KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2014-00258
COMMISSION STAFF'S SECOND REQUEST FOR INFORMATION

Witness: Brent E. O'Neill

1. Refer to the Kentucky-American response to Commission Staff's First Request for Information ("Staff's First Request"), Item 5, attachment 5, page 3 of 7, an e-mail from Andy Higgins to Brent E. O'Neill dated February 28, 2013.

   a. Provide a copy of the CPS Report prepared by American Water Engineering and submitted to Kentucky-American that is referenced in the e-mail message. Include any updates or amendments to the CPS Report that pertain to the Richmond Road Station.

   b. Provide a copy of each of the two file attachments to the February 28, 2013 e-mail message, "Structural Dwgs Set.pdf" and "Cost Estimate.pdf."

   c. The e-mail message includes the following statements. "The CPS indicated that repairs on the order of $500,000 would be required to repair pipe supports, concrete beams, floor slabs and cracks in the concrete tank walls. This approach, as outlined in the report, was comprehensive in that it provide for repairs to last 20+ years and covered more than just pipe hanger supports. It was intended to prolong the life of the entire structure and assumed the facility would remain in service for the next 20+ years." Explain whether the approach identified and outlined in the CPS Report is sufficient to restore and maintain the integrity of the structure so as to avoid any likely structural failure in the building. If not, explain why not.

Response:

   a. The CPS Report indicated in the February 28, 2013 email from Andy Higgins was a draft report. Attached please find a copy of the final CPS Report dated July 16, 2013.

   b. Copies of the two file attachments to the February 28, 2013 email from Andy Higgins are attached.

   c. The project being discussed in the February 28, 2013 email message from Andy Higgins was a proposed project that would provide an intermediate solution to the structural problems, but, because it would not eliminate the corrosive environment, it would not be a long-term solution to prevent structural failure. It was a project proposed within the draft January CPS that involved structural improvements to the existing clearwell. The identified project was to repair and reinforce 24 concrete beams, recoat the concrete roof slab and replace the pipe hangers for the 36-inch filter influent pipe. The project was considered an intermediate effort to extend the life of the existing facility and address the safety concerns identified. The suggested project addressed the major structural

concerns with the building but did not address the condition of the piping, valves and other items within the filter gallery. A copy of the portion of the draft CPS that describes the project is attached.

During review of the draft January CPS, both Kentucky American Water and American Water Engineering personnel determined that, although the identified intermediate project addressed the structural concerns, it did not address the lack of space that significantly hinders the maintenance and operation personnel from safely traversing the length of the gallery. Moreover, it did not allow for the improved access necessary for performing maintenance on equipment. The proposed project also did not address the congested filter gallery space that reduces the ability of proper ventilation within the gallery, leading to the inability to effectively remove the chlorine and water vapor within the gallery that was a major contribution to the corrosion issues. These issues and concerns with the longevity of the equipment within the filter gallery and a concern with the overall structural life of the building resulted in the identified project being removed from the final CPS in favor of the replacement of the filter building.

As a result of the removal of the project from the draft CPS, the alternative design costing $118,000 that is discussed in the February 28, 2013 email was developed to address the immediate safety issues and provide time to further investigate and plan the replacement of the filter building. The "Structural Dwgs Set.pdf" and "Cost Estimate.pdf" attached in item b above are from the development of the alternative design.

GENERAL NOTES

GENERAL:

ALL STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE ARCHITECTURAL, MECHANICAL DRAWINGS, SHOP DRAWINGS AND SPECIFICATIONS.

DESIGN:

DESIGN OF STRUCTURES IS BASED UPON AND GOVERNED BY THE INTERNATIONAL BUILDING CODE 2012, AMERICAN CONCRETE INSTITUTE BUILDING CODE (LATEST EDITION), AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL STEEL BUILDING,AND PROJECT SPECIFICATIONS.

DESIGN LOADS CRITERIA

1. DEAD LOADS

SELFWEIGTH	
SUPERIMPOSED DEAD LOAD	40 PSF
36" CAST IRON PIPE	506.4 LB/FT
30" CAST IRON PIPE	386.7 LB/FT

2. LIVE LOADS

OPERATING FLOOR	150 PSF

3. SYSTEM SCAFFOLD

	MAX ALLOW COMPRESSIVE LOAD
POST SHORE 350DB	4,400 LBS
POST SHORE AS550	8,176 LBS

CONCRETE:

ALL CAST-IN-PLACE CONCRETE SHALL CONFORM TO SECTION 03300 OF THE SPECIFICATIONS. THE FOLLOWING GENERAL CLASSES AND STRENGTHS OF CONCRETE SHALL BE USED FOR WORK UNDER THIS CONTRACT:

ALL REINFORCED WORK, EQUIPMENT BASES FILL IN FLOOR AREAS, CONCRETE CURBS, SIDEWALKS AND IN GENERAL THROUGH THE PROJECT — $f'c$ = 4,500 P.S.I.

CONCRETE COVERAGE:

CONCRETE PROTECTION FOR REINFORCEMENT SHALL BE AS FOLLOWS:

1. CONCRETE DIRECTLY AGAINST SOIL.....3"
2. CONCRETE EXPOSED TO WEATHER (#5 OR SMALLER).....1-1/2"
   (#6 OR LARGER).....2"
3. SLABS.....1"
4. BEAMS AND COLUMNS (TO MAIN REINFORCEMENT).....2"
5. WALLS 12" OR MORE.....2"
   LESS THAN 12" (#5 OR SMALLER).....1-1/2"
   (#6 OR LARGER).....2"
6. FOR SURFACES EXPOSED TO WATER OR SEWAGE IN SLABS, BEAMS, COLUMNS AND WALLS – ADD 1/2"
7. ALL EXPOSED CORNERS SHALL HAVE A 3/4" CHAMFER UNLESS NOTED OTHERWISE ON DRAWINGS.

DIMENSIONS:

CONTRACTOR TO VERIFY ALL DIMENSIONS IN FIELD WITH SHOP DRAWINGS, WITH STRUCTURAL DRAWINGS AND WITH MECHANICAL DRAWINGS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

REINFORCEMENT:

REINFORCING STEEL SHALL BE DEFORMED, NEW BILLET STEEL, A.S.T.M. A-615 GRADE 60, AS NOTED IN PROJECT SPECIFICATIONS. REINFORCING STEEL SPLICES AND OVERLAPS SHALL BE CLASS "B" PER A.C.I. 318 UNLESS SHOWN OTHERWISE ON DRAWINGS.

