INITIAL DESIGN FLOOD CONTROL PLAN

40 CFR 257.82

Ash Pond

Kammer Site

Moundsville, West Virginia

May, 2026

Prepared for: Franklin Realty

Prepared by: American Electric Power Service Corporation

1 Riverside Plaza

Columbus, OH 43215

Kammer Ash Pond

Initial Design Flood Control Plan

PREPARED BY Dan Murphy Digitally signed by Dan Murphy DN: cn=Dan Murphy, c=US, email=dsmurphy1@aep.com Date: 2026.04.17 10:55:44 -04'00' DATE _____

Dan Murphy, P.E.

REVIEWED BY Blake Arthur, PE Digitally signed by Blake Arthur, PE DN: cn=Blake Arthur, PE, c=US, email=barthur@aep.com Date: 2026.04.15 15:38:14 -04'00' DATE _____

Blake Arthur, P.E.

APPROVED BY David Anthony Miller DATE 04.10.2026

David Anthony Miller, P.E.

Director- Ash Management Services

I certify to the best of my knowledge, information, and belief that the information contained in this inflow design flood control plan meets the requirements of 40 CFR § 257.82

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Attachment A: Initial Inflow Design Flood Control Plan

1.0 OBJECTIVE

The "Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments", 89 Fed. Reg. 38950 (May 8, 2024) (amending 40 C.F.R. §257) requires owners and operators of facilities with a legacy coal combustion residual (CCR) surface impoundment to prepare an initial inflow design flood control plan for each legacy CCR surface impoundment at the facility.

The Ash Pond at the Kammer Site is subjected to this rule.

2.0 DESCRIPTION OF THE CCR UNIT

The Former Kammer Site is located at 7897 Energy Road, Moundsville West Virginia. The latitude/longitude of the facility is: 39°50'25"N / 80°49'22" W. The Ash Pond is approximately 20 acres. The Kammer Power Plant was placed in service in 1958 and subsequently retired in May of 2015.

The Ash Pond is located near the Ohio River on the south side of the plant property. The Ash Pond is created by dikes on three sides of the impoundment. The Ash Pond abuts a 345 kV substation on the northern side. The exterior slopes are generally 2 horizontal: 1 vertical or flatter while the interior slopes are generally 1.75 horizontal on 1 vertical or flatter. The crest of the dike is at elevation 640 ft-msl and the bottom of the pond is noted as elevation 612.5 ft-msl on record drawings. Original grades varied across the Ash Pond site between 625 and 638 ft-msl.

In its current configuration, the Ash Pond is separated into a northern portion and a southern portion by a splitter dike for controlling flow and to create a working surface for excavation equipment. The splitter dike has a concrete flume at the eastern end of the dike which allows water to pass to the southern portion of the pond.

The discharge structure is a pipe and riser type structure located at the southern end of the Ash Pond. The riser structure is made of reinforced concrete and sloped to match the interior slope of the dike. The outlet pipe is a 36" concrete pipe that outlets 10 feet below the navigational pool of Hanibal Lock and Dam. The pond water surface elevation is controlled by stop logs that are inserted into groove on the riser structure. The main inflow into the Ash Pond would have come from the north when the plant was operational.

3.0 INFLOW DESIGN FLOOD CONTROL PLAN 40 CFR § 257.82

The Initial inflow design flood control plan was prepared by Civil & Environmental Consultants, Inc. and is included as Attachment A.

The results of the inflow flood routing calculations demonstrate that the Kammer Ash Pond can adequately manage flow into and out of the CCR unit during the design flood. Therefore, it is concluded that the Kammer Ash Pond meets the requirements of 40 CFR §257.82

ATTACHMENT A

Initial Inflow Design Flood Control Plan

ASH POND INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

AEP KAMMER PLANT
MOUNDSVILLE, WEST VIRGINIA

Prepared For:

AMERICAN ELECTRIC POWER
1 RIVERSIDE PLAZA
COLUMBUS, OHIO 43215

Prepared By:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
CINCINNATI, OHIO

CEC Project 345-817-0101

APRIL 2026

Civil & Environmental Consultants, Inc.

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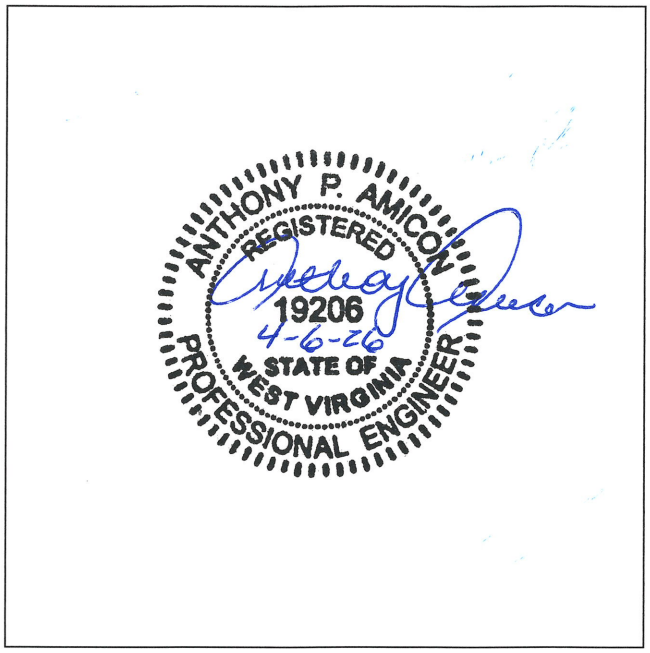
ENGINEER'S VERIFICATION STATEMENT

I hereby certify that the Inflow Design Flood Control System Plan for the Ash Pond at Kammer Plant has been performed in accordance with the requirements outlined in the Code of Federal Regulations (CFR) §257.82.



Anthony P. Amicon, P.E.
Civil & Environmental Consultants, Inc.

1.0 OBJECTIVE

Civil & Environmental Consultants, Inc. (CEC) has prepared this Inflow Design Flood Control System Plan (IDFCSP) for the Ash Pond located at the American Electric Power (AEP) Former Kammer Power Generation Plant (Kammer). The IDFCSP was created in accordance with 40 CFR §257.82, hydrological and hydraulic capacity requirements for coal combustion residuals (CCR) that includes legacy surface impoundments for inflow design flood control system plan.

In specific, 40 CFR §257.82 states that

(a) The owner or operator of an existing or new CCR surface impoundment, legacy CCR surface impoundment, or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section.

(1) The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood specified in paragraph (a)(3) of this section.

(2) The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood specified in paragraph (a)(3) of this section.

(3) The inflow design flood is:

(i) For a high hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the probable maximum flood;

(ii) For a significant hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the 1,000-year flood;

(iii) For a low hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the 100-year flood; or

(iv) For an incised CCR surface impoundment, the 25-year flood.

(b) Discharge from the CCR unit must be handled in accordance with the surface water requirements under § 257.3-3.

(c) Inflow design flood control system plan —

(1) Content of the plan. The owner or operator must prepare initial and periodic inflow design flood control system plans for the CCR unit according to the timeframes specified in paragraphs (c)(3) and (4) of this section. These plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of this section. Each plan must be supported by appropriate engineering calculations. The owner or operator of the CCR unit has completed the inflow design flood control system plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(4).

(2) Amendment of the plan. The owner or operator of the CCR unit may amend the written inflow design flood control system plan at any time provided the revised plan is placed in the facility's operating record as required by § 257.105(g)(4). *The owner or operator must amend the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.*

(3) Timeframes for preparing the initial plan —

(i) Existing CCR surface impoundments. The owner or operator of the CCR unit must prepare the initial inflow design flood control system plan no later than October 17, 2016.

(ii) New CCR surface impoundments and any lateral expansion of a CCR surface impoundment. The owner or operator must prepare the initial inflow design flood control system plan no later than the date of initial receipt of CCR in the CCR unit.

(4) Frequency for revising the plan. The owner or operator must prepare periodic inflow design flood control system plans required by paragraph (c)(1) of this section every five years. The date of completing the initial plan is the basis for establishing the deadline to complete the first periodic plan. The owner or operator may complete any required plan prior to the required deadline provided the owner or operator places the completed plan into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing a subsequent plan is based on the date of completing the previous plan. For purposes of this paragraph (c)(4), the owner or operator has completed an inflow design flood control system plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(4).

(5) The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the initial and periodic inflow design flood control system plans meet the requirements of this section.

(d) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(g), the notification requirements specified in § 257.106(g), and the internet requirements specified in § 257.107(g).

To complete this IDFCSP, CEC reviewed available historic design and construction documents provided by AEP, performed a site inspection, interviewed site operations personnel regarding the current operations procedures for surface water drainage flows into and out of the Ash Pond, and observed the stormwater control structures. In addition, CEC preformed hydrologic and hydraulic calculations and developed models to assess stormwater inflow, the Ash Pond's current stormwater detention capacity, spillway/outlet structure flow capacity, and downstream hydraulics along with determining the surface impoundment hazard classification.

2.0 SITE DESCRIPTION

2.1 GENERAL

The Kammer site is owned by AEP and is located west of West Virginia State Route 2 along the Ohio River in the City of Moundsville, as depicted in Figure 1. The Mitchell Power Plant and the Marshall County Coal Mine lie to the south and southeast of the site, respectively. The Kammer Plant was commissioned in 1958 and retired in 2015. The Legacy Ash Pond located at the southern end of the Kammer Plant was operated for the duration of the plant's life while it was generating electricity. Per 40 CFR 257.82(A)(3)(ii), the Ash Pond and its constructed embankment and berms are classified as a Significant Hazard. See Section 3.1 for detailed explanation of the hazard classification.

The Ash Pond at the Kammer site was originally designed as a single 20-acre basin providing 500 acre feet of storage (refer to Appendix B for historical reference drawings). At the time of construction of the Kammer Power Plant, the Ohio River's normal pool at the site was significantly lower. In 1965, the Pike Island Lock and Dam was completed upstream of the Kammer Plant, north of Wheeling, West Virginia. In 1975 the Hannibal Lock and Dam was completed downstream of the Kammer Plant, which raised the Ohio River's normal pool to the current elevation (623 feet above mean sea level [amsl]) in the vicinity of the Kammer Plant and raised groundwater levels in the alluvial aquifer, which are above the bottom elevation of the Ash. The Ash Pond outlet structure and grading was modified to prevent the Ohio River from entering the Ash Pond. The outlet structure was modified by the addition of a concrete riser structure upstream of the original outfall structure inlet, refer the Appendix E for a diagram of the riser structure. Through historical imagery it is evident that the northwestern corner of the original ash pond has been built up over time to an elevation above 640.57, this change is evident in Figure 2A. The Ash Pond's present-day stormwater detention area, bounded by the surrounding berm at an elevation of 640.57, provides approximately 191 acre feet of storage, refer to Figure 2A for current stormwater detention extents.

2.2 ASH POND EXISTING CONDITIONS

A summary of the existing conditions is provided in Table 1.

Table 1*:* Summary of Ash Pond Elevations

Items	Elevation, NAVD (Feet)
Dike Crest Elevation	640.57
Normal Operation Pool	630.34
Design Storm Level*	637.94
Bottom	614.59

Notes:
NAVD = North American Vertical Datum
**Maximum design storm is based on a normal pool of 623 ft and the ½ Probable Maximum Precipitation (PMP) 6-hr storm event*

2.3 SITE OBSERVATIONS

A site visit and interview of knowledgeable AEP staff was completed on November 6, 2025 to assess and document the site conditions by Charles Griebling of CEC. Observations were made and recorded regarding the condition of the stormwater conveyance infrastructure, specifically the Ash Pond outfall structure and the 60-inch Corrugated Steel Pipe (CSP) that serves as the main inflow into the pond. The approximate photograph location and direction are depicted in Figure H-1 with the Photograph Log included as Appendix H. Observations made during the site visit were utilized to prepare the hydrologic and hydraulic study of the Ash Pond and its tributary drainage areas. CEC believes that this study and the conditions modeled represents the current conditions of the Ash Pond.

It is CEC's opinion that the Ash Pond and its appurtenant structures are in satisfactory condition. Specifically, the outlet structure and embankment of the Ash Pond appear to be in good condition and functioning properly. No seepage or structural concerns were observed during the inspection. CEC also inspected the stormwater conveyance infrastructure of the site, which appeared to be functional at the time of the site visit. It is recommended that maintenance be performed at the inlet of the 60-inch CSP to remove debris.

3.0 INFLOW DESIGN FLOOD (257.82(A)(3))

The Code of Federal Regulations (CFR) have standards for legacy impoundments and their storage capabilities, these are outlined below along with the hydrologic study and stormwater detention calculations performed by CEC.

3.1 HAZARD CLASSIFICATION

Per 40 CFR 257.82(A)(3)(ii), the Ash Pond is classified as a significant hazard potential (refer to Appendix A). The failure of the Ash Pond dam is not expected to cause loss of life; however, a dam failure has the potential to cause economic and environmental losses. For these reasons the hazard classification for the Ash Pond is considered Significant. Table 2 provides a matrix to determine the hazard classification.

Table 2: Hazard Determination Matrix for Ash Pond

Hazard potential	Loss of Life	Economic and Environmental Losses
High	Probable, one or more	Yes
Significant	None expected	Yes
Low	None expected	Low and generally limited to the owner

A legacy impoundment with a significant hazard classification is required to safely pass the 1000-year flood. National Oceanic and Atmospheric Administration (NOAA) precipitation data was used to determine the rainfall data for the required storm event. The 1000-year depth estimates from NOAA point precipitation data is included in Table 3.

