★ **Roll Call Number**

.....

Agenda Item Number
9

Date March 6, 2017

APPROVING CHANGE ORDER NO. 5 WITH CRAMER AND ASSOCIATES, INC. FOR ADDITIONAL WORK ON RIVERWALK RED MULTI-USE TRAIL BRIDGE REHABILITATION, IN AN AMOUNT NOT TO EXCEED $105,835

BE IT RESOLVED by the City Council of the City of Des Moines, Iowa, that the attached Change Order No. 5 between the City of Des Moines and Cramer and Associates, Inc., Robert Cramer, President/CAO, 3100 S.W. Brookside Drive, Grimes, Iowa, 50111, for additional work on Riverwalk Red Multi-Use Trail Bridge Rehabilitation, in an amount not to exceed $105,835, be and is hereby approved, and the City Manager is authorized and directed to execute said change order.

(Council Letter Number 17-274 attached)
Activity ID 12-2014-007

Moved by _____ to adopt.

FORM APPROVED: _____
Kathleen Vanderpool
Deputy City Attorney

Funding Source: 2016-2017 CIP, Page Storm – 6, Flood Mitigation Improvements, SM087

COUNCIL ACTION	YEAS	NAYS	PASS	ABSENT
COWNIE				
COLEMAN				
GATTO				
GRAY				
HENSLEY				
MOORE				
WESTERGAARD				
TOTAL				

MOTION CARRIED APPROVED

_____ Mayor

CERTIFICATE

I, DIANE RAUH, City Clerk of said City hereby certify that at a meeting of the City Council of said City of Des Moines, held on the above date, among other proceedings the above was adopted.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal the day and year first above written.

_____ City Clerk

ENGINEERING DEPARTMENT
CITY OF DES MOINES, IOWA

CITY OF DES MOINES

CHANGE ORDER AGREEMENT NO. 5

Date: February 21, 2017 **INITIATED BY:** City

Contractor: Cramer and Associates, Inc.

Project: Riverwalk Red Multi-Use Trail Bridge Rehabilitation **Activity ID:** 12-2014-007

DESCRIPTION OF CHANGE ORDER AND PURPOSE

The existing east abutment sheet piling was not capable of connecting to a new sheet piling as detailed. Contractor to furnish labor, material, and equipment to remove and replace additional wall and sheet piling at the east abutment. This will increase items 10, 12, 16 and add additional concrete removal costs. Additional corrosion was encountered at pier location 2 going west approximately 5 ft. on both box girders. Contractor to follow specs associated with this change order for the box girder repair. Bid item #11 Structural Concrete (Bridge) was incorrectly labeled on the bidding documents. The quantity on the plans was correct. This item will need to be increased as per the plans.

SETTLEMENT FOR COST OF CHANGED WORK

A. CHANGE OF PLANS TO BE INCLUDED IN AS-BUILT MEASUREMENT OF CONTRACT ITEMS:

ITEM	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
10	STRUCTURAL CONCRETE (MISC)	1.0000 CY	$3,100.00	$3,100.00
11	STRUCTURAL CONCRETE (BRIDGE)	60.8000 CY	$1,400.00	$85,120.00
12	REINFORCING STEEL	196.0000 LB	$1.50	$294.00
16	PILES, STEEL SHEET	37.0000 SF	$33.00	$1,221.00
		NET CHANGE PART A		$89,735.00

B. ITEMS FOR WHICH CONTRACT UNIT PRICES ARE NOT ESTABLISHED:

ITEM	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
5.01	CONCRETE REMOVAL EAST ABUTMENT	1.0000 LS	$5,300.00	$5,300.00
5.02	REPAIR AND PAINT BOX GIRDER PIER 2	1.0000 LS	$10,800.00	$10,800.00
		NET CHANGE PART B		$16,100.00
			TOTAL	$105,835.00

Change Order # 5
12-2014-007

INSTRUCTION TO CONTRACTOR No. 1

Des Moines, IA

Stanley Consultants INC.

TO: Cramer and Associates, Inc

DATE: February 9, 2017

FROM: Tony Bower, PE

SUBJECT: Red Bridge Superstructure Corrosion

The Contractor's Engineer made the City aware of corrosion in Span 2 between Piers 1 and 2 of the Principal Riverwalk Red Multi-Use Trail Bridge, also known as the Red Bridge. As requested by the City of Des Moines, Tony Bower met Scott Cornelius from Cramer and Associates, Inc. on January 20, 2017, to review the condition of the bridge superstructure in the noted span.

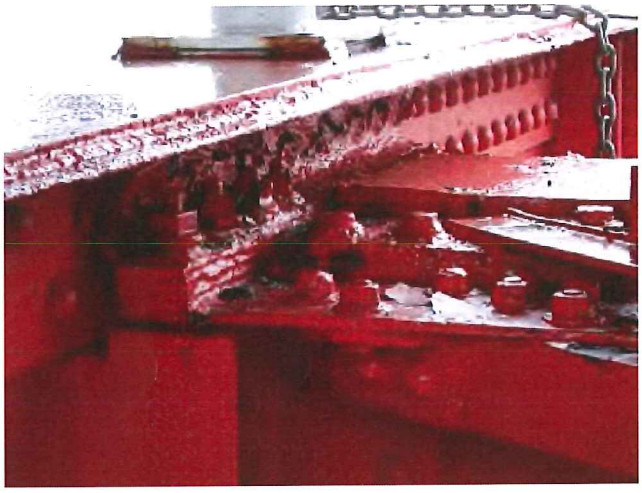
The City of Des Moines requests a cost estimate from Cramer to complete the work identified. Written approval from the City of Des Moines is required before proceeding.

Location 1 – Main Girder Connection to Pier 2 Transverse Plate Diaphragm

Assessment:

Near the top of primary girder flanges, at the connection to the transverse plate diaphragm, a riveted steel angle shows section loss. There is significant corrosion, the angle is bent, and several rivets are missing.