ALL REINFORCING SHALL BE DETAILED ACCORDING TO THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" BY A.C.I. STANDARDS.

STRUCTURAL STEEL:

1. ALL STRUCTURAL STEEL WORK, INCLUDING DETAILING, FABRICATION AND ERECTION SHALL BE IN CONFORMANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, MANUAL OF STEEL CONSTRUCTION, 13TH EDITION, EXCEPT AS HEREIN MODIFIED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS.
2. WHERE INDICATED TUBE SHALL CONFORM TO HSS ASTM A500-GR B FY=46 KSI.
3. WHERE SHOWN M,S,C,MC AND L SHAPES SHALL BE ASTM A36 MATERIAL.
4. ALL SHOP CONNECTIONS SHALL BE MADE WITH WELDS OR HIGH STRENGTH BOLTS, ALL FIELD CONNECTIONS SHALL BE MADE WITH HIGH STRENGTH BOLTS, BOTH SHOP AND FIELD CONNECTIONS SHALL CONFORM TO THE TYPICAL CONNECTION DETAILS SHOWN ON THE CONTRACT DRAWINGS UNLESS SPECIFICALLY MODIFIED BY THE ENGINEER.
5. ALL HIGH STRENGTH BOLTS SHALL BE ¾" DIAMETER FRICTION TYPE BOLTS CONFORMING TO ASTM A 325-02. PROVIDE A HARDENED WASHER UNDER THE TURNED ELEMENT (NUT OR BOLT HEAD). BOLTS AND NUTS TO BE "MADE IN USA".
6. THE INSTALLATION AND TIGHTENING OF ALL HIGH STRENGTH BOLTS SHALL CONFORM TO THE "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325-02. BOLT-ERECTION SHALL USE THE CALIBRATED WRENCH METHOD OF INSTALLATION.
7. ALL ANCHOR BOLTS SHALL BE ASTM F1554-GR 36 UNLESS OTHERWISE NOTED.
8. ALL WELDING PROCEDURES SHALL CONFORM TO THE AMERICAN WELDING SOCIETY CODE FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION.
9. ALL STRUCTURAL STEEL SHALL BE PAINTED AS PER SPECIFICATIONS. ALL FABRICATION AND ERECTION MARKS SHALL BE COVERED DURING THE FIELD PAINTING TOUCH-UP OPERATIONS.
10. PROVIDE HOLES FOR WOOD BLOCKING AS SHOWN ON THE CONTRACT DRAWINGS.
11. ALL CLIPS ANGLES USED SHALL BE A MINIMUM OF 6" LONG AND HAVE A MINIMUM THICKNESS OF ⅜" UNLESS NOTED OTHERWISE

ADHESIVE ANCHORING SYSTEM

1. WHERE CALL FOR CHEMICAL ANCHORS SHALL BE AN EPOXY ADHESIVE SYSTEM SUCH AS HIT-RE500SD ADHESIVE BY HILTI FOR CONCRETE STRUCTURES OR HIT-HY-20 FOR MASONRY STRUCTURES.
2. ALL POST-INSTALLED ANCHORS AND HARDWARE (NUTS AND WASHERS) SHALL BE GALVANIZED.
3. DIAMETER OF HOLE SHALL BE AS RECOMMENDED BY MANUFACTURER FOR THE PARTICULAR PRODUCT SPECIFIED IN THE DRAWINGS.
4. CHEMICALLY ANCHORED THREADED RODS AND REBARS SHALL BE TESTED AT THE ENGINEERS'S DIRECTION AFTER INSTALLATION AT CONTRACTOR EXPENSE. ANCHORS SHALL BE TESTED BY APPLYING A TENSION LOAD EQUAL TO THE MANUFACTURERS ALLOWABLE LOAD TO THE EMBEDDED ANCHOR. IF A TEST APPLICATION FAILS, ALL APPLICATIONS OF THAT DAY SHALL BE TESTED. TESTING PROCEDURES AND RESULTS SHALL BE SUBMITTED AND APPROVED BY THE ENGINEER.

COATING

1. SURFACE SHALL BE CLEANED BY HAND OR POWER TOOLS.
2. A PRIMER SHALL BE APPLIED FOLLOWING BY FINISHED COAT.
3. RECOMMENDED PAINT IS TNEMEC. PRIMER TO BE TNEMEC-ZINC 90-97&H90. FINISH COAT: ENDURA-SHIELD SERIES 73.
4. FINISH COAT COLOR TO BE SELECTED BY OWNER.

