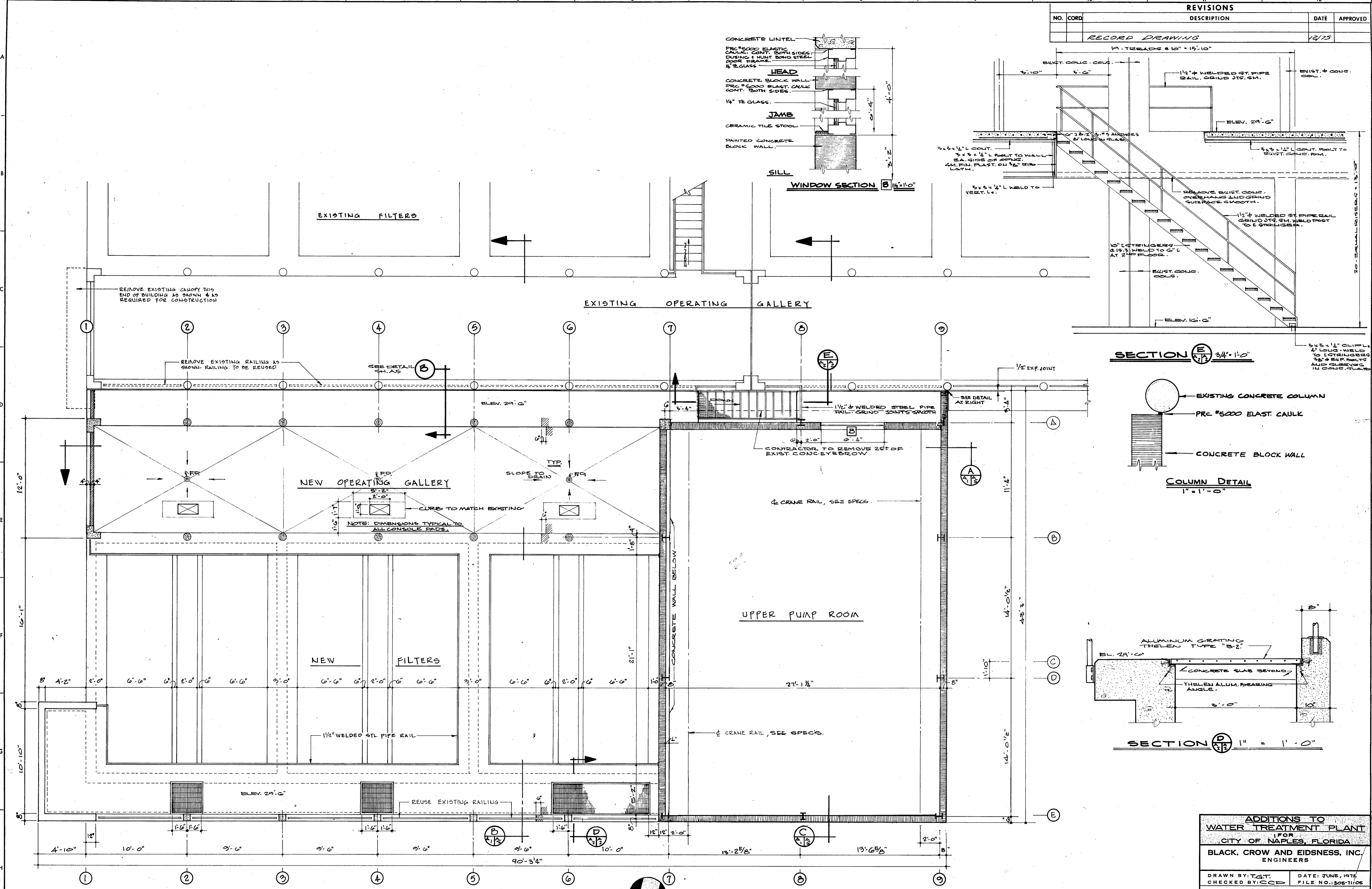
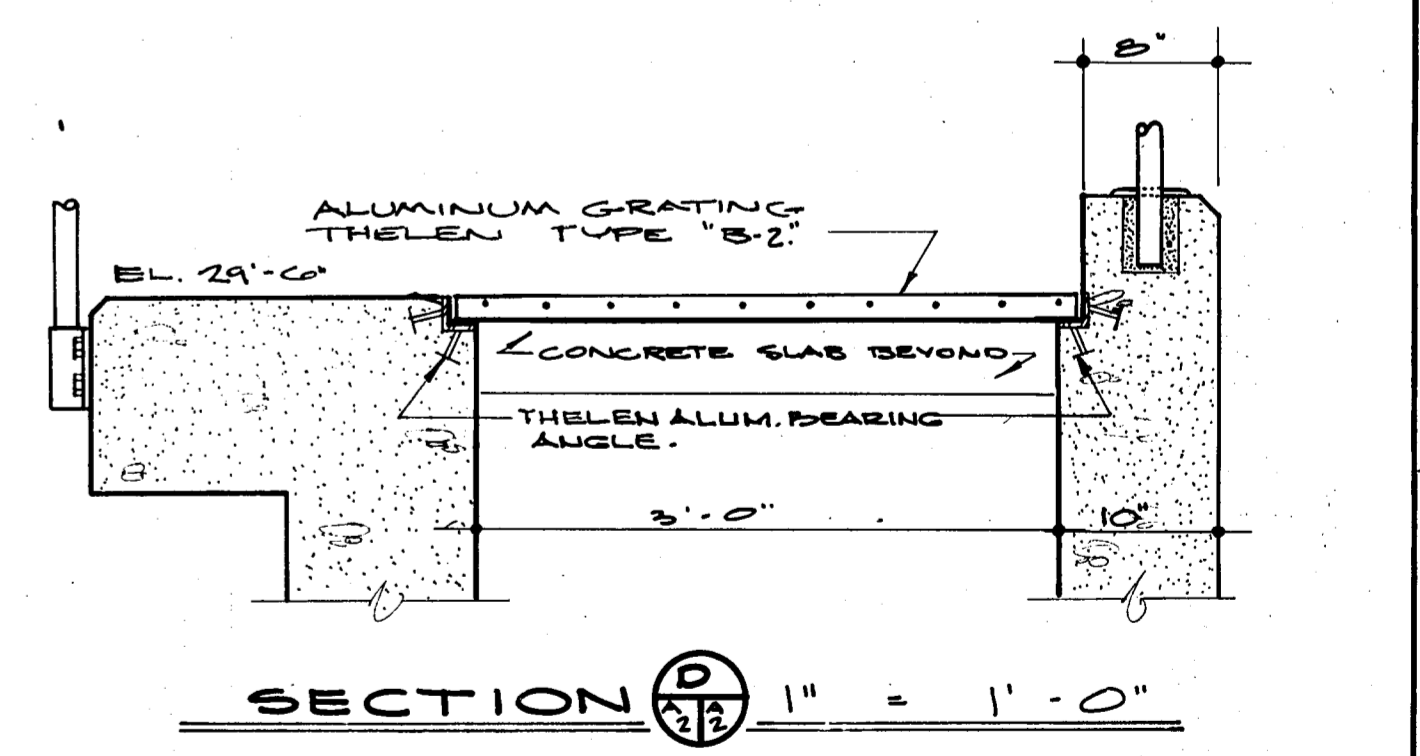
