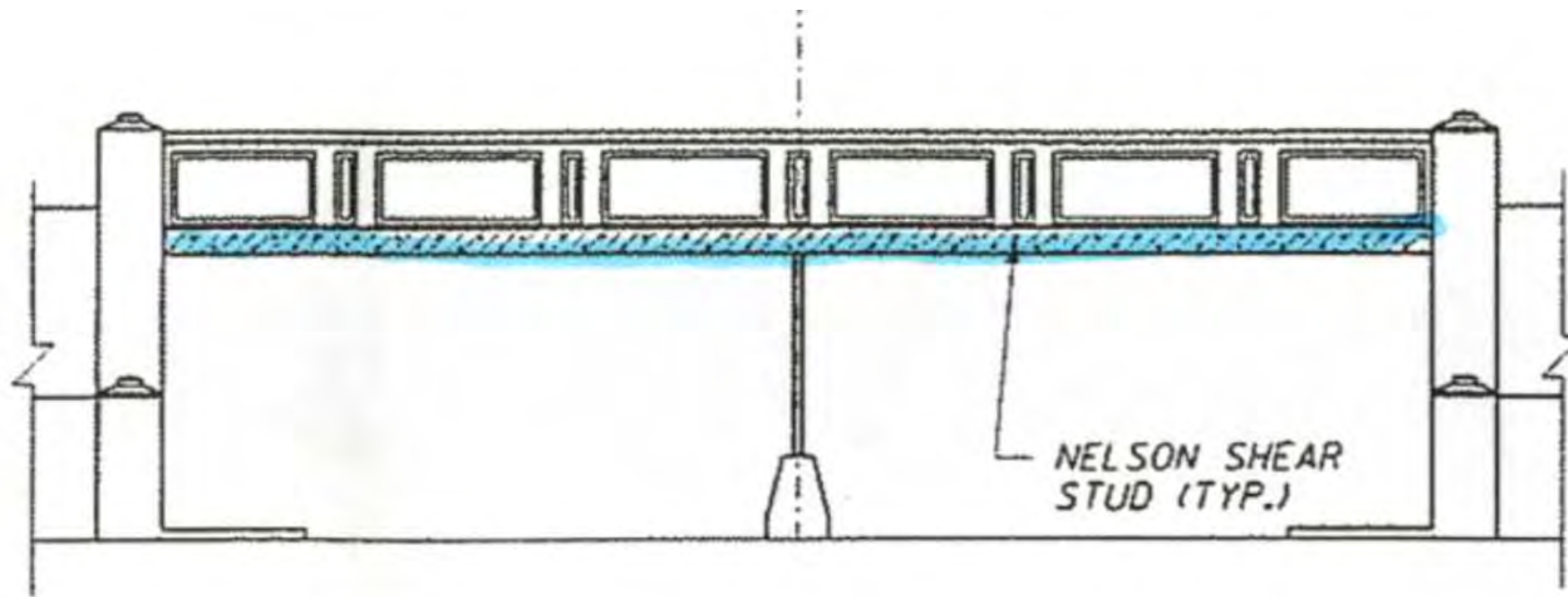


Photo 14 – Looking east at Overall of the steel backwall between beam 12 and 13 at the east abutment. Note: up to 1/8" painted over section loss throughout with a 4" wide x 1" tall void/corrosion hole in the top of the back and end of deck pan. Ballast is exposed.