REVISIONS

RRS FILTER BUILDING IMPROVEMENTS
STRUCTURAL
PIPE GALLERY
GENERAL NOTES

KENTUCKY AMERICAN WATER
CENTRAL SERVICE AREA

AMERICAN WATER ENGINEERING
3906 CHURCH ROAD
MT. LAUREL, NJ 08054

KENTUCKY AMERICAN WATER

DRAWN BY R. BEATTY
PROJECT ENG'R J. JIMENEZ
APPROVED

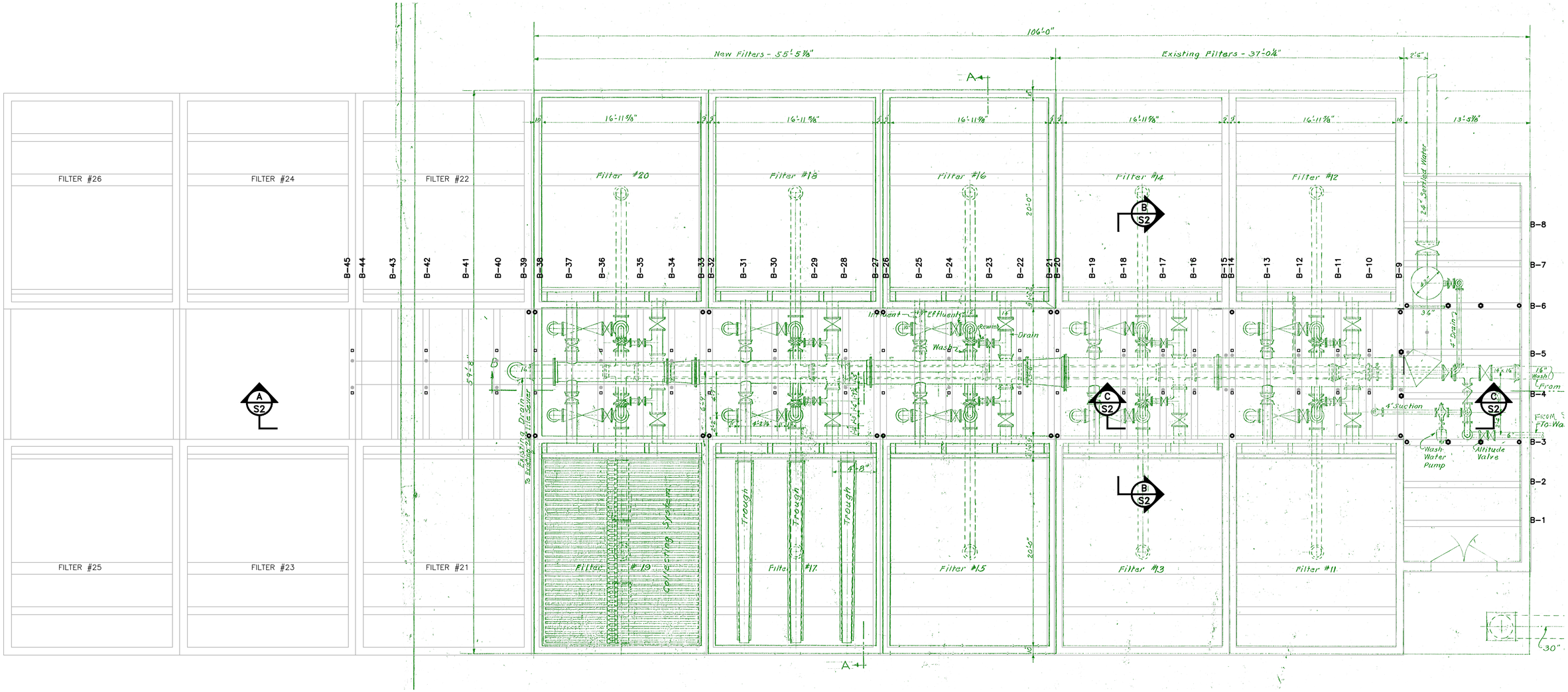
DATE 2-25-13
PROJECT ####

USE DIMENSIONS ONLY
SCALE 3/16" = 1'-0"

USE APPROVED DRAWINGS ONLY FOR CONSTRUCTION PURPOSES

120201-0017-S0

FOR COMMENTS



FLOOR PLAN – PIPE GALLERY

3/16" = 1'-0"

LEGEND:

- POST SHORE 350 DB QTY= 24
- POST SHORE AS550 QTY=4
- FRAME SUPPORT
- PIPE HANGER (EXIST)

REVISIONS

RRS FILTER BUILDING IMPROVEMENTS
STRUCTURAL
PIPE GALLERY
PLAN

KENTUCKY AMERICAN WATER
CENTRAL SERVICE AREA

AMERICAN WATER ENGINEERING
3906 CHURCH ROAD
MT. LAUREL, NJ 08054

KENTUCKY AMERICAN WATER

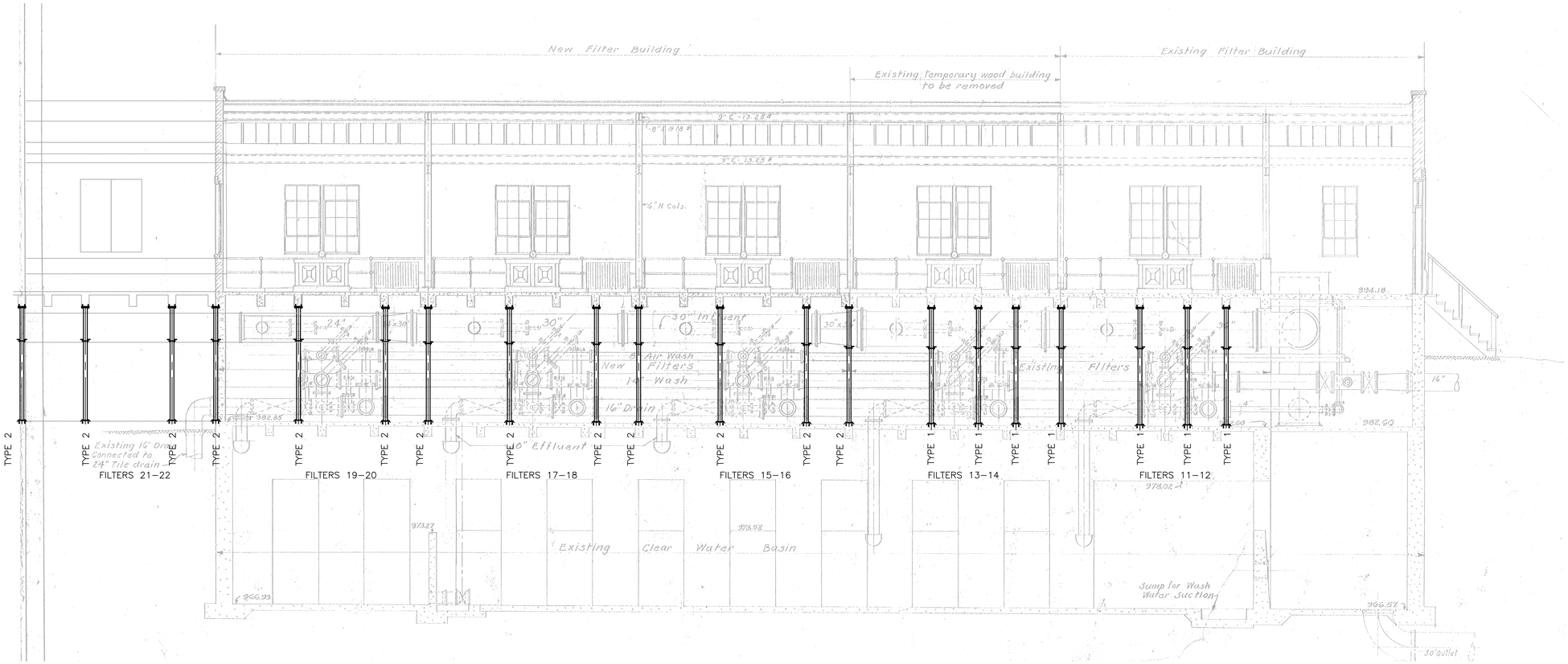
DRAWN BY R. BEATTY
PROJECT ENG'R J. JIMENEZ
APPROVED
DATE 2-25-13
PROJECT ####
USE DIMENSIONS ONLY
SCALE 3/16" = 1'-0"

