

ADDENDUM NO. 1 TO THE CONFORMED PROJECT MANUAL

**Throop Wastewater Treatment Facility (WWTF)
Digesters Covers Replacement Project**

for

**LACKAWANNA RIVER BASIN SEWER AUTHORITY
LRBSA Contract 18-2**

Date of Addendum:	May 8, 2018	
Date of Bid Receipt:	May 14, 2018	(NO CHANGE)
Time of Bid Receipt:	6:00 p.m. (EDT)	(NO CHANGE)
Date of Bid Opening:	May 14, 2018	(NO CHANGE)
Time of Bid Opening:	6:00 p.m. (EDT)	(NO CHANGE)

To All Bidders:

Bidders for the above named project shall take note of the following changes, additions, deletions, clarifications, etc., to the Conformed Project Manual, which shall become a part of and have precedence over anything contrarily shown on or described in the Conformed Project Manual, and all such shall be taken into consideration and shall be included in the Bid Proposal.

This Addendum is hereby made a part of the Conformed Project Manual on which this contract will be based and is issued to modify, explain, and/or correct the original Conformed Project Manual. Bidders are advised to attach this Addendum to your Conformed Project Manual and submit bids and be otherwise governed accordingly.

Bidder must acknowledge receipt of this Addendum on page 00300-2 of the **PROPOSAL** Forms.

Please see the attached pages.



Britt Bassett, PE, BCEE

Project Manager

Concerning the Contract Specifications:

Item No. 1 Table of Content ADD the following to the Table of Contents:

Specification 09910 Lead Paint Containment and Safe Disposal.

Appendices

Proposal (or Bid) Form

Pre-Bid Conference Meeting Minutes

DEP Letter regarding Water Quality Management Part II permit

Original Pacific Flush Tank Cover Shop Drawing and partial Specification

Specification from Digester Rehabilitation in 1995

FHWA info sheet discussing bridge demolition involving lead painted structural steel

PennDOT Standard Reinforced Concrete Repair Drawing BC-783M Sheet 2 of 4

Sludge Analysis Report

Item No. 2 Specification 00300 Proposal or Bid Form REPLACE the Original with the enclosed revised bid form:

Which increases the Unit Quantity for Bid Item 203 Digester Cleaning/Grit Disposal from 30,000 to **60,000** gallons.

Item No. 3 Specification 00800 Supplementary Conditions

Paragraph 5.04.D. ADD the following Paragraph 8:

8. Excess or Umbrella Liability: This is required to be provided for each of the specified insurance coverages. If total coverage for each insurance (example: \$2,000,000 base + \$5,000,000 Umbrella) is the same, other policy amounts can be provided (example: \$1,000,000 base + \$6,000,000 Umbrella) so long as the specified total is satisfied (\$7,000,000 for this example).

Paragraph 14.05.A.3. ADD The following Supplementary Condition 14.05.A.3:

3. Partial Substantial Completion: Owner will issue Substantial Completion for the Primary Digester once that phase of the Work is functioning and usable.

Item No. 4 Specification 01010 Summary of Work:

Part 3.01 N:

REVISE the Title to read "Phase I Primary Digester". Clarification: The western digester is the Primary Digester, see Sheet 3 Site Plan. Contractor shall work on the Primary Digester first. REVISE all references in this section to the Secondary Digester to instead refer to the Primary Digester.

ADD the following to Paragraph 1: Contractor will be required to schedule Primary Digester cleaning and demolition considering delivery of the membrane cover system, so the digester is not dewatered and unavailable for the Authority's use for an extended timeframe before the cover system is delivered.

Part 3.01 O:

REVISE the Title to read "Phase II Secondary Digester". Clarification: The eastern digester is the Secondary Digester, see Sheet 3 Site Plan. Contractor shall work on the Secondary Digester last. REVISE all references in this section to the Primary Digester to instead refer to the Secondary Digester.

Item No. 5 Specification 01150 Measurement and Payment

Part 1.05 Lump Sum Bid Items:

Part C: **Item 101 Demolish Existing Floating Cover and Stairs:** REPLACE Paragraph 2 with following:

2. Demolish and completely remove the existing digester floating covers by removing ballast, steel decking, truss framework, steel underside, gas dome; and (if they will no longer be needed) gas piping, seals, instruments, controls, appurtenances, etc. The lead paint used in the original cover installation was a red lead primer on the exterior surfaces (top and bottom) of the dome. The interior seems to have been coated with a bituminous product. When the covers were rehabbed previously, the underside of the cover and the ring faces were sandblasted and repainted so the only surface that should have lead primer remaining is the top. Contractor shall assume that 2 inches of Permalite insulation is present inside the domes and that the Permalite contains asbestos.

REPLACE Paragraph 6 with the following:

6. Demolish existing digester stairs and install relocated Archbald stairs. The Contractor may choose to retain a portion of the existing stairs to use as part of the new stair assembly. Contractor shall provide any additional miscellaneous materials necessary to install the Archbald stairs.

Part E: **Item 103 Dual Membrane Digester Cover Systems:** ADD the following Paragraph 3:

3. Furnish, install, and integrate plant SCADA system modifications as detailed. The Contractor shall be responsible for the overall operation of the SCADA system and take single source unit responsibility for every component of the System. The intent is to provide complete operating control systems. Provide specified I-O that monitors identified facility field devices (switches, sensors, and instruments) and process equipment. Provide other equipment and/or auxiliary devices as required, even if not specified, for the proper interface and performance of the overall system that are designed to accomplish the task for which they are intended.

Part F: **Item 104 TJ Cannon Controls Modifications:** REPLACE with the following:

F. **ITEM 104 TJ Cannon Controls Modifications:** This Agreement includes a Lump Sum Cash allowance for TJ Canon, Inc., who provided the price for this Bid Item to LRBSA for inclusion under this Agreement. Provide programming to integrate the new control panel IO with the existing SCADA system.

Part 1.06 Contingent Bid Items:

REPLACE the first Paragraph from Part E: **Item 203 Digester Cleaning/Grit Disposal** with the following:

Each digester contains digested sludge (sludge), broadly defined as including rags, screenings, floatables, grit, and other objectionable material. LRBSA will use its existing pumps to transfer sludge from one digester to the other, and then to pump out as much remaining sludge as possible. For the purpose of this bid, it is estimated that 60,000 gallons of digested sludge will remain following LRBA's removal efforts, 30,000 from each Primary and Secondary Digester. Contractor shall completely remove all remaining accumulated sludge. Contractor shall supply all labor, power, equipment, chemicals and material necessary to remove and process the sludge including sludge pumps, water booster pumps, suction and discharge hoses, electrical power supply and connections, equalization/mixing tank, sludge dewatering equipment, polymer feed system and conveyors. LRBSA does not have electric service available to power this sludge removal effort. Contractor must provide his own independent power source.

Item No. 6: Specification 02110 Demolition

ADD the following new Paragraphs F and G to Part 1.01 Description of Work:

1.01.F. Contractor shall assume that 2 inches of Permalite insulation is present inside the domes and that the Permalite contains asbestos, and therefore he shall handle and dispose of this Asbestos Containing Material (ACM) according to all applicable regulations. As an alternative, Contractor is free to test the Permalite insulation for asbestos content using the following procedure and to use whatever level of care that applicable regulations require, based on the asbestos content that testing identifies.

1.01.G. Should the contractor elect to test, he shall determine and certify whether the digester covers contain Asbestos Containing Materials (ACM), and if so how much, by inspecting, collecting and analyzing samples, and issuing a report of findings. If ACM are found, the Contractor shall abate and remove the contaminated material prior to general demolition.

Item No. 7 Specification 09910 Lead Paint Containment and Safe Disposal: ADD entire new Specification.

Item No. 8 Specification 11340 Anaerobic Digester Dual Membrane Gasholder Cover Systems:

ADD the following to Paragraph 1.05 F: The bond amount shall cover the full cost to replace the dual membrane gasholder cover system, based on the Contractor's approved Schedule of Values, including but not limited to sludge removal and disposal, tank cleaning and preparation, disposal of cover system components to be replaced, furnish and install cover systems, start up and testing, operator training, etc.