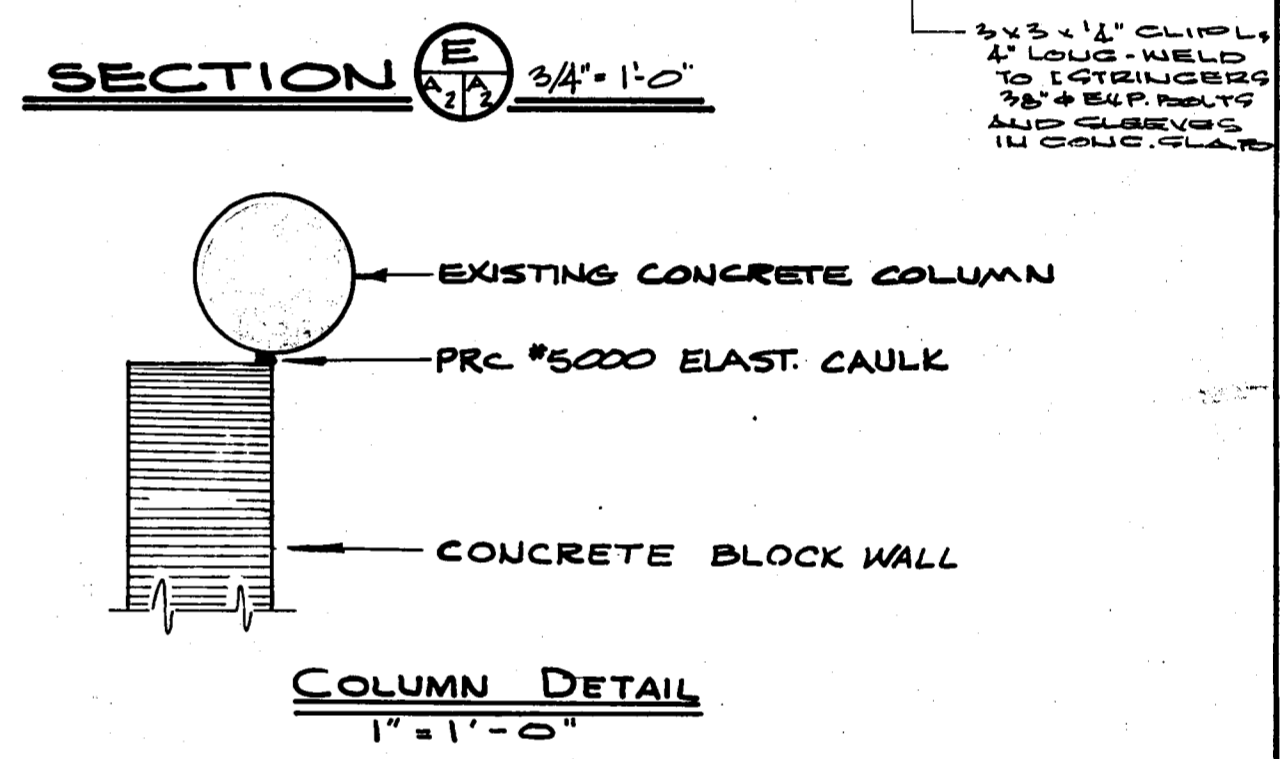