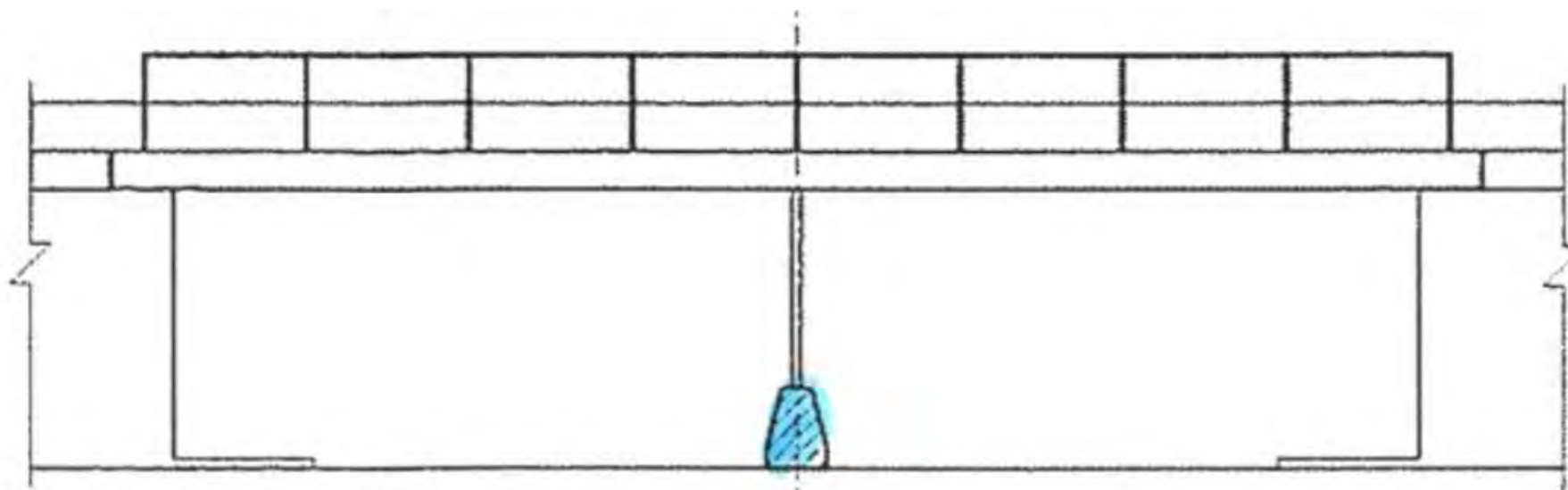
Appendix A: Deficiency Table

Photo #	Call Out #	Comment
Photo 8	C-LAL-A	Water leakage between beams 10-11. Water leaks through the span 1 to span 2 deck pan interface.
Photo 9	C-LAL-B	Leakage at pier bearing seat is intermittent and heaviest in the end 4 beam bays.
Photo 10	C-LAL-C	Minor surface corrosion, water staining, and active leakage at bearing seat with negligible section loss.
Photo 11	C-LAL-D	Underside of beam 3 at the east abutment. Note: minor surface corrosion and water staining on the bottom of beam with negligible section loss.
Photo 12	C-LAL-E	North web of beam 11 at the east abutment exhibits a 14" long x 4" tall area of up to 1/16" deep painted over section loss in the bottom of the web plate.
Photo 13	C-LAL-F	Steel backwall between beams 12 and 13 at the east abutment exhibits up to 1/8" painted over section loss throughout with a 4" wide x 1" tall void/corrosion hole in the top of the back and end of deck pan. Ballast is exposed.
Photo 14	C-LAL-G	North face of beam 13 bottom of web at the east abutment exhibits a 15" long x 3" tall area of active corrosion with up to 1/16" deep section loss.



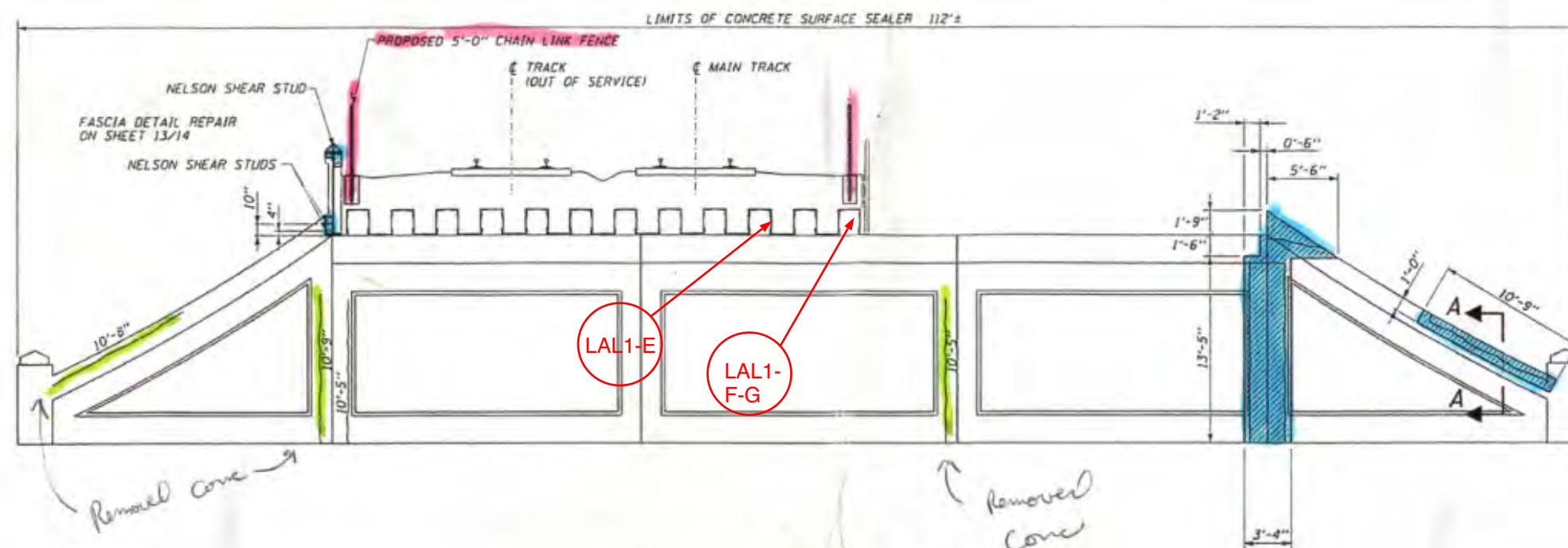
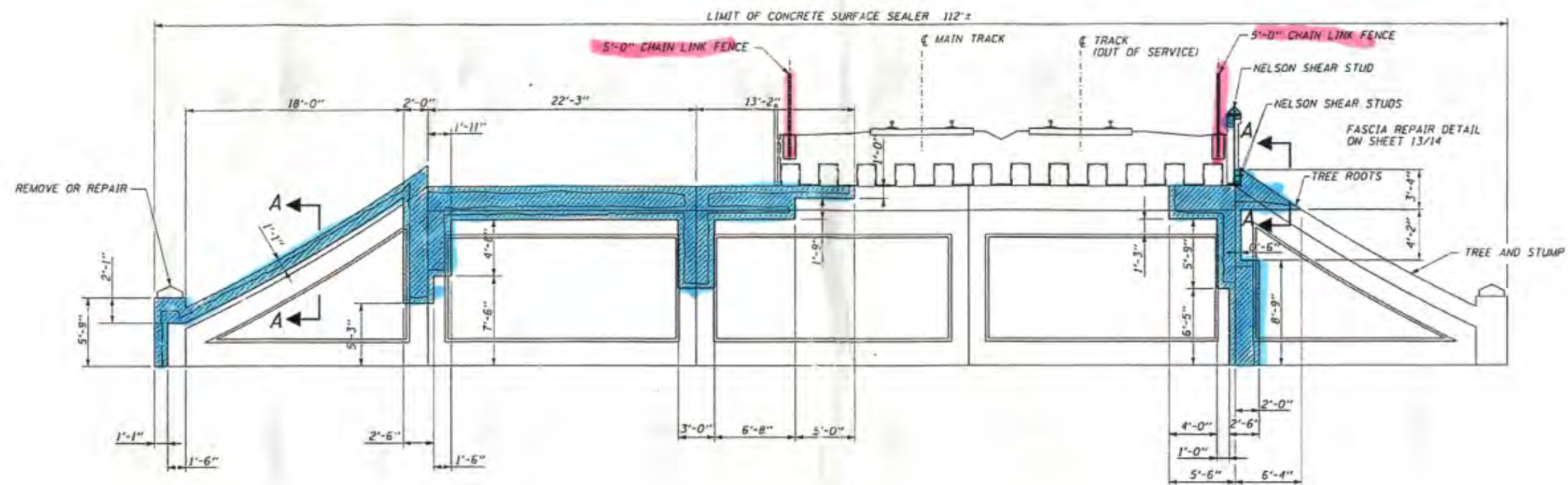


