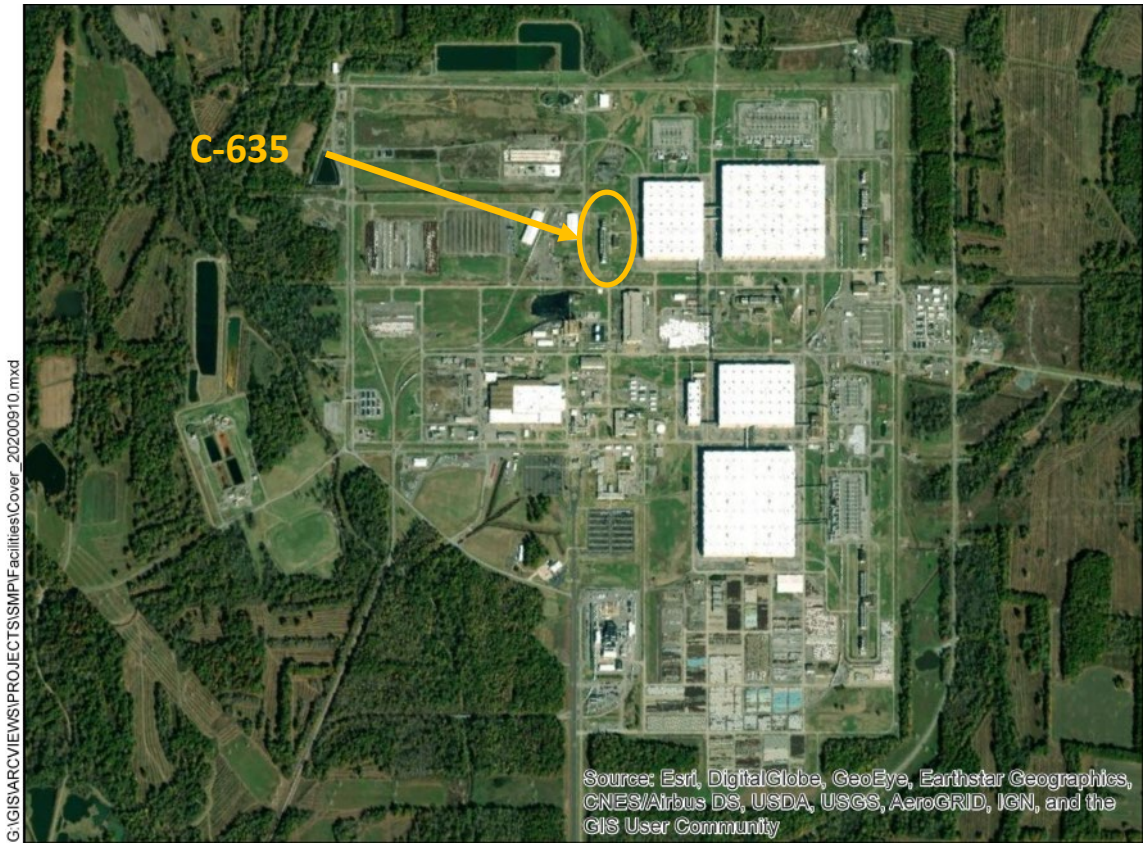
C-635 Pumphouse and Cooling Tower (Solid Waste Management Unit 88)



Facility Overview Briefing

August 31, 2022

Reflects consultation with EPA and Kentucky in accordance with the Site Management Plan that occurred on August 29, 2022, and includes incorporation of comments from those discussions.

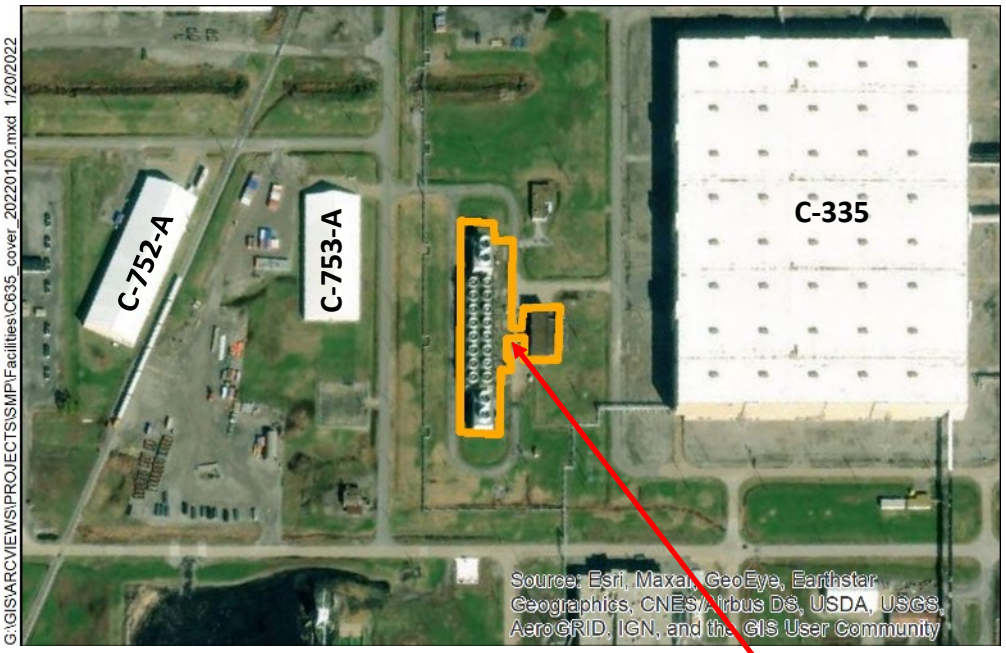
Purpose

- The C-635 Pumphouse and Cooling Tower is discussed in Appendix 4 of the Site Management Plan (SMP) and is designated as Solid Waste Management Unit (SWMU) 88.

- The C-635 Pumphouse and Cooling Tower (SWMU 88) is a candidate for future demolition and disposal, contingent upon funding priorities.

- The current SMP strategy includes the removal of the C-635 Pumphouse and Cooling Tower (SWMU 88) facilities as part of the Facility D&D Operable Unit (OU) and evaluation of underlying soils and slabs as part of the Soils and Slabs OU.

- This presentation is intended to serve as clarification of which C-635 Pumphouse and Cooling Tower facilities are associated with SWMU 88 and to document DOE's consultation with EPA and Kentucky for demolition and disposal of the aboveground structures outside of the FFA/CERCLA process.



C-635 Cooling Tower Photo: 2/2022

Construction History

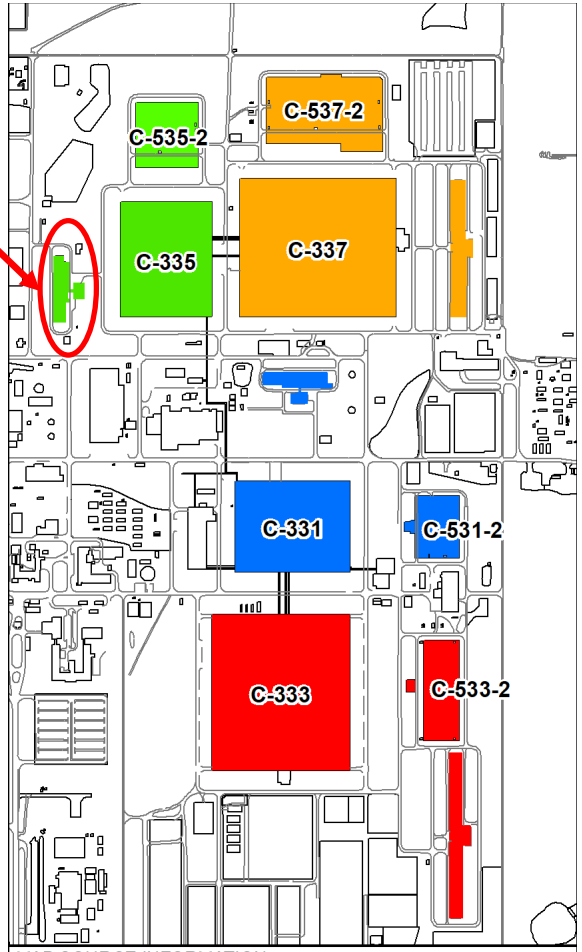
- The C-635 Pumphouse and Cooling Tower (SWMU 88) is located within the Paducah Site security fence, west of the C-335 process building.

- Construction of the C-635 Pumphouse and Cooling Tower began in 1954; with additional facilities added in 1975/1976.

- The C-635 Pumphouse and Cooling Tower is one of four similar sets of facilities designed to support the process buildings
- (C-331, C-333, C-335, and C-337).
  - The C-635 Pumphouse and Cooling Tower supported the C-335 process building and a portion of the south end of C-337.

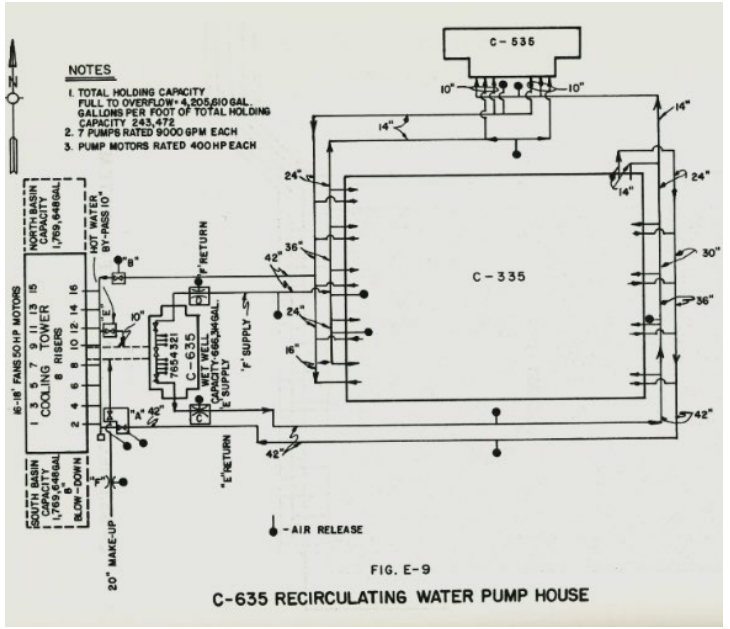
- In addition to the process buildings, the four cooling tower and pumphouse facilities also supported additional plant facilities (e.g., switchyards).
  - The C-635 Pumphouse and Cooling Tower supported the C-535 Switchyard synchronous condensers.

- The cooling tower and pumphouse facilities were, often referred to as “recirculating cooling water (RCW) plants”
  - Designed to continuously pump cooling water through the process and auxiliary building heat exchangers associated with the gaseous diffusion process.



Construction History

- RCW Cycle:
  - Cooled water was pumped from the pump house through underground supply headers to the process building and into heat exchanger units where the water temperature rose as the water absorbed heat from the process equipment. Heated water was then returned through underground return mains (gravity feed) to the cooling towers where the heated water was distributed through various sections of the cooling tower and released via evaporation. The cooled water was then collected into the cooling tower basin where it then flowed by gravity via a flume into the wet well located underneath the pump house.
    - Cooled water from the pump house was also pumped through underground supply headers to the synchronous condensers located in the switchyard; where the water was heated and then returned through underground return mains (gravity feed) to the cooling towers
  - Approximately 500 million gallons per day (MGD) of water was recirculated through the four cooling tower and pumphouse facilities with nearly 8-25 MGD of water loss to evaporation each day depending on the plant load or power level.



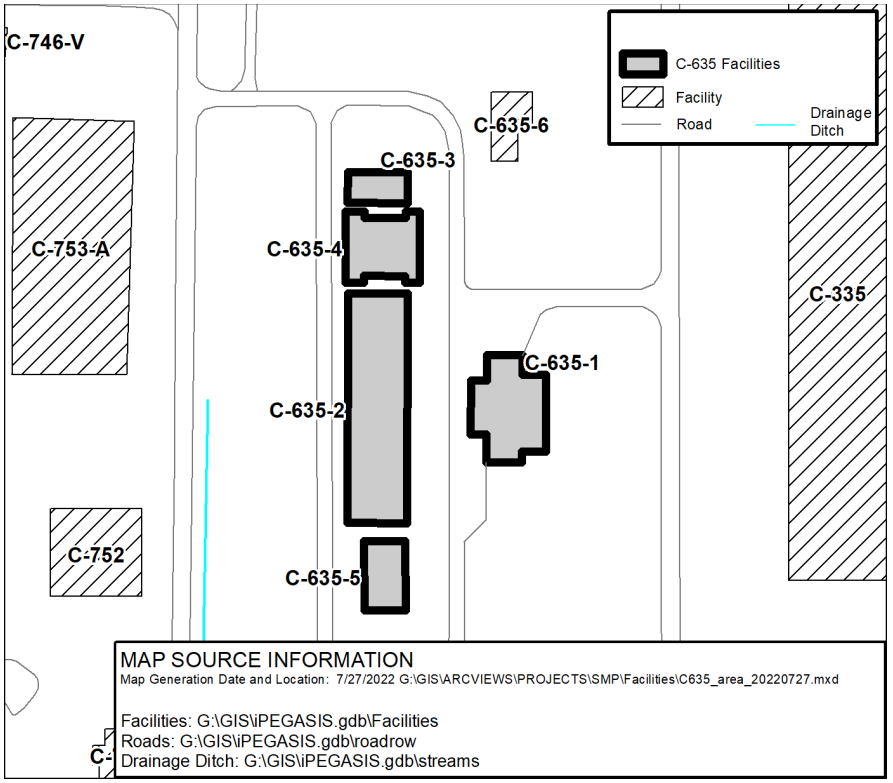
C-635 Cooling Tower Diagram: 7/1962

- Each pumphouse and cooling tower contained the following.
  - Pump house
  - Main cooling tower(s)
  - Blending pump house
  - Blending cooling towers
  - Other support buildings

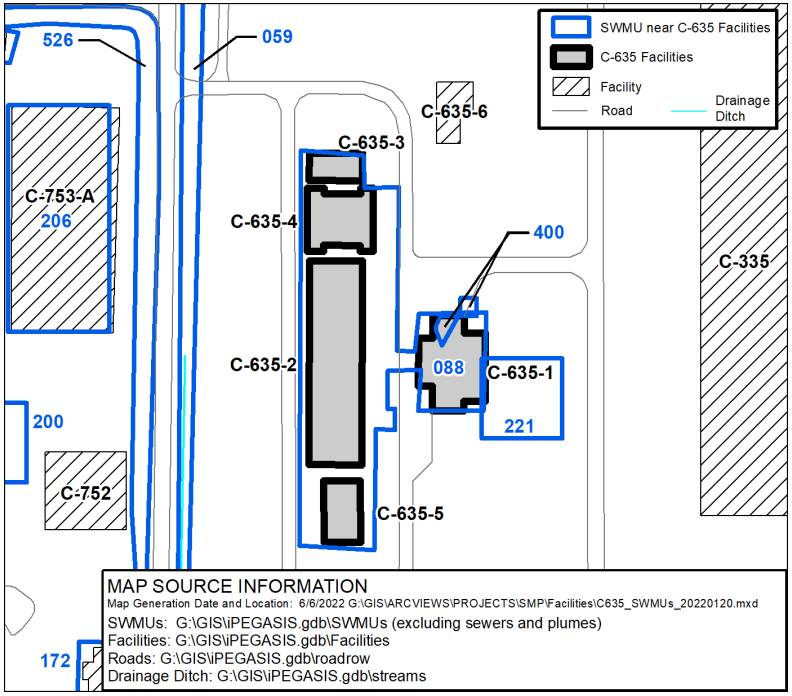
Construction History

- The C-635 Pumphouse and Cooling Tower is made up of multiple facilities generically referred to as the C-635 Cooling Tower.
  - C-635-1 Pump House and Piping
  - C-635-2 Cooling Tower
  - C-635-3 Blending Pump House
  - C-635-4 Blending Cooling Tower (North)
  - C-635-5 Blending Cooling Tower (South)

- The total area for all the main structures associated with C-635 Cooling Tower is approximately 30,673 ft2; with construction details, operational history, and current status for each facility discussed in subsequent slides.



Environmental Impacts (Solid Waste Management Units)



- The current SAR (SWMU 88) for the C-635 Pumphouse and Cooling Tower does not identify the specific facilities that are included in SWMU 88.

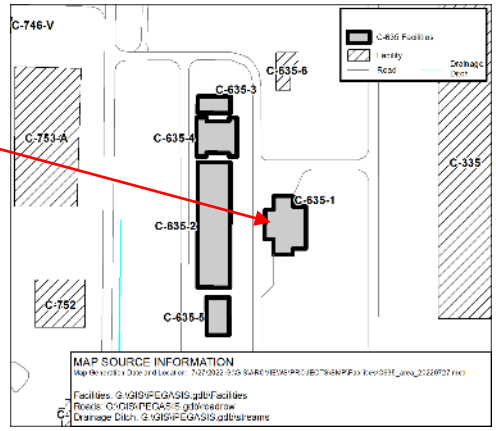
SWMU No.	Facility Name	Current Status
059	NSDD (Inside)	Final CSOU
088	C-635 Pumphouse and Cooling Tower (slab and underlying soils)	Soils and Slabs OU; Facility D&D OU
172	C-726 Sandblasting Facility (slab and underlying soils)	Soils and Slab OU
200	Soil Contamination South of TSCA Waste Storage Facility	Soils OU
206	C-753-A Toxic Substances Control Act Waste Storage Bldg.	No Further Action; KDWM 3/7/1997
221	OS-10	Soils OU
400	G-635-01	No Further Action; KDWM 3/8/2007
526	Internal Plant Drainage Ditches (includes KPDES 016)	SWOU Remedial Action

C-635-1 Pump House and Piping

C-635-1 Pump House and Piping

C-635-1 Pump House and Piping - Construction History

- C-635-1 Pump House and Piping facility is one of five facilities located in SWMU 88.
- The facility was constructed in 1954.
- C-635-1 is composed of three main structures (center structure, east wing, and west wing) on poured concrete foundations that vary from 6 to 21 inches in thickness.
  - The center structure is a two-story, one level, steel frame building with a built-up flat roof and exterior transite walls.
    - Garage-like structure with a roll-up door and pedestrian entrance.
    - Houses RCW pumps.
    - Wet well runs beneath the concrete floor.
    - Contained a laboratory bench area with sink; drained to wet well.
  - The east wing is a one-story concrete block building attached to the east side of the center structure.
    - East wing contains electrical switchgear room, battery room, restroom/shower/change area, and drinking fountain.
    - External to the east wing is a separate exterior concrete block wall with attached electrical transformers.
  - The west wing is a one-story concrete block building attached to the west side of the center structure.
    - West wing served as a chemical feed area with a loading dock/area.
    - Contains an acid platform, Calgon room, and a chlorine room.
    - Influent flume runs beneath the floor; connecting the cooling tower basin to the wet well.
    - External to the west wing is an electrical manhole.



C-635-1 - Pump House Center Structure

C-635-1 - Pump House West Wing

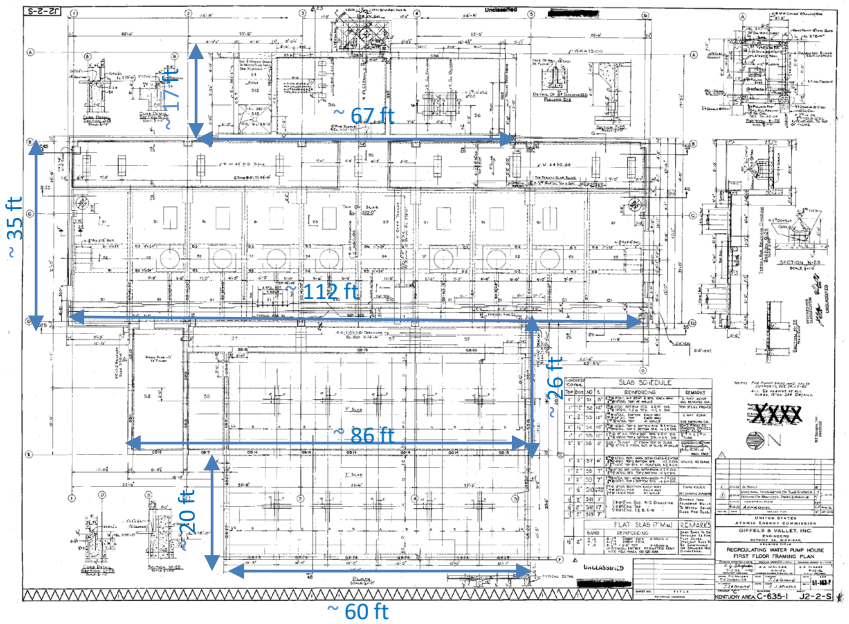
C-635-1 - Pump House East Wing

External Electrical Transformers

C-635-1 Facility Photos: 1/2022

C-635-1 Pump House and Piping - Construction History

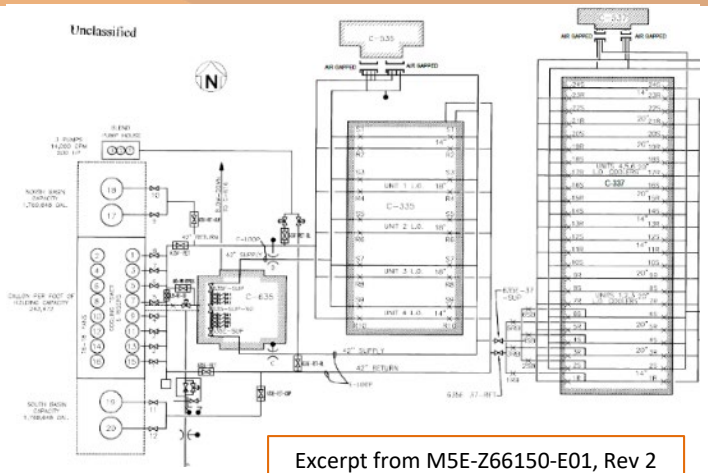
- The C-635-1 facility is approximately 8,505 ft^2 (includes external section that houses the transformers).
  - The center structure is approximately 3,920 ft^2; measuring ~35 ft x ~112 ft.
    - Wet well measuring ~35 ft x ~112 ft x ~24 ft (~ 666,314 gal capacity).
    - Sump measuring ~1½ ft x ~1½ ft x ~1 ft that drains to the storm drain system.
    - Three floor drains that drain to the sanitary sewer system and a laboratory sink that drains into the wet well.
    - Two pressure relief valves located along the bottom of the wet well floor.
  - The east wing is approximately 2,236 ft^2; measuring ~26 ft x ~86 ft.
    - Multiple floor drains associated with battery room and restroom/shower/change area, and drinking fountain that drain to the sanitary sewer system.
    - External to the east wing is an additional outside concrete area approximately 1,200 ft^2; measuring ~20 ft x ~60 ft that houses five electrical transformers.
  - The west wing is approximately 1,139 ft^2; measuring ~17 ft x ~67 ft.
    - Contains an influent flume area measuring approximately ~12 ft x ~17 ft x ~5 ft located at a depth of ~24 ft (flume runs underground from the cooling tower to the pump house).
    - External to the west wing is an electrical manhole that measures ~6 ft x ~9 ft x ~8 ft that drains into the center sump and subsequently to the storm drain system.
    - Three floor drains that drain into the influent flume.



Floor Plan View: Excerpt from Engineering Drawing J2-2-S_0001_0002_U-028134, dated 1952

C-635-1 Pump House and Piping - Operational History

- C-635-1 was originally built and operated as a pump house from its construction in 1954 to 2013.
  - Pumped RCW from the wet well located beneath the pump house through 48-inch underground supply headers to the C-335 process building, a portion of the south end of the C-337 process building (added in 1972), C-635-6 [which supplied heated water to various buildings such as C-100, C-101, etc., (see C-635-6 consultation package dated 7/16/2021 for details)], and the C-535 switchyard (synchronous condensers).
  - Utilized 7 – 32-inch multi-stage deep well turbine pumps with 400 hp motors capable of 9,000 gpm pumping rate.
    - The pumps, motors, and associated valves have been upgraded and/or replaced as needed to support operations.
  - Chlorine, sulfuric acid, and corrosion inhibitors were routinely fed into the RCW system via the wet well located beneath C-635-1.
    - Chorine was fed to control the growth of algae and other microbiological organisms.
    - Sulfuric acid was fed to control the pH or hydrogen ion concentration (Note: Soda ash was occasionally used on a non-routine basis for pH correction).
    - Corrosion inhibitors were fed to help maintain piping and equipment integrity.
      (Note: For a brief period, prior to 1962, corrosion inhibitors also were dissolved in 500 gal stainless steel tanks; pumped into the plant water line at C-611, and introduced into the RCW system as make-up water.)