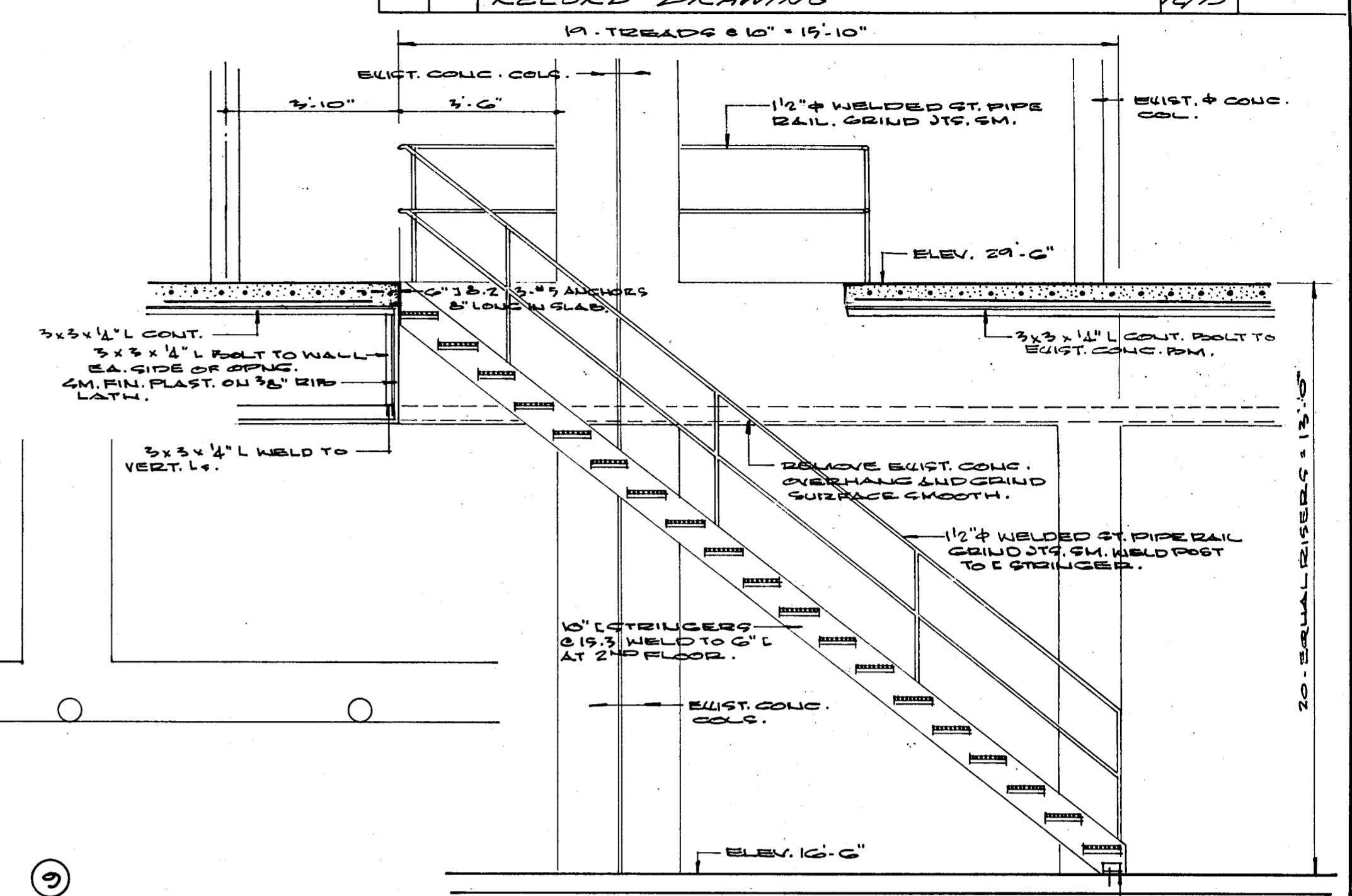
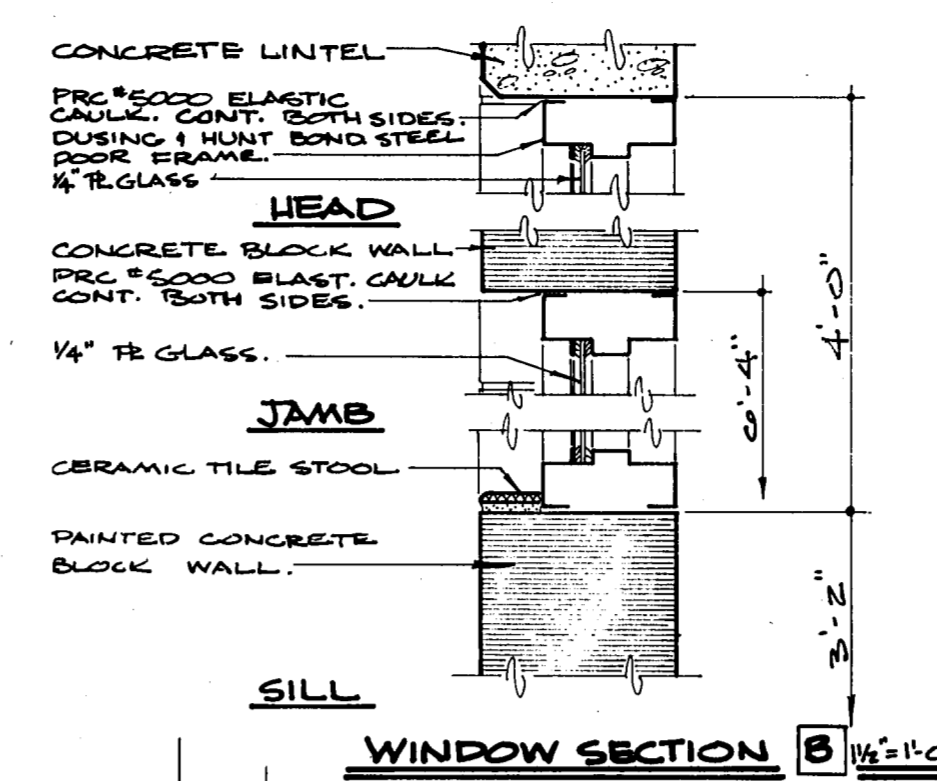