NORTH ELEVATION



SOUTH ELEVATION

KC



Mr. Sean Creighton, PLA, LEED AP
Project Manager
Great Parks of Hamilton County
10245 Winton Road
Cincinnati, OH 45231

Re: Great Parks of Hamilton County – Oasis Corridor
B&N Bridge Assessment – Collins Ave

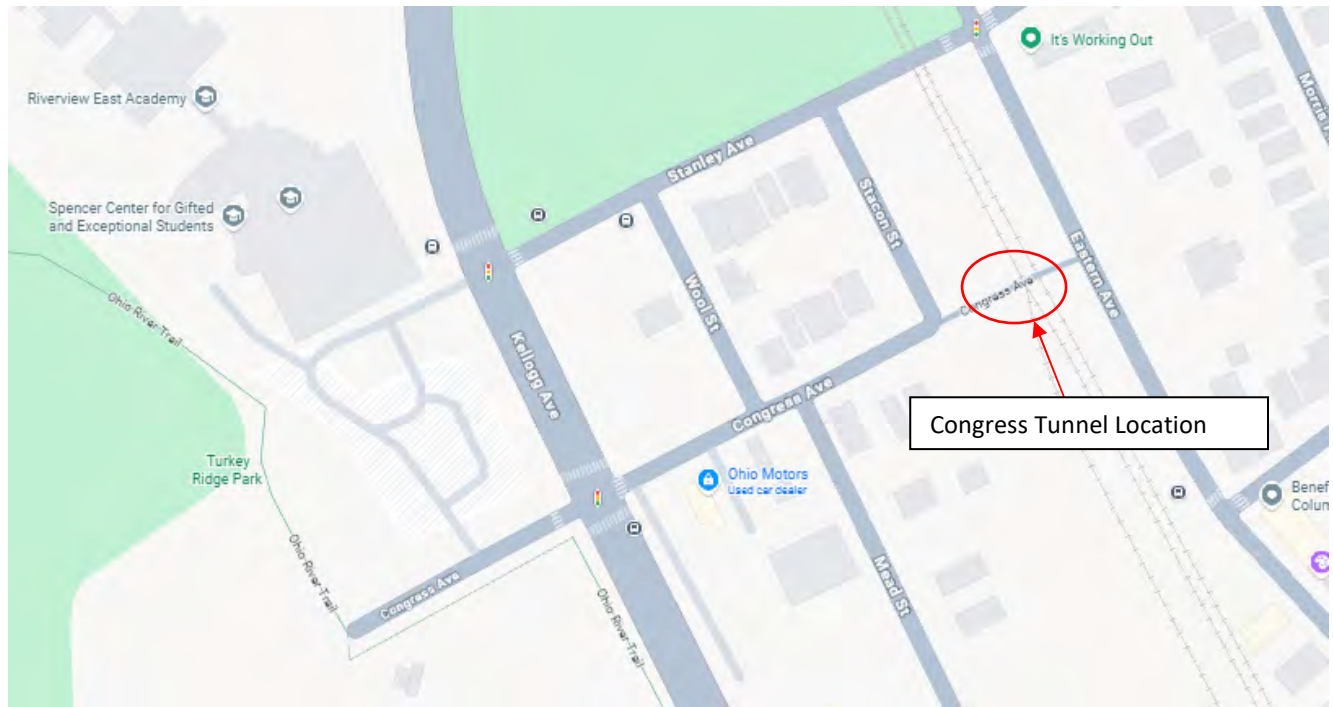
April 2, 2026

Dear Mr. Creighton:

Burgess & Niple (B&N) performed an assessment of the reinforced concrete tunnel carrying Indiana & Ohio RR over pedestrian path on January 14th & 15, 2026. The assessment focuses on the visible portions of the concrete tunnel between Eastern and Congress Ave.

The intent of this assessment is to determine areas of deficiency that need to be repaired for conversion of the north railroad track to a trail. Detailed dimensions of existing bridge members and geometry were not obtained.

LOCATION MAP



Tunnel Assessment:

Indiana & Ohio RR over Congress Ave.

Summary:

The concrete walls and top slab were sounded for spalls and delaminations. Areas of deficiency are mapped in **Appendix A** below. There were some areas of moderate spalling in the tunnel walls and on the south headwall. Spalling was heaviest in the west wall and on the south head wall. The top slab and the east walls had isolated locations of moderate spalling. Multiple spalls had exposed rebar with negligible section loss.

Recommendations:

- Abrasively clean and paint areas of spalling with exposed rebar. Consider patching spalls and delaminations with trowelable mortar or concrete based on spall depth.
- Periodically inspect the tunnel for areas of new spalls and delaminations. Remove areas of loose concrete which pose a safety hazard to pedestrians.

Photographs



Photo 1 – Elevation looking north.



Photo 2 – Elevation looking south.



Photo 3 – Top of rail over tunnel, looking east.



Photo 4 – Top of rail over tunnel, looking west.



Photo 5 – Looking south at the typical inside of tunnel condition.



Photo 6 – Looking north at full width (8') x 6" tall x up to 1" deep spall in the bottom corner of the south end tunnel entrance. 1' tall x 8' wide area of adjacent delamination above spall.



Photo 7 – Looking north at 9' x 1' x 3" deep spall in the east end of the east wall at the south entrance.



Photo 8 – Looking northwest at 3' x 6' x 2" deep spall in the south end of the east wall at the south entrance.