Table 3: Rainfall Data

Storm Duration	NOAA 1000-year depth Estimate
24-HR	7.10 inches

3.2 HYDROLOGY

CEC identified five drainage areas (two on-site and three off-site) that are tributary to the Ash Pond's stormwater detention area and contribute inflow, as depicted in Figure 3. The Ash Pond is comprised of two on-site drainage areas: North Kammer and South Kammer drainage areas. They have a combined area of approximately 78.55 acres. The North Kammer drainage area comprises approximately the mid- to northern-portions of former Kammer Power Plant, and the land cover is comprised mostly of brush and other grasses. Refer to Appendix H, Photographs 5 and 6, for land cover observed during the site visit. The North Kammer drainage area inflows enter the drainage ditch on the east side of the site before being conveyed through the existing pipe network to the Ash Pond as shown in Figure 3. The South Kammer drainage area includes the existing Kammer 345kV Station, two existing sediment basins to the west of the former Kammer Plant, the southern portion of the former Kammer Power Plant, and the Ash Pond (refer to Figure 3). These areas contribute to a combination of impervious and pervious surfaces throughout the South Kammer drainage area. The South Kammer drainage area inflows enter the pipe network at the upstream end of the 66-inch diameter CSP just before being discharged into the Ash Pond complex. Slopes across the North and South Kammer drainage areas are relatively flat, and soils within the on-site drainage areas are categorized into hydrologic soil group C.

Off-site drainage contributions east of the Ash Pond were divided into three areas: Northeast Hillside, East Hillside, and Southeast Hillside. These areas have a combined area of 132.87 acres. The Northeast and East Hillsides are mainly comprised of woods, grasses, and brush at varying levels of coverage. The land use for these areas was identified through aerial imagery as these areas were not observed during our site visit. The Southeast Hillside includes the Kammer 138 kV Station, which was considered an impervious area for this study, with woods and grasses making up the remaining land use of this drainage area. Slopes across each of the Hillside drainage areas are significantly steeper than the Kammer on-site drainage areas. Most soils in the Hillside drainage areas belong to hydrologic soil group C, with less than three acres of the total area belonging to hydrologic soil group D. All drainage from the Hillside areas flows west crossing West Virginia State Route 2 and the existing railroad lines running parallel to WV State Route 2 before entering the drainage ditch and pipe network that directs all inflow to the Ash Pond complex

(refer to Figure 3). A summary of the on-site and off-site drainage area characteristics is included in Table 4.

Table 4: Drainage Areas

Drainage Area	Area (ac)	Hydrologic Soils Group	% Impervious	Curve Number	Time of Concentration (min)
North Kammer	27	C	0	77	57.1
South Kammer	51	C	78	93	61.3
Northeast Hillside	42	C/D	0	74	47.4
East Hillside	48	C/D	0	75	30.8
Southeast Hillside	43	C/D	44	85	42.8

3.3 STORMWATER DETENTION

All stormwater detention for the Kammer Plant site is provided within the Ash Pond complex. The Ash Pond was originally constructed in 1957 providing 500 ac-ft of storage. The capacity of the Ash Pond has been reduced over the years. The pond was modified in 1974 when the Ohio River dams were installed, raising the normal pool to 623 feet amsl. This increased normal pool required the outlet structure to be modified, by adding risers to the concrete structure to prevent the Ohio River from backflowing into the Ash Pond. The area surrounding the Ash Pond was modified by the construction of two forebay areas in the northern portion of the Ash Pond. The current Ash Pond complex is separated into three interconnected basin areas for ponding, two in the northern half and one in the southern half of the Ash Pond. The northern half is separated from the southern by a stop log weir structure, shown in Appendix H, Photograph 9. The three ponds are interconnected and it is estimated they provide 191 ac-ft of stormwater detention. The current maximum extent of the Ash Pond stormwater detention area can be seen in Figure 2A.

For this evaluation and the HydroCAD calculations, the Ash Pond's original storage capacity of approximately 500 ac-ft was used. The stage-storage curve for the Ash Pond is depicted in Figure 2B. It is assumed that the starting CCR surface is 632.61 feet amsl, the maximum flood elevation in the Ash Pond from the 1000-yr 24-hr storm event. In September 2025, CEC completed a survey of the Ash Pond at the Kammer Site (refer to Appendix D, Site Layout Plan). The water

surface elevation (WSEL) in the southern portion of the Ash Pond was observed at 629.9 feet amsl; however, it was assumed in the HydroCAD calculations that the typical WSEL for the Ash Pond is at 630.34 feet amsl, and any difference between that and the observed WSEL would be due to evaporation.

4.0 HYDRAULIC STUDY (40 CFR §257.82 (1) AND (2))

CEC used the Soil Conservation Service (SCS) method to estimate the peak discharge for the 1000-year event. A hydrologic and hydraulic analysis was conducted using the HydroCAD v10 software to model the Ash Pond's current stormwater detention capabilities. Details of the modeling are provided in this section, and the HydroCAD results reports can be found in Appendix F.

4.1 ASH POND OUTLET

Outflow from the Ash Pond is controlled by an outlet structure comprised of a concrete riser and a reinforced concrete pipe (RCP) that discharges to the Ohio River. The RCP is 36-inches in diameter with an upstream invert of 614.59 feet amsl a 1.67% slope, based on historical drawings (refer to Appendix E). The top of the riser structure is at elevation 630.34 feet amsl and is comprised of three concrete walls with a masonry shaft that provides access to the primary outlet control. Appendix H, Photographs 1 through 4, depict the top of the outlet structure as photographed during the site visit on November 6, 2025. The primary control is provided by a combination of weirs at 630.34 feet amsl., a 63-inch steel weir, two 18-inch concrete weirs, and a 36-inch concrete weir. The concrete weirs are set in a notch on the side of a concrete box, once the Ash Pond exceeds 631.59 feet amsl the weir length increases to 17 feet. A diagram of the outlet structure as recorded during the site visit, along with historical drawings of the structure, are included in Appendix E. There is no record of a backflow prevention device; therefore, it is assumed that water moves freely between the Ash Pond and the Ohio River.

4.2 DRAINAGE PATTERNS (CFR §257.82 (1))

Historical drawings, included in Appendix B, indicate that a storm sewer system on the Kammer site conveyed runoff and wastewater from the Kammer 345 kV and Kammer 138 kV stations to the Ash Pond. Inlets conveyed water to CSPs ranging in diameter from 15-inches to 24-inches. These pipes discharged to a drainage ditch on the east side of the Kammer site (refer to drawings in Appendix B). The flows from the drainage ditch and the off-site drainage areas are conveyed to

the Ash Pond via a 60-inch CSP that runs north-south parallel to the eastern limits of the site. There is evidence of a former plant slurry trench from the Kammer site that also discharged to this 60-inch CSP.

The Kammer 138kV Station conveys stormwater to the 60-inch CSP through 18-inch and 24-inch CSPs. The Kammer 345 kV Station, just north of the Ash Pond, has an underdrain trench system consisting of 4-inch, 6-inch, and 12-inch diameter High-Density Polyethylene (HDPE) pipes. The flows collected from this underdrain trench system are combined in an on-site drainage ditch that enters a 66-inch CSP just before being discharged to the Ash Pond complex. When incorporating the existing CSPs into the HydroCAD model, it was discovered that the pipes are undersized for the 1000-year rainfall event. It was assumed that when the pipes are overwhelmed the excess volume reaches the Ash Pond by surface flow.

The Ash Pond has been modified significantly since its original design. The original design of the Ash Pond, according to historical drawings included in Appendix B, extended to the edge of the Kammer 345 kV Station. Historical imagery indicates that at one point there was a separate forebay to the north of the Ash Pond. That forebay was eventually filled and raised to an elevation of approximately 640 feet amsl, and the northern half of the Ash Pond was separated into two forebays, separated from themselves and the larger area by earthen berms and a stop-log weir at an elevation of approximately 631 feet amsl.

4.3 FLOOD ROUTING RESULTS (40 CFR §257.82 (2))

The 1000-year event was routed assuming the Ohio River at normal pool, 623 feet amsl, using HydroCAD. The 1000-year flood event is contained within the Ash Pond stormwater detention area with sufficient freeboard. Table 5 summarizes the flooding routing results for the rainfall event. The HydroCAD report can be found in Appendix F.

Table 5: Flood Routing Results Ash Pond

Berm Elevation (ft)	Design Storm	Primary Overflow Elevation (ft)	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Stage (ft)	Minimum Freeboard (ft)
640.57	1000-yr 24 hr	630.34	601.26	182.51	632.61	7.96

It should be noted that the Ash Pond is located within the floodplain of the Ohio River, and the Ohio River backflows into the Ash Pond. During Ohio River flooding events greater than the 10 percent annual chance flood, the Ohio River inundates the Ash Pond.

5.0 CCR RULE 40 CFR §257.82 ASSESSMENT

Each of the items to be assessed as specified in 40 CFR §257.82 is presented in ***bold*** print, followed by CEC's interpretation as to if the item was designed, constructed, operated, and maintained in accordance with good engineering practice.

257.82 (1) The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood specified in paragraph (a)(3) of this section.

The inflow design flood into the Ash Pond is adequately managed and the peak discharge of the design flood is described in Section 4.3.

257.82 (2) The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood specified in paragraph (a)(3) of this section.

The inflow design flood from the Ash Pond is adequately managed and the peak discharge of the design flood is described in Section 4.3.

257.82 (3) The inflow design flood is:

(i) For a high hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the probable maximum flood;

(ii) For a significant hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the 1,000-year flood;

(iii) For a low hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the 100-year flood; or

(iv) For an incised CCR surface impoundment, the 25-year flood.

The Ash Pond is classified as a significant hazard potential as described in Section 3.1 in accordance with §257.82(3)(ii) the inflow design flood is determined under § 257.73(a)(2) or § 257.74(a)(2), the 1,000-year flood.

257.82 (3) (b) Discharge from the CCR unit must be handled in accordance with the surface water requirements under § 257.3-3.

257.3-3 Surface water.

257.3-3 (a) For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES) under section 402 of the Clean Water Act, as amended.

The site NPDES permit for the site is WV0005291. The requirements of the site grading and storm sewer directs all potential pollutants to the Ash Pond. Ash Pond is designed to

contain pollutants on-site, by allowing sedimentation of the larger particles within the Ash Pond. Oils and other floating material are contained in the Ash Pond by the use of floating booms. These booms need to be replacement annually.

257.3-3 (b) For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of dredged material or fill material to waters of the United States that is in violation of the requirements under section 404 of the Clean Water Act, as amended.

Dredging activities do not occur at the site.

257.3-3 (c) A facility or practice shall not cause non-point source pollution of waters of the United States that violates applicable legal requirements implementing an areawide or Statewide water quality management plan that has been approved by the Administrator under section 208 of the Clean Water Act, as amended.

The Kammer sites does not have any non-point source pollution points. All potentially polluted stormwater is directed to the Ash Pond.

257.82 (c) Inflow design flood control system plan —
257.82 (c) (1) Content of the plan. The owner or operator must prepare initial and periodic inflow design flood control system plans for the CCR unit according to the timeframes specified in paragraphs (c)(3) and (4) of this section. These plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of this section. Each plan must be supported by appropriate engineering calculations. The owner or operator of the CCR unit has completed the inflow design flood control system plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(4).

This plan documents the flood control system for the Ash Pond at the former AEP Kammer site. Refer to Section 4.3 along with supporting engineering calculations included in the Appendix F for supporting documentation.

257.82 (c) (2) Amendment of the plan. The owner or operator of the CCR unit may amend the written inflow design flood control system plan at any time provided the revised plan is placed in the facility's operating record as required by § 257.105(g)(4). The owner or operator must amend the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.

This document is an initial plan and this section does not apply at this time.

257.82 (c) (3) Timeframes for preparing the initial plan —

(i) Existing CCR surface impoundments. The owner or operator of the CCR unit must prepare the initial inflow design flood control system plan no later than October 17, 2016.

(ii) New CCR surface impoundments and any lateral expansion of a CCR surface impoundment. The owner or operator must prepare the initial inflow design flood control system plan no later than the date of initial receipt of CCR in the CCR unit.

The Ash Pond is a legacy surface impoundment and ceased accumulating CCR material when the facility closed in October 2015. The timeframe for preparing an initial plan is not applicable. This plan documents the initial plan for the flood control system at the former AEP Kammer site.

257.82 (c) (4) Frequency for revising the plan. The owner or operator must prepare periodic inflow design flood control system plans required by paragraph (c)(1) of this section every five years. The date of completing the initial plan is the basis for establishing the deadline to complete the first periodic plan. The owner or operator may complete any required plan prior to the required deadline provided the owner or operator places the completed plan into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing a subsequent plan is based on the date of completing the previous plan. For purposes of this paragraph (c)(4), the owner or operator has completed an inflow design flood control system plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(4).

The document is an initial plan this section does not apply at this time. This plan must be reviewed and revised every 5 years.

257.82 (c) (5) The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the initial and periodic inflow design flood control system plans meet the requirements of this section.

Signature page is included as part of the plan.

257.82 (d) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(g), the notification requirements specified in § 257.106(g), and the internet requirements specified in § 257.107(g).

The documentation of records must be maintained for five years after completion of the closure.

6.0 RESULTS/DISCUSSION

As shown in Table 5, the Ash Pond meets the requirements of 40 CFR 257.82 by storing the 1000-yr 24-hr event while providing 7.96 feet of freeboard from the embankment. During Ohio River flood events greater than the 10 percent annual chance event, the Ash Pond is inundated by the Ohio River due to a lack of backflow controls. During this inundation, areas downstream of the Ash Pond embankment are already impacted by flooding of the Ohio River.