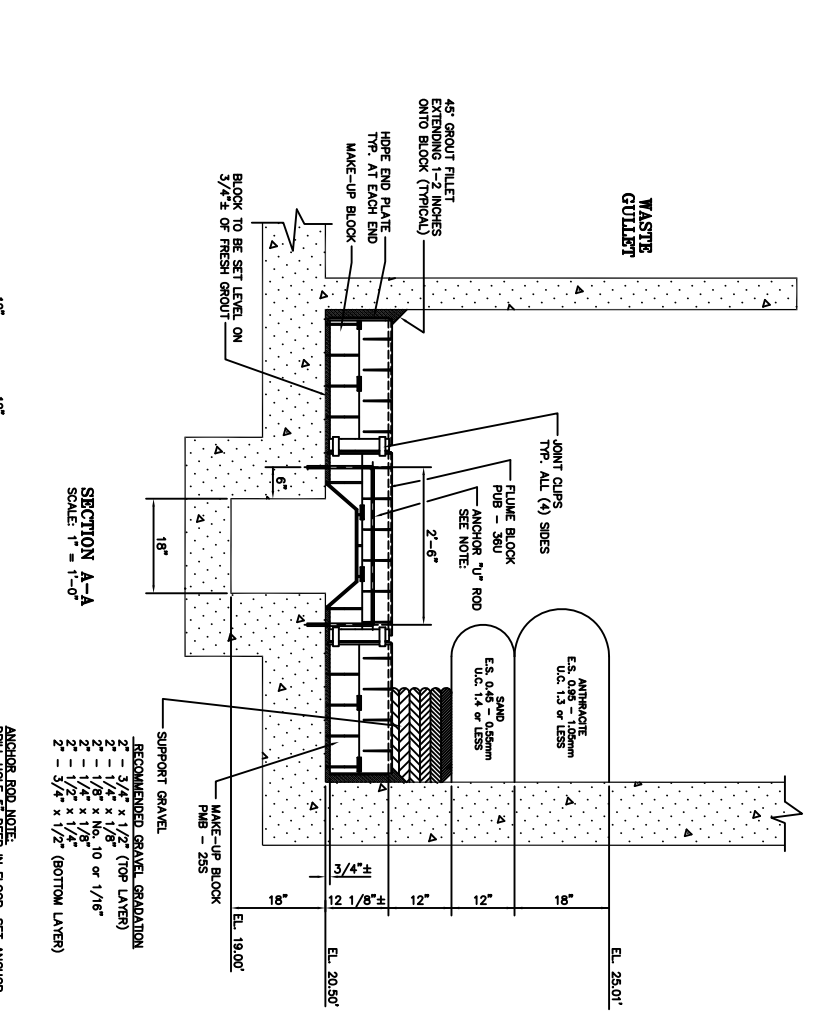
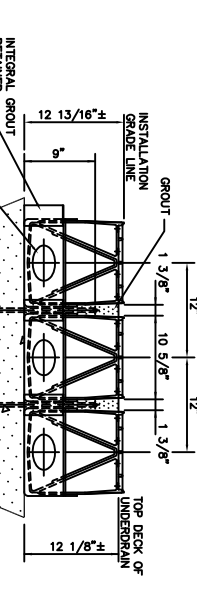
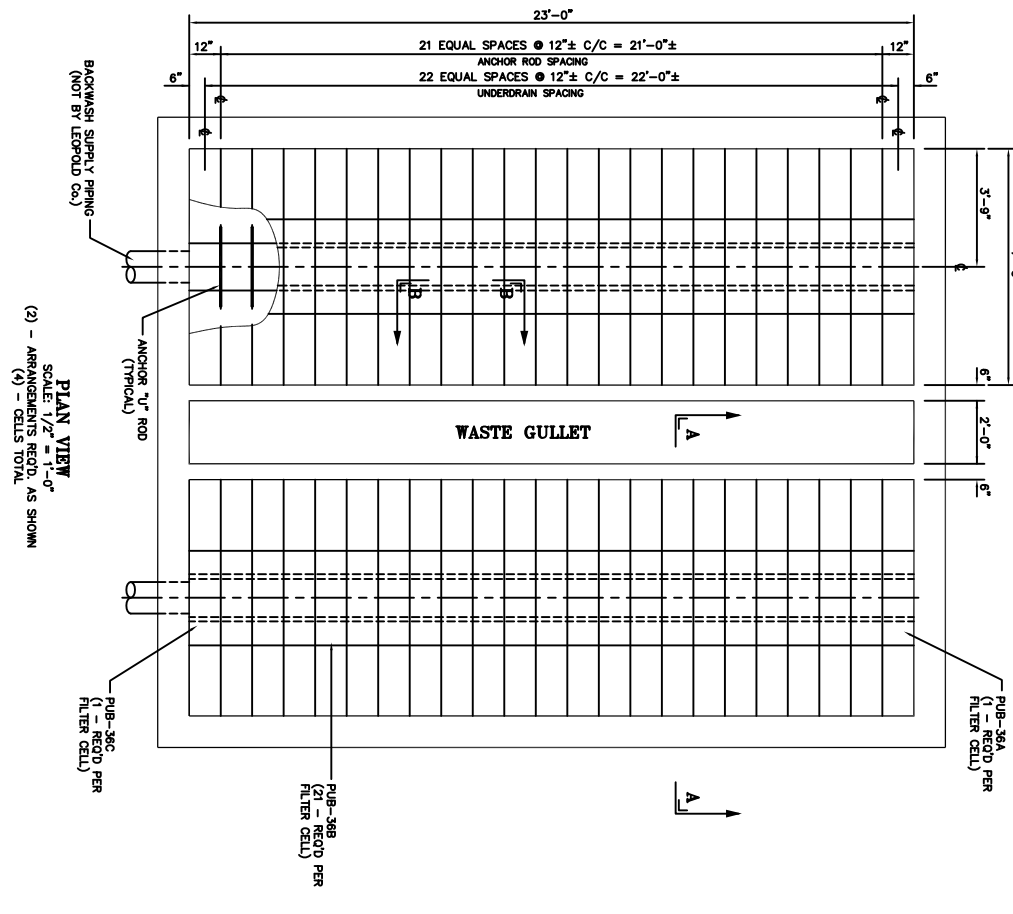
REVISIONS				
NO.	CORD	DESCRIPTION	DATE	APPROVED
		RECORD DRAWING	12/15	