Photo 9 – Looking northwest at 30 SF of intermittent spalling on the west wall, up to 1" deep.



Photo 10 – Looking northwest at 30 SF of intermittent spalling on the west wall, up to 1" deep.



Photo 11 – Looking northwest at 30 SF of intermittent spalling on the west wall, up to 1" deep.



Photo 12 – Looking south at 4 SF of spalling on the underside of top slab 8' from the north end with exposed and corroding rebar.



Photo 13 – Looking east at three, 1 SF spalls in the east top slab chamfer 15' from the north end with exposed and corroding rebar.

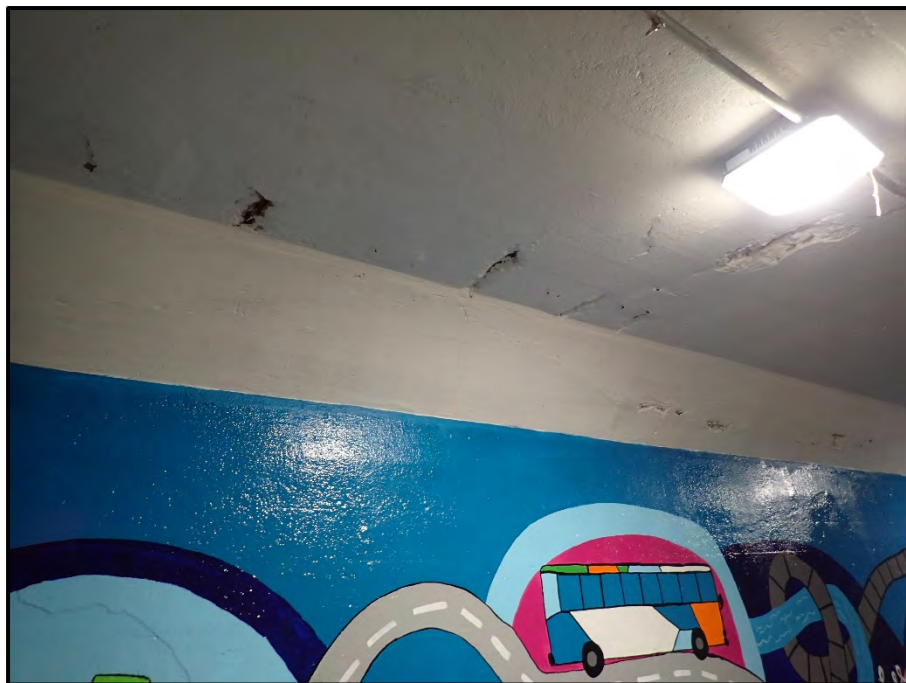


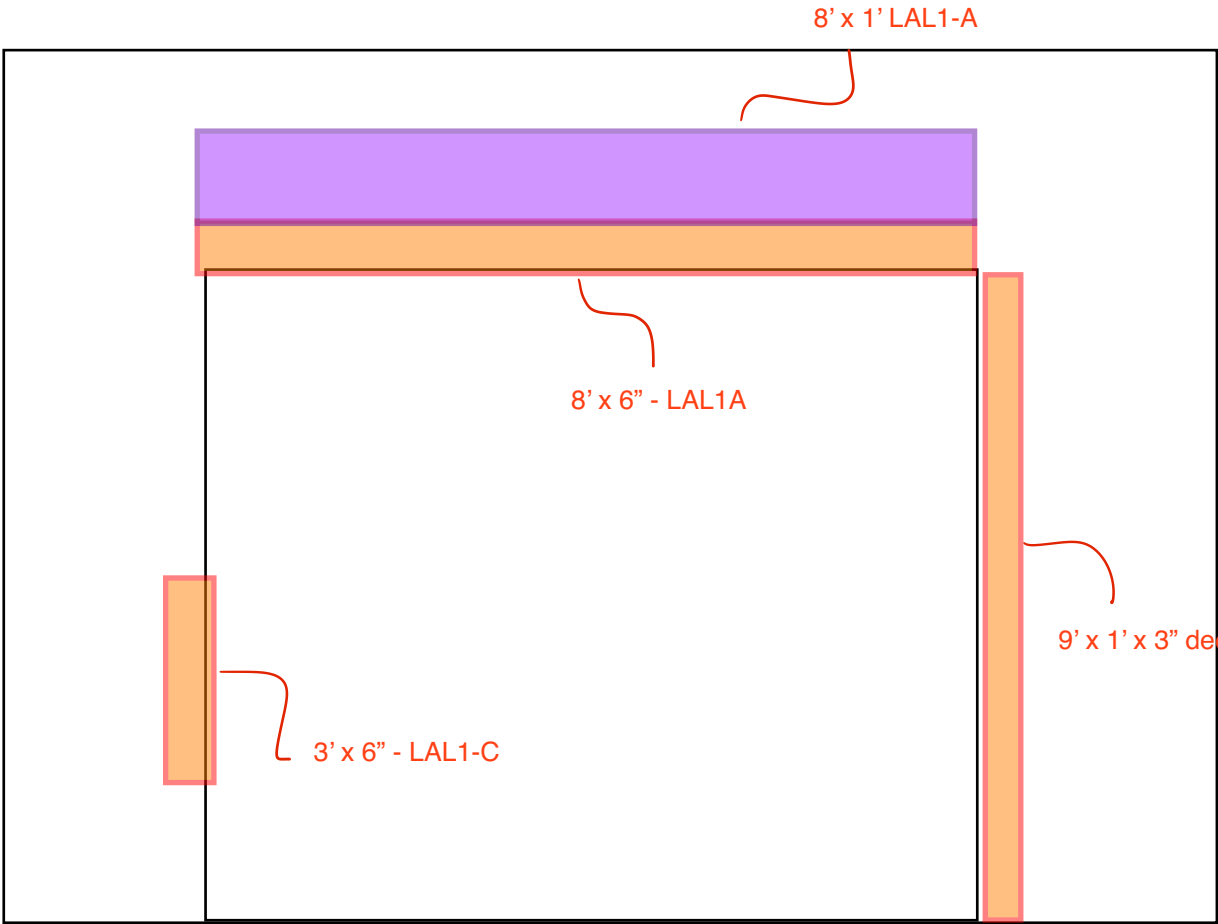
Photo 14 – Looking southeast at 4 SF of spalls with exposed rebar 20' from the south end.