USE APPROVED DRAWINGS ONLY FOR CONSTRUCTION PURPOSES

120201-0017-S1

FOR COMMENTS

1202010017S1-2



SECTION A/S1
3/16" = 1'-0"

REVISIONS

RRS FILTER BUILDING IMPROVEMENTS
STRUCTURAL
PIPE GALLERY
SECTONS, SCHEDULE AND NOTES

KENTUCKY AMERICAN WATER
CENTRAL SERVICE AREA

AMERICAN WATER ENGINEERING
3906 CHURCH ROAD
MT. LAUREL, NJ 08054

DRAWN BY R. BEATTY
PROJECT ENG'R J. JIMENEZ
APPROVED

DATE 2-25-13
PROJECT ####

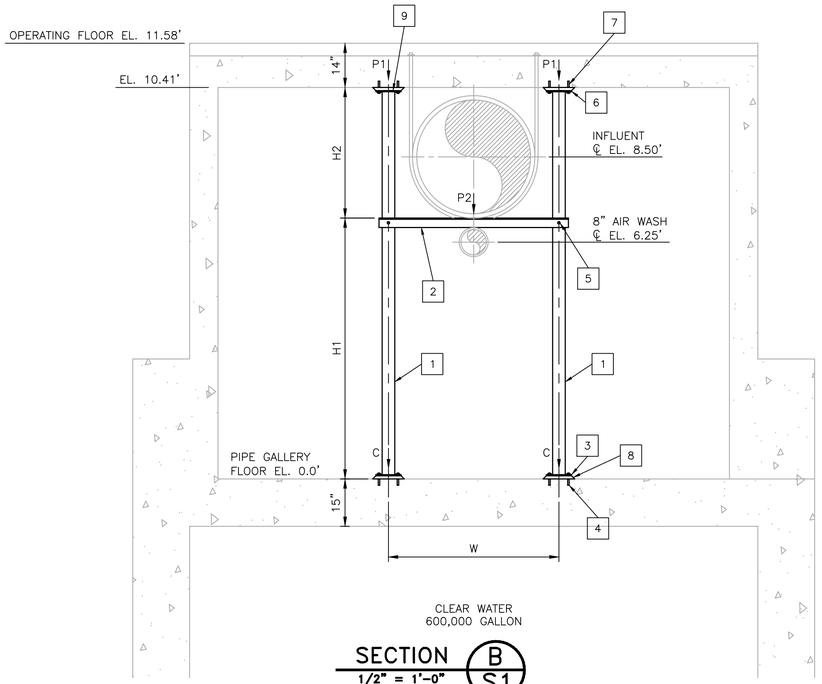
USE DIMENSIONS ONLY
SCALE 1/4" = 1'-0"

USE APPROVED DRAWINGS ONLY FOR CONSTRUCTION PURPOSES

120201-0017-S2

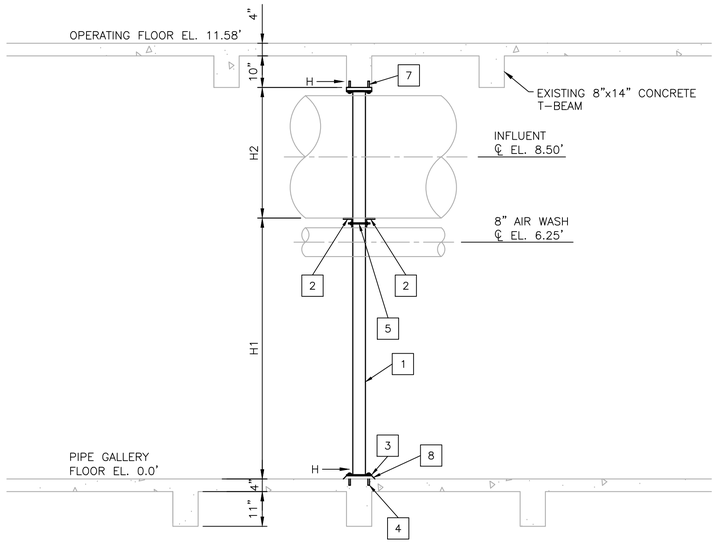
FOR COMMENTS

1202010017S1-2



CLEAR WATER
600,000 GALLON

SECTION B S1
1/2" = 1'-0"

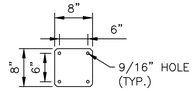


CLEAR WATER
600,000 GALLON

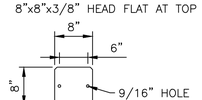
SECTION C S1
1/2" = 1'-0"

NOMENCLATURE KEY

1. HOLLOW STRUCTURAL SECTION HSS 3"x3"x0.125 L*=10'-2
2. DOUBLE ANGLE L3"x3"x7/16" SHORT LEG BACK TO BACK L*=5'-0"
3. 8"x8"x3/8" BASE PLATE AT BOTTOM OF COLUMN ONLY



4. 1/2"ø GALV. ADHESIVE ANCHOR HIT RE-500SD+HAS BY HILTI W/HEX NUT AND FLAT WASHER LOCATED AT BOTTOM OF COLUMN ONLY. ANCHOR MIN. EMBEDMENT = 2.5". MAX EMBED = 3"
5. 3/4"ø GALVANIZED A325 THRU BOLT.
6. 8"x8"x3/8" HEAD FLAT AT TOP OF COLUMN ONLY



7. 1/2"ø GALVANIZED KWIK BOLT EXPANSION ANCHOR BY HILTI W/HEX NUT AND FLAT WASHER LOCATED AT TOP OF COLUMN ONLY. ANCHOR MIN. EMBEDMENT = 4"
8. 1" NON-SHRINK SIKA GROUT 212 OR EQUIVALENT
9. HEAD PLATE TO BE ANCHORED ON SOUNDED CONCRETE. USE SIKATOP 123 PLUS PRIOR TO THE INSTALLATION OF THE HEAD PLATE IN PLACES WHERE CONCRETE IS DETERIORATED OR EXPOSED REBARS.