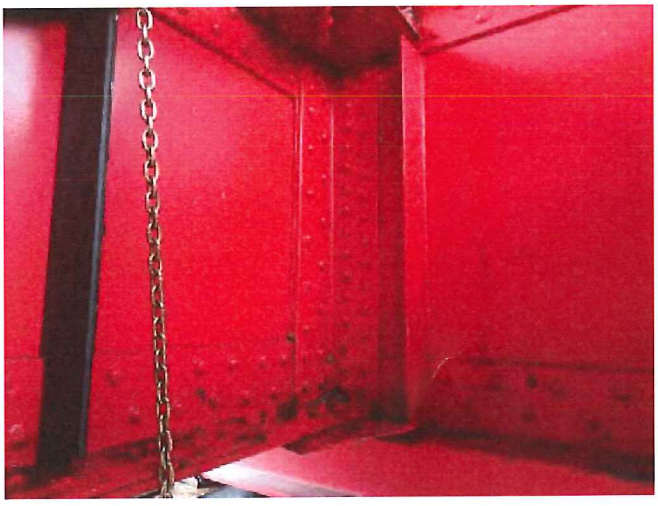
At multiple times during the life of the railroad bridge, the superstructure was strengthened with additional plates and angles to account for the increased weight of trains. The main steel members in railroad bridges are typically simply supported girders to simplify design and analysis. The web and bottom flange connections are in relatively good condition compared to the angle at the top, which is exposed to rainfall and corrosion more than other areas. It appears as if the start of corrosion, missing rivets, and bending of the top angle date to the railroad use period, prior to the 2005 renovation.



South Girder Connection at Pier 2

North Girder Connection at Pier 2

South Girder Connection Pier 2 - Exterior Side



North Girder Connection at Pier 2 – Interior Side

Recommendations:

- Remove loose debris from top connecting angles and top of girders.
- Using hand tools, cut out from the top connecting angle flaking and projecting rust along neat horizontal and vertical lines.
- Perform a light air blast clean, followed by a high pressure water blast.

- Assess condition in the field of exposed steel. Use 1/8" seal weld as required to limit infiltration of water into concealed areas.
- Prime and paint the areas where paint has been removed and repairs have been made in accordance with Specification Section 09900 Painting.
- Method of Measurement for "Location 1 Repair" shall be for each girder for a quantity of 2. Payment shall be full compensation for the all work listed in these Recommendations for Location 1.

Location 2 – Top of Top Flange of both Main Girders - Span 2

Assessment:

The top flange of main girders show paint surface irregularities. The surface irregularities are primarily on the exterior sides of the top flange, while a cover plate running along the center of the top flange top surface shows smoother paint. The surface irregularities trap water, leading to paint deterioration. Without exposing the bare surface of the riveted plate girder below the paint system, it is difficult to assess whether interior corrosion is occurring. However, the expansive rust associated with corrosion was not widespread. The primary girder load carrying capacity does not yet appear significantly reduced based on visual assessment.

North Girder – Looking West toward Pier 1

North Girder – Looking Southeast

Recommendation:

- Remove paint layers to expose structural steel surface. Perform a light air blast clean, followed by a high pressure water blast. Start by removing last 5' of both sides of top flange at both girders nearest to Pier 2.
- Assess condition of top flanges after blast cleaning spot locations. If condition of top flange is satisfactory, no additional paint removal/repair required. If condition of top flange warrants continued removal/repair, repeat removal of paint as directed above for the entire length of both girders.
- Grind exposed structural steel surfaces smooth to limit future ponding. Do not damage structural integrity of the girder. Any section loss of the top flange shall be repaired or replaced at no additional cost to the City.
- Prime and paint the areas where paint has been removed and repairs have been made in accordance with Specification Section 09900 Painting.
- Method of Measurement for "Location 2 Repair" shall be per linear foot of top flange repaired. Each linear foot includes both sides of a single top flange, but does not include work on the center cover plate. Payment per linear foot shall be full compensation for the all work listed in these Recommendations for Location 2.

LISTING OF PROJECT REVISIONS

DATE	SHEET NUMBER	DESCRIPTION OF REVISIONS
02-06-2017	A.1A	REVISION SHEET ADDED.
02-06-2017	C.1	QUANTITIES REASON: REVISION TO QUANTITIES AS REQUIRED FOR REVISED SHEET PILE AND CONCRETE I-WALL DETAIL ADJACENT TO EAST ABUTMENT.
02-06-2017	C.3	ESTIMATE REFERENCE NOTES REASON: ADDED ESTIMATE REFERENCE NOTE FOR "REMOVAL OF CONCRETE".
02-06-2017	V.14	EAST ABUTMENT DETAILS - SHEET 1 REASON: REVISED SHEET PILE AND CONCRETE I-WALL DETAIL ADJACENT TO EAST ABUTMENT.
02-06-2017	V.14A	EAST ABUTMENT DETAILS - SHEET 1A ADDED REASON: ADDITIONAL DETAILS FOR REVISION TO SHEET PILE AND CONCRETE I-WALL ADJACENT TO EAST ABUTMENT.
02-06-2017	V.15	EAST ABUTMENT DETAILS - SHEET 2 REASON: REVISED SECTION E-E FOR REVISED DETAILS TO SHEET PILE AND CONCRETE I-WALL ADJACENT TO EAST ABUTMENT.