SECOND FLOOR PLAN 1/4" = 1'-0"

ADDITIONS TO WATER TREATMENT PLANT
FOR
CITY OF NAPLES, FLORIDA
BLACK, CROW AND EIDNESS, INC.
ENGINEERS
DRAWN BY: T.G.T. DATE: JUNE, 1972
CHECKED BY: C.C.D. FILE NO.: 306-71/06
SCALE: AS NOTED
FILTER BUILDING SECOND FLOOR PLAN & DETAILS
SHEET NO. **A-2**

- NOTES**
1. FILTER DESIGN BASED ON 20 GPM/SQ.FT BACKWASH RATE
 2. FILTER BLOCK TO BE STRUCTURAL HOPE
 3. ENGINEER &/OR CONTRACTOR TO VERIFY ALL DIMENSIONS AT APPROVAL
 4. DIMENSIONS AND OTHER INFORMATION PRESENTED ON THIS DRAWING REQUIRE THE USER TO OBTAIN THE PROPER PERMITS AND APPROVALS FROM THE LOCAL AGENCIES. LEOPOLD HAS NOT AND WILL NOT MAKE ANY SITE SURVEY AND WE EXPECT THE PURCHASER TO VERIFY ALL MEASUREMENTS SHOWN. PROVIDE NEW INFORMATION WHERE REQUESTED, AND ADVISE US OF ANY CHANGES TO THE DESIGN OF OUR EQUIPMENT. LEOPOLD WILL ASSUME NO RESPONSIBILITY FOR ANY COSTS ASSOCIATED WITH EXTRA WORK NECESSITATED BY UNDISCLOSED CONDITIONS.



ITEM "A" UNDERDRAIN

FOR THE USE OF THE USER TO OBTAIN THE PROPER PERMITS AND APPROVALS FROM THE LOCAL AGENCIES. LEOPOLD HAS NOT AND WILL NOT MAKE ANY SITE SURVEY AND WE EXPECT THE PURCHASER TO VERIFY ALL MEASUREMENTS SHOWN. PROVIDE NEW INFORMATION WHERE REQUESTED, AND ADVISE US OF ANY CHANGES TO THE DESIGN OF OUR EQUIPMENT. LEOPOLD WILL ASSUME NO RESPONSIBILITY FOR ANY COSTS ASSOCIATED WITH EXTRA WORK NECESSITATED BY UNDISCLOSED CONDITIONS.

REVISION	UNIVERSAL UNDERDRAIN	DATE	SCALE
1	CENTER YIELD	10-8-93	AS NOTED
2	ARRANGEMENT		
3			

DRAWN BY: _____ CHECKED BY: _____

DATE: 10-8-93 SCALE: AS NOTED

NO. 5434.90.1

	STANDARD SPECIFICATION	MBM-S-100
	FILTER MEDIA AND GRAVEL	April 2012
		PAGE 1 OF 6

PART 1.0 GENERAL

1.1 SCOPE OF WORK

A. DESCRIPTION

Furnish, install, and test new filter media and gravel as indicated and specified. Filter media shall be provided for _____ filters with an area of _____ square feet (m²) each. The filters shall consist of _____ inches (mm) of filter media, as indicated in PART 2.0 - PRODUCTS.

1.2 QUALITY ASSURANCE

The filter equipment manufacturer shall furnish a Quality Control Manual demonstrating that the filter media and gravel to be furnished will comply with the requirements of the contract specifications. The Quality Control Manual will define the following:

- A. Qualification of the raw feedstock
- B. Control procedures at the screening mill
- C. Independent testing laboratories
- D. Packaging definition
- E. Purchase orders
- F. Storage procedures

1.3 STANDARDS

American Water Works Association Standard B100; "Standard for Filtering Material."

1.4 SUBMITTALS

All submittals and technical information will be provided and approved by a licensed engineer regularly employed by the filter manufacturer. The engineer shall have at least 15 years experience in water treatment. All submittals shall include the following information as a minimum:

- Supplier's Name
- Resume of Engineer Providing Submittals
- Quality Control Manual
- Gradation of Each Media Type
- Date of Sampling/Lot Number
- Samples of Each Media Type (If Required)

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- Complete Sieve Analysis of Representative Samples (i.e. effective size and uniformity coefficient; All other characteristics will be as described in the Quality Control Manual.)
- Material Quantities
- Diagram with Type of Material and Depth of Each
- Estimated Shipping Schedule
- Media Loading Procedure

1.5 PACKAGING

- A. All gravel and filter media will be shipped in "semi-bulk" containers having lifting loops and bottom discharge spout, weighing approximately 2,000-4,000 pounds (907.2-1814.4kg) each.

Optional: All gravel and filter media shall be delivered in one cubic foot (0.028m³) (plastic/paper) bags.

	ONE CUBIC FOOT (0.028m ³) BAG WEIGHT	SUPERBAGS SHIPPING WEIGHT
Gravel	100 lbs. (45.36 kg)	3000-3500 lbs. (1360.8-1587.6 kg)
Sand	100 lbs. (45.36 kg)	4000 lb./40 cu.ft. (1814.4 kg/1.12 m ³)
Anthracite	50 lbs. (22.68 kg)	3000 lb./60 cu.ft. (1360.8 kg/1.68 m ³)

- B. Delivery of "bulk" shipments will not be permitted unless the contractor can demonstrate that the materials can be handled and stored without contamination.