STEEL FRAME TYPES

FRAME TYPE	FILTER LOCATION	CARRIED PIPE	H1*	H2*	W*	DESIGN LOADS (lbs)				
						P1	P2	C	H	QTY
1	11 TO 14	36"	6'-10"	3'-6"	4'-6"	4,300	4,000	6,400	240	7
2	15 TO 22	30"	7'-1"	3'-3"	4'-6"	4,300	4,000	6,400	240	13

P1 = VERTICAL LOAD FROM OPERATING FLOOR

P2 = VERTICAL LOAD @ MIDSPAN FROM CAST IRON INFLUENT PIPE

C = TOTAL COMPRESSIVE LOAD PER COLUMN

H = TOTAL HORIZONTAL LOAD PER COLUMN

NOTES:

1. * ALL DIMENSIONS TO BE VERIFIED IN FIELD.
2. ALL ELEMENTS SHALL BE PRE-MEASURED AT EVERY LOCATION AND FABRICATED OUTSIDE.
3. ALL STRUCTURAL STEEL ELEMENTS TO BE PAINTED. ALL BOLTS TO BE GALVANIZED STEEL.
4. ANGLE SUPPORTS SHALL BE JACKED AND PRESSURE APPLIED TO THE PIPE. BOLTS TO BE DRILLED AND PLACE INTO COLUMN UNDER PRESSURE FOR TIGHT FIT. PIPE IS NOT TO BE LIFTED. CONTRACTOR TO JACK FROM THE BOTTOM OR FROM THE TOP.

REVISIONS

RRS FILTER BUILDING IMPROVEMENTS STRUCTURAL PIPE GALLERY SECTONS, SCHEDULE AND NOTES

KENTUCKY AMERICAN WATER
CENTRAL SERVICE AREA

AMERICAN WATER ENGINEERING
3906 CHURCH ROAD
MT. LAUREL, NJ 08054

KENTUCKY AMERICAN WATER

DRAWN BY R. BEATTY
PROJECT ENG'R J. JIMENEZ
APPROVED
DATE 2-25-13
PROJECT ####
USE DIMENSIONS ONLY
SCALE 1/4" = 1'-0"

USE APPROVED DRAWINGS ONLY FOR CONSTRUCTION PURPOSES

120201-0017-S3

FOR COMMENTS

1202010017S1-2

AMERICAN WATER

JOB	SHORT TERM REMEDIATION		
SHEET NO	1	OF	4
CALCULATED BY	J.J	DATE	12/03/12
CHECKED BY		DATE	

PRELIMINARY ESTIMATE - STRUCTURAL WORK - SUMMARY

	DESCRIPTION	QTY	UNIT	UNIT COST				SUBTOTAL
				MATERIAL	LABOR	EQUIP	TOTAL	
	Pre-measurement	2	day	$0	$1,500	$0	$1,500	$ 3,000
	1. Temporary Post shoring 350 DB	4	EA	$154	$0	$0	$154	$ 616
	2. Temporary Post shoring AS550	24	EA	$224	$0	$0	$224	$ 5,376
	3. Fabrication and installation of steel pipe supports	20	EA	$1,478	$2,220	$114	$3,813	$ 76,252

Subtotal		$ 85,244
O&P	20%	$ 17,049
Contingency	15%	$ 15,344
Total		$ 117,637

AMERICAN WATER

JOB	SHORT TERM REMEDIATION		
SHEET NO	2	OF	4
CALCULATED BY	J.J	DATE	12/03/12
CHECKED BY		DATE	

PRELIMINARY ESTIMATE - STRUCTURAL WORK

	DESCRIPTION	GRADE OF DIFFICULTY	QTY	UNIT	UNIT COST				SUBTOTAL	SOURCE
					MATERIAL	LABOR	EQUIP	TOTAL		
	Pre-measurement	1	2.0	day		$1,500		$1,500.0	$ 3,000	
	1. Temporary Post shoring 350 DB	2	4.0	EA	$77.0			$77.0	$ 616	Safway System Scaffold
	2. Temporary Post shoring AS550	2	24.0	EA	$112.0			$112.0	$ 5,376	Safway System Scaffold
	3. 1-inch Level Grouting with Sikagrout 212	2	22.5	SF	$6.3	$9.7		$16.0	$ 718	03 62 13.50 0010 Non-shink grout
	4. Steel Structure A500-GR B Fy=46 ksi	2	4,887.5	LBS	$1.7	$1.6	$0.03	$3.3	$ 32,355	05 12 23.60 0600 Pipe support framing under 10lb/ft, shop fabricated
	5. Steel Structure A36	2	1,374.4	LBS	$1.7	$1.6	$0.03	$3.3	$ 9,099	05 12 23.60 0600 Pipe support framing under 10lb/ft, shop fabricated
	6. Painting Steel	2	508.9	SF	$1.7	$1.6		$3.3	$ 3,359	09 97 13.23 7000 Exterior steel coating
	7. 7/8" Drilling steel	2	40.0	EA	$0.20	$5.5		$5.7	$ 456	05 05 21.15 1970 Drilling steel 7/8" diameter
	8. 3/4" diameter x 8" long HighStrength bolt A325	2	40.0	EA	$10.0	$4.2		$14.2	$ 1,133	05 25 23.25 0350 High Strength bolts A325 type
	9. 1/2" diameter x 8" long High Strength bolt A325	2	80.0	EA	$2.3	$8.4		$10.7	$ 1,708	05 05 23.05 0090 Anchor bolts
	10. Chemical anchor w/rod &epoxy cartridge 3/4"	2	160.0	EA	$8.6	$24.0	$4.1	$36.6	$ 11,722	05 05 23.15 1430 Chemical anchors w/rod &epoxy cartridge
	11. Application of cementitious repair mortar Sikatop123 Plus	2	0.8	CF	$1,200.0	$2.0		$1,202.0	$ 2,003	
	12. Temporary Jacking Pipe	2	20.0	days	$15.0	$250.0	$15.0	$280.0	$ 11,200	
	13. Testing grouting	1	1.0	LS		$2,500.0		$2,500.0	$ 2,500	
				Subtotal	$35,560	$47,403	$2,281		$ 85,244	
						O&P			$ 17,049	
						Contingency			$ 15,344	
						Total			$ 117,637	