DATE	SHEET NUMBER	DESCRIPTION OF REVISIONS

Change Order #5

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER
LAWRENCE W. SANDHAAS
14547
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature — Date: 02-06-2017

Printed or Typed Name: Lawrence W. Sandhaas

My license renewal date is December 31, 2017

Pages or sheets covered by this seal: ALL REVISED SHEETS

REVISION SHEET

FILE NO.	ENGLISH	DESIGN TEAM	CITY OF DES MOINES	COUNTY	ACTIVITY ID:	PLAN FILE NO.	SHEET NUMBER
		STANLEY CONSULTANTS, INC.		POLK	12-2014-007	572.003A	A.1A

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100-1C
04-17-12

ESTIMATED PROJECT QUANTITIES

Division 1: Bridge
Division 2: Electrical
Division 3: Temporary Berm

Item No.	Item Code	Item	Unit	Quantities						
				Estimated				As Built		
				Division 1	Division 2	Division 3	Total	Division 1	Division 2	Division 3
1	2102-2625000	EMBANKMENT-IN-PLACE	CY	810						
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	91						
3	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	121						
4	2111-8174100	GRANULAR SUBBASE	SY	630						
5	2401-6745354	REMOVAL OF CONCRETE FOOTINGS, AS PER PLAN	EACH	2						
6	2401-6745636	REMOVAL OF EXISTING HANDRAIL AND END POSTS	LS	1						
7	2401-6750001	REMOVALS, AS PER PLAN	LS	1						
8	2402-0425030	GRANULAR BACKFILL	CY	278.4						
9	2402-2720000	EXCAVATION, CLASS 20	CY	1295						
10	2403-0100000	STRUCTURAL CONCRETE (MISC.)	CY	8.1						
11	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	295.3						
12	2404-7775000	REINFORCING STEEL	LB	43986						
13	2408-7800000	STRUCTURAL STEEL	LB	1950						
14	2499-0700070	BRIDGE RAISING	LS	1						
15	2501-0201253	PILES, STEEL, HP 12 X 53	LF	750						
16	2501-5775000	PILES, STEEL SHEET	SF	357						
17	2507-3250005	ENGINEERING FABRIC	SY	185						
18	2507-6800042	REVETMENT, CLASS D	TON	54						
19	2508-0991000	PAINTING OF STRUCTURAL STEEL	LS	1						
20	2511-6745900	REMOVAL OF SIDEWALK	SY	351						
21	2511-7526005	SIDEWALK, P.C. CONCRETE, 5"	SY	570						
22	2511-7526105	SIDEWALK, REINFORCED P.C. CONCRETE, 5 IN.	SY	46						
23	2516-8725000	PCC RETAINING WALL	CY	50.9						
24	2519-4200020	REMOVAL AND REINSTALLATION OF FENCE, CHAIN LINK	LF	30						
25	2519-4200120	REMOVAL OF FENCE, CHAIN LINK	LF	15						
26	2524-6765010	REMOVE AND REINSTALL SIGN AS PER PLAN	EACH	3						
27	2524-9081267	CONCRETE FOOTING FOR BREAKAWAY SIGN POST, 2'-0" DIA. X 7'-0"	EACH	2						
28	2528-8445110	TRAFFIC CONTROL	LS	1						
29	2533-4980005	MOBILIZATION	LS	1						
30	2599-9999003	LIGHTWEIGHT FOAM CONCRETE FILL	CY	400						
31	2599-9999005	TRASH RECEPTACLE	EACH	2						
32	2599-9999005	BICYCLE RACK	EACH	2						
33	2599-9999005	PEDESTRIAN BENCH	EACH	6						
34	2599-9999005	SUBDRAIN OUTLET	EACH	1						
35	2599-9999005	EMERGENCY REMOVAL OF TEMPORARY ACCESS BERM	EACH			1				
36	2599-9999009	TYPE 1 RAILING	LF	216						
37	2599-9999009	TYPE 2 RAILING	LF	70						
38	2599-9999010	BRIDGE ELECTRICAL REMOVAL AND REPLACEMENT	LS		1					
39	2599-9999014	CONCRETE STEPS	SF	342						
40	2599-9999014	PCC MOW STRIP	SF	168						
41	2601-2634100	MULCHING	ACRE	0.8						
42	2601-2639010	SODDING	SQ	357						
43	2601-2643110	WATERING FOR SOD, SPECIAL DITCH CONTROL, OR SLOPE PROTECTION	MGAL	357						
44	2601-2643300	MOBILIZATION FOR WATERING	EACH	10						
45	2602-0000020	SILT FENCE	LF	728						
46	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	728						
47	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	72.8						
48	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.	LF	530						
49	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	LF	530						
50	2602-0010010	MOBILIZATION, EROSION CONTROL	EACH	5						
51	2602-0010020	MOBILIZATION, EMERGENCY EROSION CONTROL	EACH	1						
52	2610-0000110	SHRUBS	EACH	48						
53	2610-0000200	MULCH	CY	3.9						
54	2610-0000300	FERTILIZER	LB	24						
55	2610-0000400	WATERING FOR PLANTS	MGAL	28.8						
56	2401-7207030	REMOVAL OF CONCRETE	LS	1						

100-1D
10-18-05

PROJECT DESCRIPTION

This project involves the raising of the Principal Riverwalk Red Multi-Use Trail Bridge over the Des Moines River.
The project also includes rebuilding bridge substructure, PCC sidewalk, pedestrian railing, site furnishings and lighting.

The project shall utilize Iowa Department of Transportation's (Iowa DOT) Standard Specifications for Highway and Bridge Construction, unless otherwise specified. Pay Item Codes are in reference to the Iowa DOT Standard Pay Items.