7.0 REFERENCES

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FIGURES

APPENDIX A

REGULATIONS

Title 40 —Protection of Environment
Chapter I —Environmental Protection Agency
Subchapter I —Solid Wastes
Part 257 —Criteria for Classification of Solid Waste Disposal Facilities and Practices
Subpart D —Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments
Operating Criteria

Source: 80 FR 21468, Apr. 17, 2015, unless otherwise noted.
Authority: 42 U.S.C. 6907(a)(3), 6912(a)(1), 6927, 6944, 6945(a) and (d); 33 U.S.C. 1345(d) and (e).
Source: 44 FR 53460, Sept. 13, 1979, unless otherwise noted.

§ 257.82 Hydrologic and hydraulic capacity requirements for CCR surface impoundments.

(a) The owner or operator of an existing or new CCR surface impoundment, legacy CCR surface impoundment, or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section.

(1) The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood specified in paragraph (a)(3) of this section.

(2) The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood specified in paragraph (a)(3) of this section.

(3) The inflow design flood is:

(i) For a high hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the probable maximum flood;

(ii) For a significant hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the 1,000-year flood;

(iii) For a low hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the 100-year flood; or

(iv) For an incised CCR surface impoundment, the 25-year flood.

(b) Discharge from the CCR unit must be handled in accordance with the surface water requirements under § 257.3-3.

(c) ***Inflow design flood control system plan*** —

(1) ***Content of the plan.*** The owner or operator must prepare initial and periodic inflow design flood control system plans for the CCR unit according to the timeframes specified in paragraphs (c)(3) and (4) of this section. These plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of this section. Each plan must be supported by

appropriate engineering calculations. The owner or operator of the CCR unit has completed the inflow design flood control system plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(4).

(2) ***Amendment of the plan.*** The owner or operator of the CCR unit may amend the written inflow design flood control system plan at any time provided the revised plan is placed in the facility's operating record as required by § 257.105(g)(4). The owner or operator must amend the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.

(3) ***Timeframes for preparing the initial plan*** —

(i) ***Existing CCR surface impoundments.*** The owner or operator of the CCR unit must prepare the initial inflow design flood control system plan no later than October 17, 2016.

(ii) ***New CCR surface impoundments and any lateral expansion of a CCR surface impoundment.*** The owner or operator must prepare the initial inflow design flood control system plan no later than the date of initial receipt of CCR in the CCR unit.

(4) ***Frequency for revising the plan.*** The owner or operator must prepare periodic inflow design flood control system plans required by paragraph (c)(1) of this section every five years. The date of completing the initial plan is the basis for establishing the deadline to complete the first periodic plan. The owner or operator may complete any required plan prior to the required deadline provided the owner or operator places the completed plan into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing a subsequent plan is based on the date of completing the previous plan. For purposes of this paragraph (c)(4), the owner or operator has completed an inflow design flood control system plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(4).

(5) The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the initial and periodic inflow design flood control system plans meet the requirements of this section.

(d) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(g), the notification requirements specified in § 257.106(g), and the internet requirements specified in § 257.107(g).

[80 FR 21468, Apr. 17, 2015, as amended at 83 FR 36451, July 30, 2018; 89 FR 39103, May 8, 2024]

APPENDIX B

HISTORICAL DRAWINGS

1ST STAGE EXCAVATION		REVISION: Plant Excav. Extended 110'-6" Coal Yard Elev. raised 2'-0" to El 629' * * Varies
Plant Excavation From Present Grade to El 612'-6"	160000 cu.yds (2 units)	
" " " " " "	34000 " (Extension)	
" " " " " "	194000 " Total	

1ST & 2ND STAGE EXCAVATION & BACKFILL UNITS 1 & 2 * Varies		
Cut		
Plant Excavation	= 221,700	267000
Present Grade to El. 589'-6"	= 207500	162200
Coal Yard Excavation to El. 627'-0" *	= 560,000	560000
Ash Yard Excavation to El 612'-6"	= 10,000	10000
132 K.V. Structure		
Total	= 999,200 Cu.Yds	999200
Fill		
Plant Backfill to Present Grade	= 70,000	74000
Plant Backfill from Present Grade to Finished Grade	= 41,000	45000
Plant Area Grading to Finished Grade	= 650300	642500
Coal Yard to El 635'-0"	= 13,000	13000
Dike Around Coal Yard (Top El. 641'-0")	= 21,300	21300
Dike Around Ash Storage Yard (Top El. 641'-0")	= 62,000	62000
132 K.V. Structure	= 8500	8500
Back fill Riverside of Retaining Walls (Forebay)	10,000	10000
Total	= 876,300 Cu.Yds	876300
+14%	= 122,900	122900
Total	999,200 Cu.Yds	999200

General Notes

High Water (1936)	= El. 651'-0"
Modified High Water	= El. 646'-0"
Normal Pool	= El. 610.5'
Design Low Water	= El. 607.5'
Yard Grade at Plant	El. 649'-0" (Varies)
Plant Flood Protection to:	El. 649'-0"

For Removal of soft material and replacement of this materi[al] [see] [d]ate on Dwg 12-3006

For location of Observation Wells See Dwg. 12-3003

Reference Drawings

12-3006 Enlarged Plan of Plant Excavation
12-3007 Yard: Drainage System
6/23/59 Chgd. Coal Yard Top of Dike Elevs RM.
{Access Road Changed per Field Information P.M
9/16/58 {Flag pole removed.
10/24/57 {Located Gate House & Fire Eng. House Relocated Road West of N-S Axis.
+: Indicates Boring For Boring Locations See Dwg. 12-3002
Added Dimensions
Revised Ash Storage Areas & 345 KV Area. 3/11/56
Indicated Excav For Unit 3 1/4/57
Indicated Final Grade in Area Betw Coal Storage (Plant) 10/1/56
Indicated Fence Added Inv. Elevs to Drain Pipes, Relocated Lower Pipe. 8/27/56
Added Clay Blanket R.M 8/7/56
Graded Coal Yard & Relocated Pumping chambers 7-12-56
Revised Transm. Tower Locations 6-28-56
Removed Clay Blanket & Added Transmission Towers 5/29/56
General Revision 4/23/56
Indicated Clay Blanket On Dike 4/9/56
General Revision 2/20/56
General Revision 2/29/56
Regraded Area East of Plant 3/15/56
Changed Dimen. 3/21/56
Added Clay Blanket in Front of Plant 3/30/56

Date		Description	Appd.
3/16/66	22	Revised Grading At 345 K.V. Structure	S.S.
1-11-66	21	Revised Grade Level At 345 K.V. Structure	S.S.

Excavation Plan

Scale 1" = 100'-0"

Dr. By: R.M

Ohio Power Company
Kammer Plant
Cresap, West Virginia

Work This Dwg With Dwgs. 12-3005 & 12-3006

DWG 12-3004-22

#625

DR. NO. 123-30250

TRUE NORTH

PLANT NORTH

E. 9,000

E. 9,500

E. 10,000

N. 11,000

N. 10,500

N. 10,000

EXIST. WAREHOUSE ACCESS RD

TRANSFER HOUSE

PROPOSED LIMESTONE LOADING FACILITY (BY AEP)

ACCESS RD (BY AEP)

FUTURE STORAGE PILE (BY AEP)

N. 10970.00
E. 9570.00

N. 10970.00
E. 9680.00

N. 10,970.00
E. 9,884.00

50'R

N. 10916.15
E. 9612.00

N. 10887.58
E. 9558.13

N. 10887.12
E. 9630.00

N. 10921.58
E. 9826.95

STACK NO. 3 (NEW)

TRANSF. BASIN

PRECIPITATOR CONTROL BLDG. NO. 1

PRECIPITATOR CONTROL BLDG. NO. 2

PRECIPITATOR CONTROL BLDG. NO. 3

N. 10740.00
E. 9615.00

N. 10722.00
E. 9572.00

N. 10779.00
E. 9,572.00

PRECIPITATOR NO. 1

PRECIPITATOR NO. 2

PRECIPITATOR NO. 3

PRECIPITATOR PUMPHOUSE

DRY ASH TRENCH

N. 10540.00
E. 9751.00

N. 10,881.00
E. 9,919.58

N. 10540.00
E. 9928.53

N. 10520.95
E. 9932.48

SLURRY TRENCH

N. 10580.95
E. 9718.39
C OF SLURRY TRENCH

N. 10668.00
E. 9661.53

N. 10,500.00
E. 9590.79

N. 10501.38
E. 9577.00

EXIST. STACK NO. 1

EXIST. STACK NO. 2

EXISTING KAMMER PLANT

OHIO RIVER

WAREHOUSE (BY AEP)

LOADING DOCK

CONC. SLAB (BY AEP)

RETAINING WALL

FUEL OIL TRUCK

EDGE OF SURFACE TREAT. ROAD

CONVEYOR

33' MIN

50' MIN

50'

NEW A.E.P. SPUR

B&O MAINLINE

B&O RAILROAD SPUR

E. CLARK TOWN ROAD (BY AEP)

60'C.S.P.

ROLD CURVE DATA

CURVE (1)
Δ = 30°00'00"
R = 100.0'
T = 26.79'
L = 52.36'

CURVE (2)
Δ = 60°00'00"
R = 50.0'
T = 29.87'
L = 52.36'

CURVE (3) & (4)
Δ = 30°00'00"
R = 50.0'
T = 13.4'
L = 26.18'

CURVE (5)
Δ = 45°00'00"
R = 100.0'
T = 41.42'
L = 78.54'

CURVE (6)
Δ = 45°00'00"
R = 50.0'
T = 20.71'
L = 39.27'

LEGEND

- ELECTRICAL MANHOLE
- STORM DRAIN
- CONCRETE TRENCH
- SUPPORT FOUNDATIONS
- WATER SUPPLY & FIRE HYDRANT

DATE	NO.	DESCRIPTION	APPD.
9/9/77	3	ADDED NEW DRAIN, RELOCATED SLURRY DRAIN & CO'C.S.P.	
4/4/77	2	REVISED LOCATION OF SLURRY DRAINS	
1/24/77	1	APPROVED FOR CONST.	
12/27/76	A	FOR REVIEW	

REVISIONS

CIVIL

LAYOUT PLAN

OHIO POWER COMPANY
KAMMER PLANT
CAPTINA WEST VIRGINIA

DR. NO. 123-30250-3

ARCH. | ELEC. | MECH. | STR. X

SCALE: 1" = 50'

DR. PULSI

CH. R.B.H

RQ. LDR. J.K.C

DATE: 6/15/76

APPROVED: ENGINEERING DIV. | DESIGN DIV.

AMERICAN ELECTRIC POWER SERVICE CORP.
2 BROADWAY NEW YORK

NO.	REFERENCE DRAWINGS
13-3085	COAL HAUL ROAD KAMMER TO MITCHELL & ACCESS BRIDGE

PRINT RECORD

DATE ISSUED	10-29-76	12/14/76	2/24/77
REVISION NO.	1	2	3
FOR	CONST	REVIEW	REVIEW
CUSTOMER	1/5 1/6	1/5 1/6	1/5 1/6
FIELD	10/29 76	10/29 76	10/29 76
INTRA CO.	10/29 76	12/14 76	2/24 77
LIAISON		12/14 76	2/24 77

ENG. RECORD

DRAWN	PULSI	7/1/76
CHECKED	RBH	7/1/76
PROGESS CK.	KDM	9/14/76
MECH. CK.	KS	9/15/76
STRUCT. CK.	FVH	9/15/76
ELECT. CK.	NK	9/14/76
INSTR. CK.	—	—
APPROVED	RBH	9/14/76
APPROVED	RB	9/15/76

DRAWING STATUS

ISSUED	DATE
PRELIMINARY RB	8/19/76
FOR COMMENTS AND/OR APPROVAL	
APPROVED FOR CONSTRUCTION RB	10/29/76
REVISED AND APPROVED P/C'S CONSTRUCTION 3 RB REV.	2/13/77

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. VOID ALL PRINTS BEARING EARLIER DATE OR REVISION NO.