Excerpt from M5E-Z66150-E01, Rev 2

C-635-1 - Center Structure Pumps

Wet Well (located beneath the concrete)

C-635-1 - Center Structure Pump Discharge Lines

C-635-1 Facility Photos: 1/2022

C-635-1 Pump House and Piping - Operational History

- Corrosion of the piping and heat exchanger units became a reoccurring problem within two years of cooling tower startup.
  - 1952 -1956 – a polyphosphate inhibitor (e.g., Calgon), focused on steel corrosion, was introduced into the RCW system.
    - Within two years severe pitting of the copper condenser tubes had progressed to complete penetration of the tube wall resulting in the loss of Freon-114 into the RCW.
  - 1956 – the RCW system was switched over to a polyphosphate-chromate inhibitor (dianodic inhibitor) effective against both steel and copper corrosion, but prone to fouling.
  - 1957 – an A-line cooling program was initiated to clean the condenser tube bundles; at this time the RCW system was switched to a zinc dianodic inhibitor (Orocol 155-Z), a polyphosphate-chromate inhibitor that contained about half the phosphate content and added zinc.
  - 1962 – further testing of the corrosion inhibitors was conducted in a pilot plant corrosion test loop in C-631; resulting in change to Betz Orocol TL, a polyphosphate-chromate inhibitor with zinc, which was used until the RCW system was converted to a phosphate system.
  - 1992/1993 – the RCW system (one cooling tower at a time) was converted from a chromate system to a phosphate system. [Note: In 1996 and 2000/2001 the RCW system was adjusted based on vendor product changes/updates (use of dispersant to help with the calcium phosphate depositing/scaling)].

C-635-1 - West Wing Calgon Room (Corrosion Inhibitor Feed Area)

C-635-1 - West Wing Chlorine Feed Header

C-635-1 - West Wing Sulfuric Acid Dock

C-635-1 Facility Photos: 1/2022

C-635-1 Pump House and Piping - Operational History

- In 1972, concrete walls were installed in between each of the transformers located outside of the west wing of C-635-1
  - Walls were installed for fire protection.

- In 1989, a 2-inch line on a RCW pump broke resulting in the release of a significant quantity of chromated water (9 mg/l of hexavalent chromium) (1990 ASER).
  - Most of the water was contained within the facility and returned to the RCW system.
  - Approximately 1,000 gal was inadvertently released outside of the building to surface ditches in the immediate vicinity (no detectable chromium was found during the release event at Outfall 001 and Outfall 015 sampling points).

- USEC leased the facility in the early 1990s and continued to use C-635-1 as a pump house until enrichment operations ceased at C-335.

- In 2003, a fire occurred at the 5PH2 transformer located on the east side of C-635-1.
  - An internal fault in the transformer caused the main fluid tank to rupture releasing approximately 336 gals of non-polychlorinated biphenyl (non-PCB) oil to the ground and transformer pad and DMSA-OS-10 (SWMU 221).
  - Contaminated soil and gravel at the spill site were removed and disposed.

C-635-1 - East Wing External Transformers

C-635-1 - East Wing Switchgear Room

C-635-1 Facility Photos: 1/2022

C-635-1 Pump House and Piping - Operational History

- In 2013, C-635-1 was shutdown, along with its associated cooling towers (main cooling tower and blending towers).
  - Subsequent RCW leaks from pumps and associated lines occurred with some impact to the pad and surrounding drainage ditches.
  - The wet well and influent flume have not been drained and remain full of water; draining has not occurred in order to prevent hydrostatic pressure changes that could cause collapse or floating of the subsurface structure.
- C-635-1 transitioned from USEC to DOE in 2014.
- In 2017, solid waste exceeding Toxicity Characteristic Leaching Procedure (TCLP) limits for chromium, mercury, and lead was discovered in the bottom of the diked areas located within the cooling tower pump houses.
  - Waste was associated with the chemical tanks that contained corrosion inhibitors (including sulfuric acid).
  - Waste included crusty residues, sludges, liquids or a combination thereof.
  - Waste was removed and disposed in 2018.
- In 2018, the RCW supply and return lines to the synchronous condensers in the C-535-1 switchyard were drained and air-gapped.
- In 2019, the 90-day accumulation area for the sulfuric acid pigs and tanks was closed.

C-635-1 - West Wing
Diked Area Beneath Corrosion Inhibitor Tanks

C-635-1 - West Wing
Sulfuric Acid Pig and Tank Area

C-635-1 Facility Photos: 1/2022

C-635-1 Pump House and Piping - Current Status

- C-635-1 is in shutdown; however, one transformer (5PH2) is still active that provides power to C-635-1, C-635-3, C-615-H, and C-753-A.

- Walkdown inspection conducted in January and February 2022 and employee interviews confirmed no unusual conditions.
  - Center Structure:
    - Houses RCW pumps.
    - Cement corrugated siding (transite).
    - Both asbestos-containing materials (ACM) and lead-based paints are known to be present.
    - Wet well runs beneath the concrete floor; chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the wet well (wet well remains full of water).
    - Laboratory bench area with sink is no longer present; however, drain to wet well is still present.
    - Three floor drains and a single sump are present.
    - Not used for radiological storage; the center structure of the facility does not contain any radiological postings.
    - No generator staging area (GSA) or satellite accumulation area (SAA).
    - Minor oil staining around several of the RCW pumps.
    - Chromated water leaks have occurred within the center structure of the facility.
    - No known chemical spills except for the above noted chromated water leaks.
    - Flammable cabinet is empty; historically stored grease, lubricants, cleaning fluid, gasoline, etc., in accordance with regulatory requirements and site procedures.

C-635-1 - Center Structure Sump (back corner)

C-635-1 - Center Structure Surge Relief Valve

C-635-1 - Center Structure Phone Booth

C-635-1 - Center Structure Control Panel

C-635-1 – Center Structure Empty Flammable Cabinet

C-635-1 - Center Structure Pump Oil Stain

C-635-1 - Center Structure Typical Floor Drain

C-635-1 Facility Photos: 1/2022

C-635-1 Pump House and Piping - Current Status

- Walkdown inspection conducted in January and February 2022 and employee interviews confirmed no unusual conditions (Continued).
  - East Wing:
    - Houses electrical switchgear room, battery room, and restroom/shower/change area.
    - Multiple floor drains associated with battery room and restroom/shower/change area, and drinking fountain.
    - 125-volt lead calcium batteries (60 cells) used for relay protection.
    - Five transformers (two - 480 KV and three - 4160 KV) with associated electrical switchgear [one operational (5PH2), three air-gapped (5PH1, 5PH3A, and 5PH3B), and one out-of-service (5PH4)].
      - Currently four of the transformers contain PCBs <50 ppm.
      - A fire associated with an electrical fault in 2003 occurred at the 5PH2 transformer; resulted in the release of 336 gals of non-PCB oil.
      - Note: Transformers have been upgraded and replaced over the years.
    - No known chemical spills except for the above noted oil release as the result of the 2003 transformer fire.
    - Not used for radiological storage; the east wing of the facility does not contain any radiological postings.
    - No GSA or SAA.
    - Both ACM and lead-based paints are known to be present.

C-635-1 - East Wing
Switchgear Room – Looking North

C-635-1 - East Wing
Switchgear Room – Looking South

C-635-1 - East Wing
Lead Calcium Batteries

C-635-1 - East Wing
Transformer Sprinkler System

C-635-1 - East Wing
Restroom/shower/change area

C-635-1 - East Wing
Eyewash

C-635-1 Facility Photos: 1/2022

C-635-1 Pump House and Piping - Current Status

- Walkdown inspection conducted in January and February 2022 and employee interviews confirmed no unusual conditions (Continued).
  - West Wing:
    - Houses chemical feed area which is divided into three main sections: acid platform (with loading dock), Calgon room, and a chlorine room.
    - Loading dock/area housed sulfuric acid pigs/day tanks.
    - Calgon room housed tanks of corrosion inhibitors; area within the dikes contained solid waste exceeding TCLP limits for chromium, mercury, and lead that have been removed.
    - Chlorine rooms housed chlorine tanks and is currently used to store soda ash and Cal-Rod heaters.
    - Three floor drains are present.
    - Contains an influent flume located beneath the concrete (flume remains full of water).
    - External to the west wing is an electrical manhole.
    - Both ACM and lead-based paints are known to be present.
    - 90-day accumulation area for sulfuric tank; closed in April 2019; no GSA or SAA.
    - Not used for radiological storage; however, facility does contain a radioactive material area (RMA) (Cal-Rod heaters) and is posted as an RMA.

C-635-1 - West Wing
Calgon Area

C-635-1 - West Wing
Chlorine Area
(with soda ash and Cal-Rod heaters)

C-635-1 - West Wing
Acid Platform/Loading Dock

C-635-1 - West Wing
Chlorine Tank

Gray pipe from
chemical area feeding
into to wet well

C-635-1 - West Wing
North Entry Door

C-635-1 Facility Photos: 1/2022 and 2/2022

C-635-1 Pump House and Piping – Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the aboveground structure to protect future public health or welfare or the environment.
  - C-635-1 has exclusively operated as a pump house that pumped RCW from the wet well located beneath the pump house through 48-inch underground supply headers to the C-335 process building, a portion of the south end of the C-337 process building (added in 1972), and the C-535 switchyard (synchronous condensers) from its construction in 1954 to 2013.
  - Building materials used for construction could contain lead-based paints, ACM, and PCB-containing materials [e.g., C-635-1 has cement corrugated siding (transite), PCB transformers].
  - Building debris generated from demolition of the aboveground structures can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that the historical construction and system processes at C-635-1 involved equipment and chemicals that could have the potential to pose a release threat to the concrete pad and underlying soils. (See slide 6 for SWMU 88 details.)
  - Chromated water leaks have occurred; making the slab, underlying soils and surrounding area suspect for potential chromium contamination.
  - A wet well (currently full of water) runs beneath the concrete floor where chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the wet well.
    - Two pressure relief valves located along the bottom of the wet well floor.
  - An influent flume (currently full of water) runs beneath the concrete floor where floor drains from the chlorine room, Calgon room, and acid room drained.
  - Transformers located on the west side of the building contain PCBs; making the slab, underlying soils, and surrounding area suspect for potential PCB contamination.
  - Solid waste exceeding TCLP limits for chromium, mercury, and lead was discovered in the diked areas located within the cooling tower pump houses (waste was removed and disposed in 2018).

C-635-1 Pump House and Piping - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., pumps, motors, valves, electrical transformers and switchgear, etc.) (to the extent practicable) prior to demolition.
  - Separate power source/system(s) will be evaluated for C-615-H, C-753-A, and the data gathering panel which provides communication to C-752-A, C-753-A, C-757, C-612, and C-733 prior to shutdown of the active transformer.
  - Any floor drains (along with the wet well, sump, influent flume, electrical manhole, and supply/return lines) will be delineated, documented, and isolated prior to demolition.
  - An evaluation will be made to determine if any measures may be appropriate to stabilize and/or isolate the basement (or portions thereof) from the main floor prior to demolition. (Note: Measures other than isolation will require additional consultation with EPA and Kentucky).
  - Water from the wet well and influent flume will be evaluated for removal and proper disposal as part of deactivation and/or predemolition activities. (Note: Because the wet well and influent flume are part of the underlying slab and soils that constitutes the SWMU, a SWMU notification, along with a SAR revision, will be performed documenting removal and disposal of the water associated with deactivation and/or predemolition activities).

- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-635-1 facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-635-1 Pump House and Piping - Conclusion and Recommendations

- Based on the construction and historical use at C-635-1, demolition and disposal of the aboveground structure for C-635-1 is recommended to be conducted outside of the FFA/CERCLA process.

- As part of the demolition of the aboveground structure, the appropriate best management practices (BMPs) will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-635-1 facility from the Facility D&D OU will be documented in the appropriate annual SMP revision.

- Based on the construction and historical use at C-635-1, it is recommended that the underlying slab and soils undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 88 will be updated to clarify that the C-635-1 underlying slab and soils constitutes the SWMU and will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 88 that includes updated information on C-635-1 prior to removal of the aboveground structure.

C-635-2 Cooling Tower

C-635-2 Cooling Tower

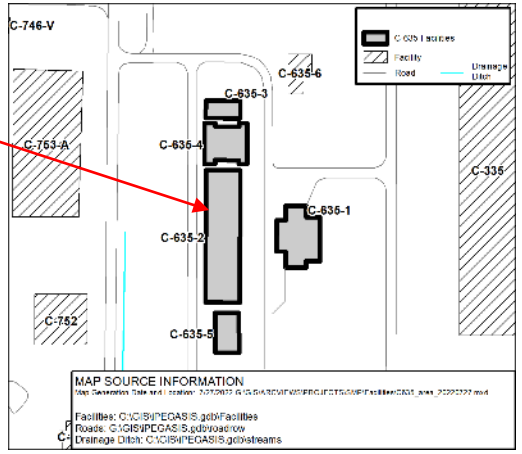
C-635-2 Cooling Tower - Construction History

- C-635-2 Cooling Tower facility is one of five facilities located in SWMU 88.

- The facility was originally constructed in 1954.

- The facility is a wood frame structure (originally approximately 49 ft tall) resting on a 1-ft poured concrete pier-type foundation; a deck roof with railing and fan shrouds; and exterior walls of corrugated panels.
  - Often referred to as the "main cooling tower."
  - Supports 8 pairs of back-to-back cooling tower cells; total of 16 cooling tower cells.
    - Each cell operates independently of the other cells.
    - Each cell has a fan and driving motor; total of 16 fans/driving motors.
    - Fans are enclosed by protective shrouds.
    - One riser serves each pair of back-to-back cells; total of 8 risers.
    - The tower contains a water distribution system (including lateral flush lines), cold water fill (system of baffles), and mist eliminators.
    - Center wall that divides the cooling tower (e.g., north and south).
    - Piping and sprinklers for fire protection throughout.
  - Cools RCW and returns it to the below grade collection basin.
    - Footprint of the basin is larger than the aboveground footprint of the cooling tower; extending an additional 93 ft on each side of the cooling tower (these sections have a concrete slab top).
    - Basin is open and visible.
    - Four v-notch overflow weirs located between the wall that divides the collection basin into two portions (e.g., north and south).
    - Two drop down areas that connect to influent flume; one on each side of dividing wall.
    - Five pressure relief valves located along the bottom of basin floor.

C-635-2 Main Cooling Tower



C-635-2 Cooling Tower – East Side

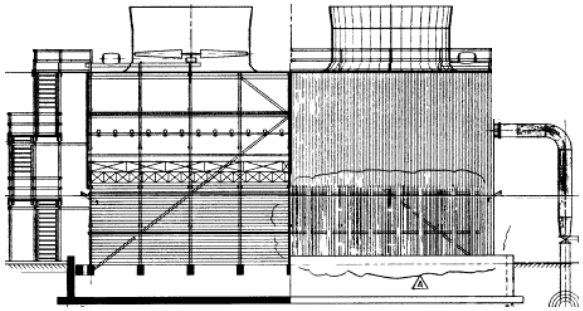
C-635-2 Facility Photo: 1/2022

C-635-2 Cooling Tower - Construction History

- C-635-2 Cooling Tower facility (Continued)

  - Houses the beginning of an influent flume.
    - Flume exits at the bottom the basin of the cooling tower; connecting the cooling tower basin to the wet well located in C-635-1 pump house.
  - East side infrastructure.
    - Eight water riser pipes; connect into the below grade piping system. Two external concrete buildings; house the fire sprinkler system.
    - Seven vaults located within the footprint of the cooling tower.
      1. Make-up Water Venturi;
      2. E-Loop Return to Blending Tower;
      3. E-Loop Return and Make-up Water (Valve Vault A);
      4. Flume/Sluice Gate/Dewatering Basin;
      5. Return Cross Over;
      6. F-Loop Return and Bypass (Valve Vault B);
      7. F-Loop Return to Blending Tower
    - V-notch Overflow Basin/Blowdown Basin
  - West side infrastructure.
    - Two exterior wood staircases; one located on the north end and one located on the south end.
  - Roof infrastructure.
    - Wood decking with railing that extends the circumference of the tower.
    - Support fans enclosed with protective shrouds.

Historical Photo of Cooling Tower Roof Deck and Shrouds



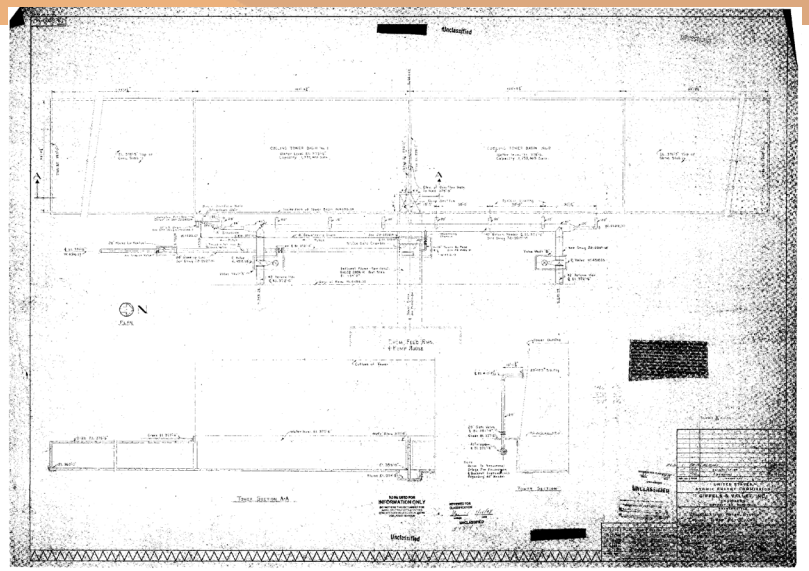
Internal Cooling Tower Components
Excerpt from Engineering Drawing HUC3403-001-01

C-635-2 Cooling Tower – West Side

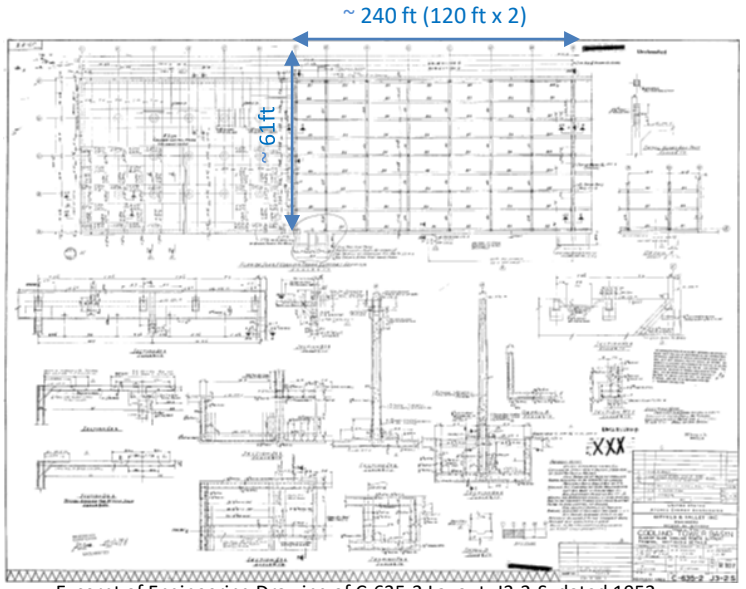
C-635-2 Facility Photo: 1/2022

C-635-2 Cooling Tower - Construction History

- The C-635-2 facility (aboveground structure) is approximately 14,640 ft^2; measuring ~61 ft x ~240 ft.
  - Collection basin measuring ~426 ft x ~66 ft x ~15 ft.
    - Footprint is larger than the aboveground footprint of C-635-2; extending an additional 93 ft on each side of C-635-2 (these sections have a concrete slab top).
    - Two drop down areas to influent flume located at the bottom of collection basin measuring ~8 ft x ~10 ft x ~5 ft each.
    - Four overflow weirs located at the top of the basin; between wall that divides the collection basin into two portions (e.g., north and south) measuring ~3 ft 4 inches x ~3 ft 8 inches each.
  - Influent flume exiting the basin measuring ~12 ft x ~74 ft x ~5 ft located at a depth of ~21 ft.
    - Runs underground from the cooling tower basin to the C-635-1 pump house wet well.
  - Two external concrete buildings measuring ~6 ft 8 inches x ~10 ft 8 inches x ~9 ft.
    - Houses the fire sprinkler system.
    - Located within footprint of main cooling tower
  - V-notch Basin Overflow/Blowdown Basin measuring ~5 ft x ~13 ft 4 inches x ~5 ft.
    - Houses the basin overflow and blowdown basin separated by a v-notch weir.
    - Dewatering drain (from dewatering basin) enters into the basin overflow.
    - Water from the basin overflow drains to the storm drain system.



Excerpt of Engineering Drawing of C-635-2 Layout; J3-2000-M, dated 1952



Excerpt of Engineering Drawing of C-635-2 Layout; J3-2-S, dated 1952

C-635-2 Cooling Tower - Construction History

- The C-635-2 facility is approximately 14,640 ft^2. (Continued)

  - Seven header/system vaults: (in order from south to north)
    1. Make-up Water Venturi "F" measuring ~6 ft 4 inches x ~10 ft 10 inches x ~9 ft 4 inches.
       a. Contained a sump measuring ~12 inches x ~12 inches x ~6 inches; drained to ground or back to basin.
    2. E-Loop Return to Blending Tower measuring ~7 ft 6 inches x ~10 ft 6 inches x ~9 ft.
       a. Located within footprint of main cooling tower; installed as part of blending towers in 1975/1976.
    3. E-Loop Return and Make-up Water (Valve Vault A) measuring ~13 ft 8 inches x ~18 ft 11 inches x ~10 ft.
       a. Contained a sump measuring ~12 inches x ~12 inches x ~6 inches; drained to ground or back to basin.
    4. Flume/Sluice Gate/Dewatering/Tower Bypass Basin measuring ~20 ft x ~11 ft 8 inches x ~8 ft.
       a. Housed two flume sluice gates, dewatering basin, and tower bypass vault.
       b. Contained a sump pump in the tower bypass vault area measuring ~2 ft x ~3 ft x unknown (legible drawing not available); discharged to the ground outside the vault.
       a. Dewatering drain line exits the dewatering basin and connects to the overflow basin (where it exits the overflow basin to the storm sewer system).
    5. Return Cross Over measuring ~11 ft 6 inches x ~15 ft x ~14 ft 10 inches.
       a. Contained a sump measuring ~2 ft 6 inches x ~2 ft 6 inches x ~3 ft 6 inches; drained to ground or back to basin.
    6. F-Loop Return and Bypass (Valve Vault B) measuring ~17 ft 8 inches x ~8 ft 8 inches x ~9 ft 10 inches.
    7. F-Loop Return to Blending Tower measuring ~10 ft x 7 ft 6 inches x ~9 ft.
       a. Located within footprint of main cooling tower; installed as part of blending towers in 1975/1976.
       b. Contained a sump measuring ~18 inches x ~18 inches x ~18 inches; drained to ground or back to basin.

F-Loop Return to Blending Tower Vault

F-Loop Return and Bypass Vault (Valve Vault B)

Return Cross Over Vault

Flume/Sluice Gate/Dewatering/Tower Bypass Basin Vault

E-Loop Return and Make-up Water Vault (Valve Vault A)

E-Loop Return to Blending Tower Vault

Make-up Water Venturi "F" Vault

C-635-2 Facility Photos: 4/2022

C-635-2 Cooling Tower - Operational History

- C-635-2 was originally built and operated as a cooling tower from its construction in 1954 to 2013.
  - Heated RCW from the C-335 process building and C-535 switchyard (synchronous condensers) was distributed through various sections of the cooling tower and released via evaporation; cooled RCW was then collected into the cooling tower basin where it then flowed by gravity via a flume into the wet well located underneath the C-635-1 pump house.
  - Tower was demolished down to the basin and rebuilt in the 1989-1990 timeframe.

- Brown rot fungi growth quickly became a problem for the cooling towers.
  - In 1958, a program was initiated to combat fungus deterioration.
  - Replaced infected wood with new pressure treated redwood.
    - Cooling tower structural members, fill, mist eliminators, outer wall, cell partitions, and deck were originally constructed of California redwood.
  - Treated remaining wood with fungicide solutions (most susceptible areas only).
  - All cell plenum chambers, tower deck, outer sidewalls, and tower tops were treated periodically with one of two types of fungicide solutions:
    - Sodium pentachlorophenate.
    - Double diffusion method – first spraying with a solution of zinc sulphate and arsenic acid followed by a second spraying with a solution of sodium bichromate.
  - Fungicide treatment was discontinued in 1987.