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
29	2533-4980005	MOBILIZATION
30	2599-9999003	LIGHTWEIGHT FOAM CONCRETE FILL This item includes placement of Lightweight Foam Concrete Fill west of the West Abutment. Construction, measurement and payment shall be in accordance with the Special Provision for Lightweight Foam Concrete. See specifications.
31	2599-9999005	TRASH RECEPTACLE
32	2599-9999005	BICYCLE RACK
33	2599-9999005	PEDESTRIAN BENCH Refer to Section 02870 of the Special Provisions within the contract documents. These items include installation of new furnishings and the removal and reinstallation of existing site furnishings. See Sheets E.1 and E.2 for removal locations. See Sheets L.1, L.2 for proposed locations and Sheet U.3 for details and pictures. Method of Measurement: Measurement of each includes complete removal and reinstallation per plans. Basis of Payment: Payment will be at the contract unit price of each. Payment is full compensation for all equipment, materials and labor required to remove, protect, and reinstall existing site furnishings, as well as, furnishing and installing new site furniture per manufacturers recommendations.
34	2599-9999005	SUBDRAIN OUTLET Refer to Iowa DOT Standard Specification 2502 for material and construction requirements, method of measurement, and basis of payment. See Sheet U.4 for outlet details. Price bid shall include all equipment, materials and labor required to install the Subdrain Outlet according to the details in the plans.
35	2599-9999005	EMERGENCY REMOVAL OF TEMPORARY ACCESS BERMS This item includes removal of temporary construction access berms within 72 hours' notice from the City due to a flood event. This item shall be used if the contractor chooses the temporary access berm method of construction. Initial installation and final remove of temporary access berm method of construction shall be included with Bridge Raising is the contractor chooses this method of construction. Construction of temporary access berms shall be as shown on Sheet V.2 and shall be in accordance with the Iowa DOT Standard Specifications Section 2547. Method of Measurement: Measurement will be each for complete removal and reinstallation of any temporary construction berms. Basis of Payment: Payment will be at the contract price per each. Payment includes are equipment, materials and labor required to remove and reconstruct the temporary access berm.
36	2599-9999009	TYPE 1 RAILING This item includes equipment, labor and materials to construct railing per drawings and Specification 05520 for Metal Railings in the Special Provisions. Locations are on bridge approaches, seating area and retaining walls. See Sheets V.15, V.16 and V.17 for details. Railing shall match existing bridge railing, and shall be as shown in attached Reference Drawings. Railing shall be installed 42 inches above walking surface. Contractor may choose to re-use existing railing if restored to an as new condition. Method of Measurement: Measurement will be linear feet along top of railing from end to end. Basis of Payment: Payment will be at the contract price per linear foot. Payment is based on length of new railing installed.
37	2599-9999009	TYPE 2 RAILING Refer to Specification 05520 for Metal Railings in the Special Provisions within the contract documents. Railing shall include LED embedded lighting. See Sheet P.14 for Type D LED embedded railing requirements. Refer to Sheets L.1, L.2, and U.2 for locations and details of Type 2 Railing. Height requirement shall be 34 inches. Install per manufacturers recommended instructions. Includes locations for concrete steps and west approach ramp. Method of Measurement: Measurement will be linear feet along top of railing from end to end. Basis of Payment: Payment will be at the contract price per linear foot. Payment is based on length of new railing installed.
38	2599-9999010	BRIDGE ELECTRICAL REMOVAL AND REPLACEMENT Bridge electrical removal and replacement shall include removal of existing lights on bridge structure, associated conduits from west end of bridge to lighting controller LC-5, and level transmitter. New work to include new light fixtures on bridge, associated conduit modifications on and to the bridge, reinstall level transmitter, new approach pole lighting and lighted stair rails. Method of Measurement: Measurement of lump sum includes completed work as detailed in P-Sheets. Basis of Payment: Payment will be at the contract unit price of lump sum. Payment is full compensation for labor, equipment and materials to complete the electrical scope of work.
39	2599-9999014	CONCRETE STEPS Refer to SUDAS Section 9080 for materials requirements, installation, and measurement and payment. See Sheets E.3, E.4, L.1, L.2 and U.2 for location and details of concrete steps. Bid item includes granular subbase and epoxy coated reinforcing as shown in detail.
40	2599-9999014	PCC MOW STRIP Refer to Iowa DOT Standard Specification 2511 for material and construction requirements. Item includes areas where the stone veneer is adjacent to sodded areas. See Sheets L.1, L.2, and U.1 for location and details. 4" Granular Subbase to be paid for separately. Method of Measurement: Measurement will be in square feet measured at the centerline of the concrete band. Basis of Payment: Payment will be at the contract price per square foot. Payment shall include all equipment, materials and labor required to install the PCC Mow Strip.
41	2601-2639010	SODDING Sodding to be placed on all disturbed areas, including contractor laydown areas. Refer to Tab 100-26 on Sheet C.4 for incidental items.
42	2601-2634100	MULCHING

100-4A
10-29-02

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
		The contractor shall apply temporary mulch using hydraulic methods in accordance with Iowa DOT Standard Specifications 2601 and 2602 to stabilize disturbed areas.
43	2601-2643110	WATERING FOR SOD, SPECIAL DITCH CONTROL, OR SLOPE PROTECTION
44	2601-2643300	MOBILIZATION FOR WATERING Item includes mobilization for 4 weekly waterings in addition to requirements in Iowa DOT Standard Specification 2601.
45	2602-0000020	SILT FENCE Refer to Tab 100-17 on Sheet C.4 for details. The tabulation includes estimated locations from placement of Silt Fence to address possible erosion during construction. Verify the specific locations with the Engineer prior to placement. Bid item includes 25% additional quantity for field adjustments and replacements.
46	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS This item is included for silt fence removal required for staging reasons, removal to allow for placement (replacement to be paid separately), or for areas that have achieved 70% permanent growth.
47	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK This item is included for clean-out and repair of the silt fence and silt fence for ditch checks during the project.
48	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.
49	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE Refer to Tab 100-19 on Sheet C.4 for locations and details. Item is to be placed along balustrade wall and protect storm sewer inlets within contractor work limits.
50	2602-0010010	MOBILIZATION, EROSION CONTROL
51	2602-0010020	MOBILIZATION, EMERGENCY EROSION CONTROL
52	2610-0000110	SHRUBS This item includes ornamental grasses to be planted adjacent to the concrete steps located at each approach. See Sheet L.1 and L.2 for locations and Sheet L550 from 2012 Riverwalk Reference Drawings for details. Contractor shall coordinate with the City to verify planting types and final locations prior to placement.
53	2610-0000200	MULCH This bid item includes mulch for ornamental grasses. See Sheet L.1 and L.2 for locations and Sheet L550 from 2012 Riverwalk Reference Drawings for details.
54	2610-0000300	FERTILIZER
55	2610-0000400	WATERING FOR PLANTS These bid items are included for ornamental grasses planted adjacent to concrete steps. See Sheet L.1 and L.2 for locations and Sheet L550 from 2012 Riverwalk Reference Drawings for details. The bid quantity for watering assumes 6 applications at a rate of 100 gallons / plant / watering. The bid quantity for fertilizer shall be applied at a rate of 0.5 lbs / shrub (ornamental grass).
56	2401-7207030	REMOVAL OF CONCRETE Includes removal of concrete and sheet pile for concrete I-wall adjacent to south edge of east abutment. Includes furnishing and installing waterstops, neoprene seals, stainless steel angles, stainless steel threaded rods, stainless steel bolts, washers, and nuts, and expansion joint filler at the floodwalls adjacent to the east abutment.