SHEET NO. Y1-1

S. R. DWG NO. L-22624

REVISION 3

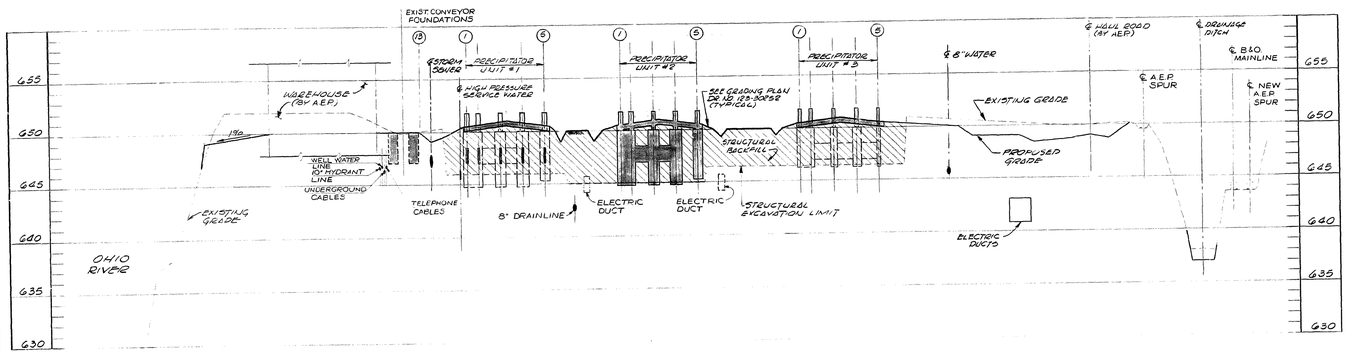
ORDER NO C-14795

Stearns-Roger INCORPORATED

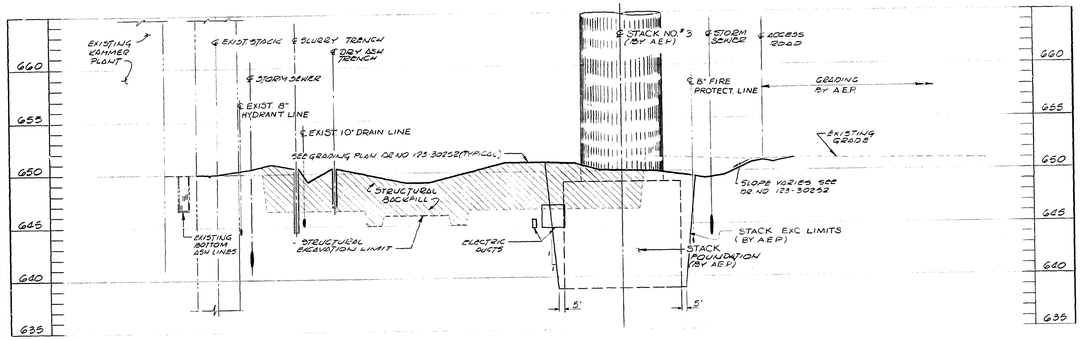
Form 13825

AEP Corporation Kanawha River Approved 10/10/77 Rev. 1/5/78 Rev. 3/20/80

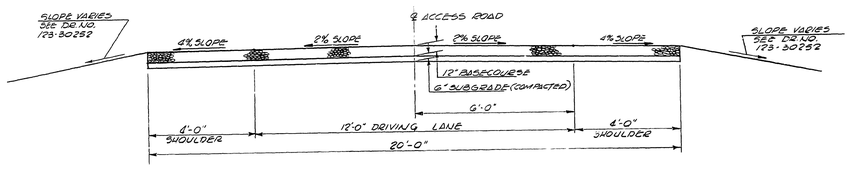
DR. NO. 123-30253



SECTION A
REF 30252 SCALE HORIZ 1"=50' VERT 1"=5' 30253



SECTION B
REF 30252 SCALE HORIZ 1"=50' VERT 1"=5' 30253



TYPICAL ACCESS ROAD SECTION
SCALE: 1"=2'

NO.	REFERENCE DRAWINGS

PRINT RECORD		
DATE ISSUED	10-23-76	
REVISION NO.	1	
FOR	CONST	
CUSTOMER	11-10-76	
FIELD	11-17-76	
INTRA CO.	NR	

ENG. RECORD		
DRAWN	RJLJ	7-8-76
CHECKED	RBH	7/13/76
PROCESS CK.	RBH	7/19/76
MECH. CK.	KB	8/3/76
STRUCT. CK.	FYH	8/12/76
ELECT. CK.	TMS	8/11/76
INSTR. CK.	—	—
APPROVED	RBH	8/16/76
APPROVED	KB	8/17/76

DRAWING STATUS		
ISSUED	DATE	
PRELIMINARY	KB	8/24/76
FOR COMMENTS AND/OR APPROVAL		
APPROVED FOR CONSTRUCTION	KB	10/14/76
REVISED AND APPROVED FOR CONSTRUCTION (REV. 1)		

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. VOID ALL PRINTS BEARING EARLIER DATE & THIS REVISION NO.

SHEET NO. Y2-3

B. R. DWG NO. L-22624

REVISION 1

ORDER NO. C-14795

Stearns-Roger INCORPORATED

DATE	NO.	DESCRIPTION	APPD.
10/14/76	1	APPROVED FOR CONST	KJS
9/13/76	A	FOR REVIEW	KJS

REVISIONS

KENNETH H. SCHEU 7055 REGISTERED PROFESSIONAL ENGINEER

CIVIL
MISCELLANEOUS SECTIONS AND DETAILS

OHIO POWER COMPANY
KAMMER PLANT
CAPTINA WEST VIRGINIA

DR. NO. 123-30253-1

ARCH. | ELEC. | MECH. | STR. ☒

SCALE: AS NOTED

DR. RJLJ

CH. RBH

EN. LDR. KJS

DATE: 8/11/76

APPROVED BY: ENGINEERING DIV. | DESIGN DIV.

AMERICAN ELECTRIC POWER SERVICE CORP.
2 BROADWAY NEW YORK

Form 10673

DR. NO. 123-30254

PLANT NORTH

E10,000

E9300

E9800

15+00

10+00

5+00

G46 G44 G42 G40 G38

T/R EL. = G44.1

T/R EL. = G44.2

T/R EL. = G44.3

INV. EL. = G40.1

NEW A.E.P. SPUR

18" C.M.P.

B&O MAIN LINE

FUTURE MAIN LINE

B.&O. R.

6 WIRE OVERHEAD R.R. COMMUNICATION LINE (EXISTING)

INV. EL. = G39.2

INV. EL. = G39.0

INV. EL. = G28.0

T/GRATE G37.8

T/GRATE EL. G34.3

T/GRATE G37.70

INV. EL. G27.4

EXIST. FENCE

EXIST. 30" DRAIN

EXIST. 8" WATER

EXIST. 2" WATER

DITCH BOTTOM SLOPE 0.4% (TYPICAL)

PLACE RIPRAP 5'(FT.) BEYOND TOE OF SLOPE

PLACE RIPRAP 5'(FT.) BEYOND TOE OF SLOPE (TYP.)

INV. EL. = G45.7

NEW KAMMER SPUR

MATCH LINE SEE BELOW

MATCH LINE SEE ABOVE

MATCH LINE SEE DWG. 123-30255

G50

COAL HAUL ROAD (BY OTHERS)

EXIST. DISTRIBUTION LINE

HIGH POINT EL. G48.5

PLANT ACCESS ROAD

P-5

N 11,300

N 11,200

N 11,100

N 11,000

N 10,900

N 10,800

N10,553
E10,020
INV. EL. G36.78

N10,401.20
E10,045.90
INV. EL. G36.16

E10,100

E10,000

INV. EL. G40.5

18" C.M.P.

B.&O. MAINLINE

EXISTING 6 WIRE OVERHEAD R.R. COMMUNICATION LINE

EXIST. 30" DRAIN

60"Ø C.S.P.

DEFLECTION ANGLE 2°20'48"

EXIST. 8" WATER

T/R EL. G47.2

T/R EL. G49.9

T/R EL. G44.4

T/R EL. G44.3

T/R EL. G48.4

T/R EL. G49.7

T/R EL. G50.2

P-18

P-19

P-20

P-21

P-22

S-20

S-21

P-13

SEE NOTE 1

8" FIRE LOOP

ELECTRICAL DUCTS

ELECTRICAL MANHOLE

SLURRY LINE TRENCH

EXISTING 8" WATER LINE

84" C.M.P. TO BE ABANDONED

N10,100

N10,200

N10,300

N10,400

N10,500

N10,600

N10,700

NOTES:

1. THE EXISTING FENCE & POSTS SHALL BE REMOVED PRIOR TO FINISHED GRADING, THEN REPLACED ALONG SAME ALIGNMENT. ANY ADDITIONAL POSTS OR FENCING MATERIAL REQUIRED SHALL BE APPROVED BY FIELD ENGINEER.

NO.	REFERENCE DRAWINGS

PRINT RECORD			
DATE ISSUED	9/14/76	9/14/76	9/14/76
REVISION NO.	0	1	
FOR	APP	CONST	CONST
CUSTOMER	10 MIL	1 MIL	—
FIELD	—	10+5 MIL	—
INTRA CO.	B&P	B&P	—
LIAISON	—	B&P	—
ARMCO			1 MIL

ENG. RECORD		
DRAWN	PDAT	7/14/76
CHECKED	CBH	9/17/76
PROCESS CK.	JHZ	9/21/76
MECH. CK.	WHH	9/19/76
STRUCT. CK.	WAS	9/19/76
ELECT. CK.	WE	9/19/76
INSTR. CK.	—	—
APPROVED	JW	9/21/76
APPROVED	KD	9/22/76

DRAWING STATUS		
ISSUED		DATE
PRELIMINARY	KB	8/31/76
FOR COMMENTS AND/OR APPROVAL	KB	9/14/76
APPROVED FOR CONSTRUCTION	KB	9/21/76
REVISED AND APPROVED FOR CONSTRUCTION REV. 1		9/19/77

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. VOID ALL PRIOR DRAWING EARLIER DATE W/OR REVISION NO.

SHEET NO. Y2-4

S. R. DWG NO. L-22624

ORDER NO. C-14795

REVISION 1

Stearns-Roger INCORPORATED

DATE	NO.	DESCRIPTION	APPD.
9/21/77	1	APPROVED FOR CONSTRUCTION	KB
9/19/77	0	FOR APPROVAL.	KB
9/14/76	A	FOR REVIEW	KB

REVISIONS

CIVIL
GRADING PLAN
DRAINAGE DITCH

OHIO POWER COMPANY
KAMMER PLANT
CAPTINA WEST VIRGINIA

DR. NO. 123-30254-1

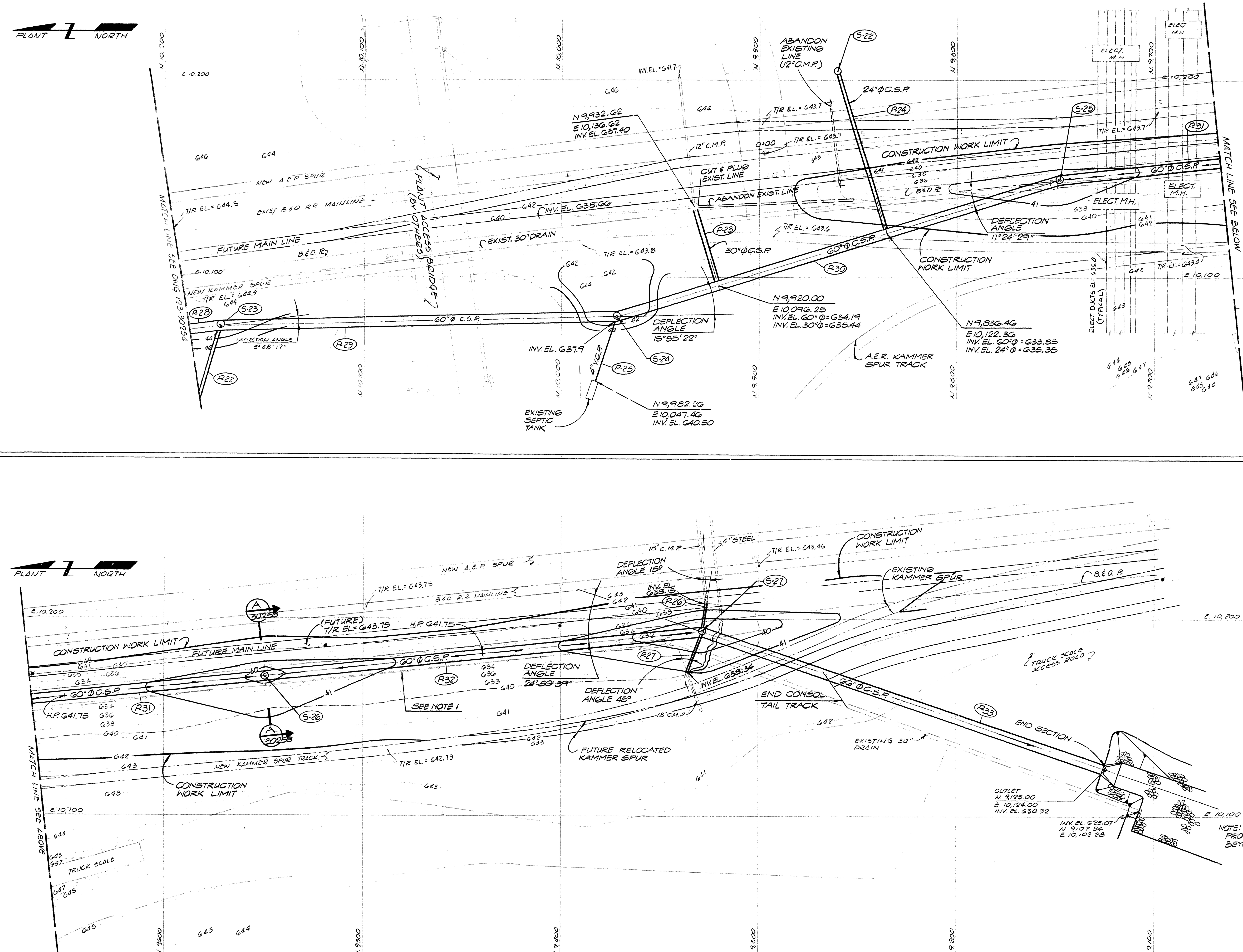
ARCH.	ELEC.	MECH.	STR.
SCALE 1"-20'		ENGINEERING DIV.	
DR.			
CH.		DESIGN DIV.	
EQ. LDR.			
DATE:			

APPROVED BY

AMERICAN ELECTRIC POWER SERVICE CORP.
2 BROADWAY NEW YORK

Form 10825

DR. NO. 123-30255



NOTES:

1. THE EXISTING FENCE & POSTS SHALL BE REMOVED PRIOR TO FINISHED GRADING, THEN REPLACED ALONG SAME ALIGNMENT. ANY ADDITIONAL POSTS OR FENCING MATERIAL REQUIRED SHALL BE APPROVED BY FIELD ENGINEER.