C-635-2 Cooling Tower – East Side

C-635-2 Cooling Tower – Interior View

C-635-2 Facility Photos: 1/2022

C-635-2 Cooling Tower - Operational History

- In 1972, the main cooling towers underwent restoration.
  - Restoration was limited; engineering drawings indicate that certain structural members were only removed if necessary. (Note: Mechanical repairs to motors, gear boxes, etc., also occurred over the years of operation.)
- Between 1975 – 1977 firewater/sprinkler systems were upgraded.
- In 1978, new wind baffling was installed.
- In 1979, a cooling tower drift study was conducted to determine the impact of chromium dispersion from the cooling towers.
  - Vegetation survey provided evidence of long-term transport and disposition of chromium to terrestrial ecosystem components.
    - Decrease in concentration with distance; most disposition is confined to DOE property.
  - Chromium deposited by drift to soils or lost to soils from vegetation does not accumulate significantly beyond 200 meters from the towers
    - Soil chromium is the less soluble and less biologically active oxidation state (Cr+3).
- In 1981, RCW sprinkler alarms were installed.

C-635-2 Sprinkler System - External View

C-635-2 Sprinkler System - Internal View

C-635-2 Facility Photos: 1/2022

C-635-2 Cooling Tower - Operational History

- In 1989-1990, the main cooling tower was replaced down to the basin.
  - A construction permit was not put in place for rebuilding of the C-635-2 cooling tower.
  - Due to potential chromium emissions, KY issued a notice of violation.
  - A permit was developed and issued; violation was withdrawn.
  - While the overall footprint of the cooling tower remained the same, the height of the new cooling tower was reduced from approximately 49 ft to approximately 30 ft.
- USEC leased the facility in the early 1990s and continued to use C-635-2 as a cooling tower until enrichment operations ceased at C-335.
- In March 1991, during routine sampling of the onsite ditch next to C-635-2, sample results indicated a higher than usual chromate reading. (1991 ASER)
  - A flexible hose that transferred RCW from the riser to the basin had been moved; allowing water to enter an adjacent valve vault, which overflowed into the onsite ditch that discharged to KPDES Outfall 001.
  - Total amount of chromate released was estimated to be less than 0.034 kg (0.075 lbs).

Historical photo of main cooling tower replacement project
(Photo of C-631 Main Cooling Tower)

C-635-2 Cooling Tower - Operational History

- In September 1991, a 48-inch pipe containing RCW with 9 ppm chromate burst; filling the E-loop valve vault.
  - 500 gal of RCW was spilled to the ground.
  - All the chromated water was contained in the drift accumulation ditches with the majority pumped back to the basin.
  - The drift accumulation ditches do not connect to the KPDES outfalls but are released to the sanitary sewer system; some ditches contain pumps that pumped drift water back into the cooling towers.

- In 2013, C-635-2 was shutdown, along with its associated pump house and blending towers.
  - The basin and influent flume have not been drained and remain full of water; draining has not occurred in order to prevent hydrostatic pressure changes that could cause collapse or floating of the subsurface structure. (Note: Calcium hypochlorite tablets are added once a month to keep the water from becoming septic.)

- C-635-2 transitioned from USEC to DOE in 2014.

- In 2014, oil and grease was discovered in the cooling tower basin believed to be associated with lube oil coolers.
  - Oil was skimmed from the basin and disposed.
  - Any residual oil was handled via blowdown to C-616.

- In 2014/2015, the basin was lowered and filled with makeup water in order to decrease the amount of phosphate remaining in the basin after shutdown (several cycles).
  - Goal was to achieve a phosphate value of <1 ppm.
  - Water was sent to the C-616 waste water treatment facility where phosphate was removed at the clarifier prior to discharge to Outfall 001.

E-Loop Return and Make-up Water Vault (Valve Vault A)

C-635-2 Cooling Tower Basin – Interior View

C-635-2 Facility Photos: 1/2022

C-635-2 Cooling Tower - Current Status

- Walkdown inspection conducted in January 2022 and employee interviews confirmed no unusual conditions.
  - Both ACM (e.g., transite siding) and lead-based paints are known to be present.
  - Basin located beneath the cooling tower contains five pressure release valves and two drop down areas that connect to an influent flume (basin remains full of water).
  - Houses an influent flume that remains full of water and exits at the bottom of the basin of the cooling tower.
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-635-1 wet well and would be present in the basin.
  - Seven vaults located within the footprint of the cooling tower; some of which contain sump pumps.
  - Two external concrete buildings; house the fire sprinkler system.
  - Not used for radiological storage; no radiological postings are present.
  - No GSA or SAA.
  - Historical release of oil and grease to the cooling tower basin in 2014 that was immediately addressed.
  - Historical use of sodium pentachlorophenate; zinc sulphate; arsenic acid; and sodium bichromate for fungicide treatment of wood.
  - Historical chromated water leaks have occurred and were immediately addressed.
  - No known chemical spills except for the above noted oil/grease (2014) and chromated water leaks.

C-635-2 - Examples of Structural Damage

C-635-2 - No. 4 Riser

C-635-2 - Lateral Flush Lines

C-635-2 - V-Notch Weir

C-635-2 - Surrounding Area Vaults and Sprinkler House

C-635-2 Facility Photos: 4/2021

C-635-2 Cooling Tower - Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the aboveground structure to protect future public health or welfare or the environment.
  - C-635-2 has exclusively operated as the main cooling tower; cooling heated RCW from the C-335 process building, a portion of the south end of C-337 (added in 1972), and C-535 switchyard (synchronous condensers) from its construction in 1954 to 2013.
  - Building materials used for construction could contain lead-based paints and ACM (e.g., corrugated transite siding).
    - Because the cooling tower was completely rebuilt (wood removed down to basin) in the 1989/1990 timeframe, chemicals used for fungicide treatment prior to 1987 are no longer a concern for the existing wood.
    - In 1992/1993, the RCW system was converted from a chromate system to a phosphate system.
  - Building debris generated from demolition of the aboveground structures can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that the historical construction and system processes at C-635-2 involved equipment and chemicals that could have the potential to pose a release threat to the basin and associated vaults and underlying soils (including the surrounding area associated with the basin/vaults). (See slide 6 for SWMU 88 details.)
  - Chromated water releases and airborne dispersion of chromium have occurred; making the underlying soils and surrounding area suspect for potential chromium contamination.
  - Five pressure release valves are located along the bottom of the basin floor.
  - Basin (currently full of water) is connected to the C-635-1 pump house via an influent flume (currently full of water).
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-635-1 wet well and would be present in the basin (Note: Soda ash was occasionally used on a non-routine basis for pH correction).
  - Seven vaults located within the footprint of the cooling tower; some of which contain sump pumps that drained or potentially drained to the surrounding soils.

C-635-2 Cooling Tower - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., risers, fans, fan motors, and shrouds, etc.) (to the extent practicable) prior to demolition.
  - Any floor drains (along with the vaults, sumps, weir, influent flume, and supply/return lines) will be delineated, documented, and isolated prior to demolition.
  - An evaluation will be made to determine if any measures may be appropriate to stabilize and/or isolate the basin (or portions thereof) from the main floor of the cooling tower prior to demolition. (Note: Measures other than isolation will require additional consultation with EPA and Kentucky).
  - Water from the basin and influent flume will be evaluated for removal and proper disposal as part of deactivation and/or predemolition activities. (Note: Because the wet well and influent flume are part of the underlying slab and soils that constitutes the SWMU, a SWMU notification, along with a SAR revision, will be performed documenting removal and disposal of the water associated with deactivation and/or predemolition activities).

- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-635-2 facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-635-2 Cooling Tower - Conclusion and Recommendations

- Based on the construction and historical use at C-635-2, demolition and disposal of the aboveground structure for C-635-2 is recommended to be conducted outside of the FFA/CERCLA process.

- As part of the demolition of the aboveground structure, the appropriate BMPs will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-635-2 facility from the D&D OU will be documented in the appropriate annual SMP revision.

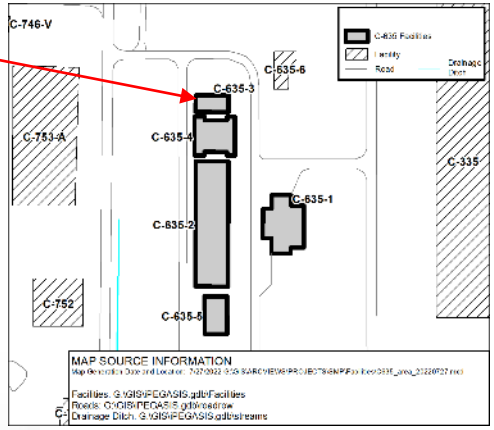
- Based on the construction and historical use at C-635-2, it is recommended that the underlying slab and soils (including surrounding soils within the C-635-2 footprint) undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 88 will be updated to clarify that the C-635-2 underlying slab and soils (including surrounding soils within the C-635-2 footprint) constitutes the SWMU and will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 88 that includes updated information on C-635-2 prior to removal of the aboveground structure.

C-635-3 Blending Pump House

C-635-3 Blending Pump House

C-635-3 Blending Pump House - Construction History

- C-635-3 Blending Pump House facility is one of five facilities located in SWMU 88.
- The facility was constructed in 1975/1976.
- The facility is a one-story steel framed building with a slanted shed roof and exterior corrugated panels on a poured concrete foundation that varies in thickness from ~6 inches to ~4 ft (reinforced under the pumps).
  - Garage-like structure with two pedestrian doorways located on the east and west side of the facility.
  - North side of the facility houses three manually operable louver panels and three high bay removable panels.
  - Houses three blending pumps.
  - Three large water pipes located on the south side of the facility are connected to the C-635-2 cooling tower basin.
- The entire facility is approximately 1,984 ft^2.
  - Measuring ~32 ft x ~62 ft.
    - Six 3-inch floor drains that drain back into the C-635-2 main cooling tower basin.



C-635-3 – Blending Pump House East Side

C-635-3 – Blending Pump House North Side

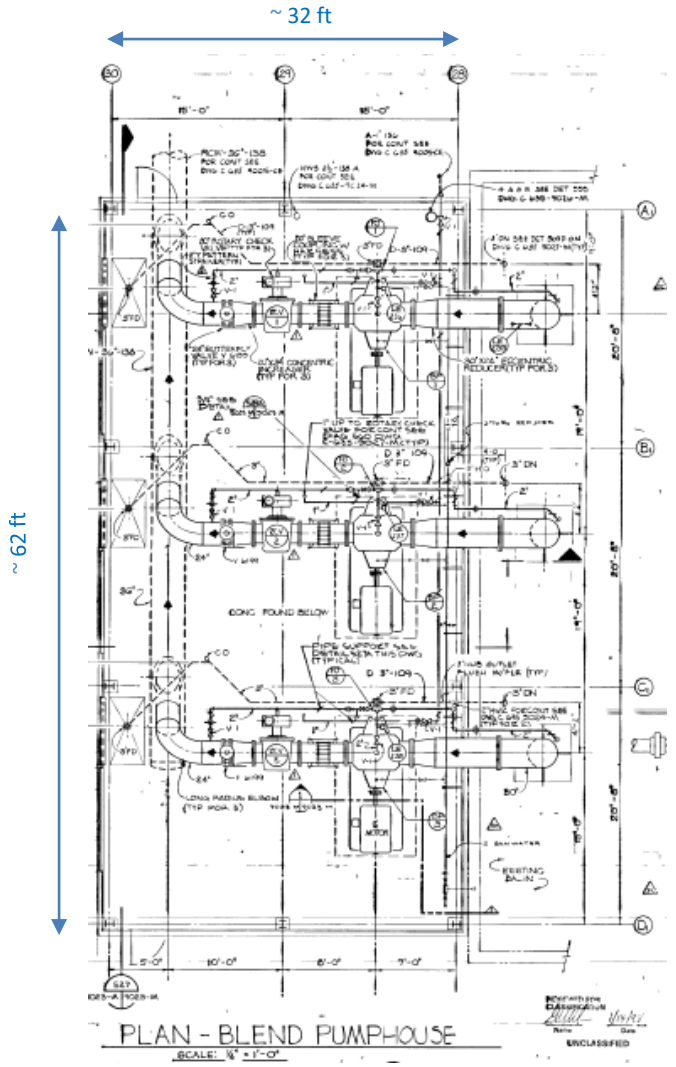
C-635-3 – Blending Pump House South Side

C-635-3 Facility Photos: 1/2022

C-635-3 Blending Pump House - Operational History

- Blending pump houses, along with the blending towers, were constructed as part of the 1970s Cascade Improvement Program and Cascade Uprating Program (CIP/CUP) in anticipation that the increase in enrichment capacity would result in an increase in process temperatures that would require additional cooling capability.
  - Blending pump houses were designed to decrease the temperature of RCW prior to entering into the main cooling tower. (Note: RCW temperatures in excess of 150°F could damage the cooling tower fill material.)
  - Cooled water from the cooling tower basin could be pumped (if needed) through the blending pump house where the cooled water could be "blended" with heated RCW in the return header before the water flowed over the cooling tower for further cooling.

- C-635-3 was originally designed and built as a blending pump house in 1975/1976; however, while brought on-line and tested to ensure proper operation, C-635-3 remained in standby and was never used.
  - The fill material temperature limits were never compromised.



Excerpt of Engineering Drawing from C-635-9023-M, Rev 4c; dated 1975

C-635-3 Facility Photos: 1/2022

C-635-3 Blending Pump House - Operational History

- USEC leased the facility in the early 1990s and continued to maintain C-635-3 as a blending pump house until enrichment operations ceased at C-335.
  - C-635-3 was routinely inspected and serviced.
  - C-635-3 was retested (late 1980s/early 1990s) to ensure that the system was still in operational order.
- In 2013, C-635-3 was shutdown, along with its associated cooling towers (main cooling tower and blending towers).
- C-635-3 transitioned from USEC to DOE in 2014.
- C-635-3 is no longer operational.

C-635-3 - Skid Frame with Blend Motor and Pump

C-635-3 - Pump Discharge Line

C-635-3 - Pump Suction Line Interior View

C-635-3 - Pump Suction Line Exterior View

C-635-3 Facility Photos: 1/2022

C-635-3 Blending Pump House - Current Status

- Walkdown inspection conducted in January 2022 and employee interviews confirmed no unusual conditions.
  - ❑ Houses three blending pumps.
  - ❑ Both ACM (e.g., corrugated transite siding) and lead-based paints are known to be present.
  - ❑ Six 3-inch floor drains are present.
    - All drain back into the C-635-2 cooling tower basin.
  - ❑ Not used for radiological storage; no radiological postings are present.
  - ❑ No GSA or SAA.
  - ❑ Minor oil staining around the blending pumps.
  - ❑ No known chemical spills.

    Note: Corrosion inhibitors (including chromate) were routinely fed into the RCW system and would have been present if leaks occurred during startup testing and periodic retesting.

C-635-3 - Floor Drains

C-635-3 - Floor Drains

C-635-3 - Fire Sprinkler System

C-635-3 - Oil Staining

C-635-3 - Damaged Wall Insulation

C-635-3 - Exhaust Fan Opening

C-635-3 Facility Photos: 1/2022

C-635-3 Blending Pump House - Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the aboveground structure to protect future public health or welfare or the environment.
  - C-635-3 was originally designed and built as a blending pump house in 1975/1976 and while brought on-line and tested to ensure proper operations; C-635-3 remained in standby and has never been used from its construction in 1975/1976 to 2013 and was placed into shutdown in 2013.
  - Building materials used for construction could contain lead-based paints and ACM (e.g., corrugated transite siding).
  - Building debris generated from demolition of the aboveground structures can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that outside of the testing of the operational status at C-635-3, the system remained in standby, was placed into shutdown in 2013, and there is no history or records of chemical spills that would pose an environmental release threat.
  - C-635-3 is located within the footprint of the C-635 Cooling Tower.
  - C-635-3 is connected to part of the RCW system which contained chromated water.
  - Six 3-inch floor drains are located along the slab of the facility that drain back into the C-635-2 main cooling tower basin.

C-635-3 Blending Pump House - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., blend pumps and motors, etc.) (to the extent practicable) prior to demolition.
  - Any floor drains (including the six identified floor drains) will be delineated, documented, and isolated prior to demolition.

- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-635-3 facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-635-3 Blending Pump House - Conclusion and Recommendations

- Based on the construction and historical use at C-635-3, demolition and disposal of the aboveground structure for C-635-3 is recommended to be conducted outside of the FFA/CERCLA process.

- As part of the demolition of the aboveground structure, the appropriate BMPs will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-635-3 facility from the Facility D&D OU will be documented in the appropriate annual SMP revision.

- While there is no history or records of chemical spills that would pose an environmental release threat at C-635-3, based on its construction and association with the C-635 Cooling Tower footprint, it is recommended that the underlying slab and soils undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 88 will be updated to clarify that the C-635-3 underlying slab and soils constitutes the SWMU and will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 88 that includes updated information on C-635-3 prior to removal of the aboveground structure.

C-635-4 Blending Cooling Tower (North)

C-635-4 Blending Cooling Tower (North)

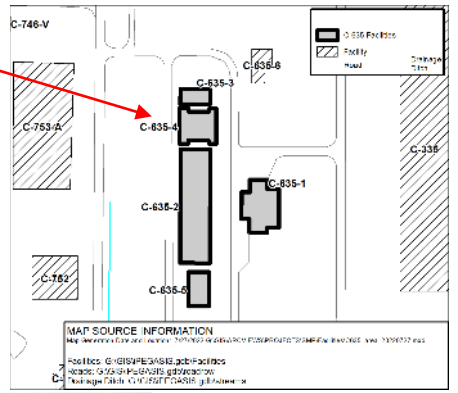
C-635-4 Blending Cooling Tower (North) - Construction History

- C-635-4 Blending Cool Tower (North) facility is one of five facilities located in SWMU 88.

- The facility was constructed in 1975/1976.

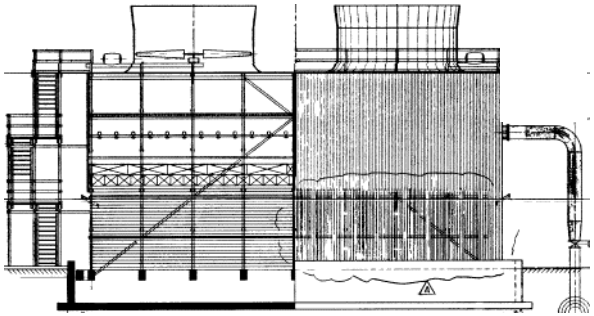
- The facility is a wood frame structure (approximately 36 ft tall) resting on an 8-inch poured concrete slab; a deck roof with railing and fan shrouds; and exterior walls of corrugated panels.
  - Often referred to as one of the "CUP towers."
  - Supports two cooling tower cells.
    - Each cell has a fan and driving motor; total of 2 fans/driving motors.
    - Fans are enclosed by protective shrouds.
    - One riser serves each cooling tower cell; total of 2 risers.
    - The tower contains a water distribution system (including lateral flush lines), cold water fill (system of baffles), and mist eliminators.
    - Piping and sprinklers for fire protection throughout.
  - Cools RCW and returns it to the below grade collection basin.
    - Footprint of the basin is larger than the aboveground footprint of the cooling tower; extending approximately 333 ft south of C-635-4.
    - C-635-4 sits on top of a concrete slab with the basin running underneath the slab; as a result the basin is not open or visible.
    - Approximately 32 – 9-inch diameter holes are drilled into the slab allowing cooled RCW water to fall into the basin below.

C-635-4 Blending Cooling Tower



C-635-4 Blending Cooling Tower – East Side

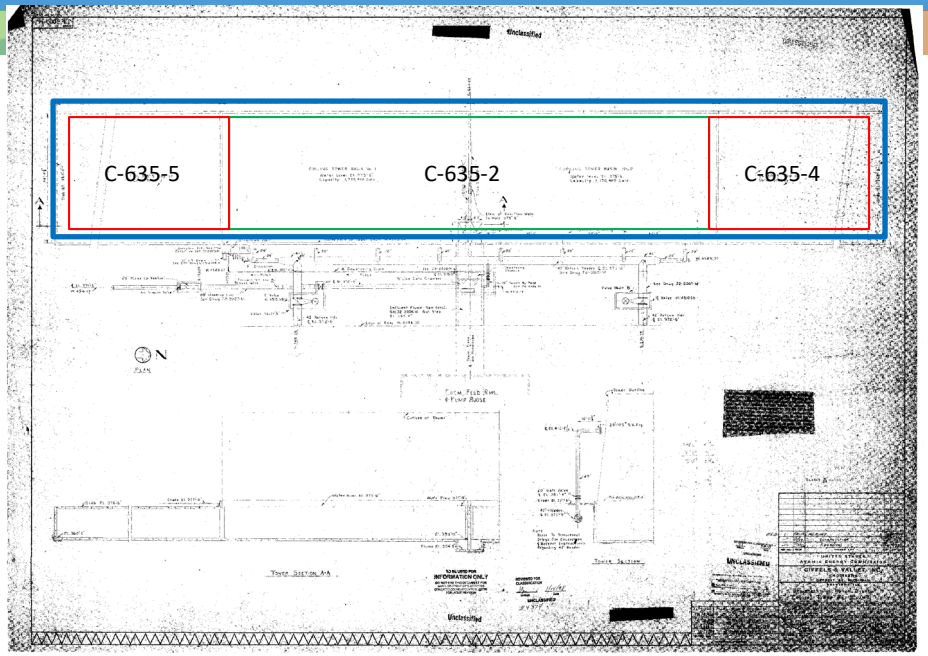
C-635-4 Facility Photo: 1/2022



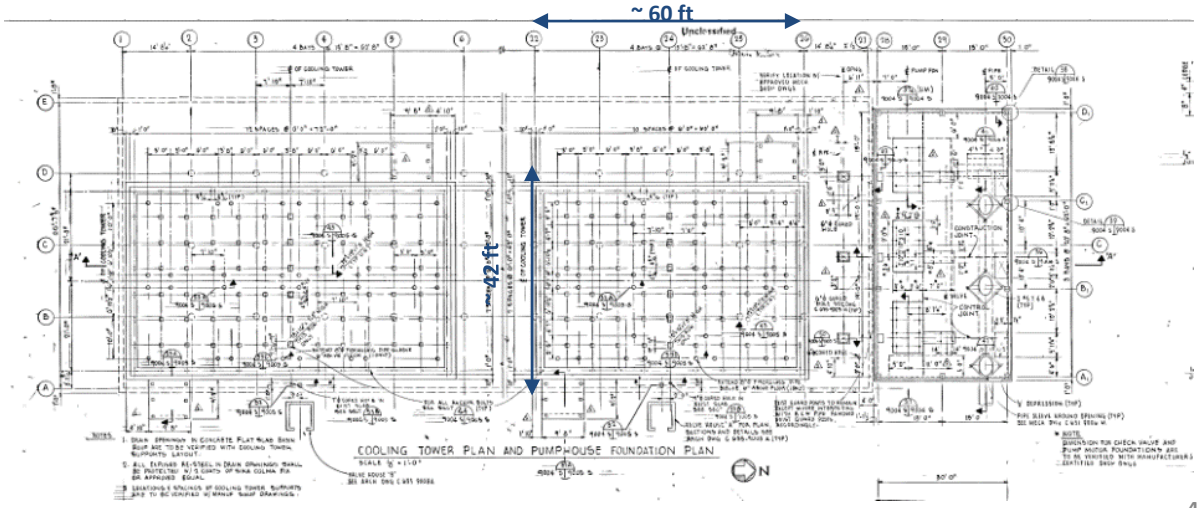
Internal Cooling Tower Components
Excerpt from Engineering Drawing HUC3403-001-01

C-635-4 Blending Cooling Tower (North) - Construction History

- C-635-4 Blending Cool Tower (North) facility. (Continued)
  - East side infrastructure.
    - One exterior wood staircase; located on the south end.
    - Two riser pipes; connect to the below grade piping system.
    - One external concrete building; houses the fire sprinkler system.
  - West side infrastructure.
    - One exterior wood staircase; located on the north end.
  - Roof infrastructure.
    - Wood decking with railing that extends the circumference of the tower.
    - Support fans that are enclosed with protective shrouds.



Excerpt of Engineering Drawing of C-635-2 Layout; J3-2000-M, dated 1952



Excerpt of Engineering Drawing of C-635 Blending Towers and Blending Tower Pump House Foundation Plan; C-635-9004-S, dated 1975

C-635-4 Blending Cooling Tower (North) - Construction History

- C-635-4 facility (aboveground structure) is approximately 2,520 ft^2; measuring ~ 42 ft x ~ 60 ft.
  - Collection basin measuring ~93 ft x ~66 ft x ~15 ft.
    - This basin is part of the larger basin footprint that runs underneath the majority of the C-635 Cooling Tower and has an overall measurement of ~426 ft x ~66 ft x ~15 ft. (Note: The portion of the basin under the C-635-2 main cooling tower contains the influent flume that connects the cooling tower basin to the C-635-1 pump house.)
  - One external concrete building measuring ~6 ft 8 inches x ~6 ft 8 inches x ~9 ft.
    - Houses the fire sprinkler system.
    - Located within footprint of the blending cooling tower.
  - F-Loop Return to blending tower vault measuring ~10 ft x 7 ft 6 inches x ~9 ft.
    - While installed and associated with the C-635-4 blending tower, the vault is located within footprint of the C-635-2 main cooling tower.
    - Contained a sump measuring ~18 inches x ~18 inches x ~18 inches; drained to ground or back to basin.