Cost per support	$ 29,568	$ 44,403	$ 2,281

AMERICAN WATER

JOB	SHORT TERM REMEDIATION		
SHEET NO	3	OF	4
CALCULATED BY	J.J	DATE	02/27/12
CHECKED BY		DATE	

RICHMOND ROAD STATION
FILTER BUILDING

SUMMARY OF QUANTITIES

ITEM	QTY	UNIT
1. Temporary Post shoring 350 DB	4	EA
2. Temporary Post shoring AS550	24.0	EA
3. 1-inch Level Grouting with Sikagrout 212	22.5	SF
4. Steel Structure A500-GR B Fy=46 ksi	4,888	LBS
5. Steel Structure A36	1,374	LBS
6. Painting Steel	509	SF
7. 7/8" Drilling steel	40	EA
8. 3/4" diameter x 8" long HighStrength bolt A325	40.0	EA
9. 1/2" diameter x 8" long High Strength bolt A325	80.0	EA
10. Chemical anchor w/rod &epoxy cartridge 3/4"	160.0	EA
11. Application of cementitious repair mortar Sikatop123 Plus	0.8	CF

AMERICAN WATER

JOB	SHORT TERM REMEDIATION		
SHEET NO	4	OF	4
CALCULATED BY	J.J	DATE	02/27/12
CHECKED BY		DATE	

1. Temporary Post shoring 350 DB 4 EA

2. Temporary Post shoring AS550 24 EA

3. 1-inch Level Grouting with Sikagrout 212

L	9	in
W	9	in
Qty	40	
Area	22.5	SF

4. Steel Structure A500-GR B Fy=46 ksi

Element	Weight (lb/ft)	Length (ft)	Qty	Total W (lbs)
HSS 3x3x0.125	8.78	13.92	40	4,888
				4,888 LBS

5. Steel Structure A36

L 3x3x 7/16"	8.3	5	20	830
PL 8"x8"x3/8"	6.81	1	80	544
				1,374 LBS

6. Painting Steel

	B(IN)	# sides	H (ft)	Qty	Area (SF)
HSS	3	4	10	40	400
Angles	3	4	5	20	100
Plates	8	1	0.67	20	8.89
					508.89 SF

7. 7/8" Drilling steel 40 EA

8. 3/4" diameter x 8" long HighStrength bolt A325 40 EA

9. 1/2" diameter x 8" long High Strength bolt A325 80 EA

10. Chemical anchor w/rod &epoxy cartridge 3/4" 160 EA

11. Application of cementitious repair mortar Sikatop123 Plus

W (in)	12	in
L (in)	12	in
thick (ft)	1	in
Req'd	10	
Vol	0.83	

Total vol	0.83	CF

Project A-3

RRS EXISTING FILTER BUILDING IMPROVEMENTS

Design and Permitting:	6 months		
Construction:	9 months	Project Cost:	$ 500,000

Need for Project:

The filter piping gallery at the Richmond Road Station is in poor condition and requires upgrades in order to remain in service. The most critical upgrades involve the repair/replacement of ceiling support beams and pipe supports which have corroded to the point that their structural integrity is compromised.

Background:

A structural evaluation of the existing filter building structure was performed in 2012 in order to provide a preliminary assessment of the existing structure. A detailed summary of the evaluation is provided in **Appendix D** of this report. During the structural evaluation, it was found that, among other issues, the pipe supports for the 36-inch cast iron filter influent pipe are severely corroded. In addition, the pipe is being supported from ceiling beams in the filter gallery that are also severely corroded as evidenced by the exposed rebar. Photographic evidence of the condition of the pipe supports and ceiling beams is presented in **Exhibit 1**.

The condition of these pipe supports and beams is of immediate concern for safety reasons as the pipe is essentially unsupported at this time. In addition, these conditions put the plant at risk as the influent pipe is the sole source of supply to the filters and loss of this piping would result in the RRS being out of commission.

Exhibit 1
Corroded Pipe Supports and Ceiling Beams in Filter Gallery

It should be noted that the filter gallery is a congested area with little room to walk or work as illustrated in **Exhibit 2**. In order to perform the improvements described above, valves, pipes, or pipe supports will likely need to be temporarily moved or relocated. This will make work difficult and time consuming which will result in a significant increase in the cost of any rehabilitation work in the pipe gallery.

Exhibit 2
Congested Filter Pipe Gallery

Recommended Solution:

The following actions are recommended to be implemented immediately in the filter gallery:

- Repair and reinforce 10 concrete beams rated critical, 6 concrete beams rated serious, and 8 concrete beams rated poor by strengthening their structural system.
- Recoat the concrete roof slab at selected places by removing the existing concrete cover, applying a corrosion inhibitor, reestablishing the concrete cover with repair mortar, and applying a corrosion-resistant protective coating.
- Replace all steel hanger supports for the 36-inch cast iron filter influent pipe by installing new stainless steel/galvanized steel hanger pipe supports.

Recommendations to address other issues discovered during the structural evaluation are provided in **Project A-2**.

Output and Benefits:

The improvements will reduce a safety risk for employees working in the filter gallery. In addition, the risk of loss of the filter influent pipe, and consequently the entire supply to the filters, is reduced thereby increasing the reliability of the RRS.

Options:

Doing nothing would result in the continued risk to employee safety and vulnerability to supply issues should the filter influent pipe fail.

Budget Discussion:

Costs include installed materials, plus 30% for legal, engineering, admin, AFUDC, overhead and permitting, and 20% for contingency, outlined in **Appendix B**.

Purpose Codes and Drivers:

Asset Type	**%**	**Purpose Code**	**%**
320 – Water Treatment Plant Equipment	100	Asset Renewal Poor Condition	100

Witness: Brent E. O'Neill

2. Refer to the Kentucky-American response to Staff's First Request, Item 5, attachment 5, page 3 of 7, an e-mail from Andy Higgins to Brent E. O'Neill dated February 28, 2013. The e-mail message states, "As a result of the high cost and the possibility that the structure may be replaced, KAW asked whether a lower cost alternative was available to address the immediate safety issue related to the pipe hangers and several of the support beams." A summary of the proposed alternative is provided. The e-mail messages further states, "These repairs should be implemented as soon as possible."

   a. Provide a detailed explanation of Kentucky-American's decision to seek an alternative to the approach for the Richmond Road Filter Piping Gallery prepared by American Water Engineering and identified as a part of the CPS Report that is discussed in the February 28, 2013 e-mail message.

   b. For the proposed alternative summarized in the February 28, 2013 e-mail message, indicate each of the repairs that have been implemented, the date of implementation, and the cost of implementation.

   c. For the proposed alternative summarized in the February 28, 2013 e-mail message, identify any repair that has not been implemented and explain why it has not been implemented.

   d. For the proposed alternative summarized in the February 28, 2013 e-mail message, indicate whether Kentucky-American will still need to implement any of the repairs if the Commission authorizes construction of the Richmond Road Filter Building improvements. If so, identify each repair that Kentucky-American will implement.