DATE	NO.	DESCRIPTION	APPD.
7/20/77	1	APPROVED FOR CONSTRUCTION	KJS
6/10/77	0	FOR APPROVAL.	KJS
8/19/76	A	FOR REVIEW	KJS

REVISIONS

CIVIL
GRADING PLAN
DRAINAGE DITCH

OHIO POWER COMPANY
KAMMER PLANT
CAPTINA WEST VIRGINIA

KENNETH G. SCHEI REGISTERED 7055 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

NO.	REFERENCE DRAWINGS	PRINT RECORD			
		DATE ISSUED	6/10/77	7/20/77	9/13/77
		REVISION NO.	0	1	1
		FOR	APP	CONST.	CONST.
		CUSTOMER	15 1/2P	15 1P+1/2	—
		FIELD	—	10+1/2 3P	—
		INTRA CO.	1V 9-1/2P	1V 7-1/2P	—
		LIAISON	—	1P 1/2P	—
		ARMCO			1S 1P

ENG. RECORD		
DRAWN	PULAI	7/14/76
CHECKED	RBH	6/9/77
PROCESS CK.	JNR	6/10/77
MECH. CK.	W.H.A.	6/10/77
STRUCT. CK.	KJS	6/10/77
ELECT. CK.	HJS	6/10/77
INSTR. CK.	—	—
APPROVED	JEL	6/10/77
APPROVED	KB	7/20/77

DRAWING STATUS	
ISSUED	DATE
PRELIMINARY KB	3/23/76
FOR COMMENTS AND/OR APPROVAL KB	6/10/77
APPROVED FOR CONSTRUCTION KB	7/20/77
REVISED AND APPROVED FOR CONSTRUCTION REV.	
NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. VOID ALL PRINTS BEARING EARLIER DATE &/OR REVISION NO.	

SHEET NO. Y2-5
S. R. DWG NO. L-22624
REVISION 1
ORDER NO. C-14795

Stearns-Roger INCORPORATED

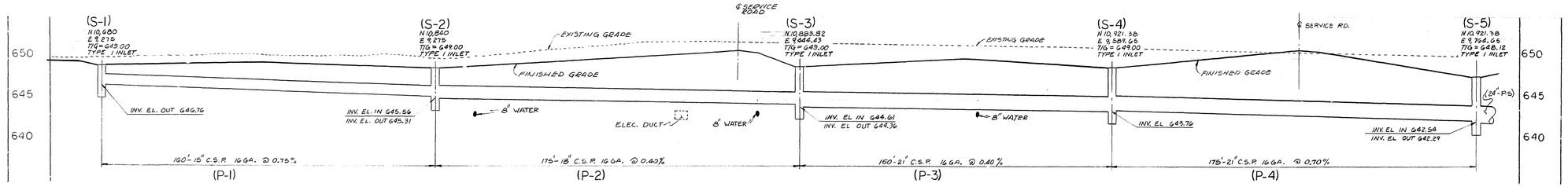
DR. NO. 123-30255-1

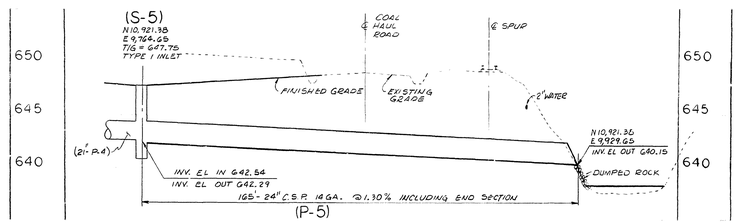
ARCH.		ELEC.		MECH.		STR.	

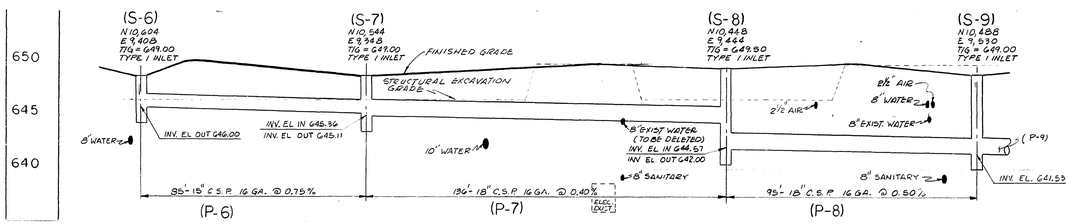
SCALE:
DR.
CH.
SQ. LDR.
DATE:
APPROVED BY — ENGINEERING DIV. — DESIGN DIV.

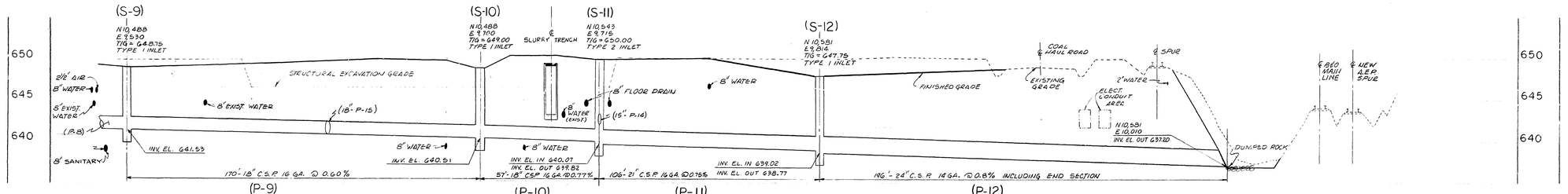
AMERICAN ELECTRIC POWER SERVICE CORP.
2 BROADWAY NEW YORK

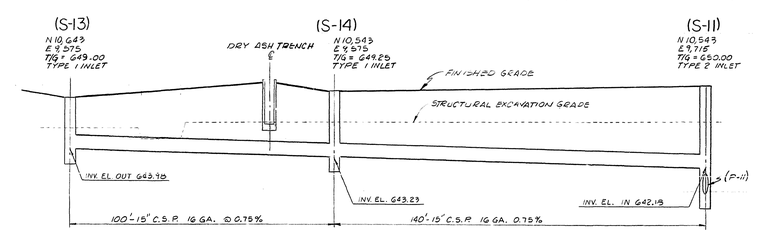
DR. NO. 123-30256

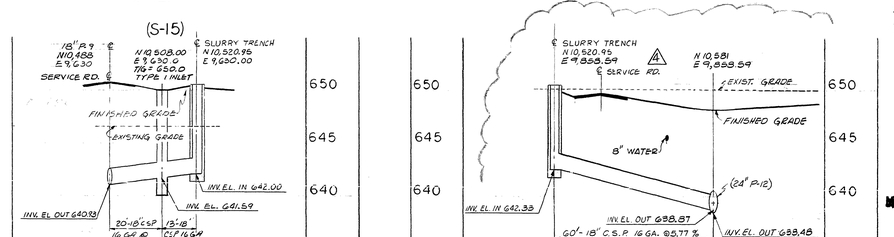


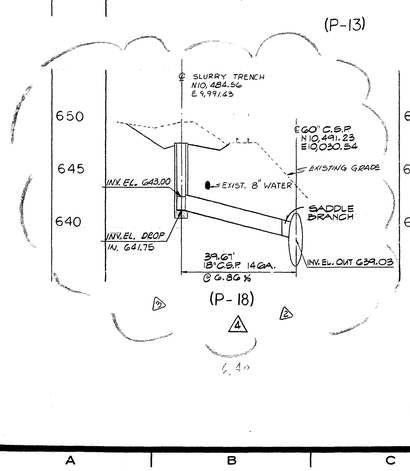


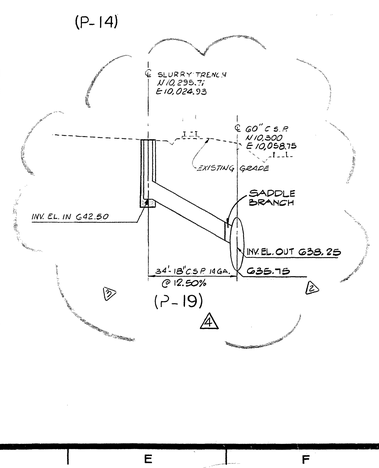












NOTES:

1) TYPE 1 = CATCH BASIN ROUND INLET FRAME & GRATE FOR 18" Ø, NEENAH TYPE R-3201-I OR EQUAL.

2) TYPE 2 = CATCH BASIN ROUND INLET FRAME & GRATE FOR 18" Ø, NEENAH TYPE R-1650-J OR EQUAL.

3) TYPE 1 & 2 INLETS SHALL CONFORM TO A.E.P. DRAWINGS SDS-46-1, SDS-47-1, & SDS-49-3.

SCALE:
1"=20' HORIZ
1"=5' VERT.

NO.	DATE	DESCRIPTION	APPD.
4	6/9/77	REVISED P-7, P-8 & P-9 & REMOVED HOLD	K.M.S.
3	4/14/77	RELOCATED P-5, P-6 & P-17 REVISED TRENCH EL. FOR P-9	K.M.S.
2	3/16/77	HOLD FOR REVISIONS	K.M.S.
1	10/15/76	APPROVED FOR CONST.	K.M.S.

REVISIONS

CIVIL
STORM SEWER PROFILES

OHIO POWER COMPANY
KAMMER PLANT
CAPTINA WEST VIRGINIA

DR. NO. 123-30256-4

NO.	REFERENCE DRAWINGS

PRINT RECORD

	DATE ISSUED	10-20-76	12-17-76	1/6/77	4/18/77	6/9/77
	REVISION NO.	1	2	3	4	
	FOR	CONST	APPROVAL	APPROVAL	APPROVAL	APPROVAL
	CUSTOMER	15	15	5	5	5
	FIELD	10P	10P	10P	10P	-
	INTRA. CO.	1P	1P	1P	1P	1P
	ARMCO	1P	-	-	-	1P
	S-R FIELD			1P	1P	-

ENG. RECORD		
DRAWN	EBH	9/10/76
CHECKED	B.P.	9/16/76
PROCESS CK.	JNF	9/17/76
MECH. CK.	K.D.	9/17/76
STRUCT. CK.	K.M.S.	10/15/76
ELECT. CK.	GCC	10/11/76
INSTR. CK.	—	—
APPROVED	J.L.	10/19/76
APPROVED	K.D.	10/19/76

DRAWING STATUS

ISSUED	DATE
PRELIMINARY	
FOR COMMENTS AND/OR APPROVAL	
APPROVED FOR CONSTRUCTION	10/19/76
REVISED AND APPROVED FOR CONSTRUCTION (4)	6/9/77

NOT APPROVED FOR CONSTRUCTION - UNLESS SIGNED & DATED. VOID ALL PRINTS BEARING EARLIER DATE & REVISION NO.

SHEET NO. Y4-1

S. R. DWG NO. L-22624

ORDER NO. C-14795

REVISION (4)

Stearns-Roger INCORPORATED

ARCH. | ELEC. | MECH. | STR.

SCALE: AS NOTED

C.E. R.W.J.

CH. B.P.

SQ. LDR. K.D.

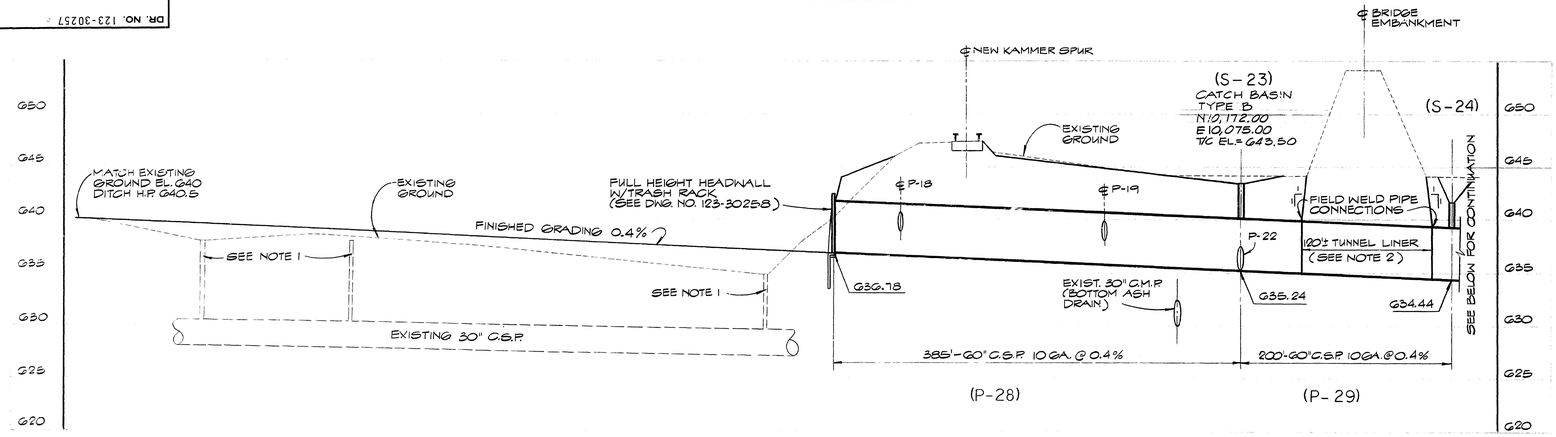
DATE: 12/15/76

APPROVED BY: ENGINEERING DIV. | DESIGN DIV.