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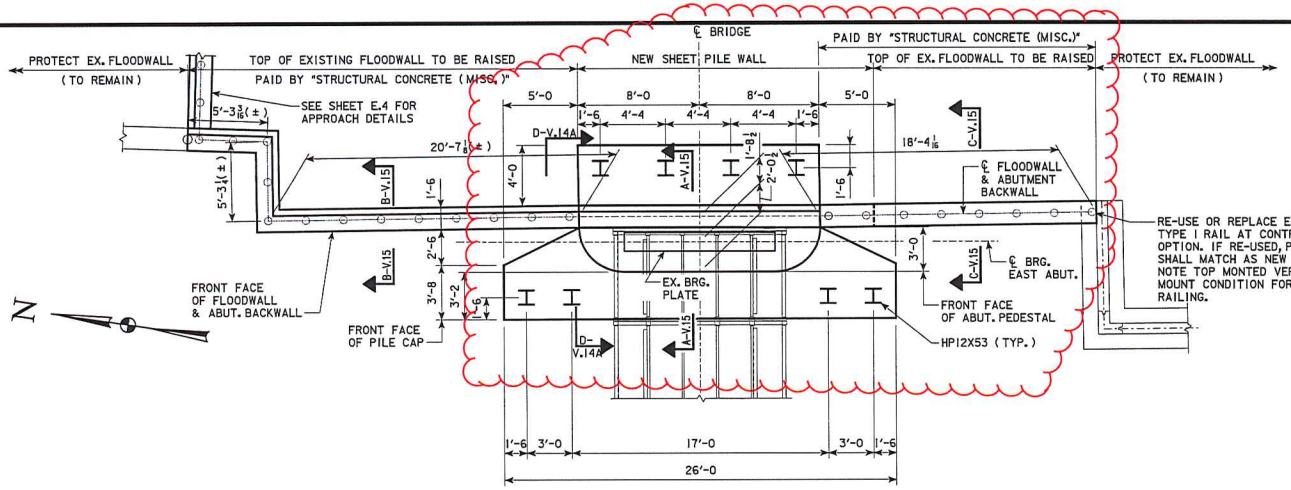
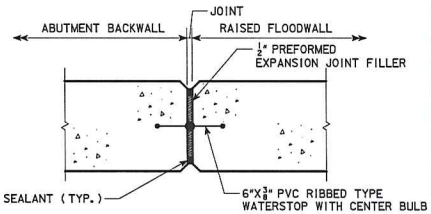


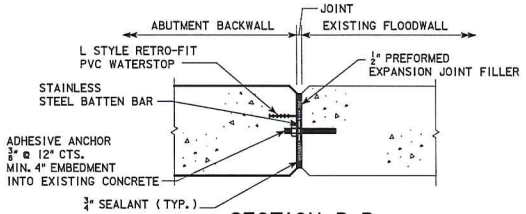
EAST ABUTMENT PLAN

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



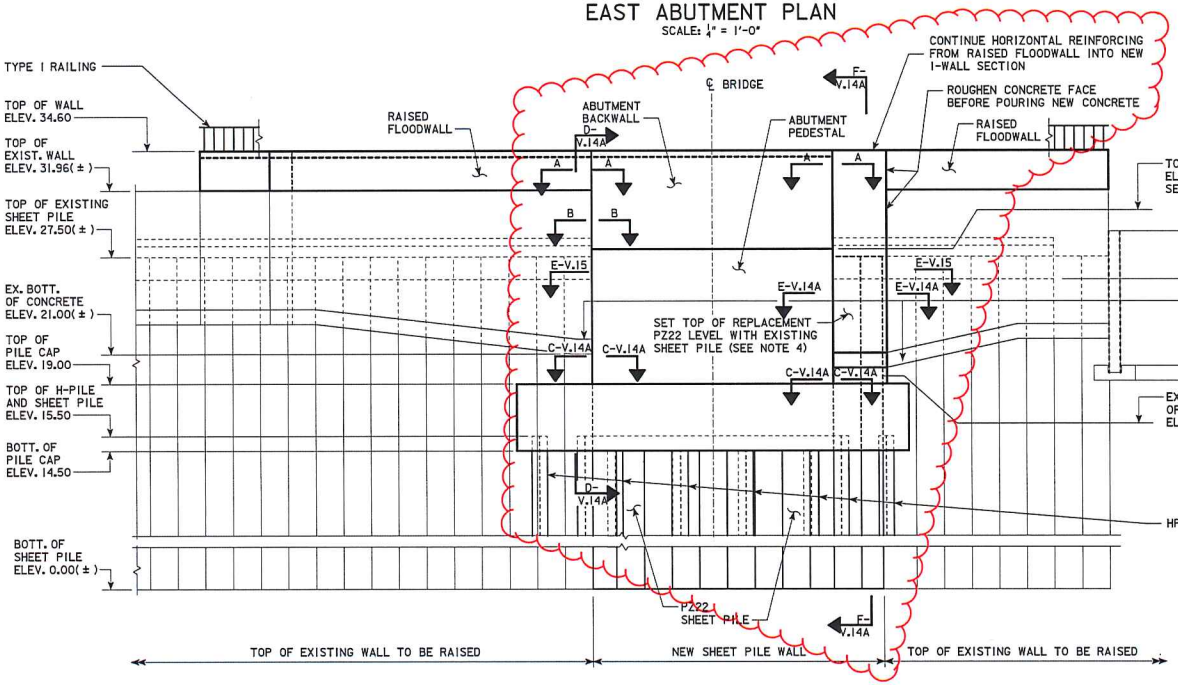
SECTION A-A

NOT TO SCALE



SECTION B-B

NOT TO SCALE



EAST ABUTMENT ELEVATION

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

NOTE:

1. REMOVE EXISTING CONCRETE PROTRUDING PAST FACE OF WALL AS NEEDED FOR CONSTRUCTION NEW PILES, PILE CAP AND PEDESTAL. REMOVAL SHALL BE DONE USING SAW CUTS LEAVING WALL FREE OF CRACKS. SEE "REMOVAL NOTES" ON SHEET V.5.
2. BRIDGE NOT SHOWN FOR CLARITY.
3. NEW TOP OF ABUTMENT PEDESTAL ELEVATION DETERMINED BY NEW TOP OF DECK ELEVATION OF 34.60 FEET. CONTRACTOR TO FIELD VERIFY ELEVATIONS.
4. REMOVE PORTION OF SHEET PILE ABOVE ELEV. 15.50 AND SEAL JOINT BETWEEN SHEET PILE AND ABUTMENT USING SECTION E-E. AT CONTRACTOR'S OPTION EMBED REPLACEMENT PZ22 INTO CONCRETE ABUTMENT MIN. 6" AND BURN HOLES TO INSTALL REINFORCING THROUGH SHEET PILE (NO MORE THAN 1 BAR PER HOLE). DIAMETER OF EACH HOLE IN SHEET PILE SHALL BE MINIMUM REQUIRED TO PASS INDIVIDUAL BAR.
5. REINFORCE CONCRETE I-WALL PER SECTION E-E AND F-F ON SHEET V.14A.

DESIGN FOR 0°

522'-7 X VARIES PRINCIPAL RIVERWALK RED MULTI-USE TRAIL BRIDGE ELEVATION

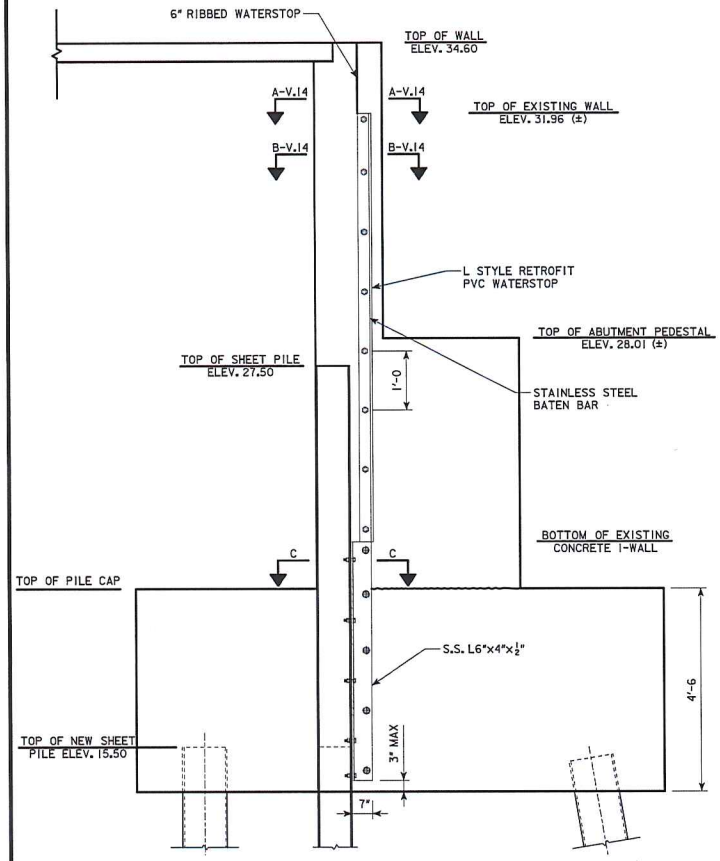
SPANS: 43'-8, 66'-4, 2 @ 151'-9, 75'-10, 24'-3

EAST ABUTMENT DETAILS - SHEET 1

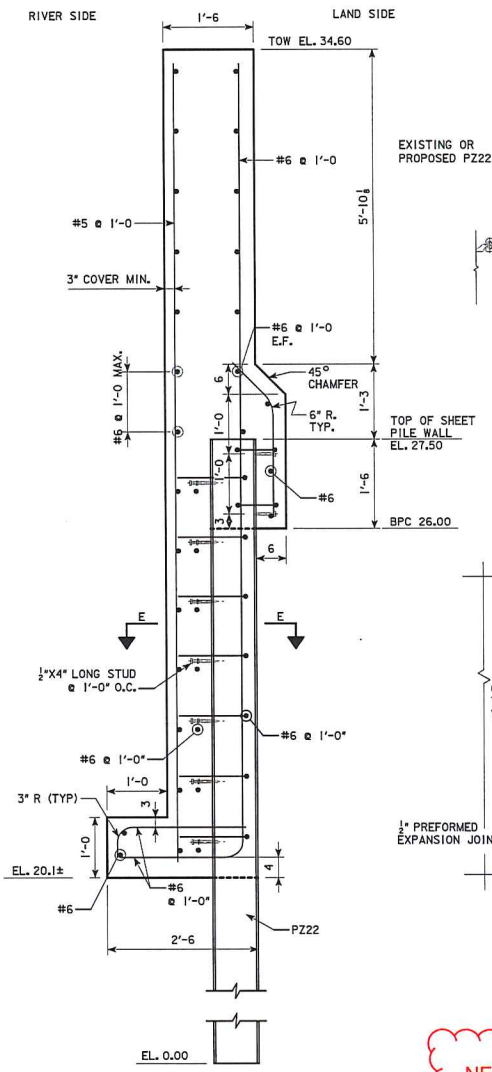
CITY OF DES MOINES

DESIGN TEAM STANLEY CONSULTANTS	CITY OF DES MOINES	POLK COUNTY	ACTIVITY ID: 12-2014-007	PLAN FILE NO. 572-048	SHEET NUMBER V.14