C-635-4 Top of Basin Slab

C-635-4 Fire Sprinkler System

F-Loop Return to C-635-4 Blending Tower

C-635-4 Facility Photos: 1/2022

C-635-4 Blending Cooling Tower (North) - Operational History

- Blending cooling towers, along with blending pump houses, were constructed as part of the 1970s CIP/CUP in anticipation that the increase in enrichment capacity would result in an increase in process temperatures that would require additional cooling capacity.
  - Blending cooling towers were designed similar to the main cooling tower and provided additional cooling capacity.

- C-635-4 was originally built and operated as a blending cooling tower from its construction in 1975/1976 to 2013.
  - Often referred to as one of the "CUP cooling towers."
  - Heated RCW from the C-335 process building, a portion of the south end of C-337, and C-535 switchyard (synchronous condensers) was distributed through various sections of the blending cooling tower and released via evaporation; cooled RCW was then collected into the cooling tower basin where it then flowed by gravity via a flume into the wet well located underneath the C-635-1 pump house.

C-635-4 Blending Cooling Tower – West Side

C-635-4 Blending Cooling Tower – East Side

C-635-4 Facility Photos: 1/2022

C-635-4 Blending Cooling Tower (North) - Operational History

- Brown rot fungi growth was a problem for the blending cooling towers even though they were constructed with treated redwood.
  - All cell plenum chambers, tower deck, outer sidewalls, and tower tops were treated periodically with one of two types of fungicide solutions:
    - Sodium pentachlorophenate.
    - Double diffusion method – first spraying with a solution of zinc sulphate and arsenic acid followed by a second spraying with a solution of sodium bichromate.
  - Fungicide treatment was discontinued in 1987.

C-635-4 West Side – Looking North

- In 1979, a cooling tower drift study was conducted to determine the impact of chromium disposition from the cooling towers.
  - Vegetation survey provided evidence of long-term transport and disposition of chromium to terrestrial ecosystem components.
    - Decrease in concentration with distance; most disposition is confined to DOE property.
  - Chromium deposited by drift to soils or lost to soils from vegetation does not accumulate significantly beyond 200 meters from the towers
    - Soil chromium is the less soluble and less biologically active oxidation state (Cr+3).

C-635-4 East Side – Riser No. 10

C-635-4 Facility Photos: 1/2022

C-635-4 Blending Cooling Tower (North) - Operational History

- In 1981, RCW sprinkler alarms were installed.
- USEC leased the facility in the early 1990s and continued to use C-635-4 as a blending cooling tower until enrichment operations ceased at C-335.
- From 2008-2010 the CUP cooling towers underwent refurbishment.
  - Refurbishment included the replacement of selected structure and decking materials. (Note: Mechanical repairs to motors, gear boxes, etc., also occurred over the years of operation.)
- In 2013, C-635-4 was shutdown, along with its associated pump house.
  - The basin and influent flume have not been drained and remain full of water; draining has not occurred in order to prevent hydrostatic pressure changes that could cause collapse or floating of the subsurface structure
- C-635-4 transitioned from USEC to DOE in 2014.

C-635-4 Southeast Corner Stairs and No. 9 Riser

C-635-4 – North Side

C-635-4 – No. 9 Riser Block Valve and Hot Water Bypass Line

C-635-4 Blending Cooling Tower (North) - Current Status

- Walkdown inspection conducted in January 2022 and employee interviews confirmed no unusual conditions.
  - Both ACM (e.g., transite siding) and lead-based paints are known to be present.
  - Historical use of sodium pentachlorophenate; zinc sulphate; arsenic acid; and sodium bichromate for fungicide treatment of wood.
  - One external concrete building; houses the fire sprinkler system.
  - Not used for radiological storage; no radiological postings present.
  - No GSA or SAA.
  - Basin located beneath the C-635-4 blending cooling tower is associated with the main basin (basin remains full of water).
    - Contains five pressure release valves and two drop down areas that connect to an influent flume.
    - Houses an influent flume that exits at the bottom of the basin of the cooling tower (influent flume remains full of water).
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-635-1 wet well and would be present in the basin.
    - Historical release of oil and grease to the cooling tower basin.
    - Historical chromated water leaks have occurred.
  - No known chemical spills except for those associated with the basin (e.g., oil/grease, chromated water leaks).
  - Vault associated with C-635-4 (F-Loop Return) is located within the footprint of the main cooling tower; contains a sump.

C-635-4 – Structural Frame

C-635-4 Sprinkler

C-635-4 Basin Top – Looking South

C-635-4 Facility Photos: 1/2022

C-635-4 Blending Cooling Tower (North) - Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the aboveground structure to protect future public health or welfare or the environment.
  - C-635-4 was exclusively operated as a blending cooling tower; cooling heated RCW from the C-335 process building, a portion of the south end of C-337, and C-535 switchyard (synchronous condensers) from its construction in 1975/1976 to 2013.
  - Building materials used for construction could contain lead-based paints and ACM (e.g., corrugated transite siding).
    - Because the C-635-4 blending cooling tower was not completely refurbished; chemicals used for fungicide treatment in 1987 may still be of concern.
    - In 1992/1993, the RCW system was converted from a chromate system to a phosphate system.
  - Building debris generated from demolition of the aboveground structures can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that the historical construction and system processes at C-635-4 involved equipment and chemicals that could have the potential to pose a release threat to the basin and underlying soils (including the surrounding area associated with the basin/vaults). (See slide 6 for SWMU 88 details.)
  - Chromated water releases and airborne dispersion of chromium have occurred; making the underlying soils and surrounding area suspect for potential chromium contamination.
  - Five pressure release valves are located along the bottom of the basin floor.
  - Basin (currently full of water) is connected to the C-635-1 pump house via an influent flume (currently full of water).
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-635-1 wet well and would be present in the basin.
  - One of the seven vaults located within the footprint of the main cooling tower is associated with C-635-4; this vault contains a sump that drained or potentially drained to the surrounding soils.

C-635-4 Blending Cooling Tower (North) - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., risers, fans, fan motors, and shrouds, etc.) (to the extent practicable) prior to demolition.
  - Any floor drains (including the six identified) will be delineated, documented, and isolated prior to demolition.
  - An evaluation will be made to determine if any measures may be appropriate to stabilize and/or isolate the basin (or portions thereof) from the main floor of the cooling tower prior to demolition. (Note: Measures other than isolation will require additional consultation with EPA and Kentucky).
  - Water from the basin and influent flume will be evaluated for removal and proper disposal as part of deactivation and/or predemolition activities. (Note: Because the wet well and influent flume are part of the underlying slab and soils that constitutes the SWMU, a SWMU notification, along with a SAR revision, will be performed documenting removal and disposal of the water associated with deactivation and/or predemolition activities).

- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-635-4 facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-635-4 Blending Cooling Tower (North) - Conclusion and Recommendations

- Based on the construction and historical use at C-635-4, demolition and disposal of the aboveground structure for C-635-4 is recommended to be conducted outside of the FFA/CERCLA process.

- As part of the demolition of the aboveground structure, the appropriate BMPs will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-635-4 facility from the Facility D&D OU will be documented in the appropriate annual SMP revision.

- Based on the construction and historical use at C-635-4, it is recommended that the underlying slab and soils (including surrounding soils within the C-635-4 footprint) undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 88 will be updated to clarify that the C-635-4 underlying slab and soils (including surrounding soils within the C-635-4 footprint) constitutes the SWMU will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 88 that includes updated information on C-635-4 prior to removal of the aboveground structure.

C-635-5 Blending Cooling Tower (South)

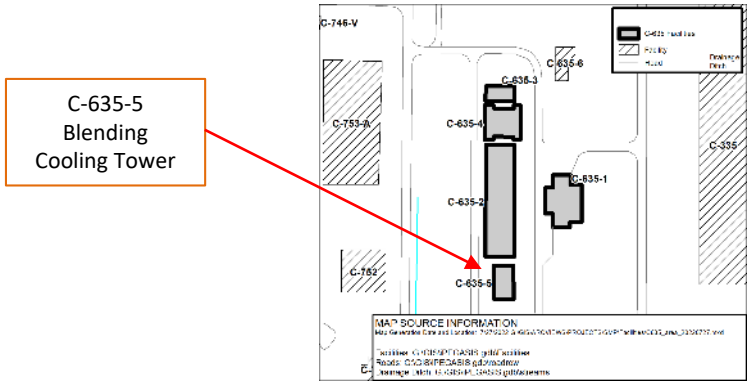
C-635-5 Blending Cooling Tower (South)

C-635-5 Blending Cooling Tower (South) - Construction History

- C-635-5 Blending Cool Tower (South) facility is one of five facilities located in SWMU 88.

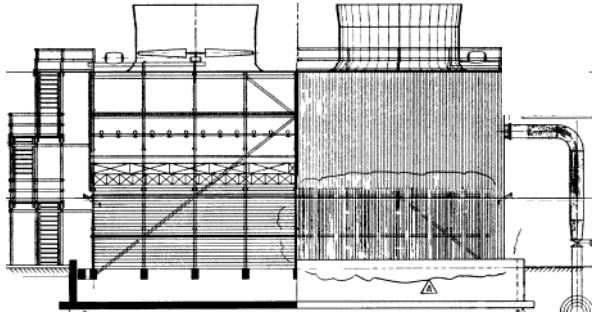
- The facility was constructed in 1975/1976.

- The facility is a wood frame structure (approximately 35 ft tall) resting on a 8-inch poured concrete slab; a deck roof with railing and fan shrouds; and exterior walls of corrugated panels.
  - Often referred to as one of the "CUP towers."
  - Supports two cooling tower cells.
    - Each cell has a fan and driving motor; total of two fans/driving motors.
    - Fans are enclosed by protective shrouds.
    - One riser serves each cooling tower cell; total of two risers.
    - The tower contains a water distribution system (including lateral flush lines), cold water fill (system of baffles), and mist eliminators.
    - Piping and sprinklers for fire protection throughout.
  - Cools RCW and returns it to the below grade collection basin.
    - Footprint of the basin is larger than the aboveground footprint of the blending cooling tower; extending approximately 333 ft north of C-635-5.
    - C-635-5 sits on top of a concrete slab with the basin running underneath the slab; as a result the basin is not open or visible.
    - Approximately 32 – 9-inch diameter holes are drilled into the slab allowing cooled RCW water to fall into the basin below.



C-635-5
Blending Cooling
Tower – East Side

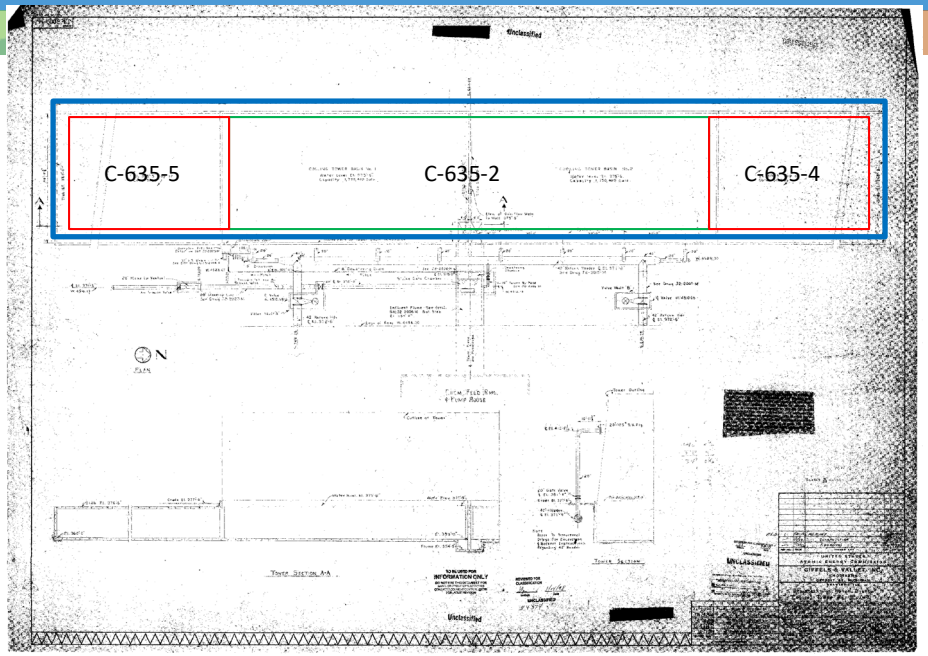
C-635-5 Facility Photos: 1/2022



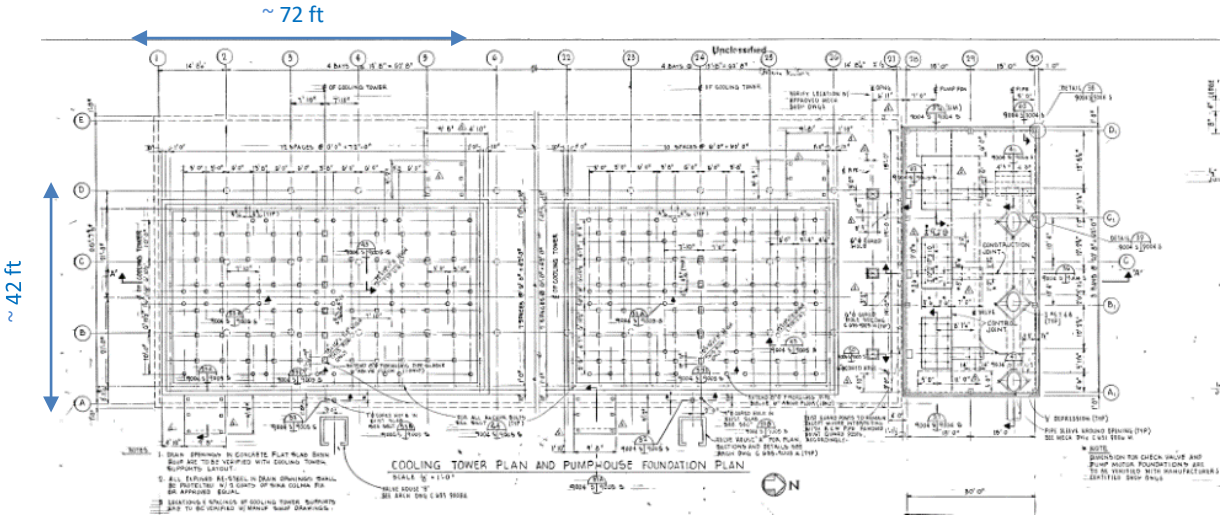
Internal Cooling Tower Components
Excerpt from Engineering Drawing
HUC3403-001-01

C-635-5 Blending Cooling Tower (South) - Construction History

- The facility is a wood frame structure… (Continued)
  - East side infrastructure.
    - One exterior wood staircase; located on the south end.
    - Two riser pipes; connect to the below grade piping system.
    - One external concrete building; houses the fire sprinkler system.
    - Withdrawal connection for firefighting located on south corner.
  - West side infrastructure.
    - One exterior wood staircase; located on the north end.
    - Withdrawal connection for firefighting located on south corner.
  - Roof infrastructure.
    - Wood decking with railing that extends the circumference of the tower.
    - Support fans that are enclosed with protective shrouds.



Excerpt of Engineering Drawing of C-635-2 Layout; J3-2000-M, dated 1952



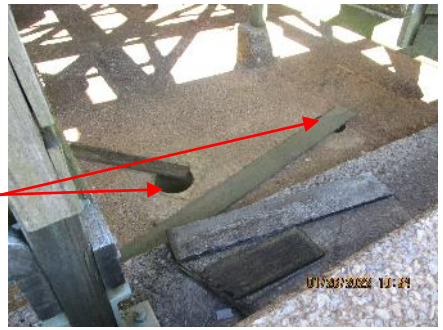
Excerpt of Engineering Drawing of C-635 Blending Towers and Blending Tower Pump House Foundation Plan; C-635-9004-S, dated 1975

C-635-5 Blending Cooling Tower (South) - Construction History

- C-635-5 facility (aboveground structure) is approximately 3,024 ft^2; measuring ~42 ft x ~72 ft.
  - Collection basin measuring ~93 ft x ~66 ft x ~15 ft.
    - This basin is part of the larger basin footprint that runs underneath the majority of the C-635 Cooling Tower and has an overall measurement of ~426 ft x ~66 ft x ~15 ft. (Note: The portion of the basin under the C-635-2 main cooling tower contains the influent flume that connects the cooling tower basin to the C-635-1 pump house.)
    - Water withdrawal systems located on southeast and southwest corner of basin used for firefighting purposes.
  - One external concrete building measuring ~6 ft 8 inches x ~6 ft 8 inches x ~9 ft.
    - Houses the fire sprinkler system.
    - Located within footprint of the blending cooling tower.
  - E-Loop Return to blending tower vault measuring ~7 ft 6 inches x ~10 ft 6 inches x ~9 ft.
    - While installed and associated with the C-635-5 blending tower, the vault is located within footprint of the C-635-2 main cooling tower.
    - No known sump.

C-635-5 - Top of Basin Slab

9-inch Diameter Holes to Basin (Allows cooled RCW water to fall into the basin below)



C-635-5 - Fire Sprinkler System

E-Loop Return Vault to C-635-5 Blending Tower

C-635-5 - Southeast Corner Water Withdrawal for Firefighting

C-635-5 - Southwest Corner Water Withdrawal for Firefighting

C-635-5 Facility Photos: 1/2022

C-635-5 Blending Cooling Tower (South) - Operational History

- Blending cooling towers, along with blending pump houses, were constructed as part of the 1970s CIP/CUP in anticipation that the increase in enrichment capacity would result in an increase in process temperatures that would require additional cooling capability.
  - Blending cooling towers were designed similar to the main cooling tower and provided additional cooling capacity.

- C-635-5 was originally built and operated as a blending cooling tower from its construction in 1975/1976 to 2013.
  - Often referred to as one of the "CUP cooling towers."
  - Heated RCW from the C-335 process building, a portion of the south end of C-337, and C-535 switchyard (synchronous condensers) was distributed through various sections of the blending cooling tower and released via evaporation; cooled RCW was then collected into the cooling tower basin where it then flowed by gravity via a flume into the wet well located underneath the C-635-1 pump house.

C-635-5 Blending Cooling Tower – East Side

C-635-5 Blending Cooling Tower - West Side

C-635-5 Facility Photos: 1/2022

C-635-5 Blending Cooling Tower (South) - Operational History

- Brown rot fungi growth was a problem for the blending cooling towers even though they were constructed with treated redwood.
  - All cell plenum chambers, tower deck, outer sidewalls, and tower tops were treated periodically with one of two types of fungicide solutions:
    - Sodium pentachlorophenate.
    - Double diffusion method – first spraying with a solution of zinc sulphate and arsenic acid followed by a second spraying with a solution of sodium bichromate.
  - Fungicide treatment was discontinued in 1987.

- In 1979, a cooling tower drift study was conducted to determine the impact of chromium dispersion from the cooling towers.
  - Vegetation survey provided evidence of long-term transport and disposition of chromium to terrestrial ecosystem components.
    - Decrease in concentration with distance; most disposition is confined to DOE property.
  - Chromium deposited by drift to soils or lost to soils from vegetation does not accumulate significantly beyond 200 meters from the towers
    - Soil chromium is the less soluble and less biologically active oxidation state (Cr+3).

C-635-5 – West Side
Looking North

C-635-5 – East Side
Riser No. 11

C-635-4 Facility Photos: 1/2022

C-635-5 Blending Cooling Tower (South) - Operational History

- In 1981, RCW sprinkler alarms were installed.
- USEC leased the facility in the early 1990s and continued to use C-635-5 as a blending cooling tower until enrichment operations ceased at C-335.
- From 2008-2010 the CUP cooling towers underwent refurbishment.
  - Refurbishment included the replacement of selected structure and decking materials. (Note: Mechanical repairs to motors, gear boxes, etc., also occurred over the years of operation.)
- In 2013, C-635-5 was shutdown, along with its associated pump house.
  - The basin and influent flume have not been drained and remain full of water; draining has not occurred in order to prevent hydrostatic pressure changes that could cause collapse or floating of the subsurface structure
- C-635-5 transitioned from USEC to DOE in 2014.

C-635-5 – Southeast Corner Stairs and No. 12 Riser

C-635-5 – North Side

C-635-5 – No. 11 Riser Block Valve and Hot Water Bypass Line

C-635-5 Facility Photos: 1/2022

C-635-5 Blending Cooling Tower (South) - Current Status

- Walkdown inspection conducted in January 2022 and employee interviews confirmed no unusual conditions.
  - Both ACM (e.g., transite siding) and lead-based paints are known to be present.
  - Historical use of sodium pentachlorophenate; zinc sulphate; arsenic acid; and sodium bichromate for fungicide treatment of wood.
  - One external concrete building; houses the fire sprinkler system.
  - Not used for radiological storage; no radiological postings present.
  - No GSA or SAA.
  - Basin located beneath the C-635-5 blending cooling tower is associated with the main basin (basin remains full of water).
    - Contains five pressure release valves and two drop down areas that connect to an influent flume.
    - Houses an influent flume that exits at the bottom of the basin of the cooling tower (influent full remains full of water).
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-635-1 wet well and would be present in the basin.
    - Historical release of oil and grease to the cooling tower basin.
    - Historical chromated water leaks have occurred.
  - No known chemical spills except for those associated with the basin (e.g., oil/grease, chromated water leaks).
  - Vault associated with C-635-5 (E-Loop Return) is located within the footprint of the main cooling tower.

C-635-5 – Structural Frame

C-635-5 – Sprinkler

C-635-5 – Basin Top Looking North

C-635-5 Facility Photos: 1/2022

C-635-5 Blending Cooling Tower (South) - Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the aboveground structure to protect future public health or welfare or the environment.
  - C-635-5 was exclusively operated as a blending cooling tower; cooling heated RCW from the C-335 process building, a portion of the south end of C-337, and C-535 switchyard (synchronous condensers) from its construction in 1975/1976 to 2013.
  - Building materials used for construction could contain lead-based paints and ACM (e.g., corrugated transite siding).
    - Because the C-635-5 blending cooling tower was not completely refurbished; chemicals used for fungicide treatment through 1987 may be of concern.
    - In 1992/1993, the RCW system was converted from a chromate system to a phosphate system.
  - Building debris generated from demolition of the aboveground structures can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that the historical construction and system processes at C-635-5 involved equipment and chemicals that could have the potential to pose a release threat to the basin and underlying soils (including the surrounding area associated with the basin/vaults). (See slide 6 for SWMU 88 details.)
  - Chromated water releases and airborne dispersion of chromium have occurred; making the underlying soils and surrounding area suspect for potential chromium contamination.
  - Five pressure release valves are located along the bottom of the basin floor.
  - Basin (currently full of water) is connected to the C-635-1 pump house via an influent flume (currently full of water).
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-635-1 wet well and would be present in the basin.
  - One of the seven vaults located within the footprint of the main cooling tower is associated with C-635-5.

C-635-5 Blending Cooling Tower (South) - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., risers, fans, fan motors, and shrouds, etc.) (to the extent practicable) prior to demolition.
  - Any floor drains (including the six identified) will be delineated, documented, and isolated prior to demolition.
  - An evaluation will be made to determine if any measures may be appropriate to stabilize and/or isolate the basin (or portions thereof) from the main floor of the cooling tower prior to demolition. (Note: Measures other than isolation will require additional consultation with EPA and Kentucky).
  - Water from the basin and influent flume will be evaluated for removal and proper disposal as part of deactivation and/or predemolition activities. (Note: Because the wet well and influent flume are part of the underlying slab and soils that constitutes the SWMU, a SWMU notification, along with a SAR revision, will be performed documenting removal and disposal of the water associated with deactivation and/or predemolition activities).

- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-635-5 facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-635-5 Blending Cooling Tower (South) - Conclusion and Recommendations

- Based on the construction and historical use at C-635-5, demolition and disposal of the aboveground structure for C-635-5 is recommended to be conducted outside of the FFA/CERCLA process.

- As part of the demolition of the aboveground structure, the appropriate BMPs will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-635-5 facility from the D&D OU will be documented in the appropriate annual SMP revision.