ADD Paragraphs 3.04 as follows:

3.04 COMPONENTS DELIVERY: Manufacturer shall deliver components in a timely manner closely coordinated with Contractor's Installation Schedule. In particular, the dual membrane covers shall not be delivered more than a month before scheduled installation, due to their sensitivity to weathering. Manufacturer shall store at its site as required.

Concerning the Contract Specifications:

Item No. 1 Sheet 4 Digester Building Roof Level Demolition Plan:

REVISE Digester Cleaning Note 1 to read: Each Digester will contain approximately 30,000 gallons of digested sludge after Authority has pumped out what it can...

ADD Notes 6, 7 and 8:

6. Cut the existing guide channels flush with the top of the existing concrete wall and grind smooth.
7. Repair concrete spalls in accordance with PennDOT Standard Reinforced Concrete Repair Drawing BC-783M Sheet 2 of 4 and Specification 03600. Utilize repair methods from the PennDOT Drawing, but utilize grout and related materials identified in Specification 03600. Apply Sika Armatec 110 Epocem bonding agent to surface before applying non-shrink epoxy grout.
8. Repair concrete cracks in accordance with PennDOT Publication 408 Section 1091 and Specification 03600. Utilize repair methods from the PennDOT Publication, but utilize grout and related materials identified in Specification 03600. Apply Sika Armatec 110 Epocem bonding agent to surface before applying non-shrink epoxy grout.

Item No. 2 Sheet 8 Digester Building Lower Level Plan and Section: REVISE the digester diameter labeled on Section A-A to read: 65' ±.

END OF ADDENDUM NUMBER 1

Bassett Engineering Inc.

**Lackawanna River Basin Sewer Authority
Throop Wastewater Treatment Facility (WWTF)
Digesters Covers Replacement Project
Pre-Bid Conference Meeting Minutes
Tuesday, May 1, 2018 – 10:00 a.m.**

Attendees: LRBSA: Michael Matechak PE Executive. Director, Bob Davis Superintendent, Jeff Spaide, PE Plant Engineer
Bassett Engineering: Britt Bassett PE Project Manager, Connor Bassett
Dickinson Crane: Rick Pletz
Eastern Environmental Contractors: Doug Muller
Fabcor: Scott McGeehan
G.M. McCrossin: Mark Mance
Heisey Mechanical: Andrew Innerst
Pioneer Construction: Charley Sansky
Quasar Energy Group: Dave Baran, Renato Contipelli, Elizabeth Lehman, Monte King
Spectraserv: Steve Scott

Agenda: *Britt Bassett started the meeting with introductions from Bassett Engineering and LRBSA, followed by reviewing the pre-bid agenda*

1. Bid Opening 5/14/2018 @ 6:00 PM (@ LRBSA Office, Throop, PA)
 - a Receive Bids up to 6:00 PM (@ LRBSA Office, Throop, PA)
 - b Bid Bond 10% of Total Amount Bid
2. Bidders must submit Paper Bid Form distributed with Contract Documents
3. Bid Award to lowest responsive & responsible bidder based on Total Bid –Lump Sum & Contingent Bid Items:
 - a Responsive – complete, correct bid package
 - b Responsible – work history
4. Entire project under one General Contract, including controls modifications
5. Contract Time 300 days - Final Completion would be in April 2019 timeframe
 - a Performance & Payment Bonds - 100% each
 - b Liquidated Damages: \$500.00 per calendar day of delay from the above-stipulated time for completion, until such work is satisfactorily completed and accepted.
 - c Engineering Charges for Delays in Completion: Contractor shall reimburse the Owner the actual engineering invoice amount for each and every person the engineer needs to perform duties on site and in the office from the above stipulated time for completion.
6. Payment: Monthly progress payments are due to Contractor within 14 days of approval by LRBSA Board of Directors.
 - a 10% retainage until Final Completion.
 - b Final Settlement – Twice value of work remaining (based on approved Schedule of Values), held for up to 3 months after Final Completion

7. Specifications 00300 Bid Proposal Form and 1150 Measurement and Payment:

Base Lump Sum Bid Item explanations:

C. ITEM 101 Demolish Existing Floating Covers and Stairs

1. Clean the digesters interior and exterior as required to create a safe working environment inside and around the digesters.
2. Demolish and completely remove the existing digester floating covers by removing ballast, steel decking, truss framework, steel underside, gas dome; and (if they will no longer be needed) gas piping, seals, instruments, controls, appurtenances, etc.
3. Detach membrane roofing that is to be reused along the digester perimeter including cap flashing, etc. Protect from damage by subsequent construction.
4. Demolish and completely remove the concrete masonry unit caps on digester walls. Cover and seal cavity wall temporarily to prevent moisture penetration. Clarification: The corbel is not to be removed.
5. Dispose of demolished materials. The Addendum will include additional safety procedures that will be required for handling waste materials.
6. Demolish existing digester stairs and install relocated Archbald stairs. The contractor may choose to retain a portion of the existing stairs to use as part of the new stair assembly.

Questions were raised about details on the steel floating covers, focusing on the potential to encounter lead paint and asbestos. Mike Matechak researched the lead paint issue further. The documentation he found indicates that the lead paint used in the original cover installation was a red lead primer on the exterior surfaces (top and bottom) of the dome. The interior seems to have been coated with a bituminous product so that surface should be OK. When the covers were rehabbed previously, the underside of the cover and the ring faces were sandblasted and repainted so the only surface that should have lead primer remaining is the top. Mr. Matechak also found the attached FHWA info sheet discussing bridge demolition involving lead painted structural steel. The last section discusses demolition. FHWA recommends cutting with hydraulic shears as opposed to torching to keep dust down. If torching, they recommend removing 4" of paint along the cut line.

The relocated stairs will be coming from Archbald WWTP, another plant operated by LRBSA. The Archbald stairs should be ready for use at Throop WWTP by June. The Conformed Project Manual includes shop drawings and pictures of the Archbald stairs. The Contractor shall provide any additional miscellaneous materials necessary to install the Archbald stairs. He will not be required to hire a structural engineer to review the design of the relocated stairs. Contractor may consider installing these stairs early on to facilitate his work on the digesters.

D. ITEM 102 Prepare Existing Digesters for Membrane Covers

1. Relocate gas flare.
2. Form and pour concrete ring walls to extend existing digester walls.
3. Prepare the interior and exterior surfaces of the digester for new work including for painting.
4. Core drill digester walls for new penetrations, cap and/or plug existing penetrations in digester walls or building roof that are no longer needed.

5. Paint digester interior walls.
6. Reattach membrane roofing complete including blocking, flashing, etc. Provide new roofing materials, flashing, appurtenances, etc. as necessary.
7. Modify TWAS piping in Digester Building Lower Level to connect directly to both digesters via existing wall thimbles. It currently connects to the digester recirculation piping. Clarification: Cement mortar lining will be fine for the TWAS piping because Throop has thorough grit removal.

Clarification: The specifications include provisions for working in cold weather, particularly painting and concrete placement. The Contractor will be permitted to form and pour both concrete ring walls in warmer weather before working on the remaining parts of the digesters.

E. ITEM 103 Dual Membrane Digester Cover Systems

1. Provide complete dual membrane digester cover systems:
 - a. Modify gas withdrawal pipe inside digester.
 - b. Inner support network secured to digester walls.
 - c. Dual membranes and external restraint cabling (if provided, manufacturer will determine if this is needed) to concrete ring wall.
 - d. Aeration fan packages in Digester Building Lower Level. Run air ducting from blowers to digester covers.
 - e. Instruments and gas safety systems on digesters, at blower packages, on membrane covers, on air and gas piping.
 - f. gas supervisory control and data acquisition (SCADA) system including new membrane cover control panels in Digester Building Electrical Room with control software.
 - g. Test, start-up. Train Operators and commission systems.
2. Complete all required ancillary work not identified above.
3. Furnish, install, and integrate plant SCADA system modifications as detailed. The Contractor shall be responsible for the overall operation of the SCADA system and take single source unit responsibility for every component of the System. The intent is to provide complete operating control systems. Provide specified I-O that monitors identified facility field devices (switches, sensors, and instruments) and process equipment. Provide other equipment and/or auxiliary devices as required, even if not specified, for the proper interface and performance of the overall system that are designed to accomplish the task for which they are intended.