1.6 SHIPMENTS

- A. Materials will not be shipped until the submittals are approved by the owner. Approval of the submittals, including the Quality Control Manual, samples and independent testing, shall constitute acceptance of the media.
- B. The schedule of work shall be submitted to the owner for approval prior to commencement of work.
- C. The contractor shall be responsible for coordinating the shipment of supplies of materials and equipment specified herein. Coordination will be required during construction, start-up and/or testing.
- D. The owner shall provide storage space for gravel and filter media and protect it from exposure to sunlight if stored for more than two weeks. Paper bags (if used) shall be protected from moisture at all times.

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PART 2.0 PRODUCTS

2.1 MANUFACTURERS

Filter media and support gravel shall be provided by Xylem Water Solutions Zelenople LLC.

2.2 FILTER MEDIA

- A. The support gravel shall consist of a minimum of 12 inches (305mm) of clean, hard, durable, rounded particles of high quality which shall meet or exceed the requirements of AWWA B100, and be consistent with the recommendations of the filter equipment manufacturer.

Gravel Sizes

Top

3" -1/8 x #10 or #12

3" - 1/4 x 1/8

3" - 1/2 x 1/4

3" - 3/4 x 1/2

- B. Filter sand shall be composed of hard, durable clean silicious particles, free of all mica with an average specific gravity of 2.6 (± 0.05) and shall be in strict accordance with AWWA B100, and have an effective size of 0.45-0.55mm, and a uniformity coefficient of 1.40 or less, for a finished depth after backwashing and scraping and removal of fines and debris of 12_ inches (mm). For depths up to 12 inches (305mm), a 1/2 inch (13mm) skimming allowance shall be provided.
- C. Filter anthracite shall be composed of specially selected and graded hard, durable anthracite coal particles. The anthracite shall be composed entirely of deep mined material. A quality control manual shall be included to show the source of the material and the quality of the material produced. The anthracite shall have an average specific gravity of 1.65 (± 0.05) with a hardness (Mohs' scale) of 2.7 or more and shall be essentially free of iron, clay, shale, extraneous dirt, and excessive dust with moisture less than 4.0 percent as shipped. The anthracite shall be in accordance with AWWA B100, and have an effective size of 0.95-1.05 mm, and a uniformity coefficient of 1.40 or less for a finished depth after backwashing and scraping and removal of fines and debris of 18_ inches (mm). A skimming allowance of 1 inch (25mm) shall be provided.

PART 3 EXECUTION

3.1 TESTING

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The contractor shall furnish test data from a licensed and recognized independent testing laboratory detailing the following characteristics. Test data to be submitted in the form of shop drawings, and shall be approved prior to shipment of materials.

- Supplier's Name
- Date of Sampling/Lot Number
- Gravel
 - Complete sieve analysis of representative samples, specific gravity and acid solubility
- Sand and Garnet Sand
 - Complete sieve analysis of representative samples, i.e., effective size, uniformity coefficient, specific gravity and acid solubility
- Anthracite
 - Complete sieve analysis of representative samples, i.e., effective size, uniformity coefficient, specific gravity, Mohs' hardness and acid solubility

Onsite or post-placement testing of the filter media is not required. Quality control testing for gradation shall be furnished for each shipment.


All testing shall conform to the requirements of the latest edition of AWWA B100.

3.2 INSTALLATION

- A. Marks shall be placed on the side of the filter designating the top elevation of each layer.
- B. Carefully place each layer so as not to disturb the previous layers.
- C. Do not stand or walk directly upon the filter materials. Workers must stand or walk on boards which will sustain their weight without displacing the gravel and media.
- D. Measure depth of each layer of media after it has been backwashed and skimmed as recommended by the filter equipment manufacturer.

3.3 TECHNICAL DIRECTION

- A. Install all items in accordance with the instruction of the filter equipment manufacturer, under the direct technical supervision of the manufacturer. The filter equipment manufacturer's technical director shall supervise the installation of all filter materials.

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The technical director shall be present for a minimum of _____ days in _____ trips to the jobsite. An additional _____ days and _____ trips shall be allocated for operator training.

- B. Upon completion of the installation, the technical director shall furnish a certificate of compliance detailing that the filtering materials have been installed in accordance with the manufacturer's instructions.


3.4 DISINFECTION

After all work is completed and before the filter is placed in service, the owner will disinfect the entire filter by chlorination.

****END OF SECTION****

OPTIONAL SECTION – ADD TO SECTION 2.2

- D. Garnet sand shall be provided in a quantity equivalent to a depth of three inches. An extra 1/2 inch shall be provided as a skimming allowance. The garnet sand shall be equivalent to the following sieve analysis.

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U.S. Sieve	Percent Retained	Percent Passing	Bulk Density	U.C.	E.S.
30	2.0	98.0	122	1.57	28mm
35	13.9	83.9			
40	29.8	53.7			
45	23.0	30.4			
50	14.0	16.2			
60	12.3	3.7			
70	3.5	.2			
80	.2	0			



POTA-POX® PLUS SERIES N140

PRODUCT PROFILE

- GENERIC DESCRIPTION** Polyamidoamine Epoxy
- COMMON USAGE** Innovative potable water coating which offers high-build edge protection and allows for application at a wide range of temperatures (down to 35°F or 2°C with 44-700 Accelerator). For use on the interior and exterior of steel or concrete tanks, reservoirs, pipes, valves, pumps and equipment in potable water service.
- COLORS** 1211 Red, 1255 Beige, 00WH Tnemec White, 15BL Tank White, 35GR Black and 39BL Delft Blue. **Note:** Epoxies chalk with extended exposure to sunlight. Lack of ventilation, incomplete mixing, miscatalyzation or the use of heaters that emit carbon dioxide and carbon monoxide during application and initial stages of curing may cause yellowing to occur.
- SPECIAL QUALIFICATIONS** Certified by **NSF International** in accordance with **ANSI/NSF Std. 61**. Ambient air cured Series N140 (with or without 44-700 Epoxy Accelerator) is qualified for use on tanks and reservoirs of 1,000 gallons (3,785 L) capacity or greater, pipes 18 inches (46 cm) in diameter or greater, valves four (4) inches (10 cm) in diameter or greater and fittings four (4) inches (10 cm) in diameter or greater. Conforms to **AWWA D 102 Inside Systems No. 1 and No. 2** (with or without 44-700). Conforms to **AWWA C 210** (without 44-700). Contact your Tnemec representative for systems and additional information. A two-coat system at 4.0-6.0 dry mils (100-150 dry microns) per coat passes the performance requirements of MIL-PRF-4556F for fuel storage. Reference the "Search Listings" section of the NSF website at www.nsf.org for details on the maximum allowable DFT.
- PERFORMANCE CRITERIA** Extensive test data available. Contact your Tnemec representative for specific test results.