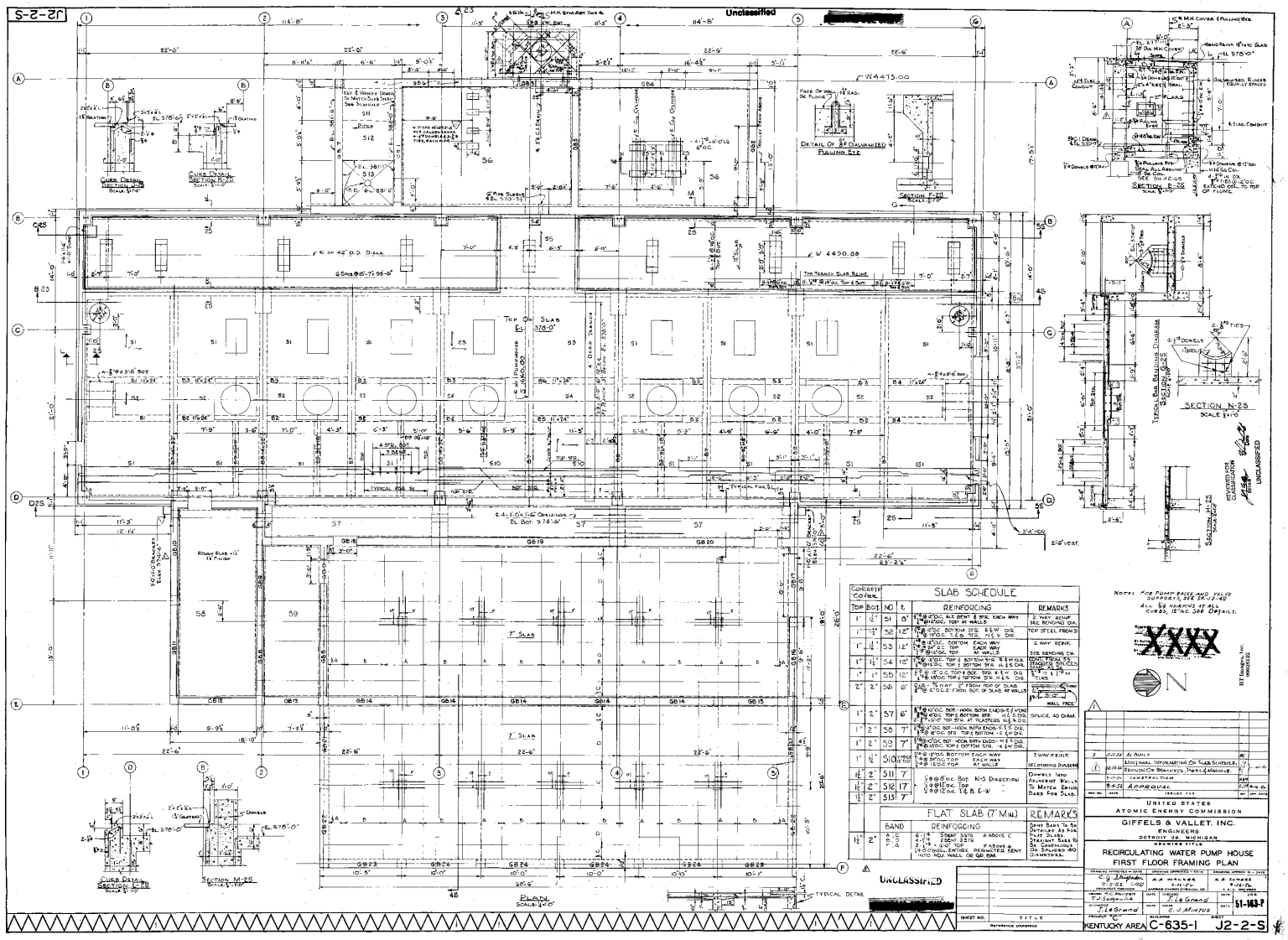
- Based on the construction and historical use at C-635-5, it is recommended that the underlying slab and soils (including surrounding soils within the C-635-5 footprint) undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 88 will be updated to clarify that the C-635-5 underlying slab and soils (including surrounding soils within the C-635-5 footprint) constitutes the SWMU and will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 88 that includes updated information on C-635-5 prior to removal of the aboveground structure.