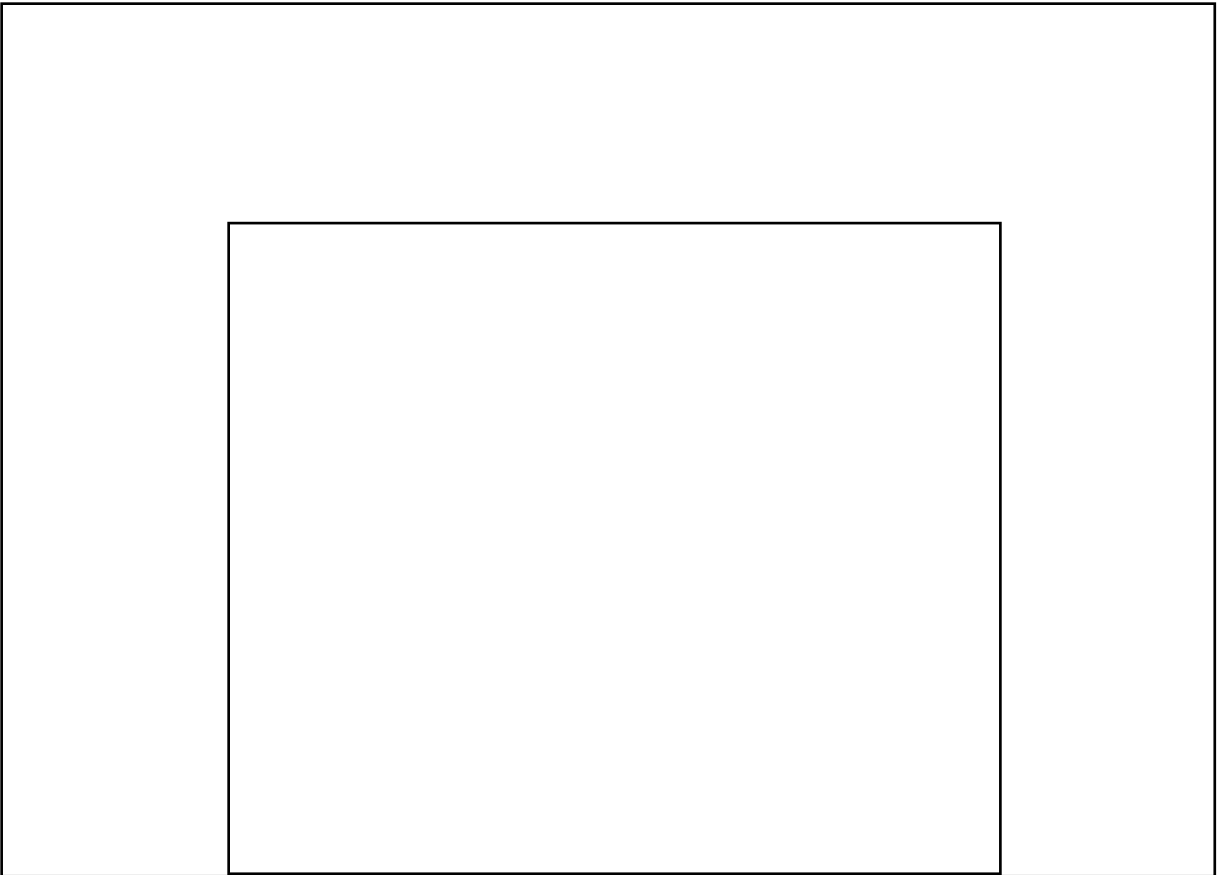
Photo 15 – Looking west at 2' x 1' x 1" deep spall with one exposed and corroding spiral bar on the west wall, 8' from the south end.

Appendix A: Deficiency Callout Table

Photo #	Call Out #	Comment
Photo 6	LAL-A	Full width (8') x 6" tall spall in the bottom corner of the south end tunnel entrance. 1' tall x 8' wide area of adjacent delamination.
Photo 7	LAL-B	9' x 1' x 3" deep spall in the east end of the east wall at the south entrance.
Photo 8	LAL-C	3' x 6' x 2" deep spall in the south end of the east wall at the south entrance.
Photo 15	LAL-D	2' x 1' x 1" deep spall with one exposed and corroding spiral bar 8' from the south end.
Photo 11	LAL-E	30 SF of intermittent spalling on the west wall, up to 1" deep.
Photo 12	LAL-F	4 SF of spalling on the underside of top slab 8' from the north end with exposed and corroding rebar.
Photo 13	LAL-G	Three 1 SF spalls in the east top slab chamfer 15' from the north end with exposed and corroding rebar.
Photo 14	LAL-H	4 SF of spalls with exposed rebar 20' from the south end.