COATING SYSTEM

- SURFACER/FILLER/PATCHER** 215, 217, 218
- PRIMERS** Self-priming, 22, 91-H₂O, 94-H₂O, L140, L140F, N140F, V140, V140F, 141
- TOPCOATS** **Interior:** Series 22, FC22, L140, L140F, N140, N140F, V140, V140F, 141, 406.
Exterior: Series 27, 66, L69, L69F, N69, N69F, V69, V69F, 72, 73, L140, L140F, N140, N140F, V140, V140F, 156, 157, 161, 175, 180, 181, 446, 740, 750, 1028, 1029, 1074, 1074U, 1075, 1075U, 1077, 1078, 1080, 1081. Refer to COLORS on applicable topcoat data sheets for additional information. **Note:** The following recoat times apply for Series N140: Immersion Service—Surface must be scarified by blasting with fine abrasive after 60 days. Atmospheric Service—After 60 days, scarification or an epoxy tie-coat is required. When topcoating with Series 740 or 750, recoat time for N140 is 21 days. Contact your Tnemec representative for specific recommendations.

SURFACE PREPARATION

- PRIMED STEEL** **Immersion Service:** Scarify the epoxy prime coat surface by abrasive blasting with fine abrasive before topcoating if it has been exterior exposed for 60 days or longer and N140 is the specified topcoat.
- STEEL** **Immersion Service:** SSPC-SP10/NACE 2 Near-White Blast Cleaning with a minimum angular anchor profile of 1.5 mils. **Non-Immersion Service:** SSPC-SP6/NACE 3 Commercial Blast Cleaning with a minimum angular anchor profile of 1.5 mils.
- CAST/DUCTILE IRON** Contact your Tnemec representative or Tnemec Technical Services.
- CONCRETE** Allow new concrete to cure 28 days. For optimum results and/or immersion service, abrasive blast referencing SSPC-SP13/NACE 6, ICRI-CSP 2-4 Surface Preparation of Concrete and Tnemec's Surface Preparation and Application Guide. Fill all holes, pits, voids and cracks with 215, 217 or 218.
- ALL SURFACES** Must be clean, dry and free of oil, grease and other contaminants.

TECHNICAL DATA

- VOLUME SOLIDS** 67.0 ± 2.0% (mixed—A, B & 44-700 Epoxy Accelerator) †
- RECOMMENDED DFT** 2.0 to 10.0 mils (50 to 225 microns) per coat. **Note:** MIL-PRF-4556F applications require two coats at 4.0-6.0 mils (100-150 microns) per coat. Otherwise, the number of coats and thickness requirements will vary with substrate, application method and exposure. Contact your Tnemec representative.

CURING TIME AT 5 MILS DFT Without 44-700 Accelerator:

Temperature	To Handle	To Recoat	Immersion
90°F (32°C)	5 hours	7 hours	7 days
80°F (27°C)	7 hours	9 hours	7 days
70°F (21°C)	9 hours	12 hours	7 days
60°F (16°C)	16 hours	22 hours	9 to 12 days
50°F (10°C)	24 hours	32 hours	12 to 14 days

Curing time varies with surface temperature, air movement, humidity and film thickness. **Note:** For valve applications allow 14 days cure at 75°F (24°C) prior to immersion. For pipe applications allow 30 days cure at 75°F (24°C) prior to immersion. **Ventilation:** When used in enclosed areas, provide adequate ventilation during application and cure. **Note:** Refer to product listing on www.nsf.org for specific potable water return to service information. **Note:** For faster curing and low temperature applications, add No. 44-700 Epoxy Accelerator, see separate product data sheet for cure information.

- VOLATILE ORGANIC COMPOUNDS** **Unthinned:** 2.4 lbs/gallon (285 grams/litre)
Thinned 5% (#60): 2.6 lbs/gallon (311 grams/litre)
Thinned 10% (#4): 2.8 lbs/gallon (334 grams/litre) †
- HAPS** **Unthinned:** 2.4 lbs/gal solids **Thinned 5% (#60):** 2.4 lbs/gal solids
Thinned 10% (#4): 3.3 lbs/gal solids
- THEORETICAL COVERAGE** 1,070 mil sq ft/gal (27.2 m²/L at 25 microns). See APPLICATION for coverage rates. †
- NUMBER OF COMPONENTS** Two: Part A (amine) and Part B (epoxy) — One (Part A) to one (Part B) by volume.

POTA-POX® PLUS | SERIES N140

PACKAGING	5 gallon (18.9L) pails and 1 gallon (3.79L) cans - Order in multiples of 2. Reference 44-700 Epoxy Accelerator product data sheet for its packaging information.
NET WEIGHT PER GALLON	12.66 ± 0.25 lbs (5.82 ± .11 kg) (mixed) †
STORAGE TEMPERATURE	Minimum 20°F (-7°C) Maximum 110°F (43°C)
TEMPERATURE RESISTANCE	(Dry) Continuous 250°F (121°C) Intermittent 275°F (135°C)
SHelf LIFE	Part A: 24 months; Part B: 12 months at recommended storage temperature.
FLASH POINT - SETA	Part A: 82°F (28°C) Part B: 80°F (27°C) 44-700: None
HEALTH & SAFETY	Paint products contain chemical ingredients which are considered hazardous. Read container label warning and Material Safety Data Sheet for important health and safety information prior to the use of this product. Keep out of reach of children.