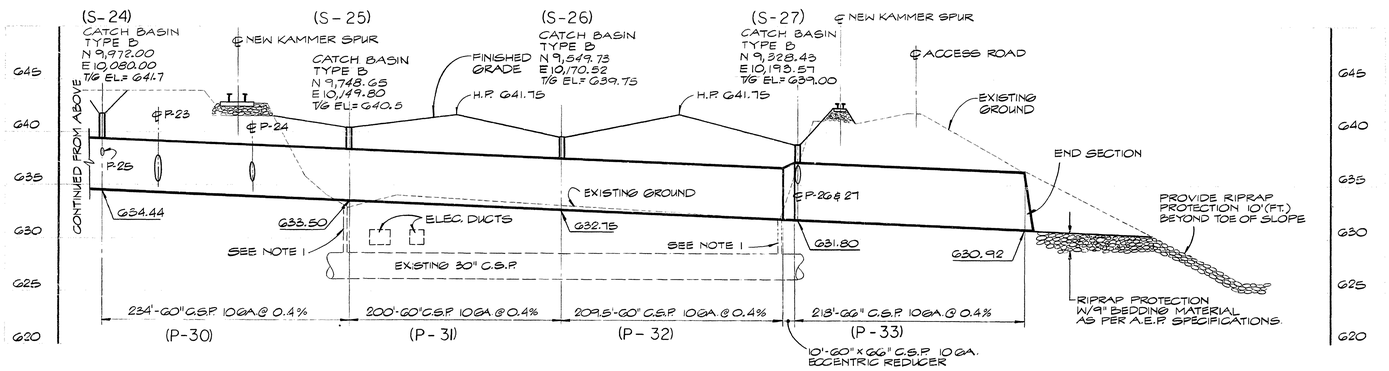
AMERICAN ELECTRIC POWER SERVICE CORP.
2 BROADWAY NEW YORK

Form 11693

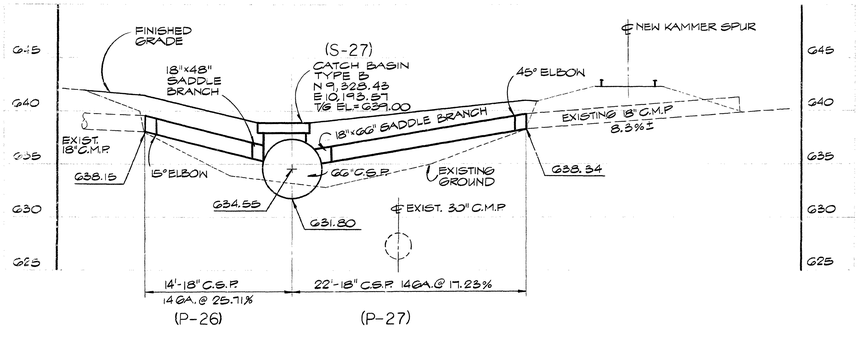
DR. NO. 123-30257



SCALE:
1" = 50' HORIZ.
1" = 5' VERT.



SCALE:
1" = 50' HORIZ.
1" = 5' VERT.



SCALE:
1" = 5' HORIZ.
1" = 5' VERT.

NOTES:
1. CATCH BASINS TO BE ABANDONED:
EXISTING DRAINAGE STRUCTURES WHICH ARE DESIGNATED TO BE ABANDONED SHALL BE REMOVED TO A MINIMUM OF 1 FOOT 6 INCHES BELOW THE FINISHED DITCH GRADING OR BOTTOM OF TRENCH FOR PROPOSED PIPE. EXISTING PIPES SHALL BE CONNECTED THROUGH THE STRUCTURES WITH PIPE OF A TYPE AND MANNER ACCEPTABLE TO THE FIELD ENGINEER. AFTER CONNECTING ACROSS THE EXISTING PIPES AND REMOVING WALLS TO THE REQUIRED DEPTH, REMAINING CAVITIES SHALL BE BACKFILLED AND CAREFULLY TAMPED SOLIDLY UNDER AND AROUND THE PIPE.

2. TUNNELING:
120'(FT.) OF 62" NEUTRAL AXIS DIA. 12 GAUGE GALVANIZED TUNNEL LINER PLATES, ASPHALT DIPPED; GROUT HOLES WITH COUPLING AND PLUGS SHALL BE INSTALLED AS PER ARMCO DRAWINGS AND SPECIFICATIONS.

3. TYPE B CATCH BASIN:
CATCH BASIN ROUND INLET FRAME AND GRATE FOR 48"Ø, NEENAH TYPE R-2565-I OR EQUAL. TYPE 'B' INLETS SHALL CONFORM TO A.E.P. DRAWINGS SDS-46-1; SDS-47-1 AND SDS-49-3.

NO.	REFERENCE DRAWINGS

PRINT RECORD												
DATE ISSUED	7/6/77	7/6/77	7/6/77									
REVISION NO.	0	1	1									
FOR	APP	CONST	CONST									
CUSTOMER	1/2	1/2	–									
FIELD	–	10+1/2	–									
INTRA CO.	6+1/2	7+1/2	–									
LIAISON		1/2	–									
ARMCO		1/2	1/2									

ENG. RECORD		
DRAWN	CL	6/8/77
CHECKED	EBM	6/9/77
PROCESS CK.	LWE	6/10/77
MECH. CK.	WMM	6/10/77
STRUCT. CK.	KMS	6/10/77
ELECT. CK.	MK	6/6/77
INSTR. CK.	—	—
APPROVED	JAL	6/10/77
APPROVED	KB	6/6/77

DRAWING STATUS		
	ISSUED	DATE
PRELIMINARY		
FOR COMMENTS AND/OR APPROVAL	JAL	6/10/77
APPROVED FOR CONSTRUCTION	KB	7/6/77
REVISED & APPROVED FOR CONSTRUCTION (1)	KEY	

SHEET NO. Y4-2

S.R. DWG NO. L-22624

ORDER NO. C-14795

REVISION (1)

Stearns-Roger INCORPORATED

DATE	NO.	DESCRIPTION	APPD.
7/6/77	1	APPROVED FOR CONSTRUCTION	KMS
6/6/77	0	FOR APPROVAL.	KMS

REVISIONS

"THIS DRAWING IS THE PROPERTY OF THE AMERICAN ELECTRIC POWER SERVICE CORP. AND IS LOANED UPON CONDITION THAT IT IS NOT TO BE REPRODUCED OR COPIED IN WHOLE OR IN PART, OR USED FOR FURNISHING INFORMATION TO ANY PERSON WITHOUT THE WRITTEN CONSENT OF THE A.E.P. SERVICE CORP., OR FOR ANY PURPOSE DETRIMENTAL TO THEIR INTEREST. AND IS TO BE RETURNED UPON REQUEST."

CIVIL
STORM CULVERT & DETAILS

OHIO POWER COMPANY
KAMMER PLANT
CAPTINA WEST VIRGINIA

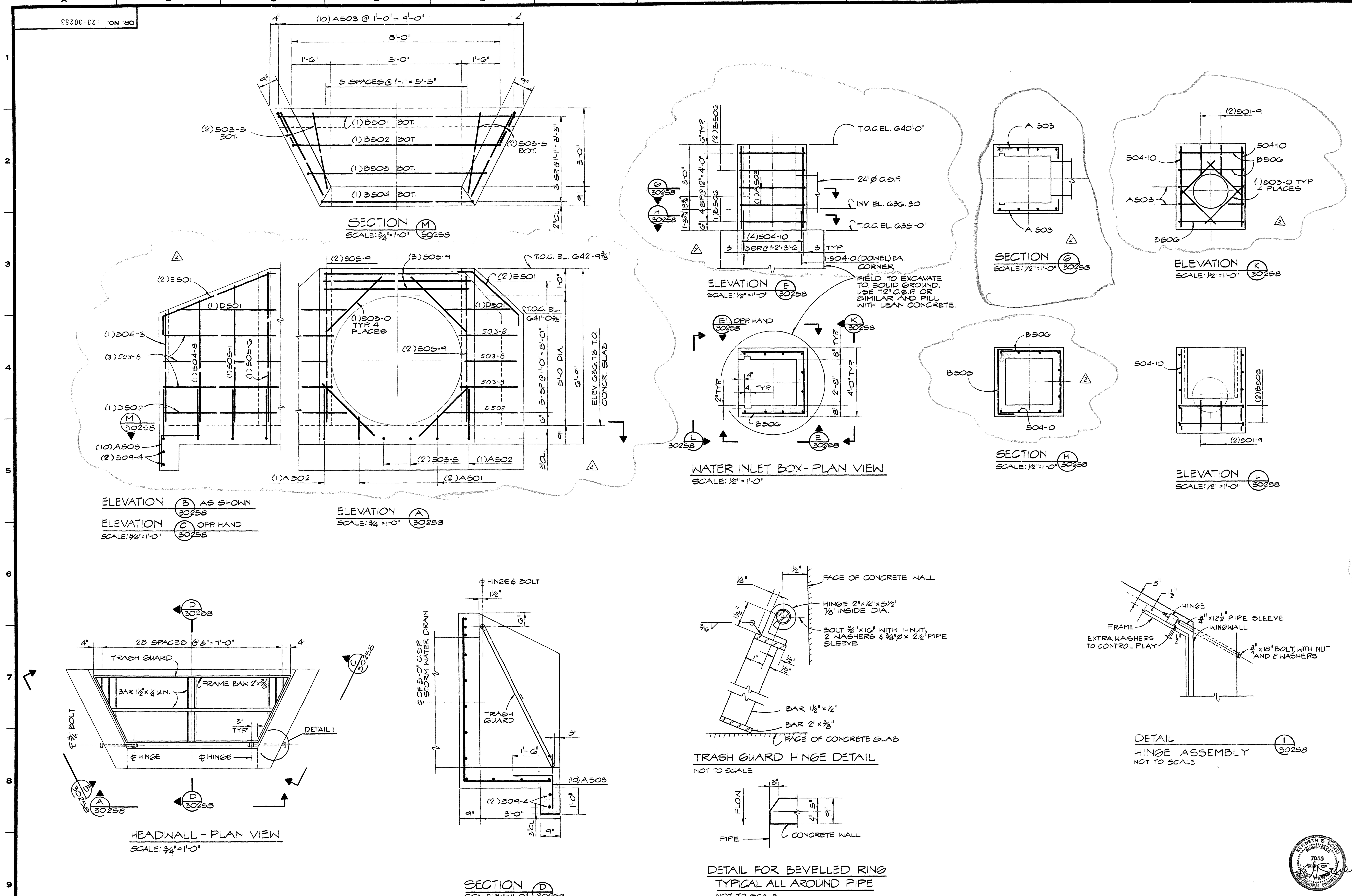
DR. NO. 123-30257-1

ARCH	ELEC	MECH	STR.
SCALE		ENGINEERING DIV.	
DR			
CH			
SQ. LGH		DESIGN DIV.	
DATE			

APPROVED

AMERICAN ELECTRIC POWER SERVICE CORP.
2 BROADWAY NEW YORK

DR. NO. 123-30258



NOTE:
1. FOR GENERAL CONCRETE NOTES SEE DRAWINGS 123-30104, NOTES 6 THRU 9, 11 AND 12.
2. TRASH GUARD SHALL BE ALL WELDED CONSTRUCTION OF ASTM A36 STEEL.

DATE	NO.	DESCRIPTION	APPD.
10/22/77	2	REVISED REINF. & NOTE.	KHS
7/20/77	1	APPROVED FOR CONSTRUCTION	KHS
6/22/77	0	FOR APPROVAL.	KHS

REVISIONS

CIVIL
HEADWALL & DETAILS

OHIO POWER COMPANY
KAMMER PLANT
CAPTINA WEST VIRGINIA

DR. NO. 123-30258-2

NO.	REFERENCE DRAWINGS

PRINT RECORD			
DATE ISSUED	6/22/77	7/20/77	10/25/77
REVISION NO.	0	1	2
FOR	APP	CONST	CONST
CUSTOMER	1S 1/2P	1S 1P+1/2	1S 2-1/2
FIELD	—	10+1/2 3P	10+1/2 3P
INTRA CO.	1/2V 9-1/2P	1/2V 7-1/2P	1/2V 7-1/2
LIAISON		1P 1/2P	1P 1/2P

ENG. RECORD		
DRAWN	a	6/6/77
CHECKED	W.F.F.	6/17/77
PROCESS CK.	JHR	6/21/77
MECH. CK.		6/21/77
STRUCT. CK.	KHS	6/21/77
ELECT. CK.		6/21/77
INSTR. CK.	—	—
APPROVED		6/21/77
APPROVED		

DRAWING STATUS ISSUED	DATE
PRELIMINARY	
FOR COMMENTS AND/OR APPROVAL	
APPROVED FOR CONSTRUCTION KB	7/20/77
REVISED & APPROVED FOR CONSTRUCTION 2 MCA for REV.	10/25/77
NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. VOID ALL PRINTS BEARING EARLIER DATE &/OR REVISION NO.	

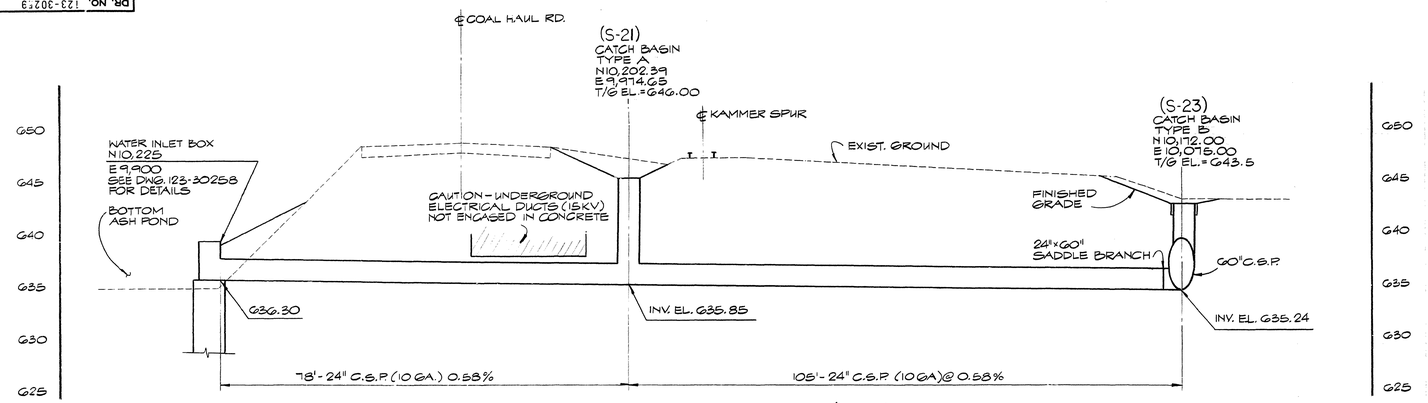
SHEET NO. Y4-3
S. R. DWG NO. L-22624
REVISION 2
ORDER NO. C-14795
Stearns-Roger INCORPORATED

ARCH		ELEC		MECH.		STR.	