SOUTH ELEVATION (FASCIA)



NORTH ELEVATION (FASCIA)

###-#

Note

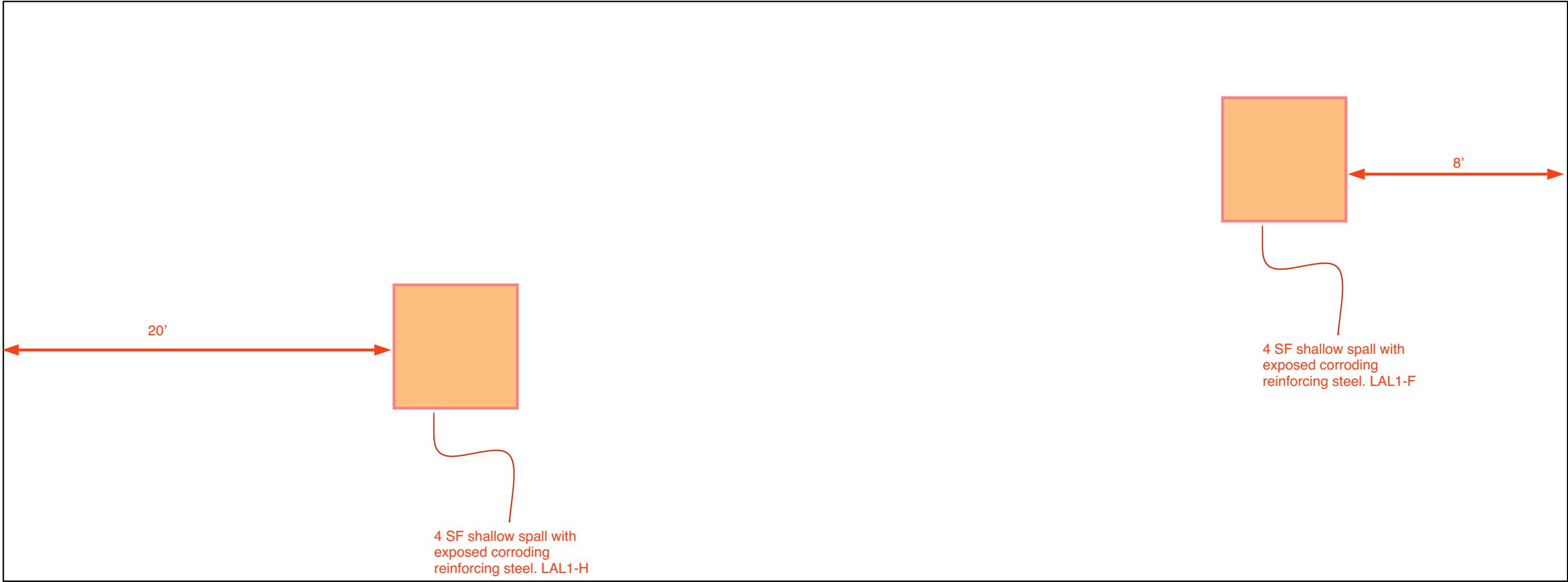
Spall

Delam

Patch

Cracks

Crack



SOUTH END

TUNNEL SOFFIT

NORTH END

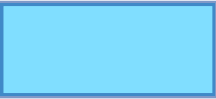
###-# Note



Spall



Delam



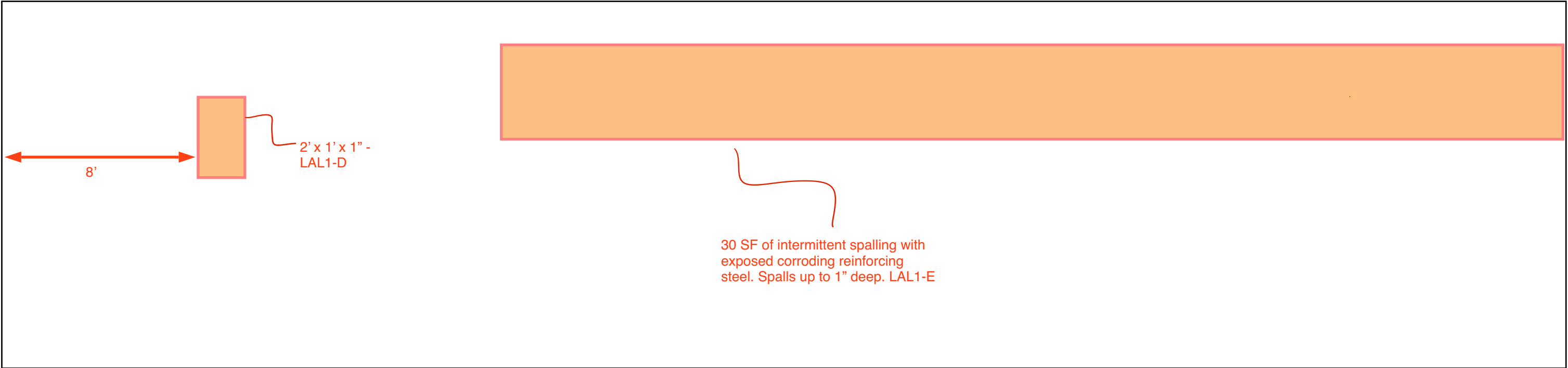
Patch



Cracks



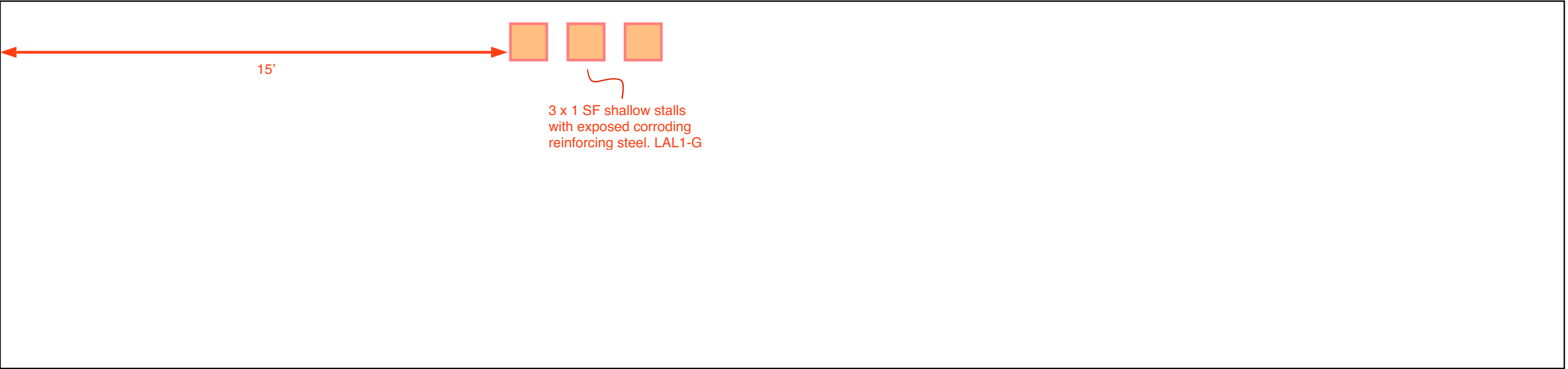
Crack



SOUTH END

NORTH END

LEFT ELEVATION VIEW
(West Wall)