APPLICATION

COVERAGE RATES	Dry MILS (Microns)	Wet MILS (Microns)	Sq Ft/Gal (m ² /Gal)
Suggested	6.0 (150)	9.0 (230)	179 (16.6)
Minimum	2.0 (50)	3.0 (75)	537 (49.9)
Maximum	10.0 (225)	15.0 (375)	107 (10.0)

Note: Roller or brush application requires two or more coats to obtain recommended film thickness. Allow for overspray and surface irregularities. Wet film thickness is rounded to the nearest 0.5 mil or 5 microns. Application of coating below minimum or above maximum recommended dry film thicknesses may adversely affect coating performance. Reference the "Search Listings" section of the NSF website at www.nsf.org for details on the maximum allowable DFT. †

- MIXING**
1. Start with equal amounts of both Parts A & B.
 2. Using a power mixer, separately stir Parts A & B.
 3. (For accelerated version. If not using 44-700, skip to No. 4.) Add four (4) fluid ounces of 44-700 per gallon of Part A while Part A is under agitation.
 4. Add Part A to Part B under agitation, stir until thoroughly mixed.
 5. Both components must be above 50°F (10°C) prior to mixing. For application of the unaccelerated version to surfaces between 50°F to 60°F (10°C to 16°C) or the accelerated version to surfaces between 35°F to 50°F (2°C to 10°C), allow mixed material to stand 30 minutes and restir before using.
 6. For optimum application properties, the material temperature should be above 60°F (16°C).
- Note:** The use of more than the recommended amount of 44-700 will adversely affect performance.

THINNING Use No. 4 or No. 60 Thinner. For air spray, thin up to 10% or 3/4 pint (380 mL) per gallon with No. 4 Thinner or thin up to 5% or 1/4 pint (190 mL) per gallon with No. 60 Thinner. For airless spray, roller or brush, thin up to 5% or 1/4 pint (190 mL) per gallon. **Caution: Series N140 NSF certification is based on thinning with No. 4 or No. 60 Thinner for tanks and only No. 60 Thinner for pipe, valves and fittings.** Use of any other thinner voids ANSI/NSF Std. 61 certification.

POT LIFE Without 44-700 6 hours at 50°F (10°C) 4 hours at 75°F (24°C) 1 hour at 100°F (38°C)
With 44-700 2 hours at 50°F (10°C) 1 hour at 75°F (24°C) 30 minutes at 100°F (38°C)

SPRAY LIFE Without 44-700: 1 hour at 77°F (25°C) With 44-700: 30 minutes at 75°F (24°C)

Note: Spray application after listed times will adversely affect ability to achieve recommended dry film thickness.

APPLICATION EQUIPMENT

Air Spray

Gun	Fluid Tip	Air Cap	Air Hose ID	Mat'l Hose ID	Atomizing Pressure	Pot Pressure
DeVilbiss JGA	E	765 or 704	5/16" or 3/8" (7.9 or 9.5 mm)	3/8" or 1/2" (9.5 or 12.7 mm)	75-100 psi (5.2-6.9 bar)	10-20 psi (0.7-1.4 bar)

Airless Spray

Tip Orifice	Atomizing Pressure	Mat'l Hose ID	Manifold Filter
0.015"-0.019" (380-485 microns)	3000-4800 psi (207-330 bar)	1/4" or 3/8" (6.4 or 9.5 mm)	60 mesh (250 microns)

Low temperatures or longer hoses require higher pot pressure. Use appropriate tip/atomizing pressure for equipment, applicator technique and weather conditions.

Roller: Use 3/8" or 1/2" (9.5 mm to 12.7 mm) synthetic woven nap roller cover. Use longer nap to obtain penetration on rough or porous surfaces.

Brush: Recommended for small areas only. Use high quality natural or synthetic bristle brushes.

SURFACE TEMPERATURE Without 44-700: Min. 50°F (10°C), Max. 135°F (57°C) With 44-700: Min. 35°F (2°C), Max. 135°F (57°C)
The surface should be dry and at least 5°F (3°C) above the dew point. Coating will not cure below minimum surface temperature.

CLEANUP Flush and clean all equipment immediately after use with the recommended thinner or MEK.
† Values may vary with color.

WARRANTY & LIMITATION OF SELLER'S LIABILITY: Tnemec Company, Inc. warrants only that its coatings represented herein meet the formulation standards of Tnemec Company, Inc. THE WARRANTY DESCRIBED IN THE ABOVE PARAGRAPH SHALL BE IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. The buyer's sole and exclusive remedy against Tnemec Company, Inc. shall be for replacement of the product in the event a defective condition of the product should be found to exist and the exclusive remedy shall not have failed its essential purpose as long as Tnemec is willing to provide comparable replacement product to the buyer. NO OTHER REMEDY (INCLUDING, BUT NOT LIMITED TO, INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR LOST PROFITS, LOST SALES, INJURY TO PERSON OR PROPERTY, ENVIRONMENTAL INJURIES OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL LOSS) SHALL BE AVAILABLE TO THE BUYER. Technical and application information herein is provided for the purpose of establishing a general profile of the coating and proper coating application procedures. Test performance results were obtained in a controlled environment and Tnemec Company makes no claim that these tests or any other tests, accurately represent all environments. As application, environmental and design factors can vary significantly, due care should be exercised in the selection and use of the coating.