BACKUP INFORMATION

C-635 Pumphouse and Cooling Tower (SWMU 88) Drawings

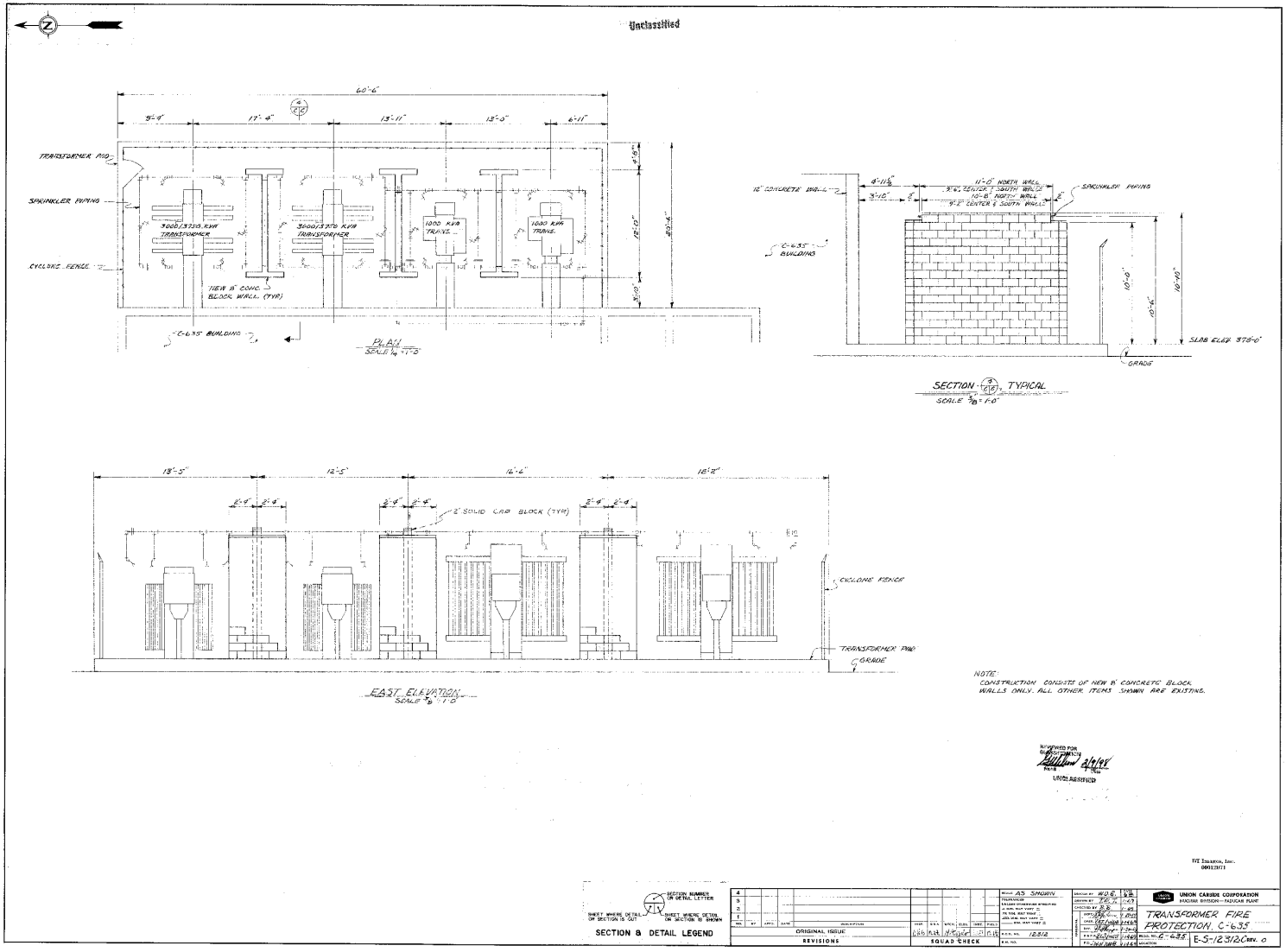
C-635-1 Pump House and Piping

C-635-1 Engineering Drawings

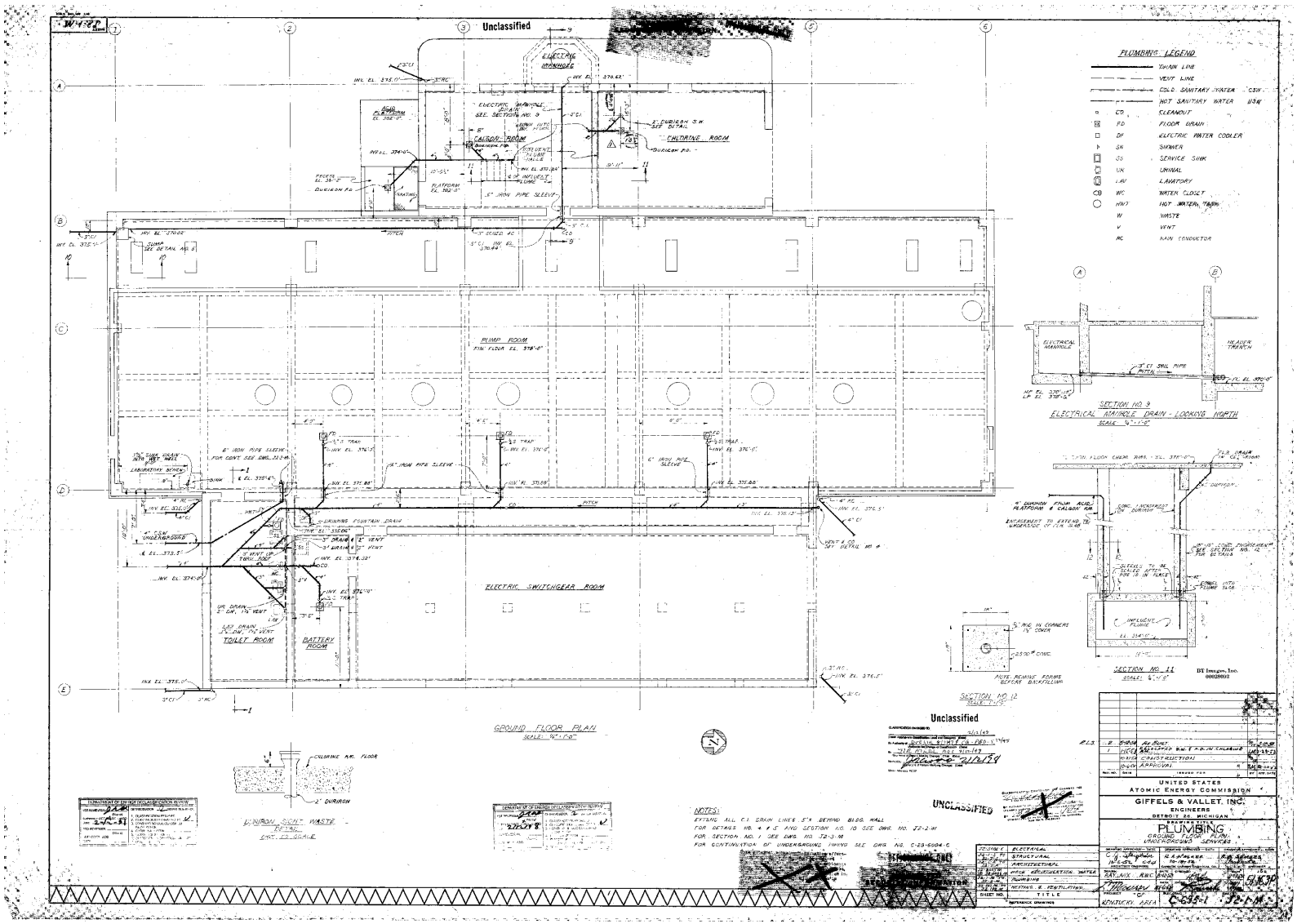


C-635-1; J2-2-S

C-635-1 Engineering Drawings

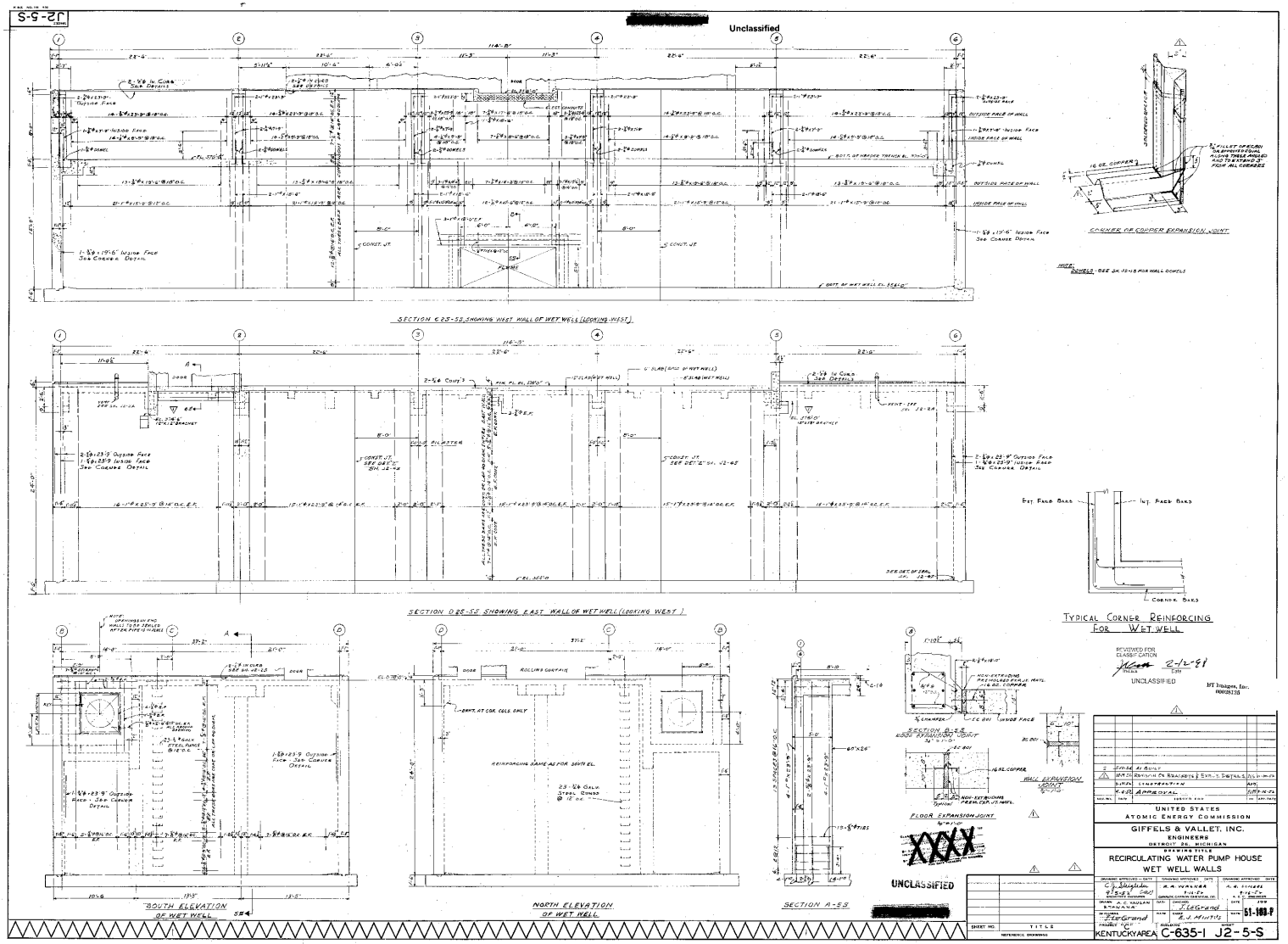


C-635-1 Engineering Drawings



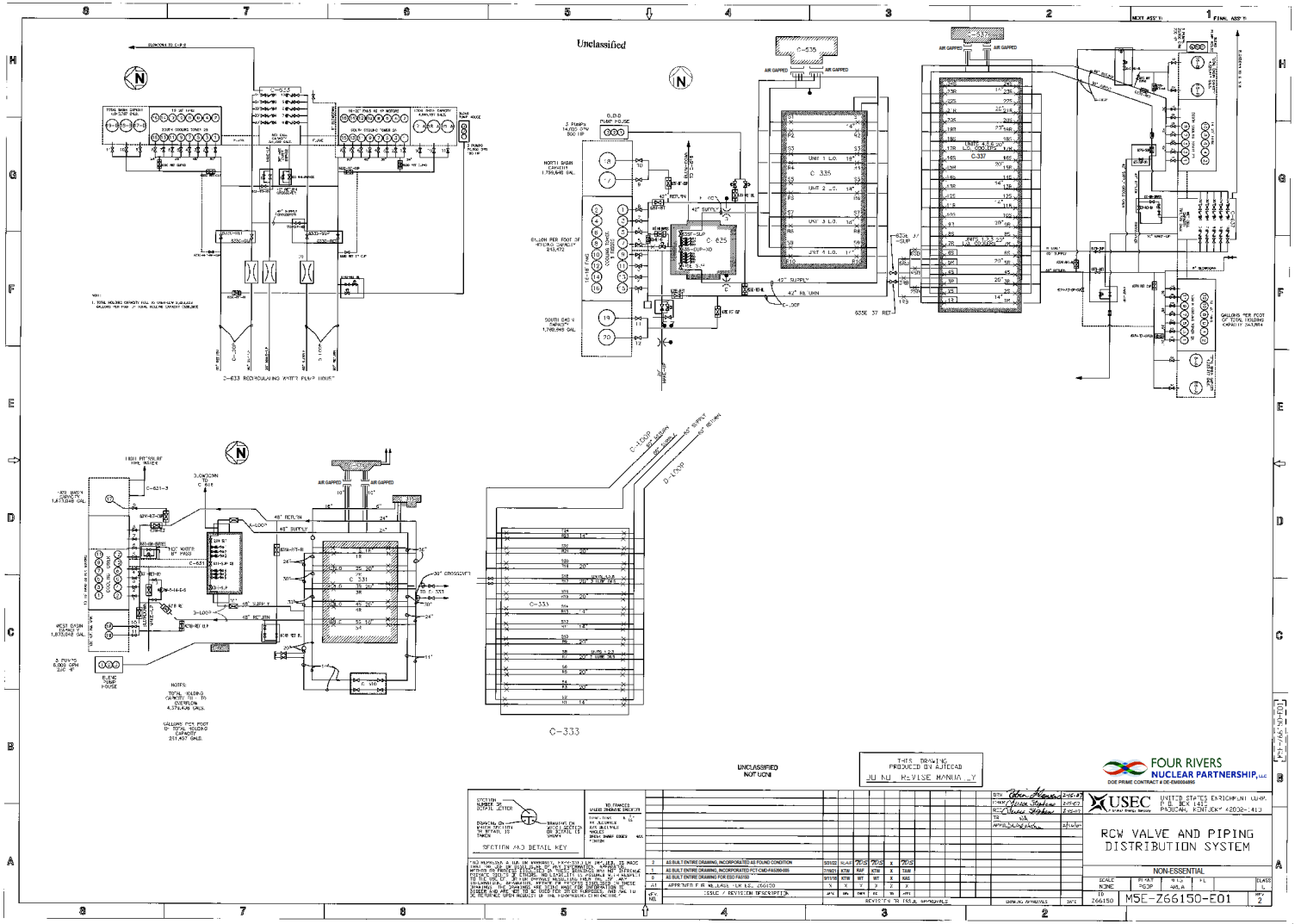
C-635-1, J2-1-M

C-635-1 Engineering Drawings



C-635-1; J2-5-S

C-635-1 Engineering Drawings

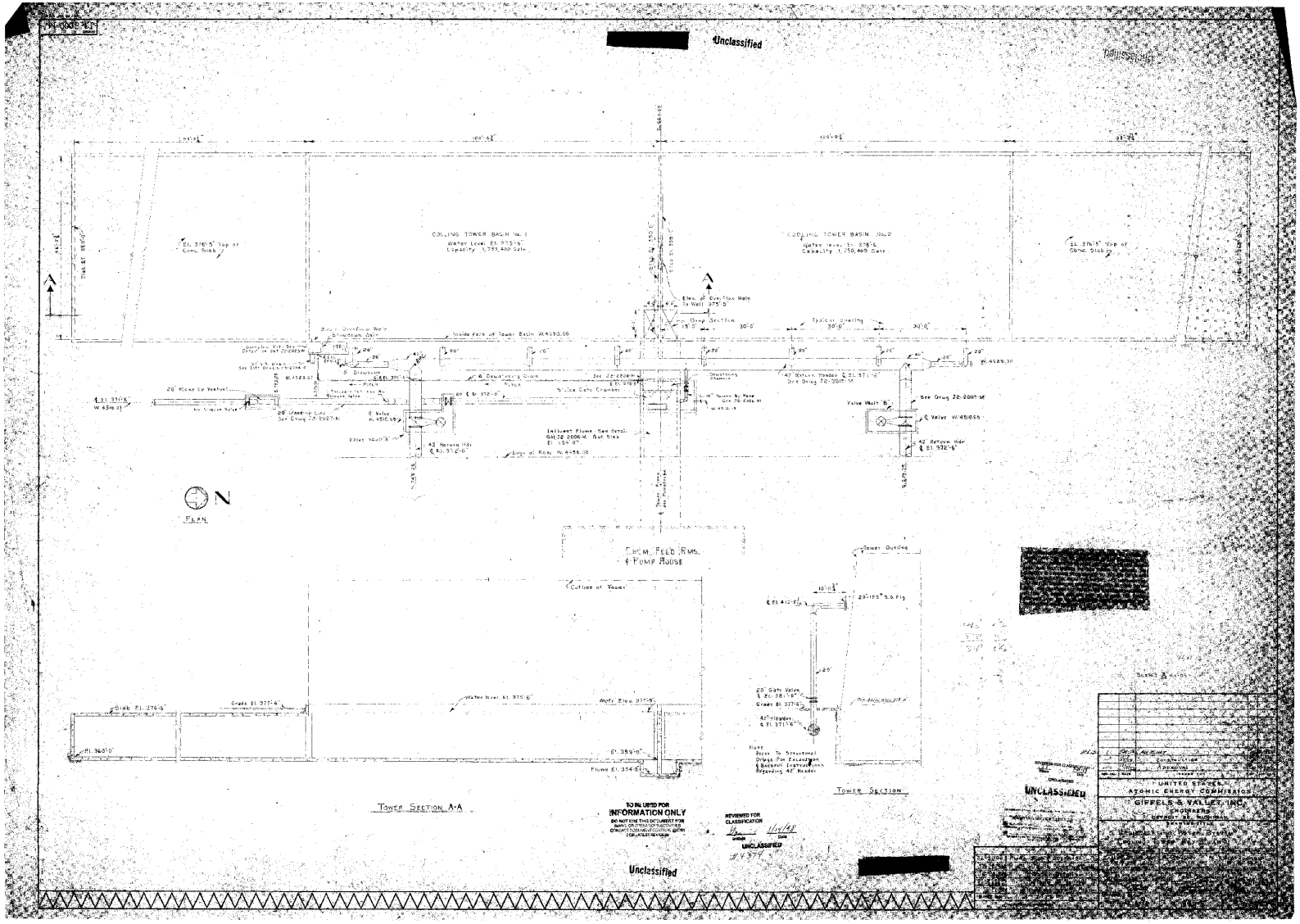


M5E-Z66150-E01, Rev2

C-635 Pumphouse and Cooling Tower (SWMU 88) Drawings

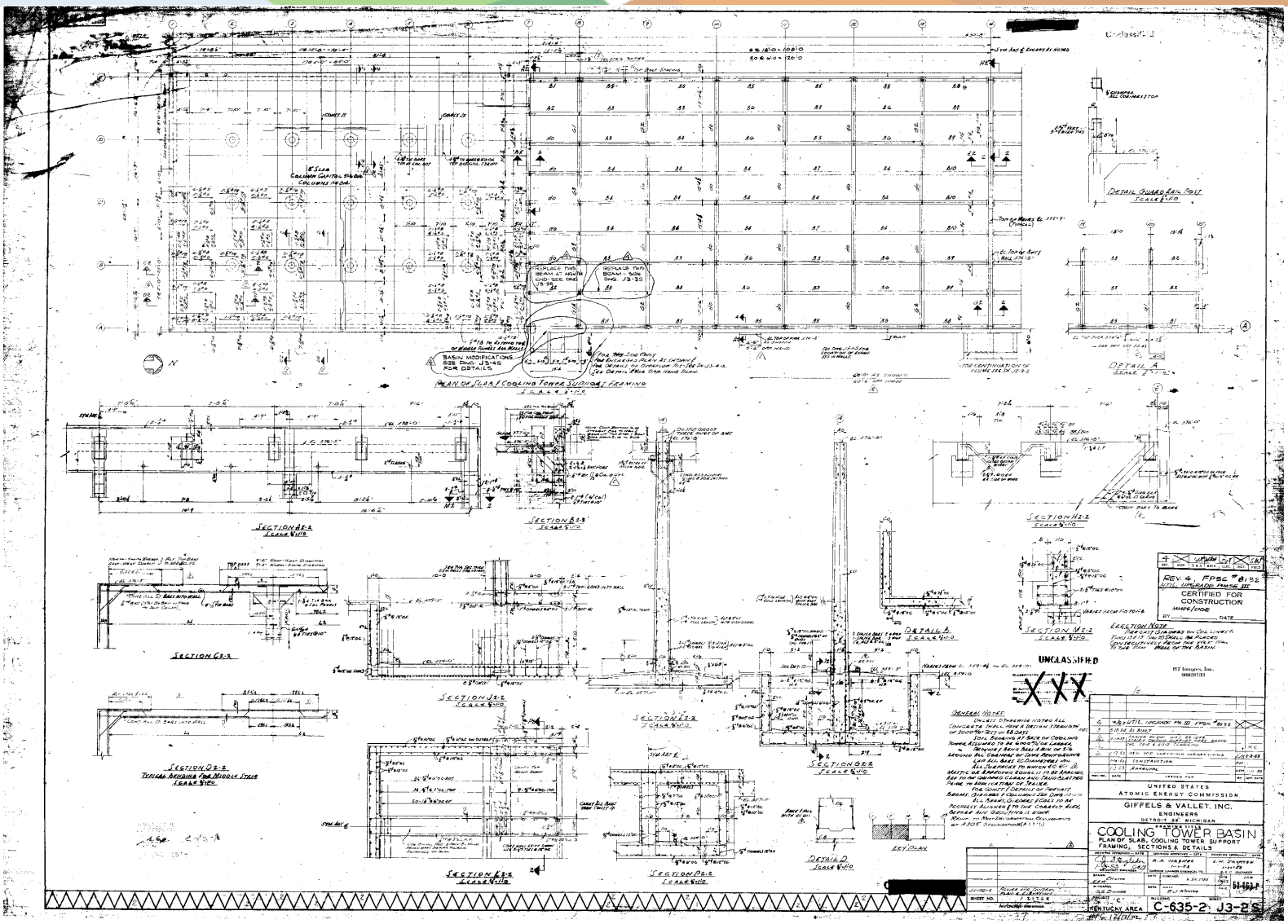
C-635-2 Cooling Tower

C-635-2 Engineering Drawings



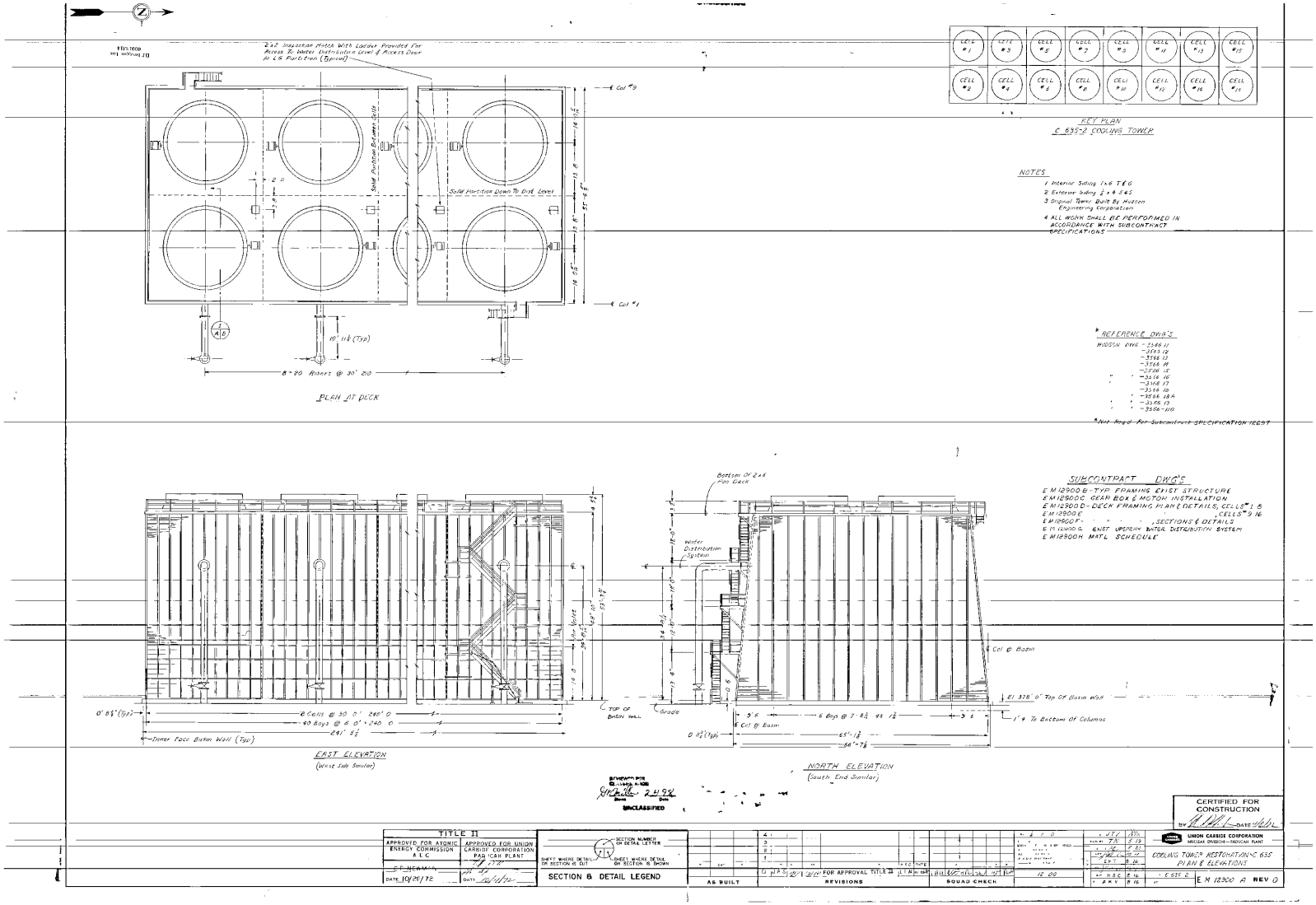
C-635-2; JS-2000-M

C-635-2 Engineering Drawings



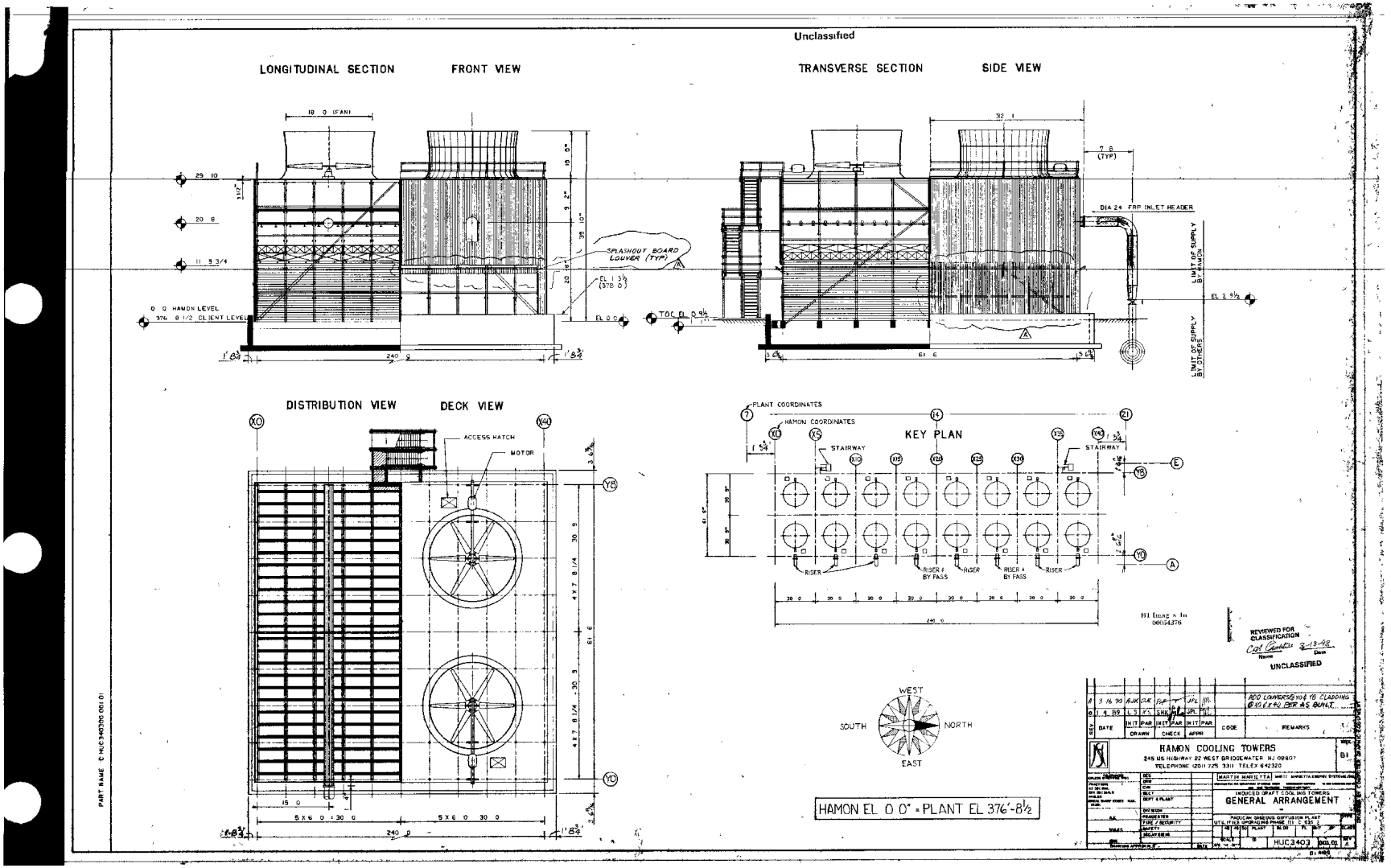
C-635-2; J3-2-S

C-635-2 Engineering Drawings

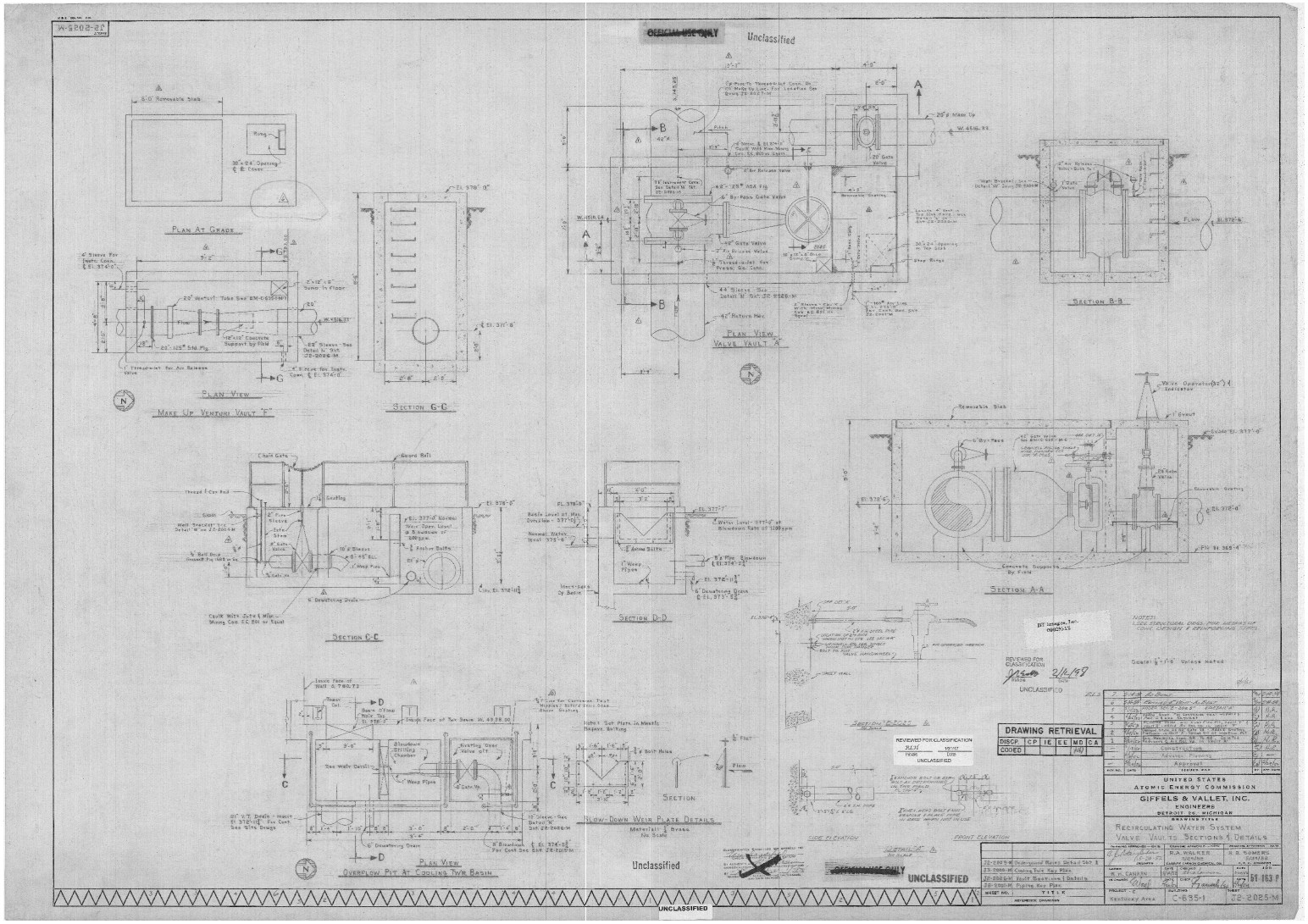


E-M-12900-A; Rev 0

C-635-2 Engineering Drawings

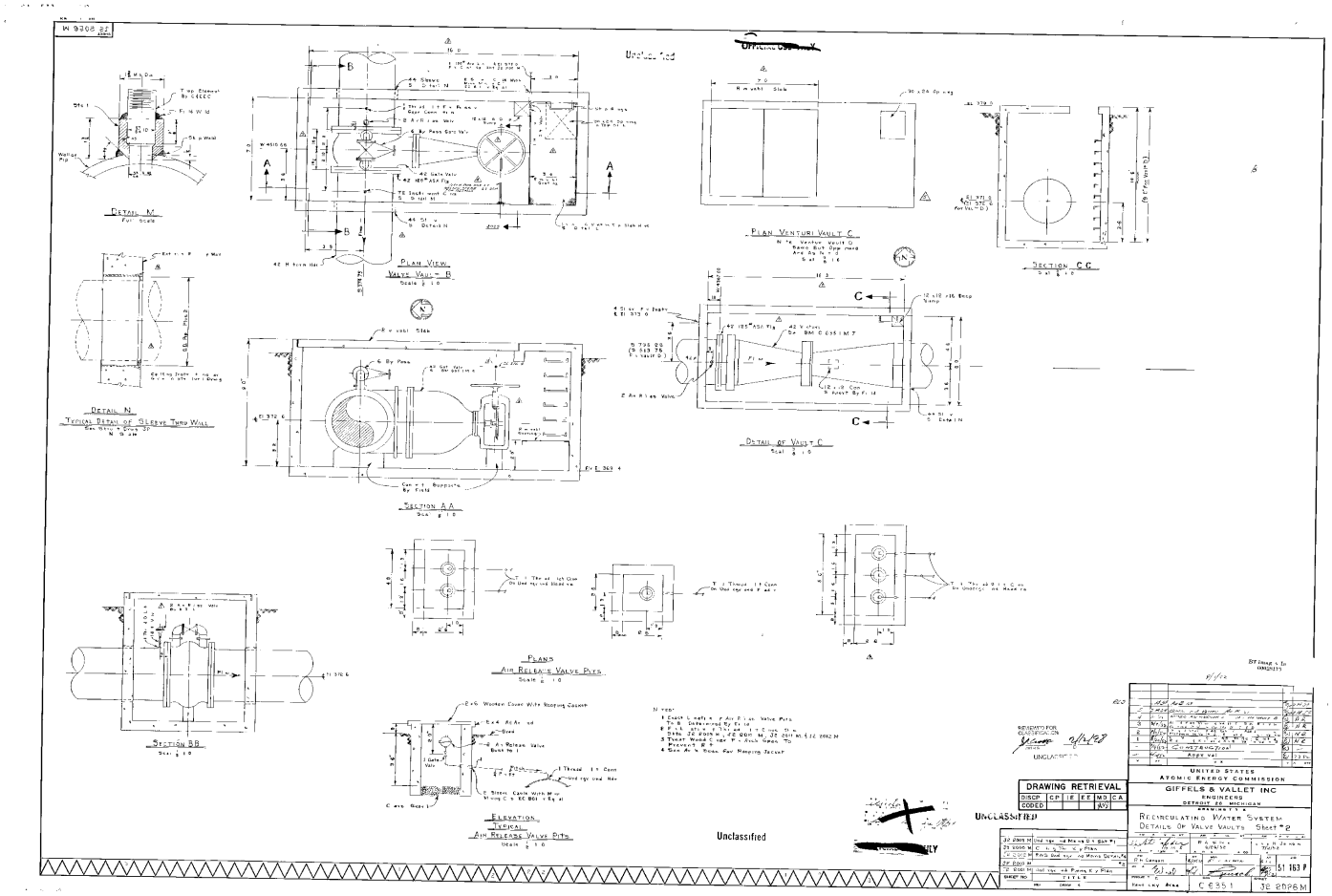


C-635-2 Engineering Drawings

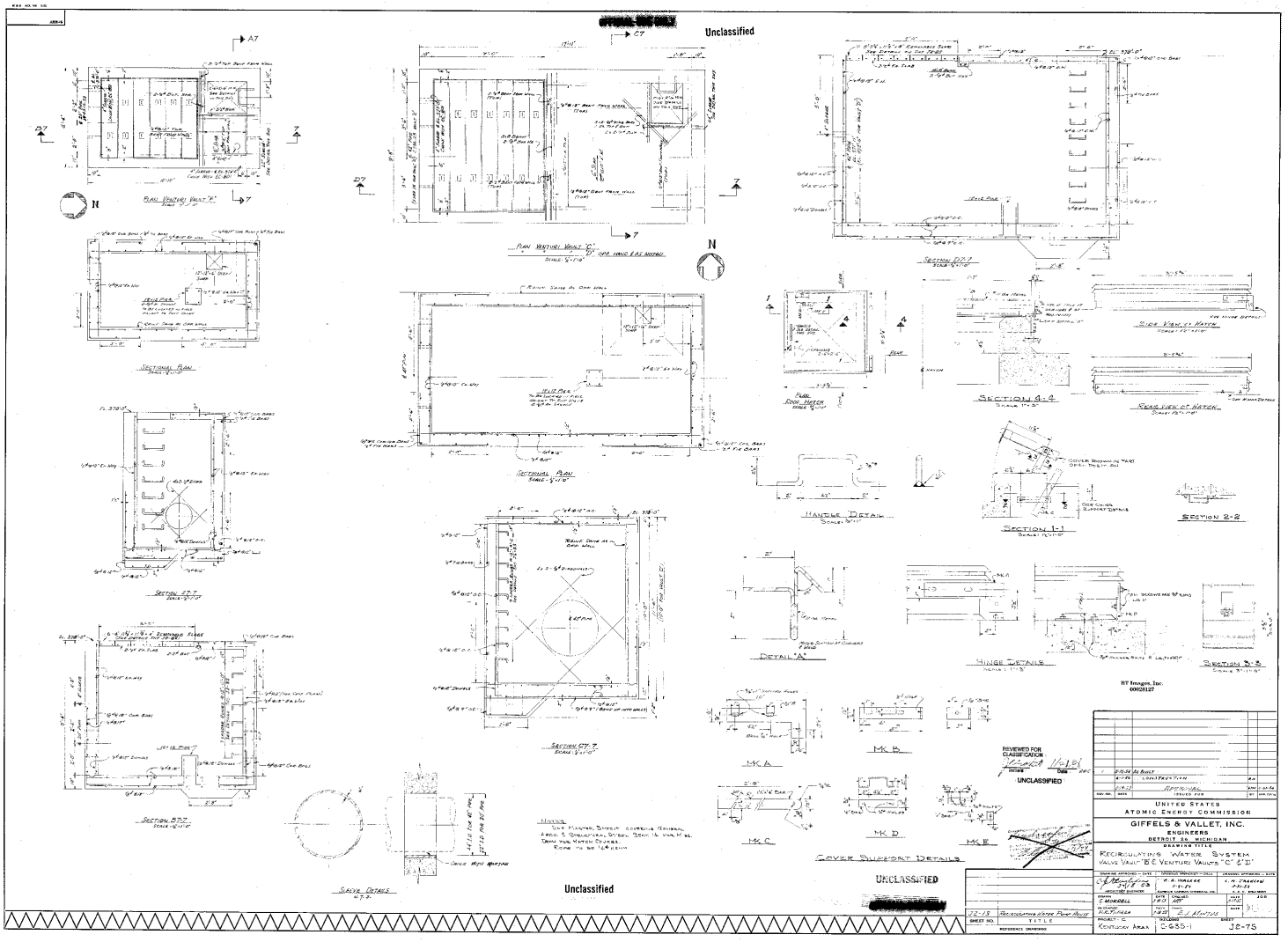


C-635-1, J2-2025M

C-635-2 Engineering Drawings

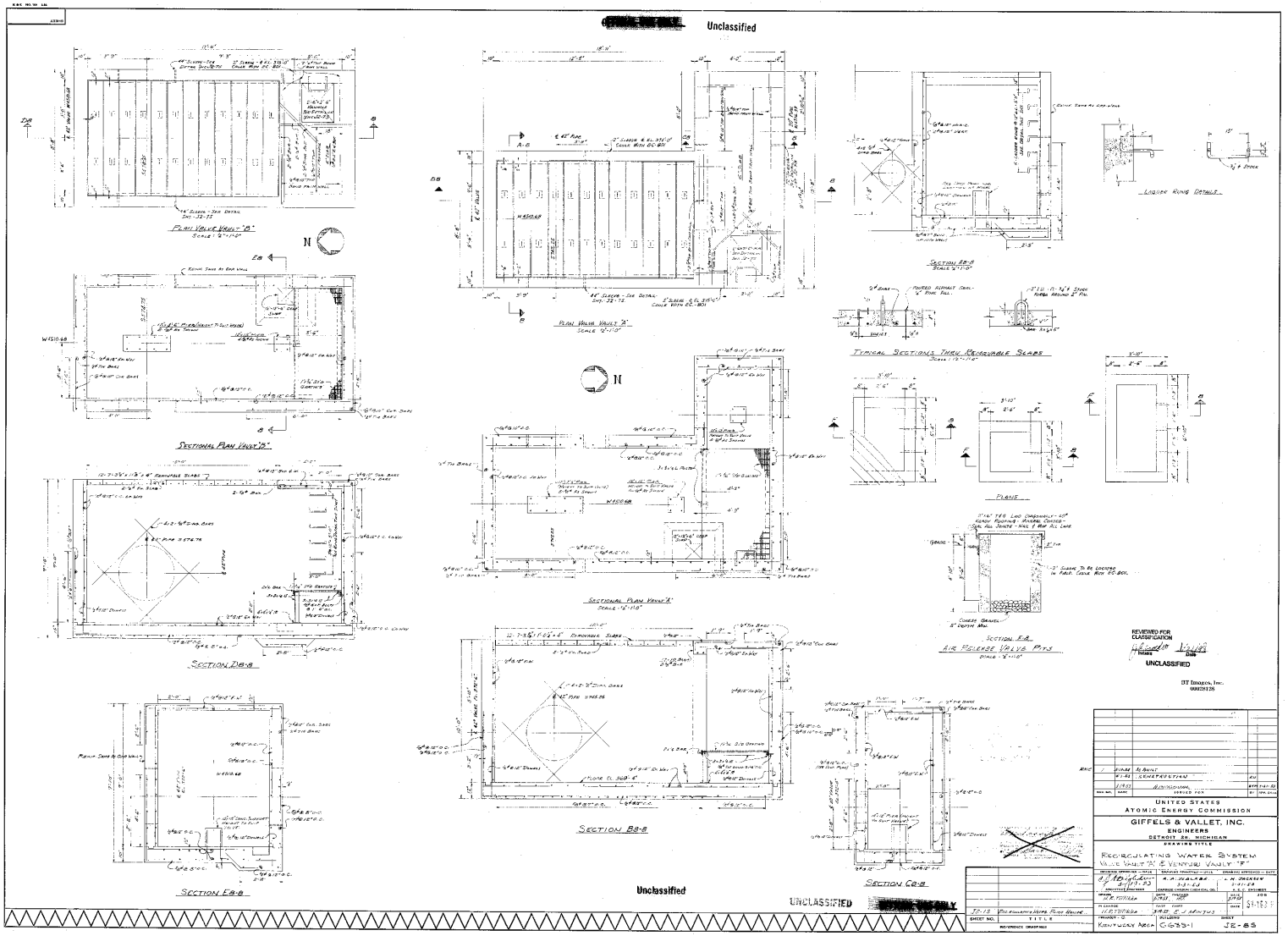


C-635-2 Engineering Drawings

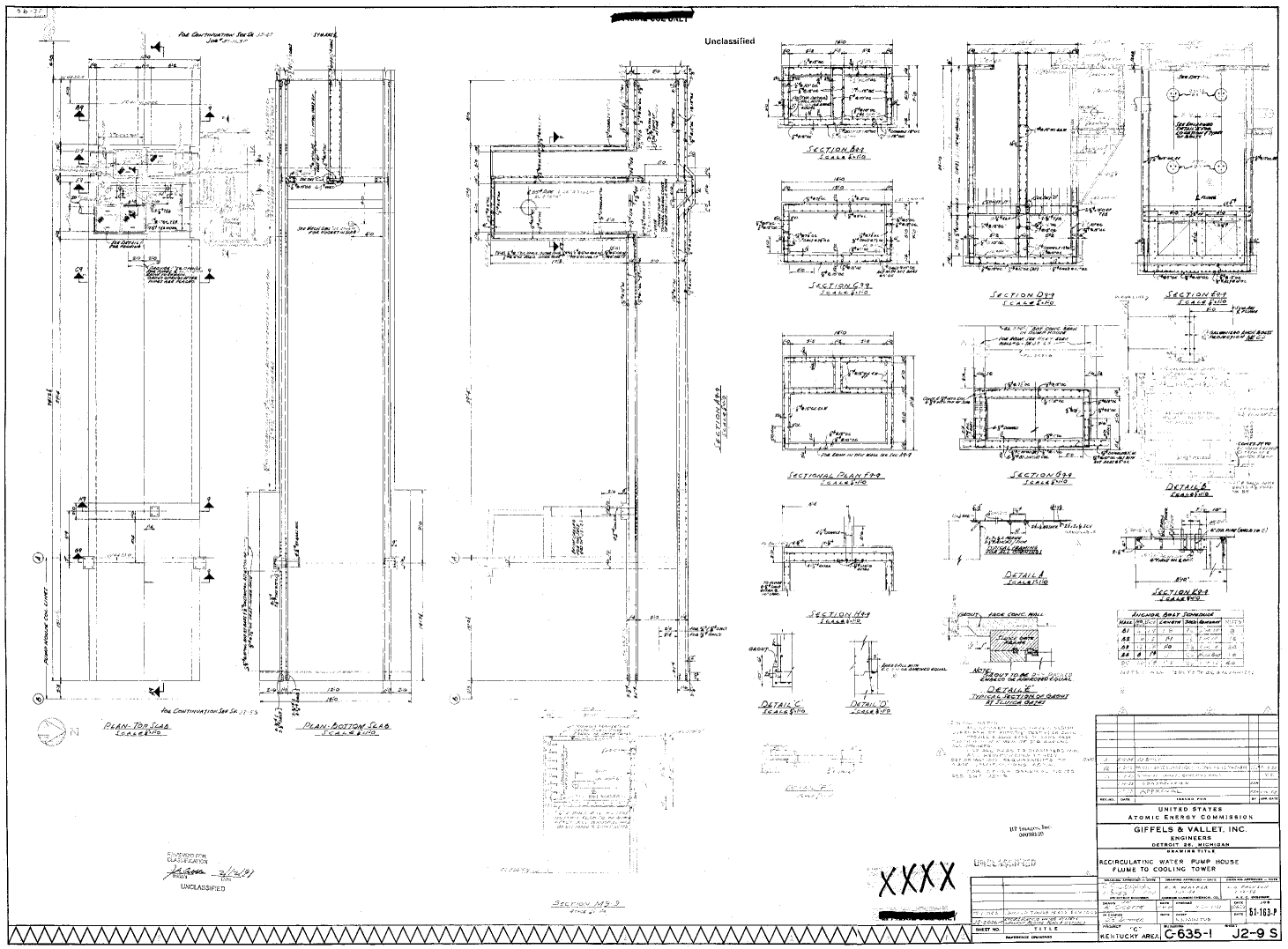


C-635-1; J2-7-S

C-635-2 Engineering Drawings

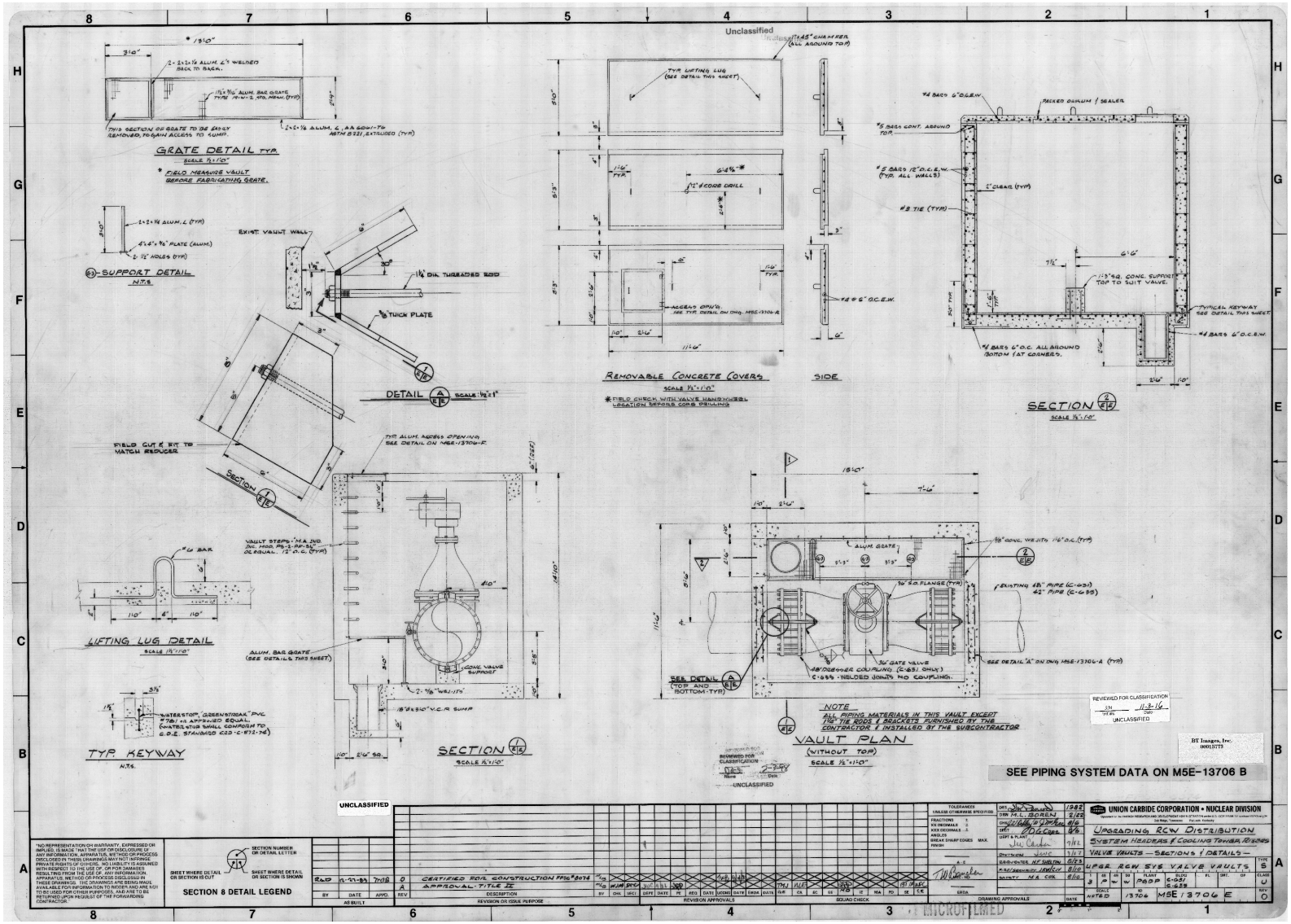


C-635-2 Engineering Drawings



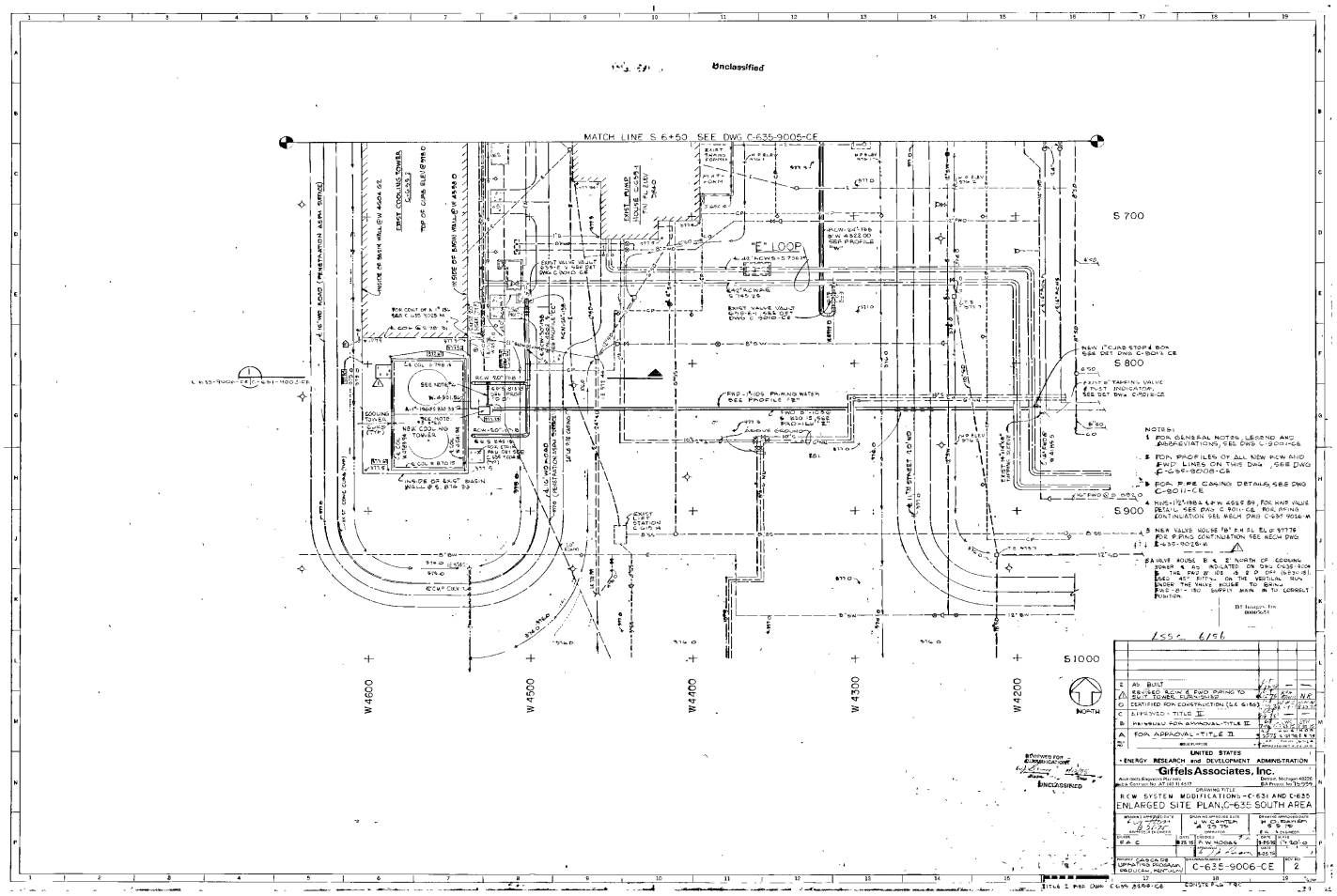
C-635-1; J2-9-S

C-635-2 Engineering Drawings



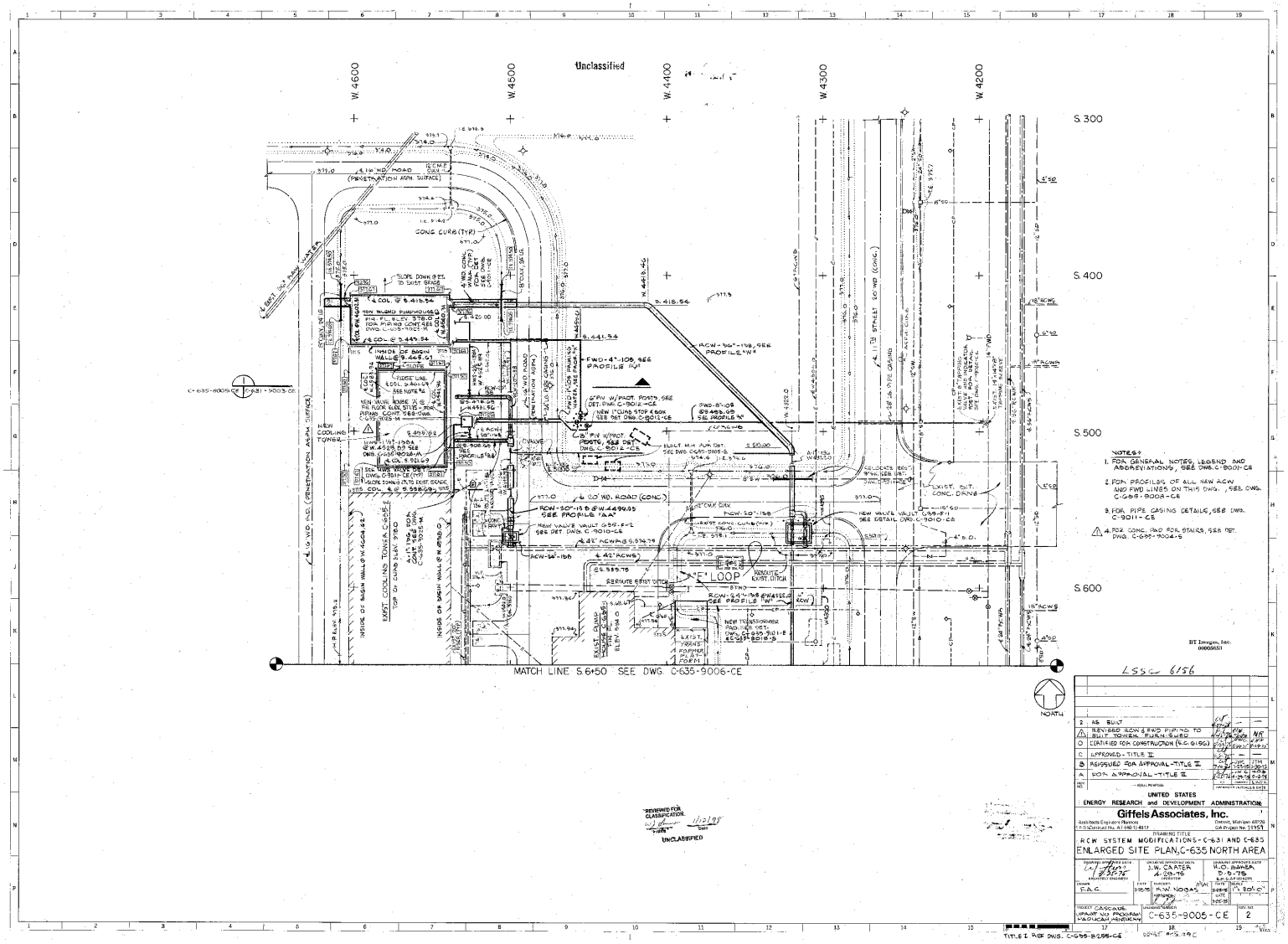
M5E-13760-E

C-635-2 Engineering Drawings



C-635-9006-CE