Clarification: The contractor will provide the necessary personnel for Start-up identified in Specification 01660. The Manufacturer's requirements for personnel on site are itemized under Specification 01640.

- F. ITEM 104 TJ Cannon Controls Modifications:** This Agreement includes a Lump Sum Cash allowance for TJ Canon, Inc., who provided the price for this Bid Item to LRBSA for inclusion under this Agreement. Provide programming to integrate the new control panel IO with the existing SCADA system.

- G. **ITEM 105 Unison Controls Modifications:** This Agreement includes a Lump Sum cash allowance for Unison, Inc. who provided the price for this Bid Item to LRBSA for inclusion under this Agreement. Modify the Unison Gas Conditioning Skid Control Panel software and (if necessary) hardware as required so the Gas Conditioning Skid and the Capstone Microturbines respond to control input from the Dual Membrane Control Panels. Specifically, volume of digester gas held in the gasholder covers will become the primary mechanism to control the operation of the Gas Conditioning Skid and the Microturbines. Gas pressure under the gasholder covers will become a secondary control mechanism.

Contingent Bid Item explanations:

- C. **ITEM 201 Concrete Surface Repair:** Repair the concrete surface where it has spalled with epoxy mortar patch as required by written order of the Engineer. The work includes preparing the surface as recommended by the mortar manufacturer and placing the mortar, complete. Measurement shall be made by the two-dimensional method determined in the field. Payment shall be made at the unit price bid per square foot for the actual surface area. Assume the maximum depth of repair shall be 2 inches. Repair the concrete surface according to PennDOT Standard Reinforced Concrete Repair Drawing BC-783M Sheet 2 of 4.
- D. **ITEM 202 Concrete Crack Repair:** Repair cracks in the concrete, up to 2-inches deep, with epoxy mortar patch as required by written order of the Engineer. The work includes preparing the crack as recommended by the mortar manufacturer and placing the mortar, complete. Measurement shall be made by linear feet of crack repaired. Payment shall be made at the unit price bid per linear foot for the actual crack length. Assume the maximum depth of repair shall be 2 inches. Repair the concrete crack according to PennDOT Publication 408 Section 1091.

Clarifications: Assume surface and crack repairs can extend from the face of the concrete to the face of the rebar, up to 2-inches deep. Follow PennDOT Standard Reinforced Concrete Repair Drawing BC-783M Sheet 2 of 4 for surface repair and Publication 408 Section 1091 for crack repair.

- E. **ITEM 203 Digester Cleaning/Grit Disposal:** Each digester contains digested sludge (sludge), broadly defined as including rags, screenings, floatables, grit, and other objectionable material. LRBSA will use its existing pumps to transfer sludge from one digester to the other, and then to pump out as much remaining sludge as possible. For the purpose of this bid, it is estimated that 60,000 gallons of digested sludge will remain following LRBA's removal efforts, 30,000 from each Primary and Secondary Digester. Contractor shall completely remove all remaining accumulated sludge. Contractor shall supply all labor, power, equipment, chemicals and material necessary to remove and process the sludge including sludge pumps, water booster pumps, suction and discharge hoses, electrical power supply and connections, equalization/mixing tank, sludge dewatering equipment, polymer feed system and conveyors. LRBSA does not have electric service available to power this sludge removal effort. Contractor must provide his own independent power source.

Prior to the start of work, the Owner and Contractor shall jointly measure and agree to the initial volume of sludge remaining in the digester. This volume shall be used as the measured quantity basis for the contract amount. The estimated quantity of sludge upon which the bid was based will be adjusted upward or downward, as appropriate, and the contract dollar amount correspondingly adjusted utilizing the bid unit price per gallon.

The dewatered sludge shall be free of water by the paint filter test and shall contain a minimum 13% total solids by weight. Test method shall be in accordance with EPA Document No. SW-846, Test Methods for Evaluating Solid Waste (September 1986).

LRBSA reserves the right to test the material. No material may be added to the dewatered sludge to achieve compliance with the paint filter test or total solids requirement unless authorized in advance by the Authority.

LRBSA will pay Keystone Landfill disposal fees.

Clarification: The Bid Form lists 30,000 gallons of digested sludge (**Revised to 60,000 gallons by Addendum**) for the Contractor to remove for the purposes of establishing the Unit Price, which will be used regardless of the actual final volume. Contractors should bid assuming on-site pressing of the remaining sludge, although LRBSA may allow liquid hauling; this will be decided during construction.

8. Spec 01500: Field office and laydown areas: See Sheet 3, beyond the far/south/upper end of employee parking lot and behind Dewatering Building. Clarification: Bassett Engineering will provide its own field office. The general contractor will be responsible to provide utilities, etc., for this field office as specified.
9. Maintenance & protection of traffic: Contractor must not interfere with normal plant traffic flow. This will require close coordination of crane locations and digester cover lay-down areas (the latter if contractor plans to lay covers or cover sections down on plant site while demolishing).
10. Spec 11340: Addendum will clarify that the Manufacturers will be required to deliver materials (particularly the membrane covers) to the site in stages as they are needed. Contractor must coordinate with Bassett Engineering and LRBSA if they need to store materials on site. Addendum will also clarify that the Contractor will be required to schedule secondary digester cleaning and demolition considering delivery of the membrane cover system, so the digester is not dewatered and unavailable for the Authority's use for an extended timeframe before the cover system is delivered.
11. Testing by Contractor to protect the Authority's interests: concrete, pressure, leakage, electrical continuity, automated control systems etc. Pipes will require water or air pressure testing, as applicable.
12. Spec 00800: Question on Excess or Umbrella Liability Insurance: See Addendum.
13. Clarification: A municipal permit is not required for the project as the project is considered maintenance. The Addendum includes the Letter from DEP confirming that a DEP Water Quality Management Part II permit is also not required.
14. Any additional questions should be sent to Bassett Engineering, who will coordinate with LRBSA and respond. Addendums and RFI's will be sent to all bidders electronically.
15. Attendees toured the Project Site following the meeting.

April 19, 2018

Britt Bassett
Bassett Engineering
1440 Broad Street
Montoursville, PA 17754

Re: Request for Determination
LRBSA Throop Wastewater Treatment Plant
NPDES Permit No. PA0027090
Throop Borough, Lackawanna County

Dear Mr. Bassett:

The Department of Environmental Protection (DEP) has reviewed your request for permit determination dated March 13, 2018 regarding replacing the installation of digester covers at the LRBSA-Throop Wastewater Treatment Plant in the Borough of Throop, Lackawanna County.

The Department has concluded that the described improvements represent activities that do not alter the wastewater treatment process, plant capacity, or collection system capacity. Therefore, a Water Quality Management (WQM) permit is not required.

If you have any questions, please contact me at 570.826.2318 or abellanca@pa.gov.