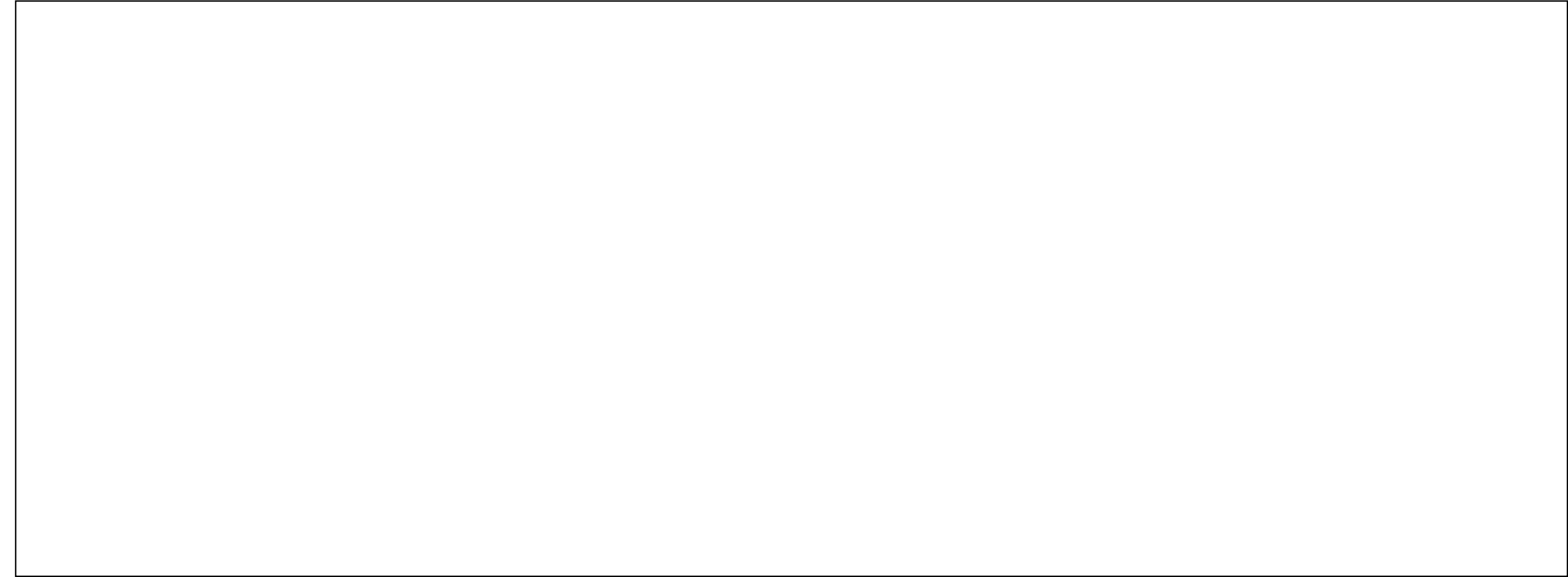


NORTH END

SOUTH END

RIGHT ELEVATION VIEW
(East Wall)





WEST END

TUNNEL FLOOR

EAST END

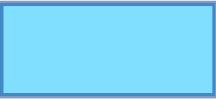
####-# Note



Spall



Delam



Patch



Cracks



Crack

Mr. Sean Creighton, PLA, LEED AP
Project Manager
Great Parks of Hamilton County
10245 Winton Road
Cincinnati, OH 45231

Re: Great Parks of Hamilton County – Oasis Corridor
B&N Bridge Assessment – Collins Ave

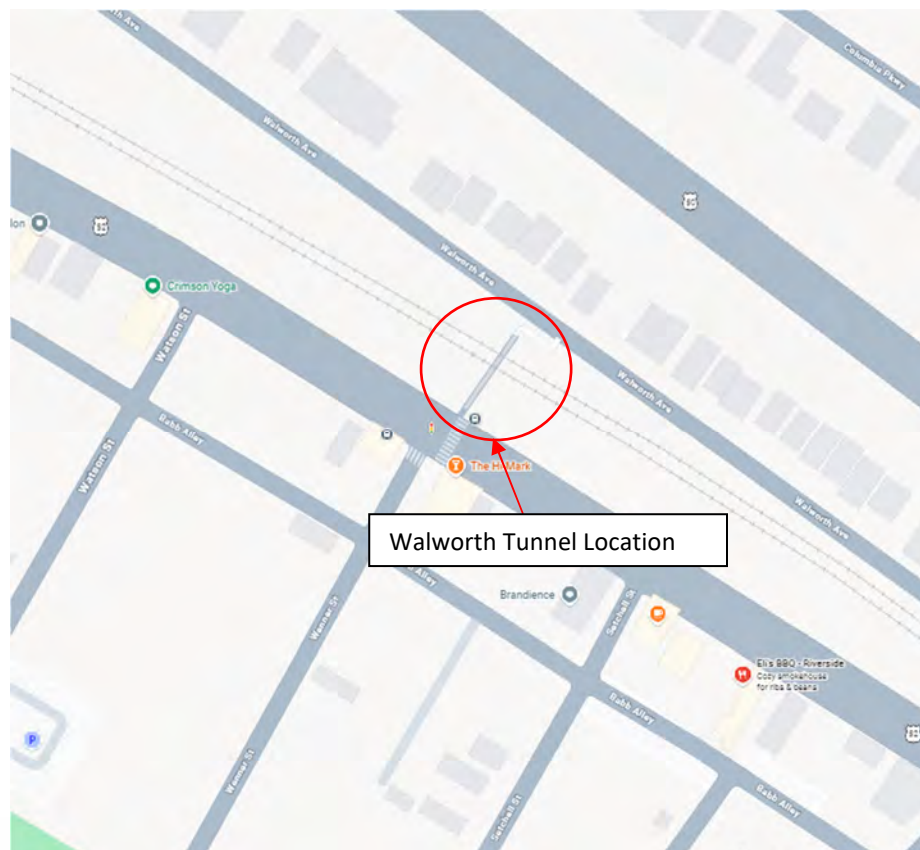
April 2, 2026

Dear Mr. Creighton:

Burgess & Niple (B&N) performed an assessment of the reinforced concrete tunnel carrying Indiana & Ohio RR over pedestrian path on January 14th & 15, 2026. The assessment focuses on the visible portions of the concrete tunnel between Eastern and Congress Ave.

The intent of this assessment is to determine areas of deficiency that need to be repaired for conversion of the north railroad track to a trail. Detailed dimensions of existing bridge members and geometry were not obtained.

LOCATION MAP



Tunnel Assessment:

Tunnel carrying Indiana & Ohio RR between Walworth Ave and US52

Summary:

The concrete walls and top slab were sounded for spalls and delaminations. Areas of deficiency are mapped in **Appendix A** below. There were isolated areas of minor spalling on the south end of the west tunnel wall. Isolated locations of minor shallow delaminations exist on both tunnel walls. Delaminations are heaviest near the north end of the tunnel.

Recommendations:

- Consider resealing the concrete on regular intervals.
- Periodically inspect the tunnel for areas of new spalls and delaminations. Remove areas of loose concrete which pose a safety hazard to pedestrians.
- Consider patching spalls and delaminations with trowelable mortar or concrete based on spall depth.

Photographs



Photo 1 – Elevation looking north.



Photo 2 – Elevation looking southwest.



Photo 3 – Top of rail over tunnel, looking east.



Photo 4 – Top of rail over tunnel, looking west.



Photo 5 – Looking north at the typical inside of tunnel condition.



Photo 6 – Looking north at the typical inside of tunnel condition.



Photo 7 – Looking southwest at the typical top of track over tunnel condition.



Photo 8 – Looking west down the north end steps. Note: minor isolated crack in the concrete steps. Flaking seal coat and insignificant width isolated cracks in retaining walls.



Photo 9 – Looking south at the overall of the above ground portion of the retaining wall from Walworth Ave.



Photo 10 – Looking west at 3' x 1' unsound patch on the west wall 5' from the north end of the tunnel.



Photo 11 – Looking west at 3.5' x 1' delamination on the west wall 10' from the north end of the tunnel.



Photo 12 – Looking west at 4" diameter x 1/2" deep spall 10' from the south end of the tunnel.



Photo 13 – Looking north at 2 SF of delaminations, 52' from the north end of the tunnel.

Appendix A: Deficiency Callout Table

Photo #	Call Out #	Comment
Photo 10	LAL-A	3' x 1' unsound patch on the west wall 5' from the north end of the tunnel.
Photo 11	LAL-B	3.5' x 1' delamination on the west wall 10' from the north end of the tunnel.
Photo 12	LAL-C	4" diameter x 1/2" deep spall 10' from the south end of the tunnel.
Photo 13	LAL-D	2 SF of delaminations, 52' from the north end of the tunnel.

SOUTH/WEST END

TUNNEL SOFFIT

NORTH/EAST END

2 SF - LAL1-D

52'

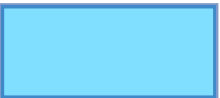
###-# Note



Spall



Delam



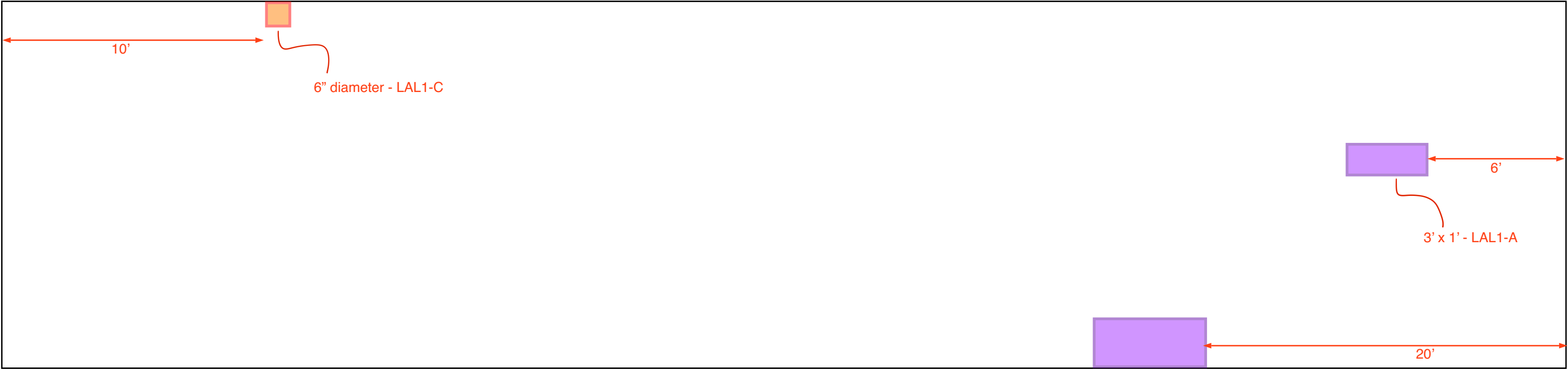
Patch



Cracks



Crack



SOUTH END

NORTH END

LEFT ELEVATION VIEW
(West Wall)



SOUTH END

NORTH END

RIGHT ELEVATION VIEW
(East Wall)

###-#

Note

Spall

Delam

Patch

Cracks

Crack