Response:

   a. As discussed in the response to Item No. 1 of the Commission Staff's Second Request for Information, Kentucky American Water and American Water Engineering personnel determined that although the identified intermediate project addressed the structural concerns it did not address the lack of space that significantly hinders the safe traversing of the length of the gallery. Moreover, it did not allow for the improved access necessary for performing maintenance on equipment. The project also did not address the congested filter gallery space that also reduced the ability of proper ventilation within the gallery, leading to the inability to effectively remove the chlorine and water vapor within the gallery that was a major contribution to the corrosion issues. These issues and concerns with the longevity of the equipment within the filter gallery and a concern with the overall structural life of the structure resulted decision to seek an alternative to the approach.

b. As discussed in the response to Item No. 8 of the Commission Staff's First Request for information, Kentucky American Water installed 17 floor-mounted pipe supports and cross members to temporarily enhance existing pipe supports for 30-inch and 36-inch diameter cast iron raw water pipe, and to support severely corroded floor slab beams during June 2013. These measures were outlined in the Structural Drawing Set that was attached to the February 28, 2013 email.

The cost associated with the installation of the remedial measures was as follows:

Contracted Services	$ 51,400.00
AFUDC	$ 747.19
Overhead	$ 2,210.20
Total	$ 54,357.39

c. All of the work identified with the alternative project discussed in the February 28, 2013 e-mail message was implemented as part of the work performed during June 2013.

d. Kentucky American Water will not need to implement any additional repairs to the existing filter building if the Commission authorizes construction of the Richmond Road Filter Building improvements.

Witness: Brent E. O'Neill

3. Provide a detailed description of the existing clearwell capacity of the Kentucky-American system as it pertains to the operation of the Richmond Road Station. Indicate the impact to Kentucky-American's clearwell capacity if the Commission authorizes construction of Richmond Road Station Filter Building improvements.

Response:

The Richmond Road Station Water Treatment Facility currently has two (2) clearwells with a combined total volume of 1,054,000 gallons and a combined usable volume of approximately 362,600 gallons. Clearwell 1, which is located next to the High Service Pump Station, has a total volume of 454,000 gallons with a usable volume of approximately 156,000 gallons due to suction requirements of the existing High Service Pumps under most pumping configurations. Clearwell 2, which is located below the existing filter building, has a total volume of 600,000 gallons with a usable volume of approximately 206,600 gallons due to the previously mentioned pump configurations. Currently both clearwells are used to achieve sufficient disinfection contact time (CT) to allow the Richmond Road WTP to achieve a minimum of 4-log inactivation of viruses and 3-log-log inactivation of *Giardia* cysts.

The Richmond Road Station Filter Building improvements include the demolition of Clearwell 2 which is located beneath the existing filter building. To achieve required disinfection without Clearwell 2, one new 275,000 gallon, dual cell CT Contact Basin will be constructed as part of this project. Unlike the existing Clearwell 2, the volume of the CT Contact Basin will be fully usable based on the designed hydraulic grade line through the improvements. The basin allows for the facility to continue to achieve a minimum of 4-log inactivation of viruses and 3-log-log inactivation of *Giardia* cysts.

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2014-00258
COMMISSION STAFF'S SECOND REQUEST FOR INFORMATION

Witness: Brent E. O'Neill

4. Refer to the Kentucky-American response to Staff's First Request, Item 1. Provide an update on the completion status of both the Hazen and Sawer Project Drawings and Specifications and Contract Documents.

Response:

The Hazen and Sawyer Specifications were attached as Exhibit D to the Application in this matter. At that time, they were at a 60% level of detail as explained at page 4 of the Application. Those specifications have now been finalized at a 100% level of detail and are attached.

The Hazen and Sawyer Project Drawings were attached confidentially to the Application as Exhibit E. At that time, they were at a 60% level of detail as well. Those drawings have now been finalized at a 100% level of detail and are being submitted herewith confidentially along with a Petition for Confidential Treatment.

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2014-00258
COMMISSION STAFF'S SECOND REQUEST FOR INFORMATION

Witness: Brent E. O'Neill

5. Provide a discussion regarding the operation of Kentucky-American's existing Richmond Road Station Filter Building as it pertains to compliance with the requirements of the Division of Water. Indicate whether there have been any findings or notices of lack of compliance with the requirements of the Division of Water attributable to the condition and operation of the Richmond Road Station Filter Building. Include any supporting documentation.

Response:

Kentucky American Water has been able to maintain the operation of the filters at the Richmond Road Station WTP efficiently and remain within compliance with the requirements of the Division of Water. The Richmond Road Station facility was presented the Phase III Directors Awards from the Partnership for Safe Water through the U.S Environmental Protection Agency during the 2013 American Water Works Association Annual Conference. The Partnership for Safe Water Program is a voluntary initiative developed by the U.S. Environmental Protection Agency and other water organizations designed to increase protection of the public by encouraging partner utilities to meet requirements that are more stringent than what is required by law through total plant optimization.

As a member of the Partnership for Safe Water, Kentucky American Water demonstrates its commitment to improving the quality of drinking water delivered to customers by optimizing system operations. The Richmond Road Station WTP was further recognized for maintaining the Phase III Directors Award status for 15 years.

Although the existing Richmond Road Filter Building has been able to remain within compliance, a long term concern is that future compliance with the requirements of the DOW will become challenging if not impossible due to the lack of space that significantly hinders the ability to access most of the equipment in the gallery and the performance of maintenance on equipment. These issues and concerns with the age of the equipment within the filter gallery and the restricted ability to further enhance the equipment to meet future requirements that may be established by the DOW support the need to construct the improvements proposed in this case.