Sincerely,



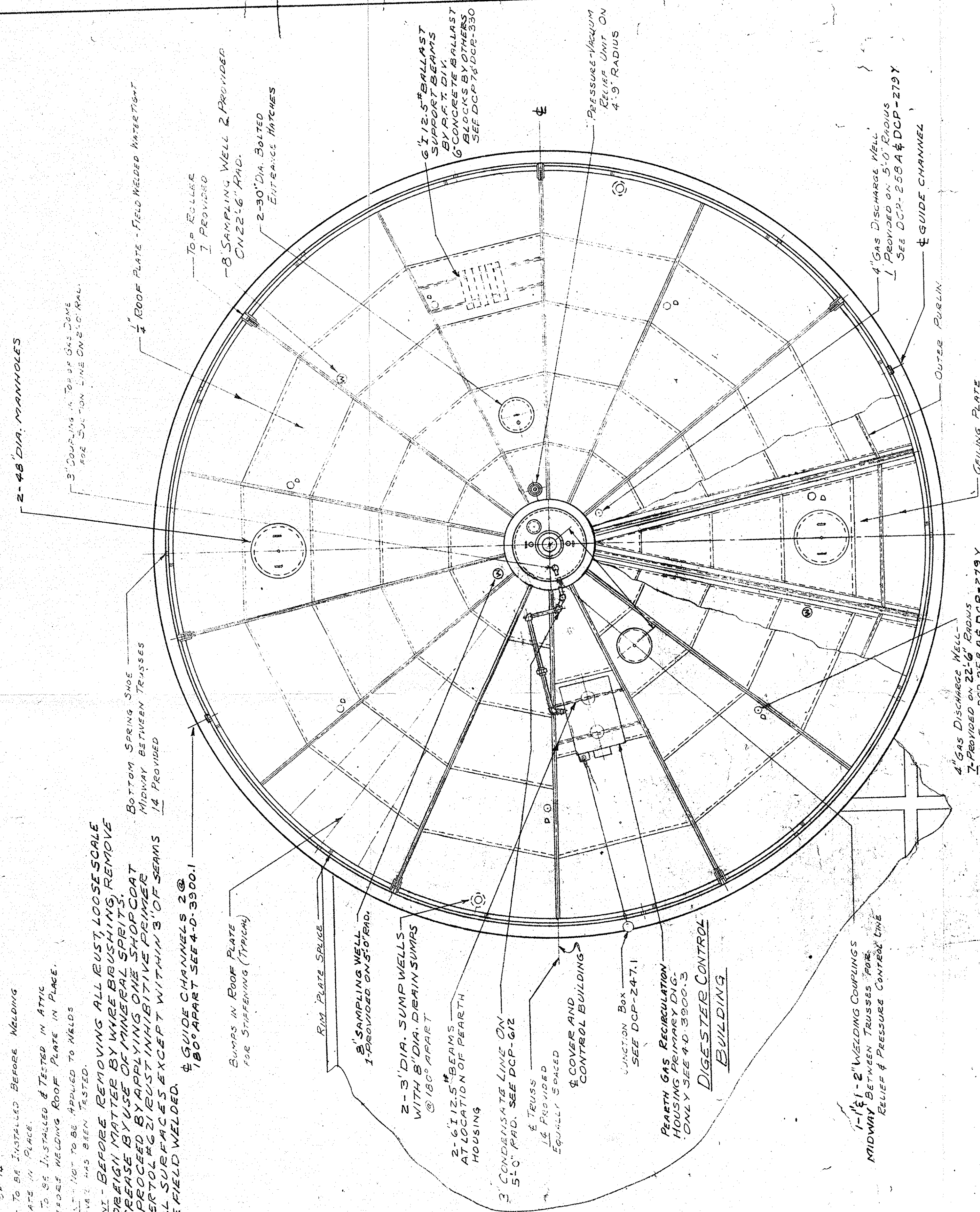
Amy M. Bellanca, P.E.
Environmental Engineer Manager
Clean Water Program

cc: S. Insalaco – PADEP
M. Matechak – LRBSA
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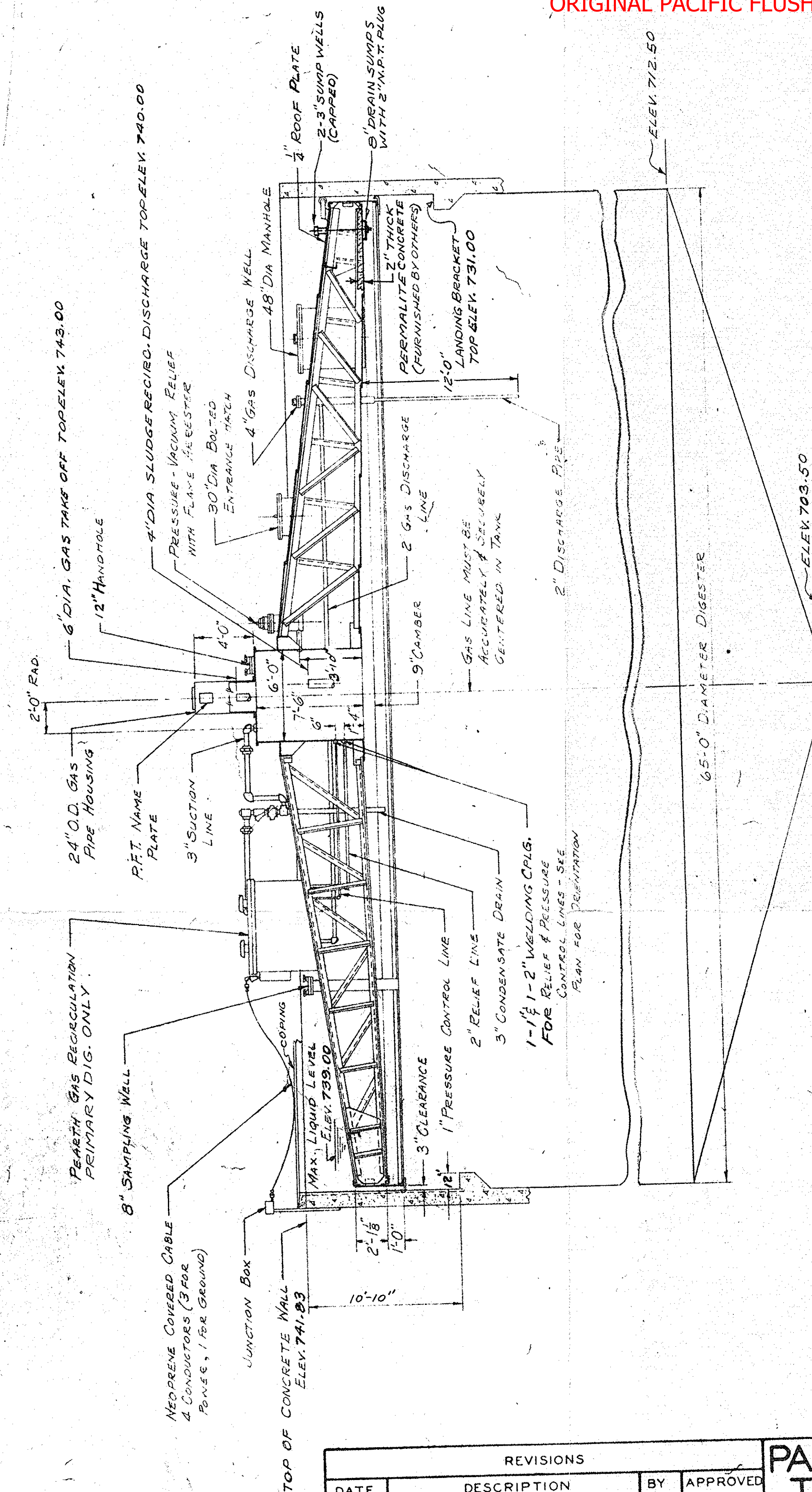
RECEIVED
APR 23 2018


BY:

ORIGINAL PACIFIC FLUSH TANK COVER SHOP DRAWING



PLAN OF PRIMARY DIGESTION TANK COVER IS SHOWN. SECONDARY DIGESTION TANK COVER IS SIMILAR, EXCEPT ROTATED 70-15 COUNTER CLOCKWISE BEGETH ONLY.



REVISIONS				PACIFIC TANK		FLUSH COMPANY
DATE	DESCRIPTION	BY	APPROVED	CHICAGO		NEW YORK
3-25-65	REVISED	RJK		DUO-DECK 2-65' DIA. DIGESTER FLOATING COVERS ONE WITH FUTURE & 1 WITH COMPLETE PEARTH FOR: THROOP, PENNSYLVANIA (LACKAWANNA RIVER BASIN AUTHORITY)		
				SCALE 3/4" = 1'-0" DATE 13 APRIL 1972		
				DRAWN BY R.J.K. CHECKED BY MJB No. 4-D-3900		

Original Paint Specification for Pacific Flush Tank from 1965

for water-tightness. Necessary water for conducting testing shall be furnished by the Contractor. Following testing of each cover, the Contractor shall check all welded roof-deck seams for leaks, by means of a soap suds solution under a 10" w.c. pressure test. All leaks found in the roofing or entrance hatches shall be repaired by the Contractor, to the satisfaction of the Engineer.