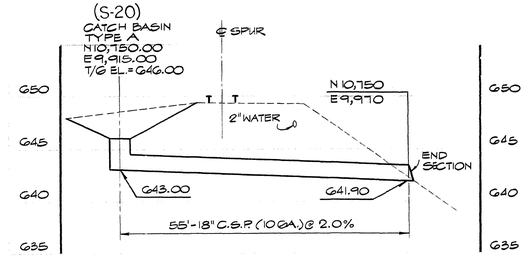
SCALE A.N. — DR. a — CH. W.F.F. — SQ. LDR. KHS — DATE 6/22/77 — APPROVED BY: ENGINEERING DIV. / DESIGN DIV.

AMERICAN ELECTRIC POWER SERVICE CORP.
2 BROADWAY NEW YORK

DR. NO. 123-30259

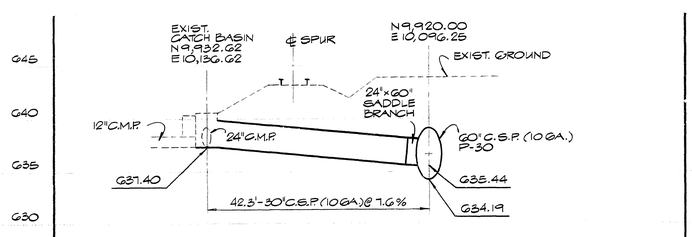


(P-21) (P-22)

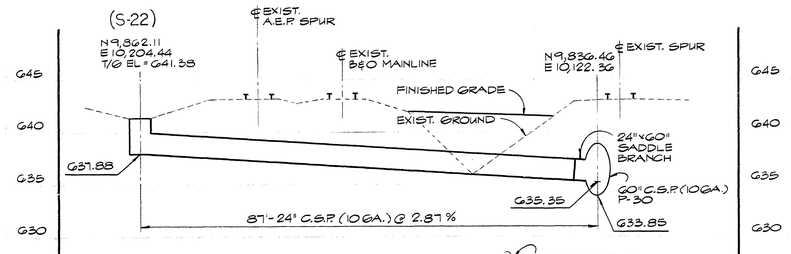


(P-20)

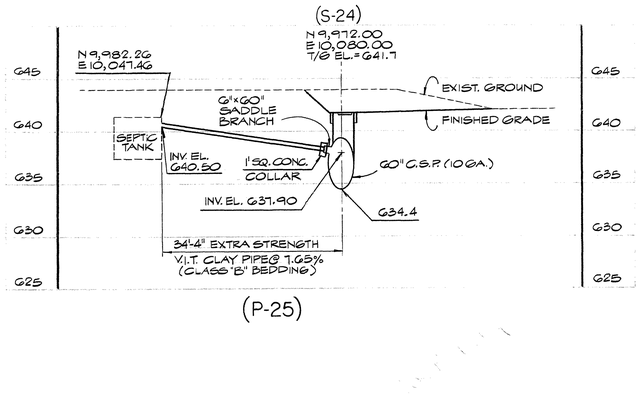
NOTES:
1. TYPE "A" CATCH BASIN:
CATCH BASIN ROUND INLET FRAME AND GRATE FOR 48"Ø, NEENAH TYPE R-2565-J OR EQUAL. TYPE "A" INLETS SHALL CONFORM TO A.E.P. DRAWINGS SDS-46-1; SDS-47-1 AND SDS-49-3.



(P-23)



(P-24)



(P-25)

SCALE:
1" = 10' HORIZONTAL
1" = 5' VERTICAL

NO.	REFERENCE DRAWINGS

PRINT RECORD			
DATE ISSUED	7/6/77	9/6/77	9/6/77
REVISION NO.	0	1	1
FOR	APP.	CONST.	CONST.
CUSTOMER	7/6/77	10/6/77	—
FIELD	—	10/6/77	—
INTRA CO.	9/6/77	9/6/77	—
LIAISON		9/6	—
ARAMCO			9/6

ENG. RECORD		
DRAWN	CL	6/6/77
CHECKED	RDH	6/6/77
PROCESS CK.	JWG	6/6/77
MECH. CK.	WHM	6/6/77
STRUCT. CK.	KHS	6/6/77
ELECT. CK.	RJS	6/6/77
INSTR. CK.	—	—
APPROVED	JAL	9/6/77
APPROVED	KB	9/6/77

DRAWING STATUS	
ISSUED	DATE
PRELIMINARY	
FOR COMMENTS AND/OR APPROVAL	6-21-77
APPROVED FOR CONSTRUCTION	9-12-77
REVISED & APPROVED FOR CONSTRUCTION (REV. 1)	

THIS APPROVED FOR CONSTRUCTION VALIDATES DRAWINGS ONLY AS TO THOSE REVISIONS LISTED DATED 9/6/77 OR BEFORE.

Stearns-Roger INCORPORATED

SHEET NO. Y4-4

S. R. DWG NO. L-22624

ORDER NO. C-14795

REVISION 1

DATE	NO.	DESCRIPTION	APPD.
9/6/77	1	APPROVED FOR CONSTRUCTION	KB
6/6/77	0	FOR APPROVAL	KB

REVISIONS

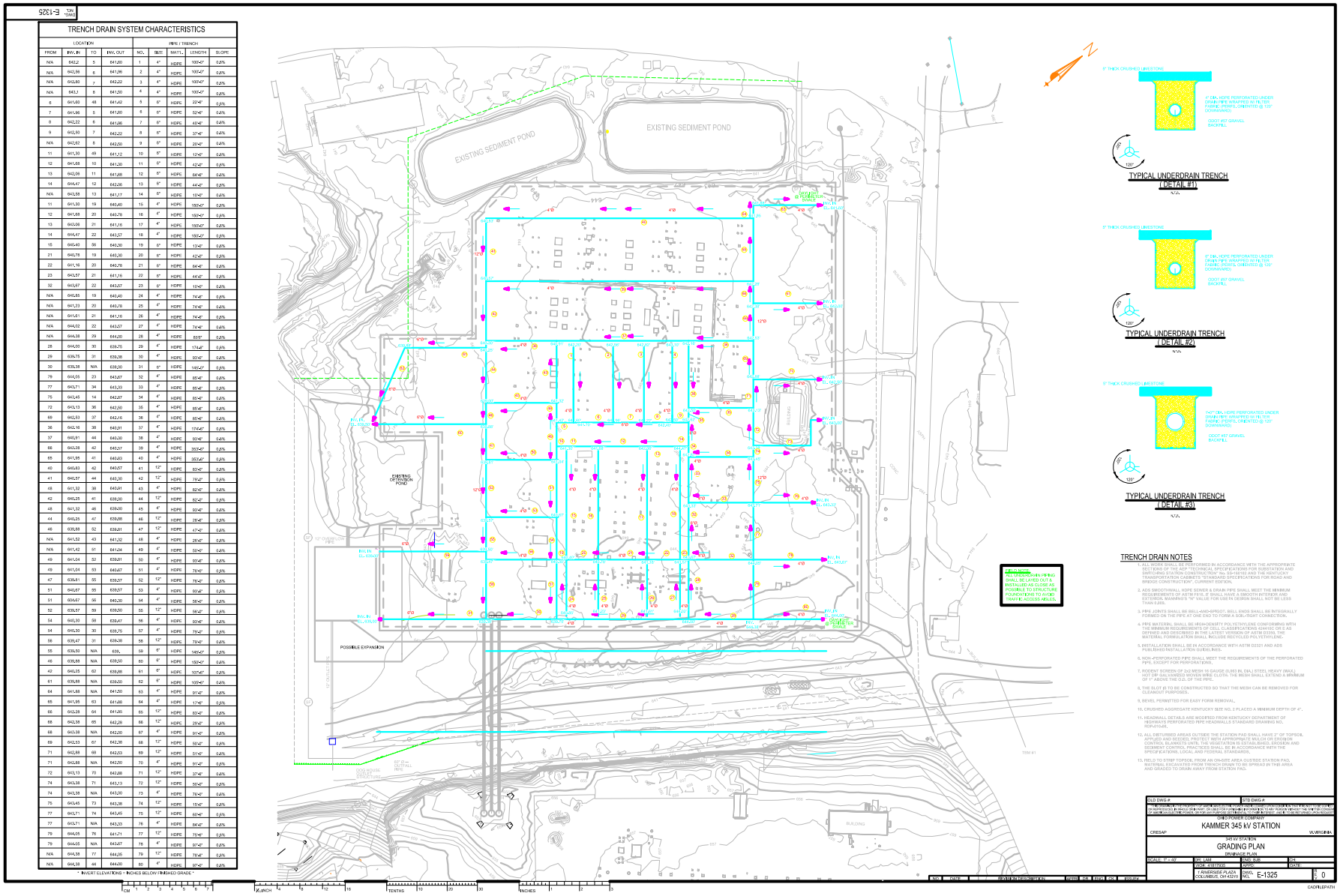
CIVIL
STORM SEWER PROFILES

OHIO POWER COMPANY
KAMMER PLANT
CAPTINA WEST VIRGINIA

DR. NO. 123-30259-

ARCH.	ELEC.	MECH.	STR.
SCALE:		ENGINEERING DIV.	
DR.	APPROVED		
CH.		BES-BH DIV.	
SO. L.OR.			
DATE.			

AMERICAN ELECTRIC POWER SERVICE CORP.
2 BROADWAY NEW YORK



E-1325

TRENCH DRAIN SYSTEM CHARACTERISTICS

LOCATION				PIPE / TRENCH				
FROM	INV. IN	TO	INV. OUT	NO.	SIZE	MATL.	LENGTH	SLOPE
N/A	642.2	5	641.60	1	4"	HDPE	100'-0"	0.6%
N/A	642.58	6	641.96	2	4"	HDPE	100'-0"	0.6%
N/A	642.60	7	642.22	3	4"	HDPE	100'-0"	0.6%
N/A	643.1	8	641.50	4	4"	HDPE	100'-0"	0.6%
6	641.60	48	641.42	5	6"	HDPE	22'-6"	0.8%
7	641.96	5	641.60	6	6"	HDPE	52'-6"	0.6%
8	642.22	6	641.96	7	6"	HDPE	40'-6"	0.6%
9	642.50	7	642.22	8	6"	HDPE	37'-6"	0.6%
N/A	642.62	8	642.50	9	6"	HDPE	20'-6"	0.6%
11	641.30	49	641.12	10	6"	HDPE	12'-6"	0.6%
12	641.68	10	641.30	11	6"	HDPE	42'-6"	0.6%
13	642.08	11	641.68	12	6"	HDPE	64'-6"	0.6%
14	644.47	12	642.08	13	6"	HDPE	44'-6"	0.6%
N/A	643.58	13	641.17	14	6"	HDPE	10'-6"	0.6%
11	641.30	59	640.40	15	4"	HDPE	150'-0"	0.6%
12	641.68	20	640.78	16	4"	HDPE	150'-0"	0.6%
13	642.08	21	641.18	17	4"	HDPE	150'-0"	0.6%
14	644.47	22	643.27	18	4"	HDPE	150'-0"	0.6%
15	640.40	56	640.20	19	6"	HDPE	13'-6"	0.6%
21	640.78	19	640.20	20	6"	HDPE	42'-6"	0.6%
22	641.18	20	640.78	21	6"	HDPE	64'-6"	0.6%
23	643.57	21	641.18	22	6"	HDPE	44'-6"	0.6%
32	643.57	22	643.27	23	6"	HDPE	10'-6"	0.6%
N/A	640.85	19	640.40	24	4"	HDPE	74'-6"	0.6%
N/A	641.23	20	640.78	25	4"	HDPE	74'-6"	0.6%
N/A	641.61	21	641.18	26	4"	HDPE	74'-6"	0.6%
N/A	644.02	22	643.27	27	4"	HDPE	74'-6"	0.6%
N/A	644.38	29	644.20	28	4"	HDPE	85'6"	0.6%
28	644.00	30	639.75	29	4"	HDPE	174'-6"	0.6%
29	639.75	31	639.38	30	4"	HDPE	93'-6"	0.6%
30	639.38	N/A	639.00	31	6"	HDPE	149'-6"	0.6%
76	644.05	23	643.67	32	4"	HDPE	85'-6"	0.6%
77	643.71	34	643.33	33	4"	HDPE	85'-6"	0.6%
75	643.45	14	642.67	34	4"	HDPE	85'-6"	0.6%
72	643.13	36	642.50	35	4"	HDPE	85'-6"	0.6%
69	642.83	37	642.16	36	4"	HDPE	85'-6"	0.6%
36	642.16	39	640.91	37	4"	HDPE	174'-6"	0.6%
37	640.91	44	640.20	38	4"	HDPE	93'-6"	0.6%
66	643.28	42	640.27	39	4"	HDPE	353'-6"	0.6%
65	641.95	41	640.63	40	4"	HDPE	353'-6"	0.6%
40	640.63	42	640.27	41	12"	HDPE	83'-6"	0.6%
41	640.97	44	640.20	42	12"	HDPE	78'-6"	0.6%
48	641.32	38	640.91	43	4"	HDPE	82'-6"	0.6%
42	640.25	41	639.00	44	12"	HDPE	82'-6"	0.6%
48	641.32	46	639.63	45	4"	HDPE	93'-6"	0.6%
44	640.25	47	639.88	46	12"	HDPE	28'-6"	0.6%
46	639.88	52	639.81	47	12"	HDPE	47'-6"	0.6%
N/A	641.52	43	641.32	48	4"	HDPE	28'-6"	0.6%
N/A	641.42	51	641.24	49	4"	HDPE	50'-6"	0.6%
49	641.24	52	639.81	50	4"	HDPE	93'-6"	0.6%
49	641.24	53	640.67	51	4"	HDPE	78'-6"	0.6%
47	639.81	55	639.27	52	12"	HDPE	78'-6"	0.6%
51	640.67	55	639.27	53	4"	HDPE	69'-6"	0.6%
51	604.67	56	640.20	54	4"	HDPE	56'-6"	0.6%
52	639.57	59	639.50	55	12"	HDPE	56'-6"	0.6%
54	640.30	59	639.47	56	4"	HDPE	93'-6"	0.6%
54	640.30	30	639.75	57	4"	HDPE	78'-6"	0.6%
56	639.47	31	639.38	58	12"	HDPE	78'-6"	0.6%
55	639.50	N/A	639.	59	8"	HDPE	149'-6"	0.6%
46	639.88	N/A	639.50	60	8"	HDPE	150'-0"	0.6%
42	640.25	62	639.88	61	8"	HDPE	107'-6"	0.6%
61	639.88	N/A	639.50	62	8"	HDPE	107'-6"	0.6%
64	641.68	N/A	641.50	63	4"	HDPE	91'-6"	0.6%
65	641.95	63	641.68	64	4"	HDPE	17'-6"	0.6%
66	642.28	64	641.95	65	12"	HDPE	82'-6"	0.6%
68	642.38	65	642.28	66	12"	HDPE	28'-6"	0.6%
68	643.38	N/A	642.00	67	4"	HDPE	91'-6"	0.6%
69	642.53	67	642.26	68	12"	HDPE	50'-6"	0.6%
71	642.88	69	642.53	69	12"	HDPE	51'-6"	0.6%
71	642.88	N/A	642.50	70	4"	HDPE	91'-6"	0.6%
72	643.13	70	642.88	71	12"	HDPE	37'-6"	0.6%
74	643.38	71	643.13	72	12"	HDPE	50'-6"	0.6%
74	643.38	N/A	643.00	73	4"	HDPE	78'-6"	0.6%
75	643.45	73	643.28	74	12"	HDPE	15'-6"	0.6%
77	643.71	74	643.45	75	12"	HDPE	60'-6"	0.6%
77	643.71	N/A	643.33	76	4"	HDPE	84'-6"	0.6%
79	644.05	76	643.71	77	12"	HDPE	75'-6"	0.6%
79	644.05	N/A	643.67	78	4"	HDPE	91'-6"	0.6%
N/A	644.38	77	644.05	79	12"	HDPE	78'-6"	0.6%
N/A	644.38	44	644.20	80	4"	HDPE	57'-6"	0.6%