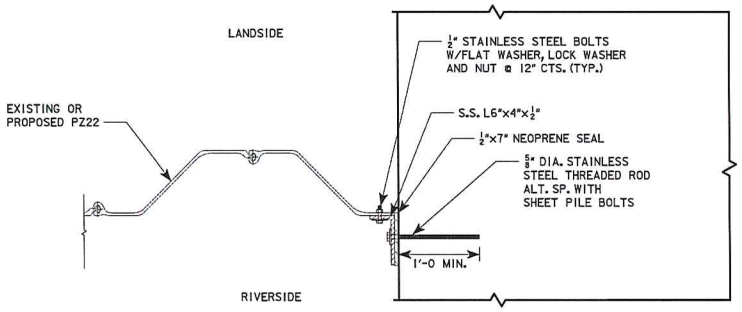
2/3/2017 3:38:47 PM 09039 pw:\\SCI-PWINTEG-2.stanleygroup.com:Datasource-1\Documents\Infrastructure Business Unit\25386\11-CADD\25386-UnionBrg 77DDDDV014 11x17_pdf.pltcfg



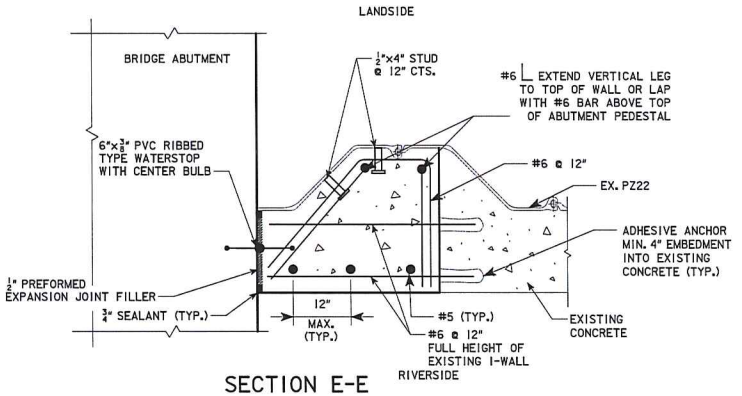
SECTION D-D
NOT TO SCALE



SECTION F-F



SECTION C-C
NOT TO SCALE



SECTION E-E
NOT TO SCALE

NEW SHEET

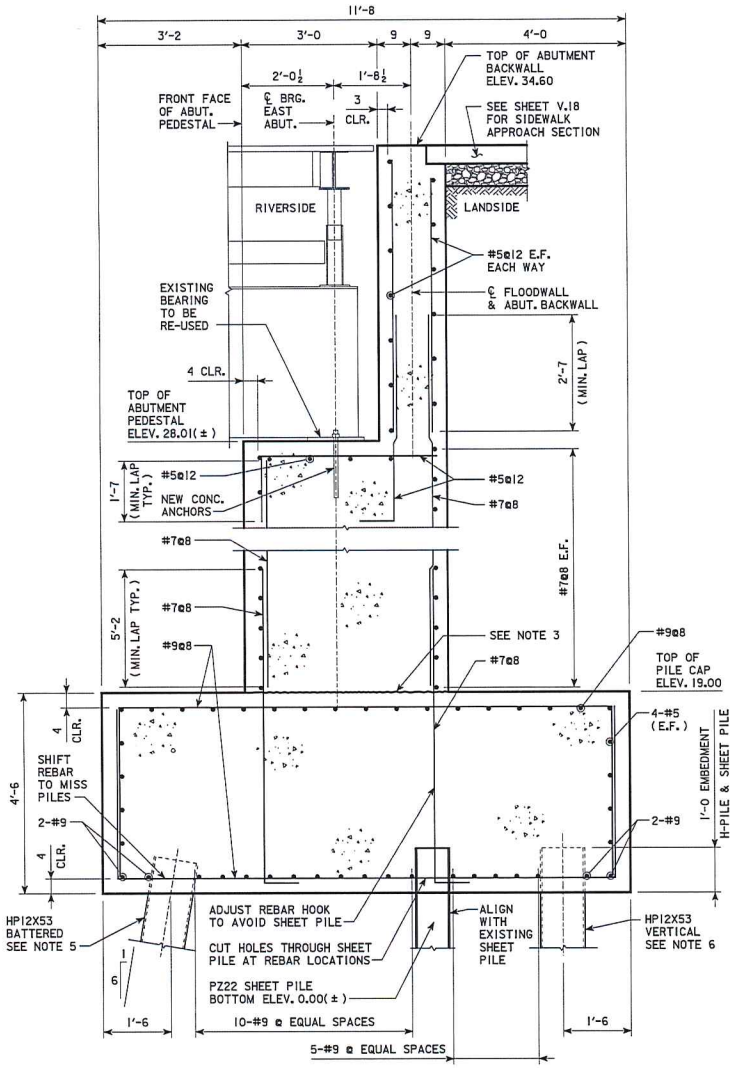
DESIGN FOR 0°

522'-7 X VARIES PRINCIPAL RIVERWALK
RED MULTI-USE TRAIL BRIDGE ELEVATION
SPANS: 43'-8, 66'-4, 2 @ 151'-9, 75'-10, 24'-3
EAST ABUTMENT DETAILS - SHEET 1A

CITY OF DES MOINES

DESIGN TEAM STANLEY CONSULTANTS	CITY OF DES MOINES	POLK COUNTY	ACTIVITY ID: 12-2014-007	PLAN FILE NO. 572-049	SHEET NUMBER V.14A