PAINT + PERMALITE

All structural steel, miscellaneous assemblies and the roof deck plates shall be provided with one (1) shop coat of Inertol Rustinhibitive Primer No. 621 paints on all surfaces, except within 3" of all seams to be field welded. Before beginning assembly of covers, the outside of all rim-plate assemblies shall be wire brushed and cleaned where necessary and painted one touch-up coat of Inertol No. 621. After field welding and after air and water testing of the covers, all seams and other bare metal shall be wire brushed and cleaned and receive a touch-up coat of Inertol Rustinhibitive Primer No. 621. Prior to installation of the steel roof decks, the underside of ceilings and inside of rim-plate assemblies, the complete inside areas of gas dome assemblies, the top of the ceiling plates, truss assemblies, purlins and all other structural parts and miscellaneous assemblies shall receive two (2) coats of Inertol Thick paint. After complete testing of both the covers and the roof-decks, the top-side of the roof-decks, gas domes and extensions and all other exposed steel work above the sludge line of the covers when resting in water, shall receive two (2) field coats of Inertol RUSTAMOR alkyd aluminum.

After completion of testing of the floating covers and before installation of the roof plates, there shall be applied to the top-side of the ceiling plates, insulating Permalite concrete aggregate of not less than 2" thickness. Aggregate shall consist of a 1:4 mix ratio, having a thermal conductivity "k" of 0.77. Permalite concrete shall not be placed when the temperature is below 30°F., or forecast to fall below 30°F. within the next 48 hours.

Upon the total area apply not less than 2 lbs. of coarse sand per sq. ft. directly on the final coat of paint for the purpose of effecting a non-skid finished surface.

Gas Recirculation System

Furnish and install one (1) complete gas recirculation system for the primary digester. The system shall provide positive means for elimination and dispersal of scum in the digester by recirculation of digester gas from the gas dome of the cover to points on the supernatant zone below the scum zone. The system shall also provide intermixing of tank contents in such manner that raw material entering shall be brought into intimate contact with actively digesting material with a minimum distribution of concentrated, digested matter in the extreme lower portion of the tank.

There shall be supplied one (1) Sludge Sampler, as furnished by Morse-McCormack Inc., Port Chester, New York.

Unit shall be complete including 800 cc cast iron main chamber, upper and lower ball valves and seats, pressure spring, air port, valve cord, and 40 ft. of chain including depth markers.

The sampler design shall have been proven in at least twenty-five (25) previous installations.

This specification was included in the 1995 contract to rehabilitate the digester covers.

SECTION 09900

REPAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide labor, materials, equipment, and services needed to clean and prepare the surfaces, and to paint and/or repaint including, but not necessarily limited to:
 - 1. Underside of the digester cover ceiling, rim plate, guide channels and interior surfaces of the gas dome, gas pipe housing, sampling wells, pressure vacuum relief mounting well, access manholes, entrances hatches and cover plates all with coal tar epoxy as specified herein.
 - 2. Top side of the digester cover, gas recirculation system housing, guide channels and exposed surfaces of topside piping, gas dome, gas pipe housing and applicable appurtenances with an epoxy mastic primer and hi-solids catalyzed polyurethane topcoat as specified herein. The entire top surface and all attachments will be painted once the surface is hand cleaned.

1.2 QUALITY ASSURANCE

- A. Comply with applicable laws, codes, and regulations.
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Identify each container with manufacturer's name, brand name, material type, stock number, and application instructions, including reducing instructions if permitted.
- B. Stack and store paint containers so that labels clearly display manufacturer's name, type of paint, color, batch number, and instructions.
- C. When not in actual use, store paint materials and equipment in a location or locations specifically assigned for that purpose.
 - 1. Such storage space shall be well ventilated and adequately fire protected.
 - 2. Perform all paint mixing and handling in such assigned storage locations.

REPAINTING
09900-1

3. Remove all painting materials, including rags, tarpaulins, mixers, empty containers and fillers, and partially filled containers from the work areas at the close of each day's work, and store in the assigned storage locations.
- D. For epoxy and polyurethane catalyzed systems follow manufacturers recommendations for separated mixing prior to introducing components. Special attention shall be given to the limited pot life. Properly mix Part A and Part B, per manufacturers recommendations, prior to adding catalyst to base.
- E. Follow the manufacturer's instructions regarding thinning; thin only as necessary.
- F. Maintain paint storage and mixing area neat and clean at all times.
 1. Hang out soiled oily rags to dry.
 2. Store in covered metal containers.
- G. Remove all rejected and noncomplying materials from the job site promptly.
- H. Take all necessary steps to protect the public and all property and vehicles from damage during progress of the Work of this Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Except as specifically otherwise approved in advance by the Owner, in writing, use the specified products of Shermin Williams Paint Company.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine surfaces scheduled to receive the Work of this Contract, and locate conditions which will adversely affect the permanence and quality of the Work. Advise the Owner of all such conditions, and secure further directions from the Owner as required.
- B. Surface preparation:
 1. Clean all surfaces scheduled to receive new paint coatings free from all dirt, dust, oxidized paint film, loose and unsound paint coatings, and other foreign matter.

2. a. Topside: Top surfaces exposed to atmosphere will be hand tool cleaned to SSPC-SP2. Use water blast to remove loose material after hand cleaning is completed.
- b. Bottom Side & Rim Plate: Surfaces exposed to immersion and/or digestion gasses, but not sunlight, will be blast cleaned to SSPC-SP5 (white metal blast) with a finished metal median profile of 2.5 to 4.0 mils.
- c. Prior to proceeding with the production blast cleaning operation, prepare test sections of at least 9 square feet, on the bottom side (ceiling), in locations considered by the Engineer to be representative of existing surface conditions and structural characteristics. Blast clean test section areas using the same equipment, materials and procedures that will be used for the production blast cleaning. Provide safe access for close visual inspection and testing. Do not proceed with the production blast cleaning operation until the Engineer agrees that the surface of the test section has been prepared to conform with specified requirements.

Blast clean to leave an anchor pattern to mil depth specified in a dense, uniform pattern of depression and ridges. Determine pattern depth by the Keane-Tator Surface Profile Comparator or Testex Replica Tape to be provided by Contractor.

Grind laminations raised by the blasting operation to a flush surface and reblast the ground area to obtain the specified anchor pattern.

Clean dry-blasted surface with clean bristle, fiber, or hair brushes; compressed air; a vacuum; or a combination thereof. Remove traces of blast residue from the surface and from pockets and corners. Equip compressors with separators or traps to remove water and oil.

If water is used in the cleaning procedure, assure that surfaces, pockets, and corners are dry and clean before applying paint. Allow a minimum of 48 hours of ambient air drying; then, remove rust bloom by dry blasting and clean to remove blast residue from surfaces, pockets, and corners. Do not use rust inhibitors.

- d. Acceptable Abrasives: Select abrasive size and type based on the type, grade, and surface condition of the steel to be cleaned and on the finished surface condition to be attained with the paint that is to be applied.

Use abrasives for blast cleaning free of oil, grease, or other deleterious contaminants.

Use recyclable abrasives of aluminum oxide, silicon carbide, zirconium aluminum oxide, steel grit, or steel shot. Non-recyclable abrasives with or without the use of Blastox is acceptable.

When using steel grit or shot under atmosphere conditions that cause these abrasives to rust, use dehumidification equipment to prevent rusting which will adversely affect the cleanliness of the blasted surface.

If recyclable abrasives are used recycle abrasives to create the least amount of waste practicalbe. Equip the reclamation system with dust collectors to ensure that discharge meets air quality requirements.

C. Workmanship:

1. Provide best quality workmanship, performed by skilled mechanics.
2. Evenly spread or flow on the proper film thickness to a smooth surface.
3. Apply materials in accordance with the manufacturer's recommendations and printed specifications.
4. Provide finished painted surfaces which are free from sags, skips, and other defects.
5. Perform work under conditions best suited to the production of acceptable work.
6. Protect adjacent areas and surfaces from damage from misplaced paint and preparatory work.
7. Provide continuous dust control as required to protect adjacent areas.
8. Apply coatings by spray, roller, or hand brushing, as best suited to the material and to the coating being applied.