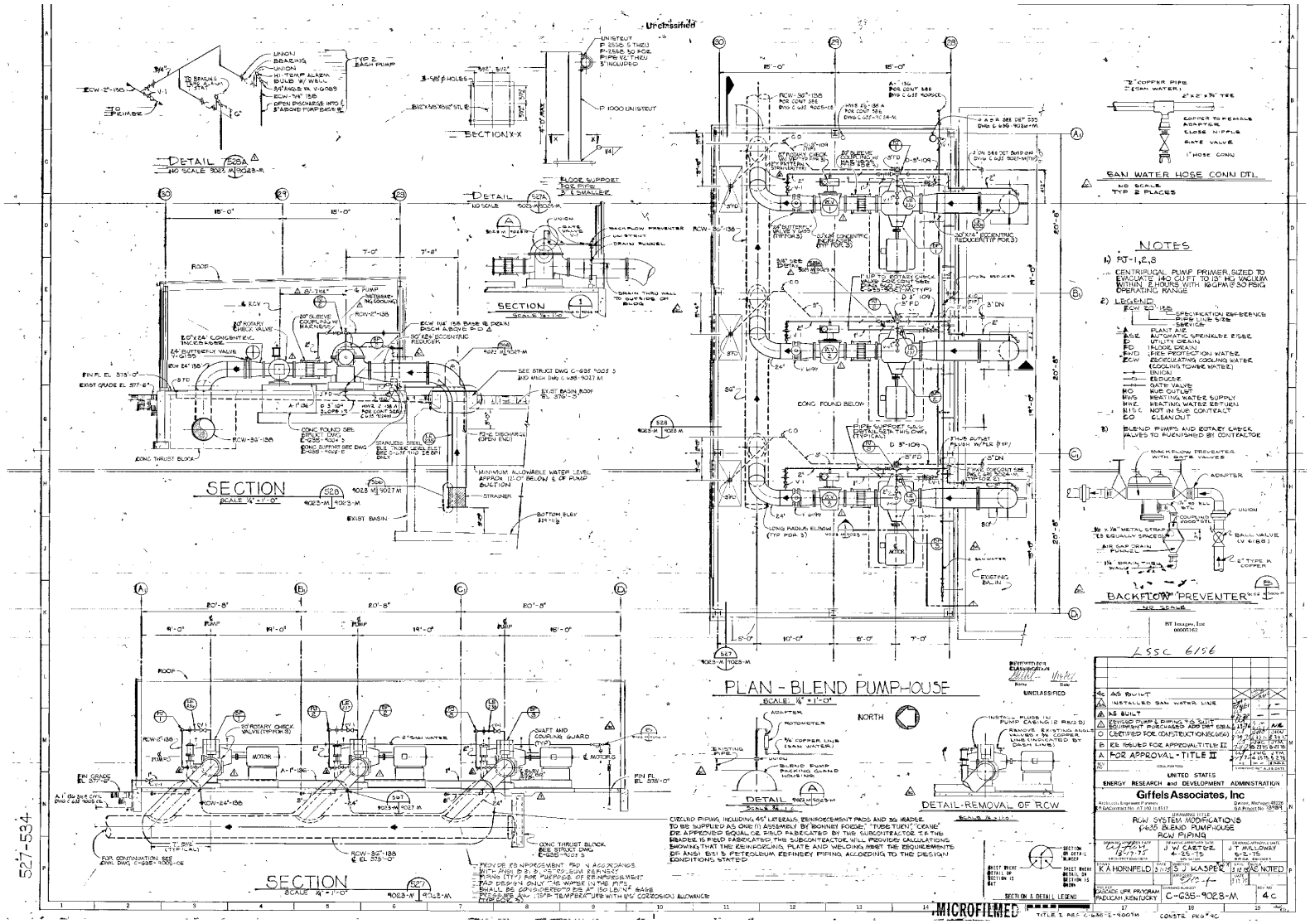
C-635-2 Engineering Drawings



C-635 Pumphouse and Cooling Tower (SWMU 88) Drawings

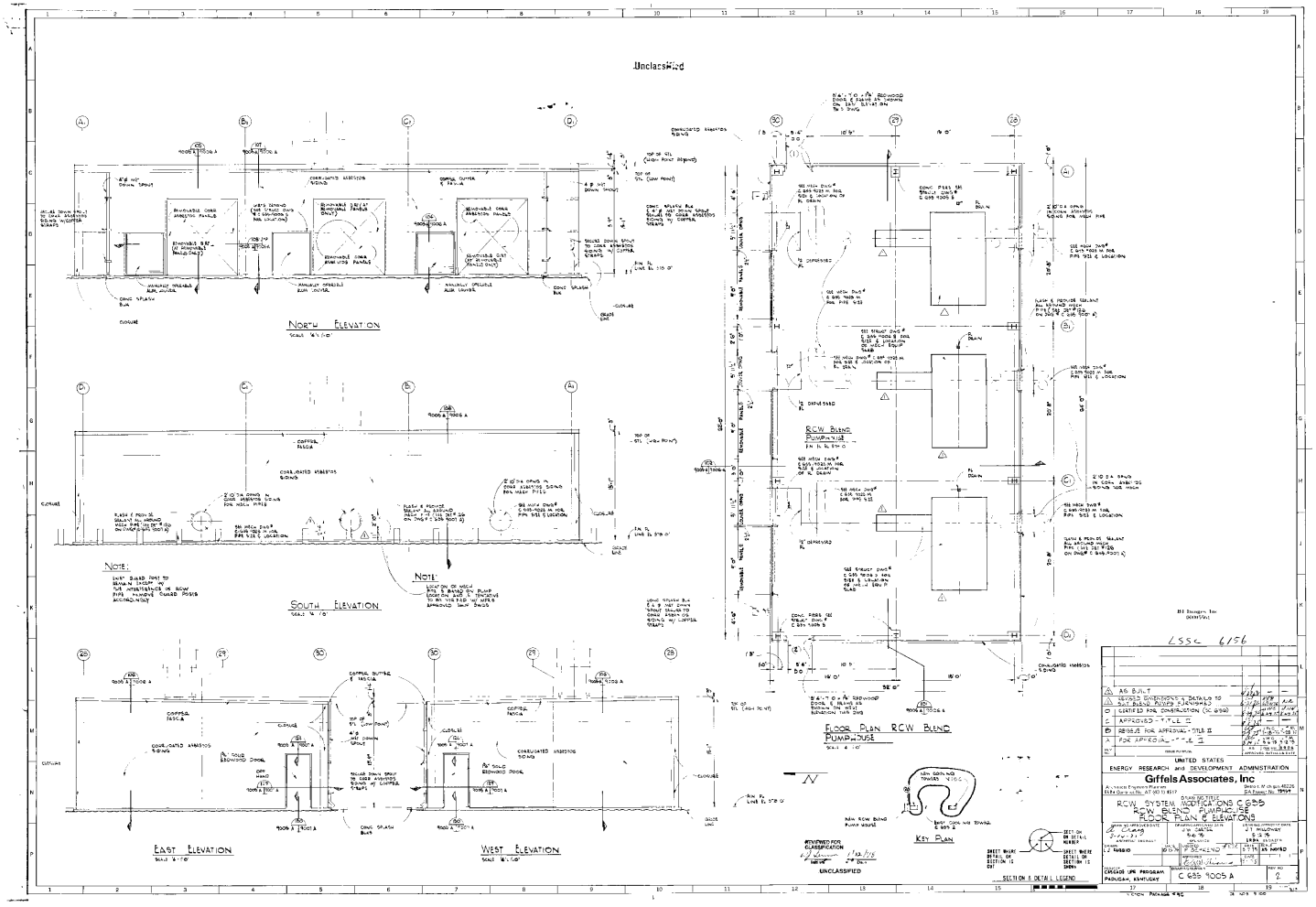
C-635-3 Blending Pump House

C-635-3 Engineering Drawings



C-635-9023-M, Rev 4C

C-635-3 Engineering Drawings

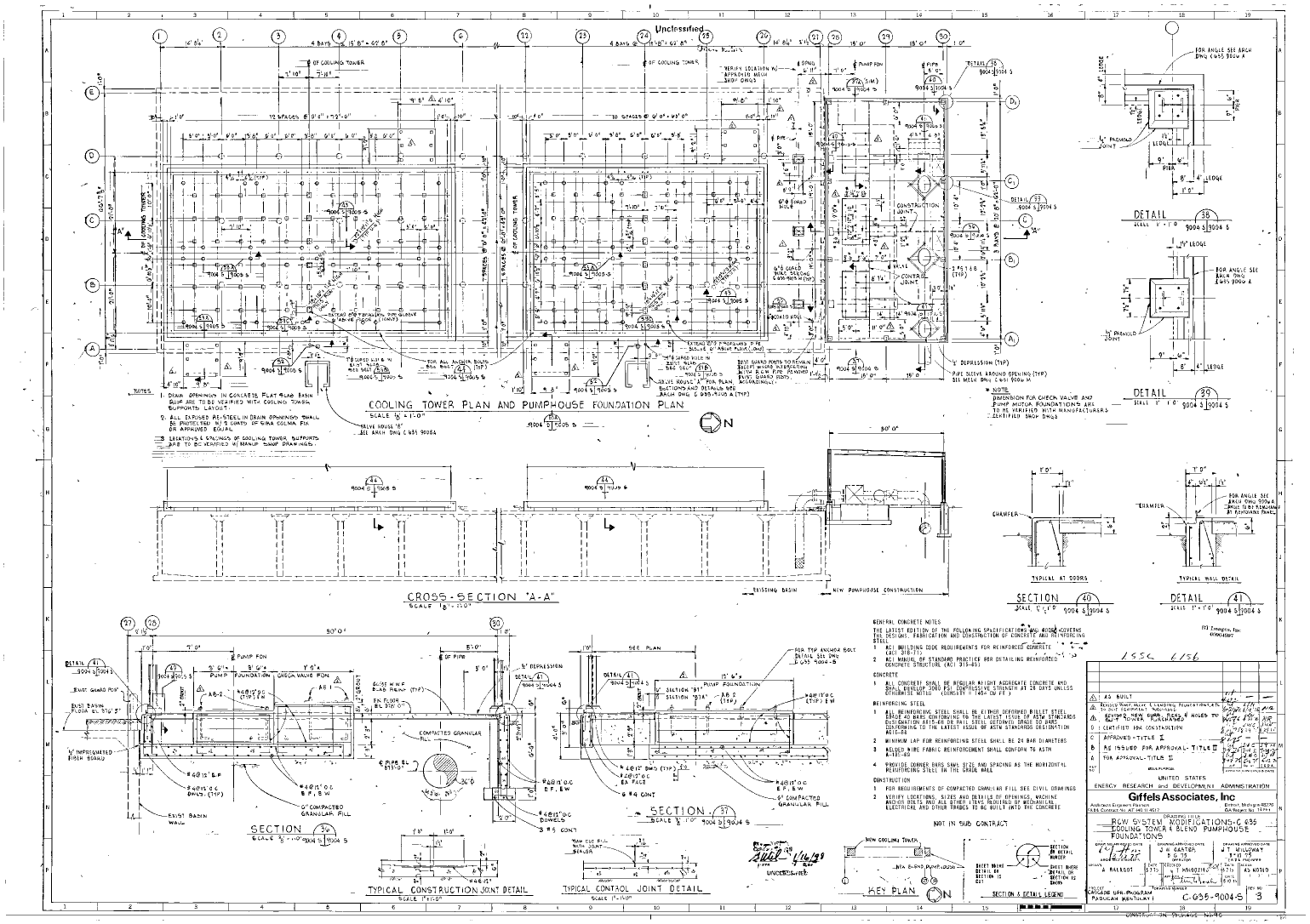


C-635-9005-A, Rev 2

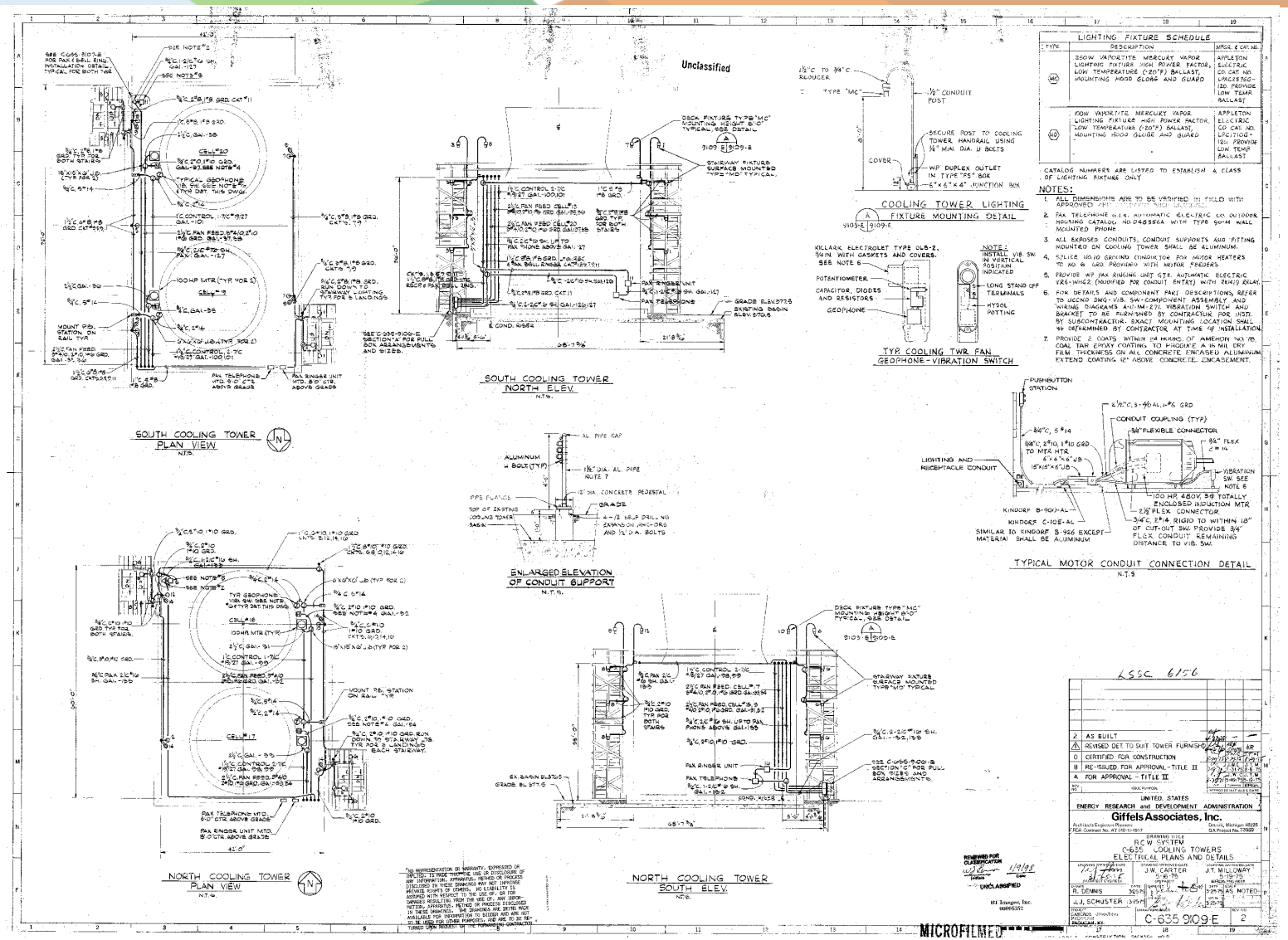
C-635 Pumphouse and Cooling Tower (SWMU 88) Drawings

C-635-4 Blending Cooling Tower (North)

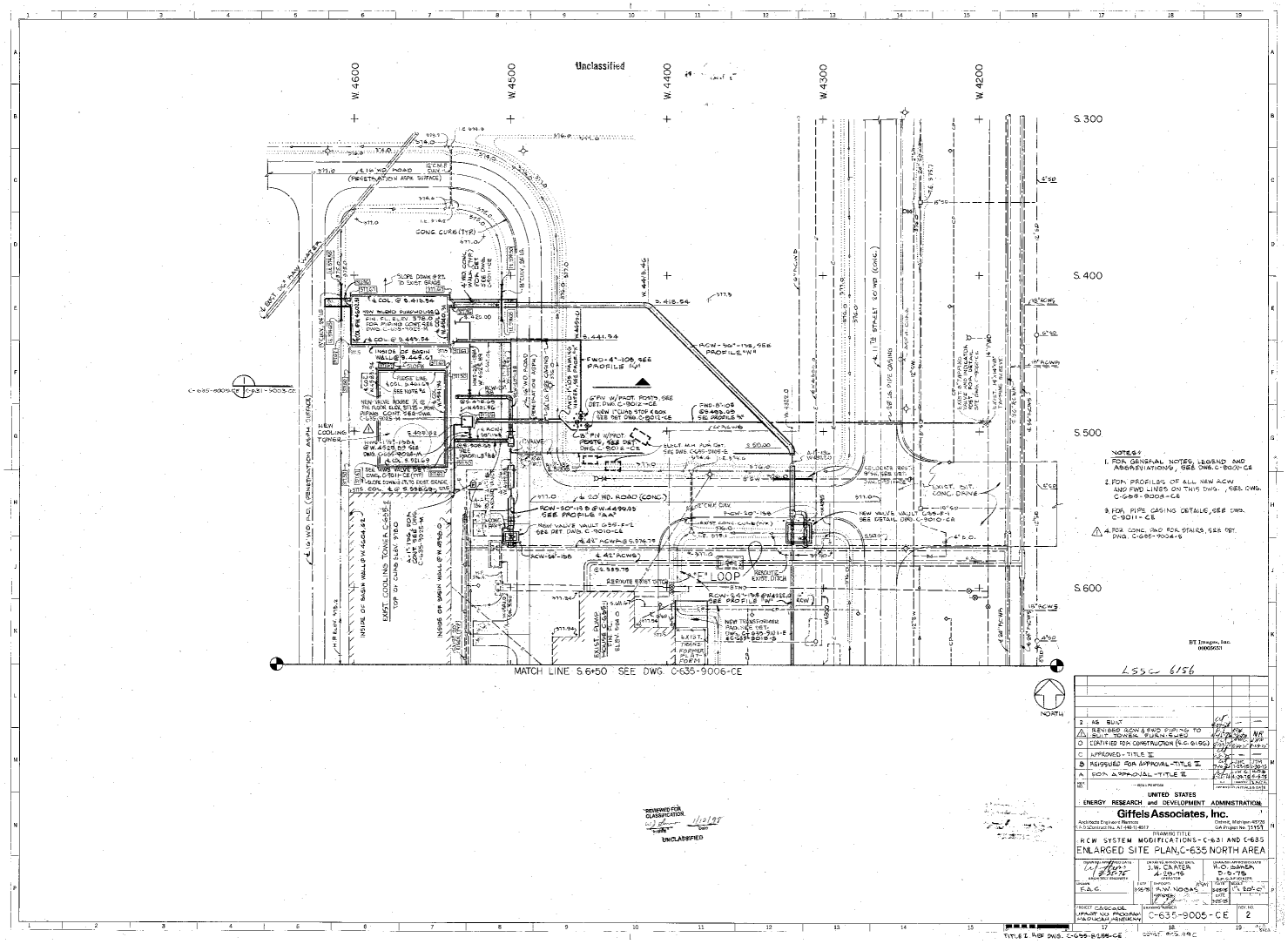
C-635-4 Engineering Drawings



C-635-4 Engineering Drawings



C-635-4 Engineering Drawings

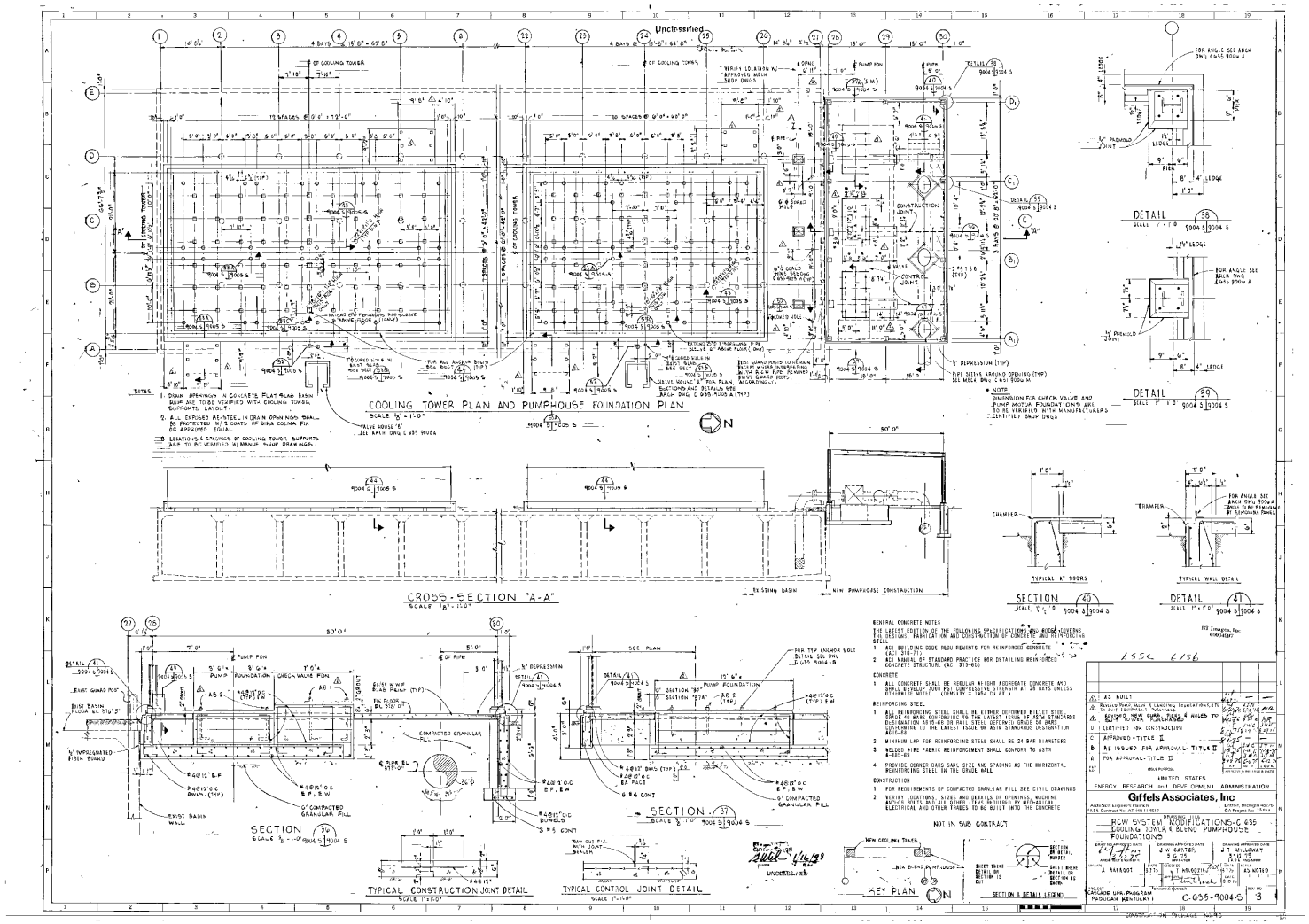


C-635-9005-CE, Rev 2

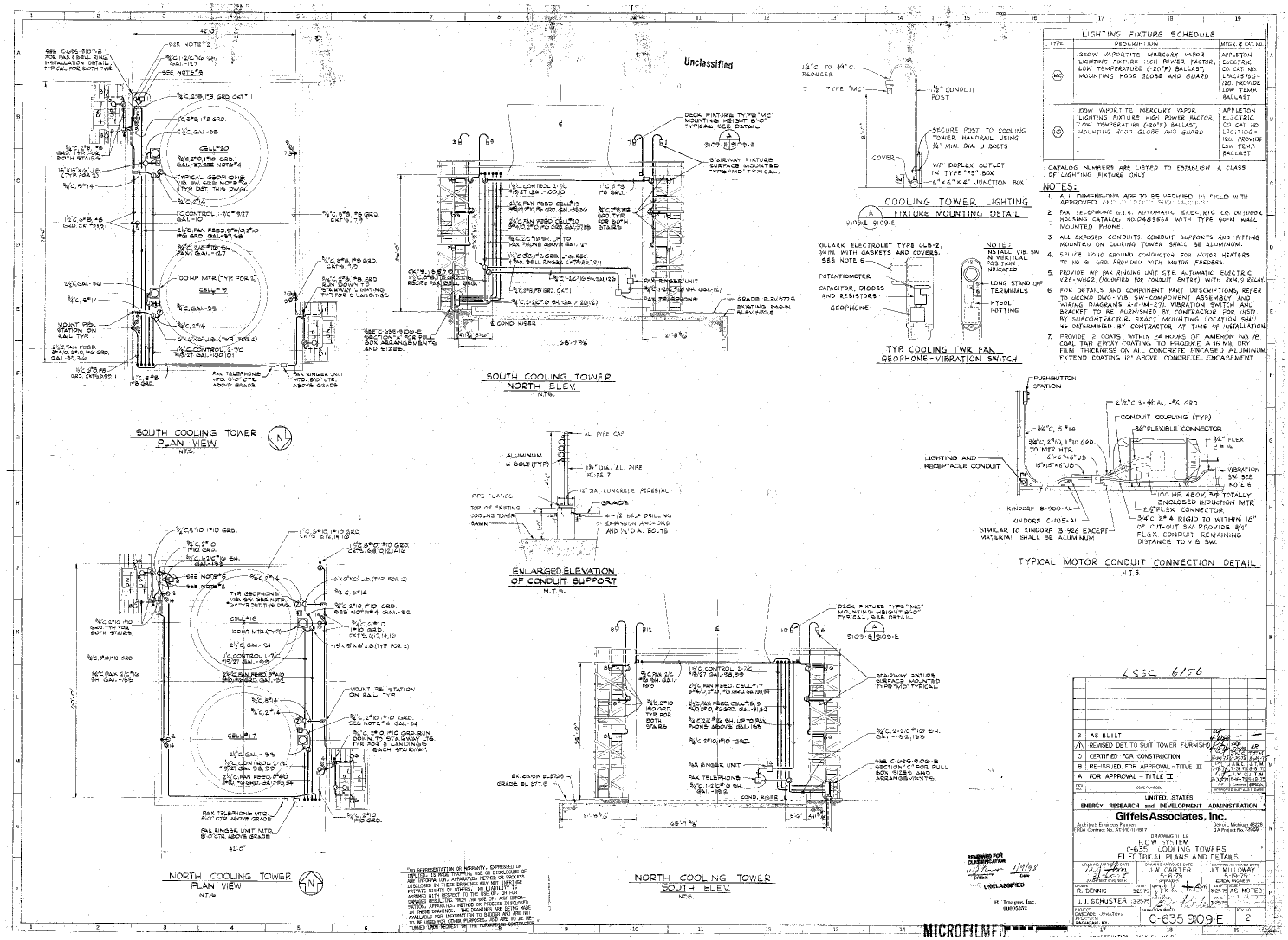
C-635 Pumphouse and Cooling Tower (SWMU 88) Drawings

C-635-5 Blending Cooling Tower (South)

C-635-5 Engineering Drawings

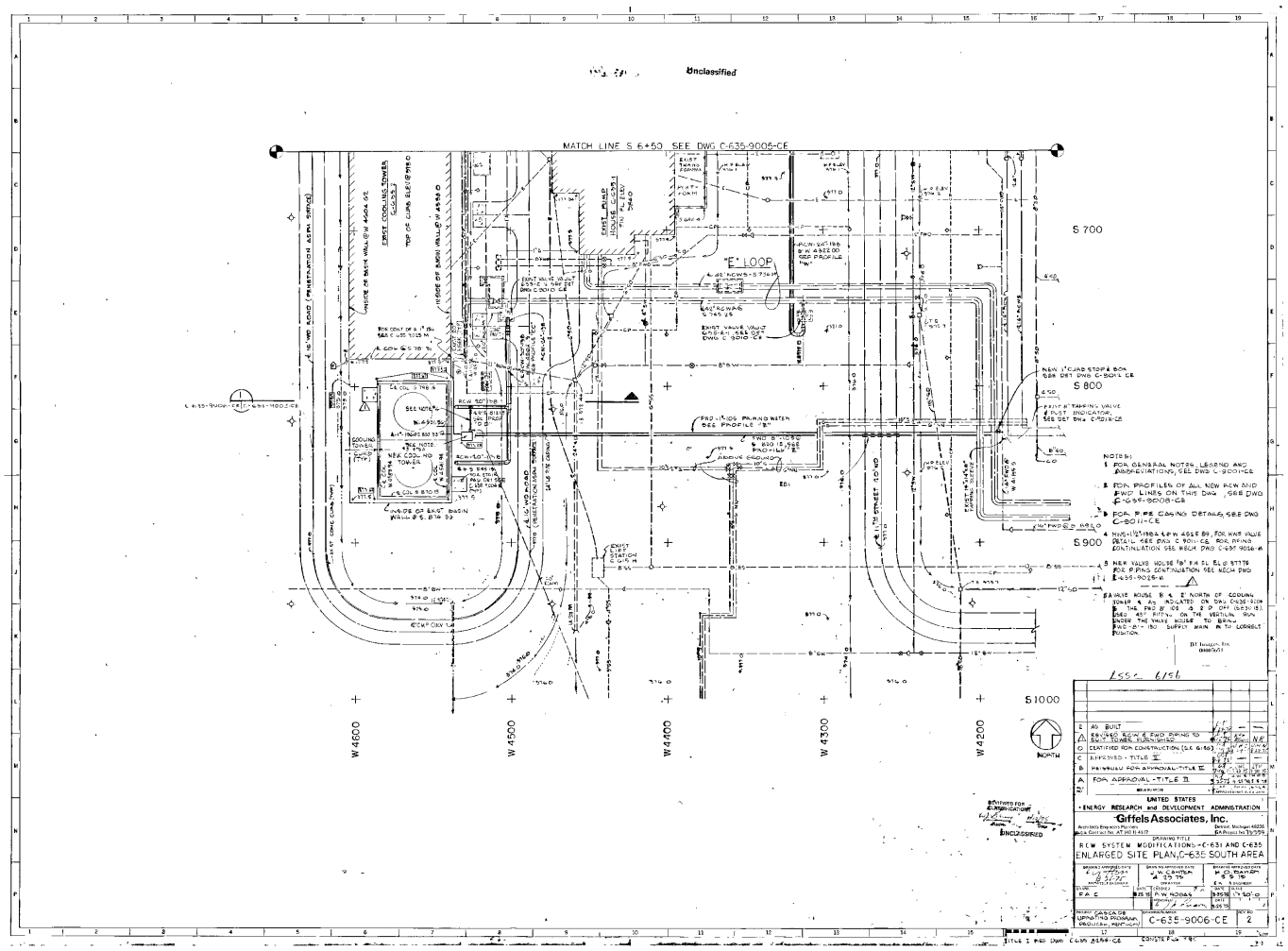


C-635-5 Engineering Drawings



C-635-9109-E, Rev 2

C-635-5 Engineering Drawings



C-635-9006-CE, Rev 2

C-635 Pumphouse and Cooling Tower (SWMU 88) Sources

- Engineering Drawings:
  - Provided in presentation
- Databases:
  - USEC's BPS
  - Issues Management System
  - Regulatory Compliance Archive Spill Log (pre-2018)
  - PCB Database (1989 – 2021)
  - Active GSAs and SAAs Master List
  - Asbestos Walkdown (October 2020)
- Employee Interviews:
  - Utility Operations Subject Matter Expert (45 years plant expertise; operator/manager/supervisor)
  - Compliance Subject Matter Expert (45 years plant expertise; trained on system)
  - Systems Engineer (Lead) Subject Matter Expert (34 years plant expertise)