As explained in Mr. O'Neill's Direct Testimony (p. 3), the continued deterioration of the concrete support beams of the operating floor above the pipe gallery are concerning. A significant loss of the concrete from the beams and subsequent exposure of the rebar to the corrosive atmosphere of the filter gallery pose a tremendous and potentially catastrophic risk to the 90-year old structure. Although temporary support was installed, a long term solution is critical for the safe and reliable operation of the filters. Please see the Mr. O'Neill's Direct Testimony, generally, and at pp. 3-7 and the HDR Evaluation and Report which was attached to the Application as Exhibit B for all of the analysis and reasoning supporting the proposal in this case.

Witness: Brent E. O'Neill

6. Refer to Kentucky-American's letter dated August 27, 2014, concerning the cost implications related to the timing of issuance of the final decision in this case. Provide documentation supporting the expected price increases of cement, reinforcing steel, stainless steel, and ductile iron pipe. Provide a revised project cost estimate using the increased costs and compare this to the current projected construction cost.

Response:

W. Rogers Company (the selected construction contractor) assessed the possibility of price increases and provided a letter documenting that assessment to Kentucky American Water on August 26, 2014 outlining the potential cost increases or savings that may be derived from Kentucky American Water being able to provide a Notice To Proceed (NTP) in January 2015 instead of in April 2015. A copy of that letter is attached which provides a listing of the cost implications related to the timing of the issuance of the NTP. Based on the information from W. Rogers Company, it is believed that savings would be realized in Division 3, Division 5, Division 11 and Division 15. Following is the revised project cost estimate compared to the current projected construction costs of $13,568,055 as outlined in Question 17 of the Commission Staff's First Request for Information.

Construction Costs ($13,466,055)

Division 1 – General Conditions	$	687,481
Division 2 - Sitework	$	1,940,575
Division 3 – Concrete	$	2,803,844
Division 4 – Masonry	$	259,804
Division 5 – Metals	$	135,586
Division 6 – Woods and Plastics	$	8,240
Division 7 – Thermal and Moisture Protection	$	269,676
Division 8 – Doors and Windows	$	48,839
Division 9 – Painting	$	112,672
Division 10 – Specialties	$	5,672
Division 11 – Process Equipment	$	569,940
Division 13 – Special Construction	$	1,334,450
Division 15 – Mechanical	$	2,258,137
Division 16 – Electrical	$	1,209,888
Division 17 – Control and Information Systems	$	696,358
Contractor Fixed Fees (Supervision)	$	929,893
Engineering Services	$	195,000

The proposed saving is approximately $102,000 of the construction costs for the project or a savings of 0.8% if the project is able to be released for construction 3 months sooner than currently planned. The savings of $102,000 will also reduce the project contingency by approximately $5,000 providing an overall savings to the project of $107,000.

W. ROGERS COMPANY

W. ROGERS COMPANY

CORPORATE OFFICE
649 Bizzell Drive
Lexington, KY 40510
P.O. Box 11640
Lexington, KY 40576
(859) 231-6290
Fax (859) 231-6296

August 26, 2014

Kentucky American Water
2300 Richmond Road
Lexington, Kentucky 40502

Attention: Mr. Brent O'Neill

RE: Richmond Road Station
Filtration Building
Lexington, KY

Dear Brent,

As requested, W. Rogers Company has evaluated potential cost increases or savings which may be derived from KAW issuing a Notice To Proceed (NTP) in January 2014 in lieu of the current schedule of April 2014. Please accept the following as a summary of our review.

From an historical perspective, ENR's Construction Cost Index indicates an average cost increase for materials and labor of 0.01% in the last five years between January and April. However, the material components upon which this measurement is taken is not reflective of the work involved in this project. To project escalation one must look closer at certain components.

Cement prices have been escalating steadily through 2014 and given the steady increase in US construction activity, projections indicate escalation will continue. Through June, the cement Producer Price Index was up 4.3% for the year resulting in an average increase in ready mix concrete of 2%. Annualizing this increase and applying to the January-April period we expect a cost increase approaching $5,000.

Reinforcing steel has also escalated steadily through 2014 although retracting in August. Much of the retraction was believed due to concerns regarding

the Highway Trust Fund. With reauthorization and the return of highway funding and market activity, we expect reinforcing steel costs to steadily increase. In an escalating market producers will not hold long term prices beyond calendar year and increases of $25 to $30 per ton per month thereafter are not uncommon. The earlier NTP will allow us to avoid a likely cost increase of $25,000.

As with any water treatment facility, the project requires a substantial stainless steel component. In this project we have stainless steel air pipe, pump shafts, anchors and other miscellaneous stainless fabrications. Nickel represent 7% to 8% of stainless and since mid year nickel has been rapidly escalating. Further it is expected to continue escalating through 2016. Given the quantity of stainless in the project, we believe an earlier NTP would reduce the escalation the project will incur by $15,000 to $20,000.

The original project scope includes $900,000 of ductile iron pipe and fittings and in the first 7 months of 2014 we have observed a .01% per month increase in cost. Although there will monthly adjustments in the rate of increase we expect the general trend to continue through 2015 and 2016. Through a January to April period this is an expected cost increase of $27,000.

As currently planned, the project is to be constructed with substantial completion achieved in 12 months. As noted in our proposal the schedule requires concrete forming and pouring to be achieved with two (2) shifts. Increasing the contract time will reduce, but not eliminate, the need for second shift work. It also moves concrete work that is planned for late 2015 into better weather months. However, offsets to these savings are increases in overhead cost for the extended duration and the need to perform initial excavation activities in less desirable months. All factors considered, our view is the net change of an earlier NTP will save the project approximately $25,000.

Beyond the above, the impact of diesel fuel and other petroleum distillates should not be overlooked. These components impact all materials incorporated in the project whether used in the manufacturing process (such as filter underdrains) or simply from the impact on cost of freight delivery. Further, such products escalate rapidly in response to weather, politics and international dispute. Currently oil prices are relatively low but considering all factors impacting price, it's not difficult to see a quick rise. Unfortunately this cost is too volatile for us to predict over a short period six (6) months from now.

I hope the above addresses your concern and question. Should you require further information, please contact me.

Sincerely

W ROGERS COMPANY

Boyd Rogers
Vice President

cc: Michael Bailey, Project Manager