D. Protection and cleanup:

1. Carefully protect from damage those areas where work is in progress.
2. Provide and spread clean drop cloths when and where required to provide the necessary protection.
3. Immediately clean up all accidental spatter, spillage, and misplaced paint, and restore the affected area to its original undamaged condition.
4. At completion of the Work, promptly remove from the job site all materials, supplies, equipment, debris, and rubbish arising by virtue of work performed under this Section, and leave each area in a clean and acceptable condition.

3.2 OWNER'S REPRESENTATIVE

- A. The Owner has retained the services of a representative to visit the site, observe progress of the Work, and report to the Owner on the Contractor's adherence to the specified requirements.

- B. Cooperate with the Owner's representative as needed to enable his efficient and complete observation of the Work.

3.3 PAINT SCHEDULE

- A. Provide paint finishes of even, uniform color, free from cloudy or mottled appearance.
 - 1. Promptly correct all non-complying work to the Owner's approval.
 - 2. Colors will be selected by the Owner.
- B. Apply the following paints in strict accordance with the manufacturer's recommendations.
- C. Topside:
 - 1. First Coat: Epoxy Mastic, B58 Series/B58 V 1 at 6 mils DFT.
 - Second Coat: Hi-Solids Polyurethane B65 W 300 Series/B60 V 3 at 3-4 mils DFT.
- D. Bottom Side:
 - 1. First Coat: Tile Clad II Hi-Bild Primer, B62N71/B60V70 applied at DFT 1-2 Mils.
 - Second Coat: Hi Mil Sher-Tar Epoxy, B69B40/B60V40 applied at DFT of 8-12 Mils.
 - Third Coat: Hi Mil Sher-Tar Epoxy, B69B40/B60V40 applied at DFT of 8-12 Mils.

NOTE: The second coat must be applied to the primer within 72 hours of the application of the primer.

END OF SPECIFICATION



This report is an archived publication and may contain dated technical, contact, and link information

[Federal Highway Administration](#) > [Publications](#) > [Research Publications](#) > [Infrastructures](#) > [Structures](#) > [98179](#) > Bridge Lead Removal and General Site Safety

Publication Number: FHWA-RD-98-179

Bridge Lead Removal and General Site Safety

Work Methods On Steel Structures

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Welding, Burning, And Torch Cutting In Maintenance, Renovation, And Demolition

This section on work methods on steel structures will give workers general knowledge as to the type of construction activities associated with steel structures, bridges, and demolition that can cause exposure to lead. It also looks at what work practices can be used to reduce worker exposure. Many tasks that workers perform can cause very high lead exposure, including abrasive blasting, welding, cutting, and burning.

Housekeeping

A good housekeeping program is required on all jobs to keep airborne lead levels below permissible limits. Good housekeeping can be as easy as setting up a schedule to make sure that accumulations of lead dust and lead containing debris are reduced to a minimum.

Lead dust in the workplace on overhead ledges, equipment, floors, and other surfaces must be removed before disruption like traffic, vibration, or random air currents can cause dust to become airborne again. Such cleaning operations should be conducted whenever possible, and always at the end of each day and after normal operation ceases. Furthermore, everyone doing the cleanup should be provided with suitable respiratory protection and personal protective clothing to prevent contact with lead.

Vacuuming is considered to be the most reliable method of cleaning surfaces on which dust accumulates. When vacuuming equipment is used, the vacuums must be equipped with HEPA filters. Blowing with compressed air is generally prohibited as a cleaning method. All lead-containing debris and contaminated items accumulated for disposal must be collected and put into sealed, impermeable bags or other closed, impermeable containers. Bags and containers must be appropriately labeled as lead-containing waste.

Inspections and Maintenance

Scheduled inspection and equipment maintenance, such as for ventilation systems, is another important work practice control. At work sites where total containment is used as an engineering control, the failure of the ventilation system in the containment area can result in high levels of lead exposure. Often, equipment that is near failure will not perform normally. Regular inspections can detect problems so that timely maintenance can then be performed. If equipment is routinely inspected, maintained, and repaired, or replaced before equipment failure happens, there is less chance that hazardous exposures will occur.

Proper Task Performance

In addition to the above work practice controls, workers must know the proper way to perform their jobs. For example, if a worker inappropriately performs a task away from an exhaust vent, the exhaust vent will be of no use. All training will be provided by the employer.

Supervision

Good supervision is critical. It provides needed backup support for protection against mistakes. For example, directing a worker to position the exhaust vent properly or improving work practices, such as by having the worker stand to the side of the cutting torch, will reduce the worker's exposure to lead.

METHODS OF LEAD PAINT REMOVAL

Open Abrasive Blasting

The most common method of removing lead-based paint from steel structures is open (nozzle) abrasive blasting. The abrasive material, generally steel shot/grit, sand or slag, is forced by compressed air through hoses. The material cleans the surface of the structure, exposing the steel. The abrasive also conditions the steel, which improves the adherence of the new paint or weld.

Until recently, abrasive blasting work was conducted in open air, which helped to reduce the airborne concentration of abrasive dust containing lead in the workers' breathing zone. Tarpaulins were generally used only to protect neighboring homes and automobiles from a damaging blast of abrasive dust or to reduce residents' complaints about over spray, dust, and dirt. Now that the health effects are clearly known, it is even more important to ensure that lead-containing debris does not contaminate the surrounding area. Regulations now require the erection of containment structures for open abrasive blasting operations.

Although containment structures are designed to reduce the release of lead into the environment, they usually increase worker exposure to airborne lead inside the containment, reduce visibility, and increase the risk of slip and fall injuries resulting from waste material buildup on footing surfaces. Contaminant structures vary in design and ability to contain debris. Some containment structures consist of tarpaulins made of open mesh fabrics (screens) that are loosely fitted around the blasting area; some use rigid materials, such as wood, metal, or plastic to enclose the blasting area, and some use a combination of flexible and rigid materials. Large air-moving devices may be connected to an enclosed containment structure to exhaust dust-laden air and create negative pressure inside the containment.

These steps should be followed:

- Design the containment and ventilation system to provide adequate air movement so that the dust in the air is removed from the blast operator's breathing zone and the structure itself This can be done by using a forced air supply to provide clean air to move the contaminated air from the worker's breathing zone.
- Compressors for supplying respiratory air for abrasive blasting respirators must be situated on the job site so as to avoid entry of contaminated air into the system.
- Respirators must be donned before entering the containment area and should not be removed until workers have exited the area or as part of a decontamination procedure.
- The abrasive cleaner must be extremely efficient in removing lead dust; otherwise, lead is reintroduced into the containment area.

Vacuum Blast Cleaning

Vacuum blasting is a variation on open abrasive blasting. The blast nozzle has local containment (a shroud) at its end, usually accomplished by brush lined attachments at its outer edges and a vacuum inlet between the blast nozzle and the outer brushes. The brushes prevent release of the abrasive and debris as they rebound from the steel surface. These particles are removed from the work area by the built-in vacuum system. The abrasive can be disposed of or cleaned and recycled.

Vacuum blast cleaning is the most efficient method, with minimal dust generation if used properly, except where accessibility is difficult, such as between back-to-back angles. A variety of heads are available to achieve a tight seal for inside corners, outside corners, and flat surfaces. The advantages of vacuum blasting are that most of the waste materials and abrasive are collected at the site of generation and are not transported to the breathing zone of the workers, and the need for containment may be reduced or eliminated.

Wet Abrasive Blast Cleaning

Wet abrasive blast cleaning is a modification of traditional open abrasive blast cleaning. This system uses compressed air to propel the abrasive material to the surface being cleaned. Water is injected into the abrasive stream either before or after the abrasive exits the nozzle. The water reduces dust levels and minimizes the need for the containment enclosures, which would be required for dry blast cleaning.

A disadvantage to using water is that it may be necessary to use rust inhibitors to avoid rusting. The containment also must be designed to capture the water. Wet abrasive/paint debris is more difficult to handle and transport than dry debris, and unless the water can be filtered, it may add to the volume of debris generated.