  - Systems Engineer (Senior) Subject Matter Expert (32 years plant expertise)
  - Chemical Engineer Subject Matter Expert (31 years plant expertise)
- Documents:
  - Paducah Gaseous Diffusion Plant Sitewide Strategy Facility Background Information, FPDP-RPT-0021, May 2016
  - Report for Environmental Audit Supporting Transition of the Gaseous Diffusion Plants to the United States Enrichment Corporation, DOE/OR/1087&V5 (June 1993)
  - Paducah Asbestos Survey Executive Summary (Lee Wan Report), October 1990

C-635 Pumphouse and Cooling Tower (SWMU 88) Sources

- Documents (Continued):
  - Cultural Resource Management Plan for the Paducah Gaseous Diffusion Plant Paducah, Kentucky, BJC/PAD-691, May 2005
  - Fluor Federal Services, Inc., Paducah Deactivation Project Comprehensive Environmental Compliance Due Diligence Review, CP5-ES-0101, October 2014
  - Operations Division Training Manual – Utilities Operations, KYD-1482, July 1962
  - Evaluation of Corrosion Inhibitors for Open Recirculating Water Systems, KY-455, May 1964
  - Cooling Tower Drift Studies at the Paducah, Kentucky Gaseous Diffusion Plant, Conf-790109-1, January 1979
  - Paducah Gaseous Diffusion Plant Environmental Report for 1989, ES/ESH-13/V3, October 1990
  - Paducah Gaseous Diffusion Plant Environmental Report for 1991, Vol. 3, Part 1, 1991
  - 2018 Annual Hazardous Waste Report, Assessment Return, and Claim for Exclusion for the Paducah Gaseous Diffusion Plant, McCracken County, Kentucky, Permit Number KY8-890-008-982, Summary of Noncompliance, 2018