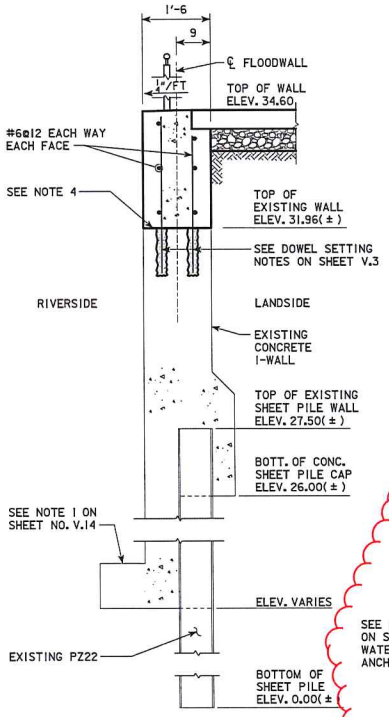
2/3/2017 3:12:54 PM 09039 pw:\\SCI-PWINTEG-2.stanleygroup.com:Datasource-1\Documents\Infrastructure Business Unit\25386\11-CADD\25386-UnionBrg 77DDDDV014A 11x17_pdf.pltcfg



SECTION A-V.15 (V.14)

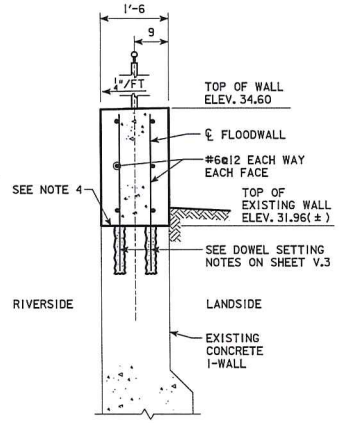
SCALE: ¾" = 1'-0"

NOTE: ALL REBAR IN PILE CAP SHALL BE TERMINATED WITH A 90° HOOK AT EACH END, 3'-6" LONG.



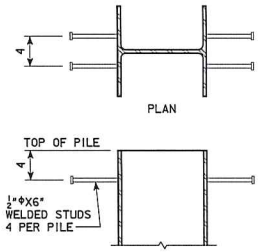
SECTION B-V.15 (V.14)

SCALE: ¾" = 1'-0"



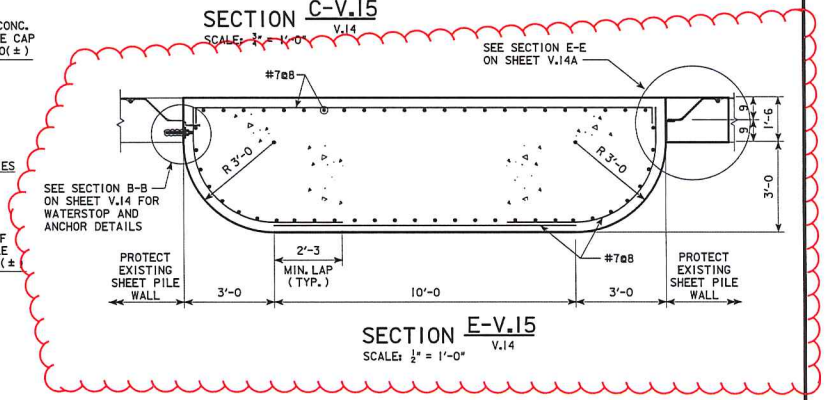
SECTION C-V.15 (V.14)

SCALE: ¾" = 1'-0"



TYPICAL H-PILE

SCALE: NONE



SECTION E-V.15 (V.14)

SCALE: ½" = 1'-0"

NOTES:

1. FOR REINFORCING DRILL AND EPOXY ANCHOR INTO EXISTING CONCRETE, PROVIDE 4" MINIMUM CLEAR MEASURED FROM FACE OF EXISTING CONCRETE. ADDITIONAL FACE COVER MAY BE PROVIDED IF RECOMMENDED BY EPOXY ANCHORING SYSTEM MANUFACTURER. SEE DOWEL SETTING NOTES ON SHEET V.3.
2. ALL STEEL H-PILES TO BE DRIVEN TO REFUSAL.
3. LEAVE SURFACE OF CONCRETE IN HORIZONTAL JOINT ROUGH TO INCREASE BOND WITH CONCRETE PLACED LATER. TYPICAL ALL HORIZONTAL JOINTS.
4. ROUGHEN AND BLAST CLEAN EXISTING CONCRETE TO RECEIVE NEW CONCRETE. SEE IOWA DOT STANDARD SPECIFICATION SECTION 2403 STRUCTURAL CONCRETE.
5. ESTIMATED PILE LENGTH: 70' (LENGTH) X 4 (EACH) = 280' ESTIMATED LENGTH INCLUDES ADDITIONAL 20' LENGTH BEYOND LENGTH REQUIRED FOR DESIGN, TO ALLOW PILE DRIVING NEAR EXISTING BRIDGE AND FLOODWALL. CONTRACTOR TO CUTOFF PILE AT REQUIRED ELEVATION. CUTOFF LENGTH TO BECOME PROPERTY OF CONTRACTOR.
6. ESTIMATED PILE LENGTH: 50' (LENGTH) X 4 (EACH) = 200'

DESIGN FOR 0°

522'-7 X VARIES PRINCIPAL RIVERWALK RED MULTI-USE TRAIL BRIDGE ELEVATION

SPANS: 43'-8, 66'-4, 2 @ 151'-9, 75'-10, 24'-3

EAST ABUTMENT DETAILS - SHEET 2

CITY OF DES MOINES

DESIGN TEAM STANLEY CONSULTANTS	CITY OF DES MOINES	POLK COUNTY	ACTIVITY ID: 12-2014-007	PLAN FILE NO. 572-049	SHEET NUMBER V.15