Chemical Cleaning

Old paint also can be removed from steel structures using chemical strippers. These strippers can be solvent- or caustic-based and be applied by hand or sprayed on. Depending on the thickness of the paint, the chemical remains on the surface anywhere from 5 minutes to 48 hours. After the chemical has had time to do its job, scraping and brushing are used to clean the chemical and paint off. Pressurized water may also be used. It is very important that all of the waste is contained so it will not contaminate the environment.

Chemicals used can be hazardous. They can be inhaled, ingested, or absorbed through the skin. Many of these chemicals will cause eye and skin irritation or burns. It is very important to ensure that workers are protected from not just the hazards of lead but also the chemicals. Proper training in the use of chemical strippers must take place. Respirator cartridges and protective clothing must be selected for the specific chemicals that are used.

Hand Scraping of Lead-based Paint

The hazard of hand-held scraping comes from dust generation and paint chips released from the scraping process. A wet method with a HEPA vacuuming ventilation system should be used.

Heat Gun Removal of Lead-based Paint

In this process, a heat gun, which is similar to a hair dryer, is used to peel paint away. This process uses heat to separate the paint from the steel structure and the paint can then be removed with a putty knife. The health hazards associated with this process come from lead fumes released into the air during the heating process and from lead paint chips created from the scraping.

Heat guns should be restricted to 700°F (371°C) by using a built-in thermostat. Above this temperature lead is vaporized into the air. Commercial heat guns can produce temperatures as high as 1000°F (538°C), generating and releasing high levels of airborne lead.

WELDING, BURNING, AND TORCH CUTTING IN MAINTENANCE, RENOVATION, AND DEMOLITION

High levels of lead are emitted when welding or burning takes place on lead-painted steel structures. Exposure can result from a large variety of construction projects, from bridge rehabilitation to demolition of a high-rise building. Welding is a process that joins two pieces of metal together, generating many hazardous compounds from the metal itself. When lead paint is added to it, the hazard is compounded. Cutting metal with lead coating on it results in the same problems as welding. Both welding and cutting cause the metal and its coating to be released in the air as fumes, making it available for inhalation by workers.

- All surface coatings should be tested prior to applying heat to protect from possible fire hazards.
- Where lead is present, local exhaust ventilation equipped with a HEPA filter should be used.
- Use long cutting torches so the welder or cutter can remain as far away as possible from the work.
- Before beginning any work on the metal, remove at least 4 inches (10.2 cm) of lead-containing material from where the welding or burning will take place.
- During demolition, the use of hydraulic shears as opposed to cutting metal with a torch significantly reduces lead exposure to workers.
- Avoid standing in the fumes when using a torch. Many hazardous chemicals can be released, not just lead.
- Avoid using heat to bum off lead coatings whenever possible.

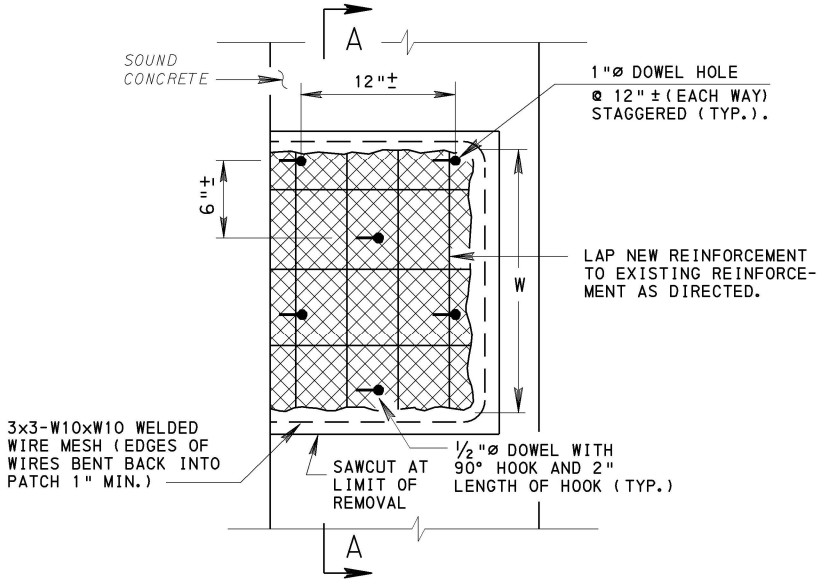
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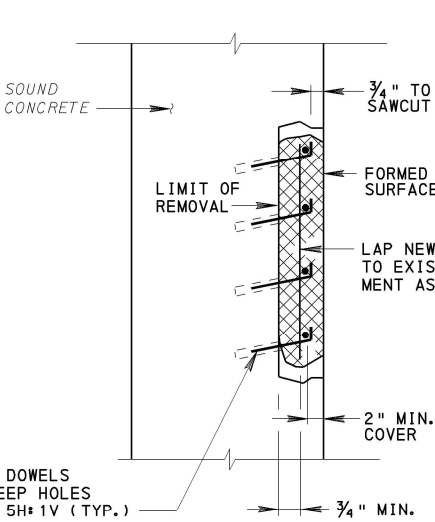
TRT Terms: Lead based paint; Occupational safety; Bridges
Scheduled Update: Archive - No Update needed

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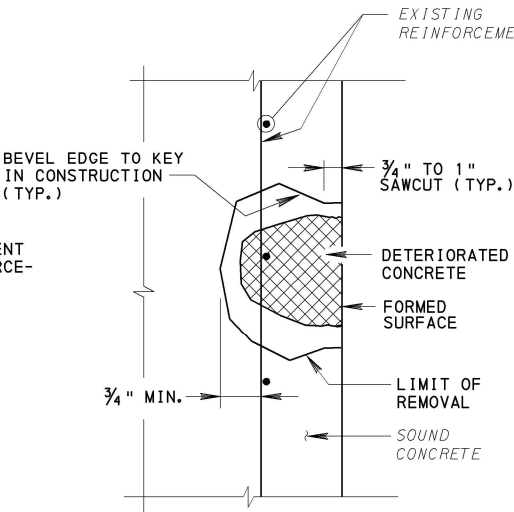
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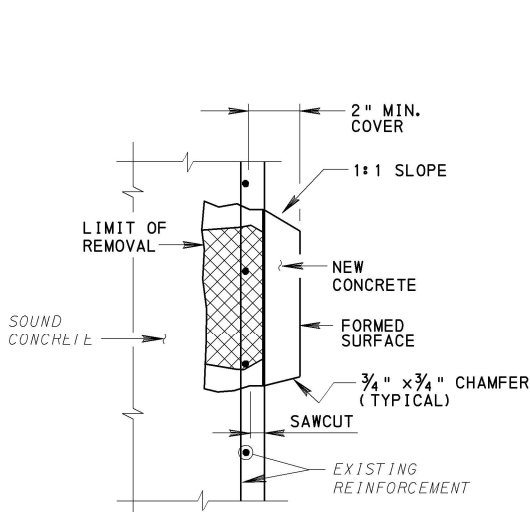
ELEVATION VIEW



SECTION A-A
NEW REINFORCEMENT



SECTION A-A
EXISTING REINFORCEMENT



SECTION A-A
BLISTER DETAIL

NOTE: CONCRETE REPAIR TYPE 2 DETAIL FOR AREAS WITH EXISTING REINFORCEMENT HAVING LESS THAN 2" OF COVER.

CONCRETE REPAIR TYPE 2

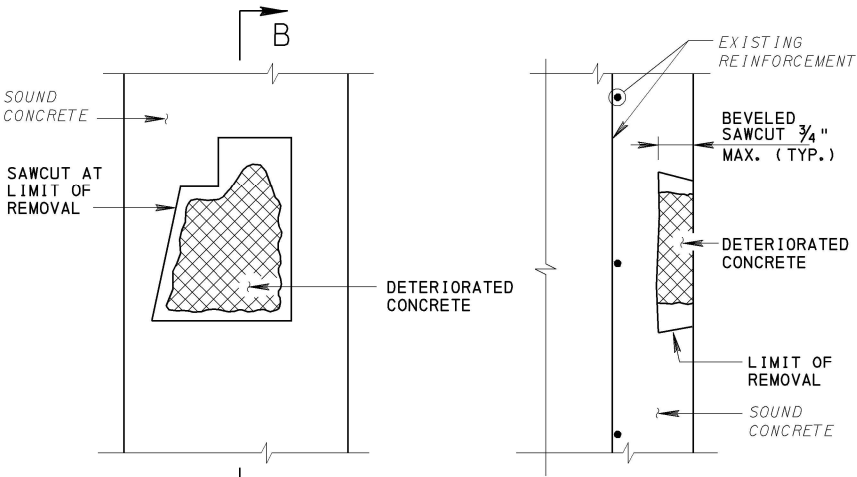
NOTE: REPAIR TYPE 2 IS USED WHEN DEPTH OF DETERIORATED CONCRETE IS GREATER THAN 3/4" AND EXISTING REINFORCEMENT SPACED ≤ 12" ON CENTERS.

REINFORCED CONCRETE REPAIR TYPE 1 NOTES:

1. SQUARE OFF DETERIORATED CONCRETE TO SOUND CONCRETE WITH A SAWCUT OF 3/4" MAXIMUM.
2. REMOVE ALL LOOSE AND DELAMINATED CONCRETE TO PROVIDE A SOUND BOND BETWEEN EXISTING CONCRETE AND PATCHING MATERIAL.
3. APPLY A RAPID HARDENING CONCRETE PATCHING MATERIAL FROM A MANUFACTURER LISTED IN BULLETIN 15 UNDER MISCELLANEOUS POLYMER MODIFIED AND SPECIAL CEMENTS, MORTARS AND CONCRETES, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
4. CONCRETE REPAIRS INDICATED ARE PAYABLE UNDER 1040.3(f) 2.

LEGEND

 - REMOVE DETERIORATED CONCRETE.

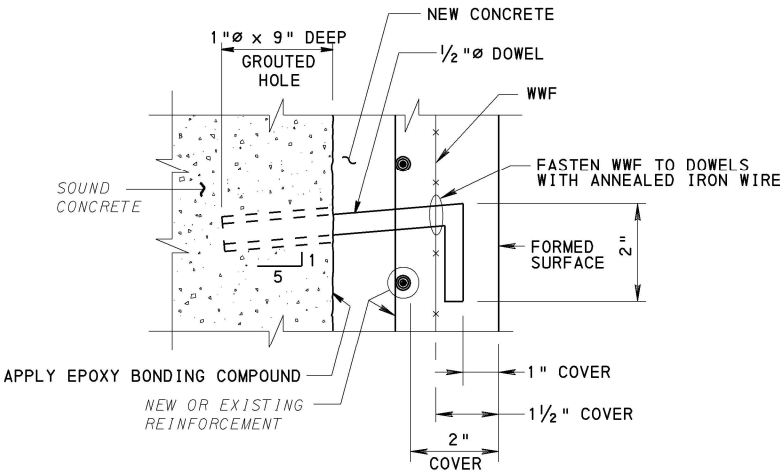


ELEVATION VIEW

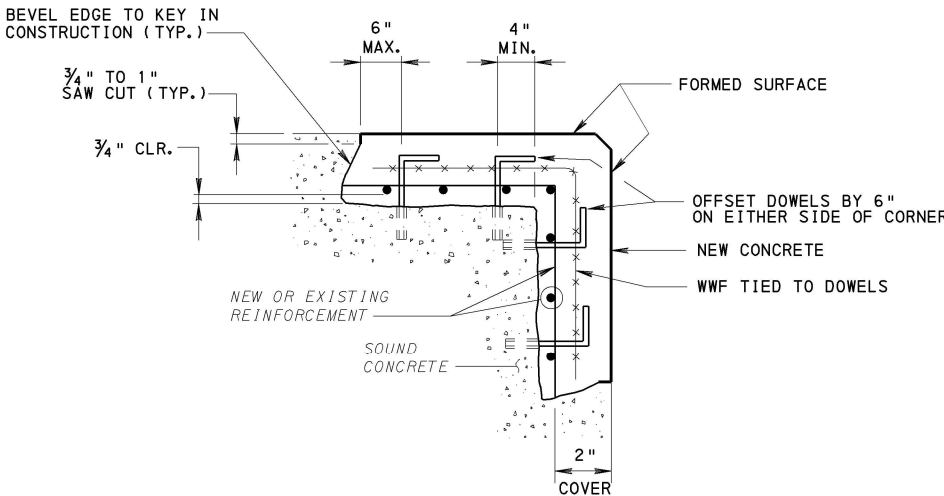
SECTION B-B

CONCRETE REPAIR TYPE 1

NOTE: REPAIR TYPE 1 IS USED WHEN DEPTH OF DETERIORATED CONCRETE IS LESS THAN OR EQUAL TO 3/4".



TYPICAL DOWEL DETAIL



TYPICAL CORNER REPAIR DETAIL

REINFORCED CONCRETE REPAIR TYPE 2 NOTES:

1. SQUARE OFF DETERIORATED CONCRETE TO SOUND CONCRETE WITH A SAWCUT OF 3/4" MINIMUM TO 1" MAXIMUM BUT NOT TO THE DEPTH OF THE REINFORCEMENT STEEL. BACK BEVEL EDGE BEYOND SAWCUT.
2. USE HAND TOOLS TO REMOVE ALL LOOSE AND DELAMINATED CONCRETE THAT PROVIDES A SOUND BOND BETWEEN EXISTING CONCRETE AND NEW CONCRETE. PNEUMATIC HAMMERS WITH IMPACT RATINGS OF 30 FT/LB OR LESS MAY BE USED IF REQUIRED.
3. IF DETERIORATED CONCRETE EXTENDS BEYOND THE PRIMARY REINFORCEMENT, REMOVE THE CONCRETE TO AT LEAST 3/4" BEHIND THE REINFORCEMENT.
4. APPLY AN EPOXY BONDING COMPOUND BETWEEN THE EXISTING AND THE NEW CLASS AA CEMENT CONCRETE.
5. W REPRESENTS LEAST DIMENSION OF DETERIORATED CONCRETE.
6. USE DOWELS ONLY WHEN W DIMENSION OF DETERIORATED CONCRETE IS GREATER THAN 2'-0" AND NEW OR EXISTING REINFORCEMENT CANNOT ADEQUATELY BE DEVELOPED BY LAPPING WITH EXISTING REINFORCEMENT.
7. USE A PACHOMETER TO LOCATE EXISTING REINFORCEMENT WHEN DRILLING DOWEL HOLES TO AVOID DRILLING THRU EXISTING BARS.
8. AN APPROVED EPOXY ANCHORING SYSTEM IN 90° HOLES MAY REPLACE GROUT IN SLOPED HOLES. USE A 6" MINIMUM EMBEDMENT AND IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.
9. A #4 DEFORMED REINFORCEMENT BENT "L" BAR MAY REPLACE THE 1/2"Ø DOWEL HOOK.
10. ALTERNATE WIRE MESH MAY BE SUBSTITUTED FOR 3x3-W10xW10, PROVIDED WIRE SPACING DOES NOT EXCEED 4" AND AN EQUIVALENT STEEL AREA IS PROVIDED. NEW REINFORCEMENT BARS MAY BE OMITTED IF WIRE MESH STEEL AREA EXCEEDS EXISTING REINFORCEMENT.
11. CLEAN EXISTING REINFORCEMENT BY MECHANICAL MEANS.
12. LAP EQUIVALENT NEW REINFORCEMENT TO THE EXISTING REINFORCEMENT AS DIRECTED.
13. REINFORCEMENT BARS TO BE EPOXY COATED.
14. CONCRETE REPAIRS INDICATED ARE PAYABLE UNDER 1040.3(f) 2.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
REINFORCED CONCRETE REPAIR

RECOMMENDED SEPT. 30, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDED SEPT. 30, 2016
Brian Stapp
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 2 OF 4
BC-783M

SLUDGE ANALYSIS REPORT

Lackawanna River Basin Sewer Authority Belt Filter Press Feed

2017	%TS
January	2.7
February	2.76
March	2.75
April	
May	2.94
June	3.04
July	3.07
August	3.05
September	3.01
October	3
November	2.87
December	2.86

2018	
January	2.9
February	2.89
March	2.83