* INVERT ELEVATIONS = INCHES BELOW FINISHED GRADE *

DWG. NO. E-1221

EARTH WORK / TRENCHING NOTES

1.) SATISFACTORY SOIL MATERIALS: ASTM D 2487 SOIL CLASSIFICATION GROUPS SW, GP, GM, SW, SP & SM: FREE OF ROCK OR GRAVEL LARGER THAN 2 INCHES IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION & OTHER DELETERIOUS MATTER.

2.) UNSATISFACTORY SOIL MATERIALS: ASTM D 2487 SOIL CLASSIFICATION GROUPS GC, SC, ML, MH, CL, CH, OL, OH & PT.

3.) BACKFILL & FILL MATERIALS: SATISFACTORY SOIL MATERIALS.

4.) STATION PAD MATERIAL EVENLY GRADED MIXTURE OF CRUSHED STONE AASHTO #57 WASHED LIMESTONE AGGREGATE.

5.) PROVIDE EROSION CONTROL MEASURES TO PREVENT EROSION OR DISPLACEMENT OF SOILS & DISCHARGE OF SOIL-BEARING WATER RUNOFF OR AIRBORNE DUST TO ADJACENT PROPERTIES.

6.) PREVENT SURFACE WATER & SUBSURFACE OR GROUND WATER FROM ENTERING EXCAVATIONS, FROM PONDING ON PREPARED SUBGRADES & FROM FLOODING PROJECT SITE & SURROUNDING AREA. PROTECT SUBGRADES & FOUNDATION SOILS FROM SOFTENING & DAMAGE BY RAIN OR WATER ACCUMULATION.

7.) "UNCLASSIFIED EXCAVATION" EXCAVATION IS UNCLASSIFIED & INCLUDES EXCAVATION TO REQUIRED SUBGRADE ELEVATIONS REGARDLESS OF THE CHARACTER OF MATERIALS & OBSTRUCTIONS ENCOUNTERED.

8.) STOCKPILE EXCAVATED MATERIALS ACCEPTABLE FOR BACKFILL AND FILL SOIL MATERIALS, INCLUDING ACCEPTABLE BORROW MATERIALS. STOCKPILE SOIL MATERIALS IN DESIGNATED AREA. PLACE, GRADE & SHAPE STOCKPILES TO DRAIN SURFACE WATER.

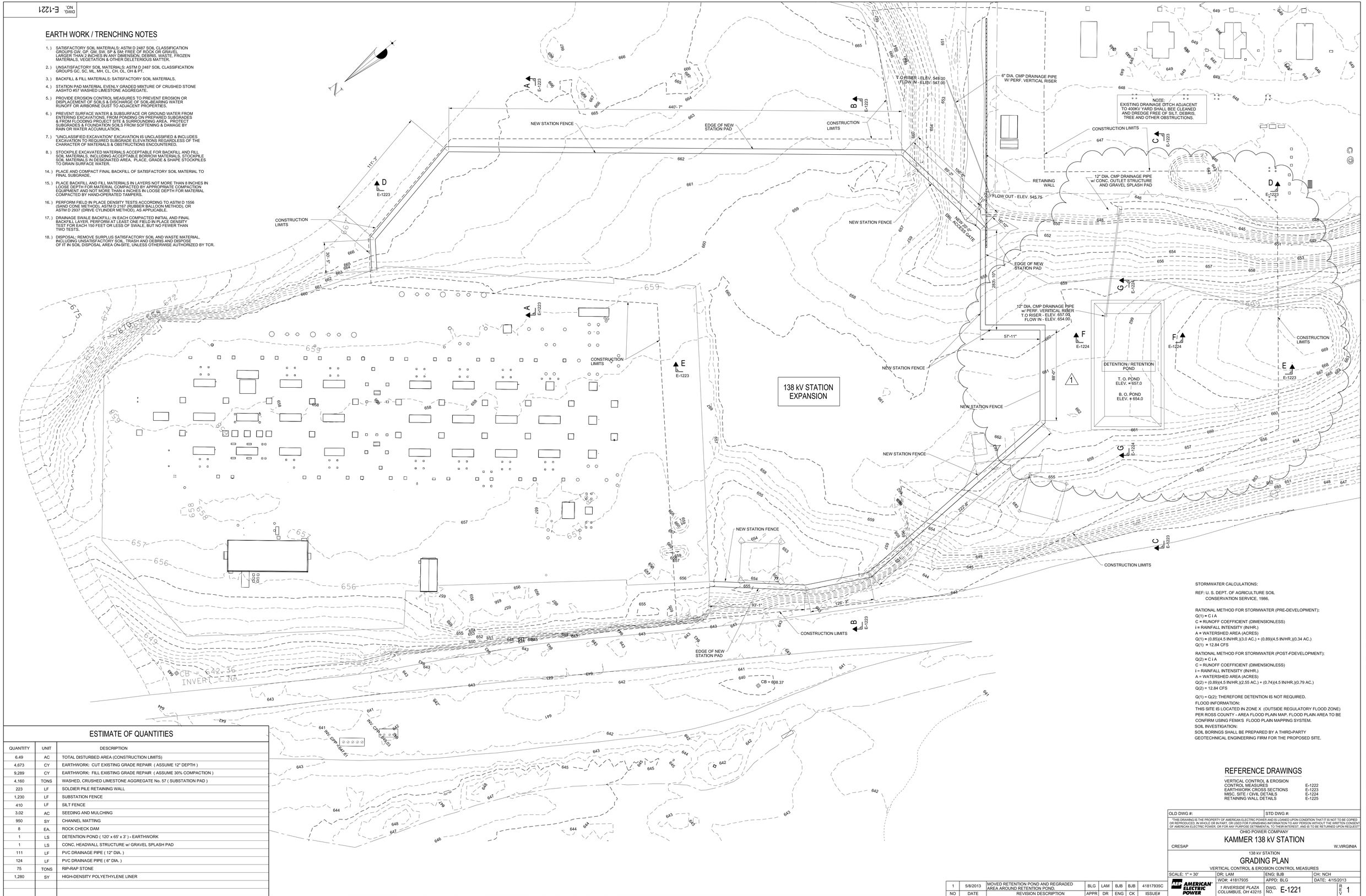
14.) PLACE AND COMPACT FINAL BACKFILL OF SATISFACTORY SOIL MATERIAL TO FINAL SUBGRADE.

15.) PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY APPROPRIATE COMPACTION EQUIPMENT AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND-OPERATED TAMPERS.

16.) PERFORM FIELD IN PLACE DENSITY TESTS ACCORDING TO ASTM D 1556 (SAND CONE METHOD), ASTM D 2167 (RUBBER BALLOON METHOD), OR ASTM D 2937 (DRIVE CYLINDER METHOD), AS APPLICABLE.

17.) DRAINAGE SWALE BACKFILL: IN EACH COMPACTED INITIAL AND FINAL BACKFILL LAYER, PERFORM AT LEAST ONE FIELD IN PLACE DENSITY TEST FOR EACH 150 FEET OR LESS OF SWALE, BUT NO FEWER THAN TWO TESTS.

18.) DISPOSAL: REMOVE SURPLUS SATISFACTORY SOIL AND WASTE MATERIAL, INCLUDING UNSATISFACTORY SOIL, TRASH AND DEBRIS AND DISPOSE OF IT IN SOIL DISPOSAL AREA ON-SITE, UNLESS OTHERWISE AUTHORIZED BY TCR.



ESTIMATE OF QUANTITIES

QUANTITY	UNIT	DESCRIPTION
6.49	AC	TOTAL DISTURBED AREA (CONSTRUCTION LIMITS)
4,673	CY	EARTHWORK: CUT EXISTING GRADE REPAIR (ASSUME 12" DEPTH)
9,289	CY	EARTHWORK: FILL EXISTING GRADE REPAIR (ASSUME 30% COMPACTION)
4,160	TONS	WASHED, CRUSHED LIMESTONE AGGREGATE No. 57 (SUBSTATION PAD)
223	LF	SOLDIER PILE RETAINING WALL
1,230	LF	SUBSTATION FENCE
410	LF	SILT FENCE
3.02	AC	SEEDING AND MULCHING
950	SY	CHANNEL MATTING
8	EA.	ROCK CHECK DAM
1	LS	DETENTION POND (120' x 65' x 3') - EARTHWORK
1	LS	CONC. HEADWALL STRUCTURE w/ GRAVEL SPLASH PAD
111	LF	PVC DRAINAGE PIPE (12" DIA.)
124	LF	PVC DRAINAGE PIPE (6" DIA.)
75	TONS	RIP-RAP STONE
1,280	SY	HIGH-DENSITY POLYETHYLENE LINER

STORMWATER CALCULATIONS:

REF: U. S. DEPT. OF AGRICULTURE SOIL CONSERVATION SERVICE, 1986.

RATIONAL METHOD FOR STORMWATER (PRE-DEVELOPMENT):
Q(1) = C I A
C = RUNOFF COEFFICIENT (DIMENSIONLESS)
I = RAINFALL INTENSITY (IN/HR.)
A = WATERSHED AREA (ACRES)
Q(1) = (0.85)(4.5 IN/HR.)(3.0 AC.) + (0.89)(4.5 IN/HR.)(0.34 AC.)
Q(1) = 12.84 CFS

RATIONAL METHOD FOR STORMWATER (POST-FDEVELOPMENT):
Q(2) = C I A
C = RUNOFF COEFFICIENT (DIMENSIONLESS)
I = RAINFALL INTENSITY (IN/HR.)
A = WATERSHED AREA (ACRES)
Q(2) = (0.89)(4.5 IN/HR.)(2.55 AC.) + (0.74)(4.5 IN/HR.)(0.79 AC.)
Q(2) = 12.84 CFS

Q(1) = Q(2); THEREFORE DETENTION IS NOT REQUIRED.

FLOOD INFORMATION:
THIS SITE IS LOCATED IN ZONE X (OUTSIDE REGULATORY FLOOD ZONE) PER ROSS COUNTY - AREA FLOOD PLAIN MAP. FLOOD PLAIN AREA TO BE CONFIRM USING FEMA'S FLOOD PLAIN MAPPING SYSTEM.

SOIL INVESTIGATION:
SOIL BORINGS SHALL BE PREPARED BY A THIRD-PARTY GEOTECHNICAL ENGINEERING FIRM FOR THE PROPOSED SITE.

REFERENCE DRAWINGS

VERTICAL CONTROL & EROSION CONTROL MEASURES	E-1222
EARTHWORK CROSS SECTIONS	E-1223
MISC. SITE / CIVIL DETAILS	E-1224
RETAINING WALL DETAILS	E-1225

OLD DWG #:	STD DWG #:

OHIO POWER COMPANY

KAMMER 138 kV STATION

CRESAP — W.VIRGINIA

138 kV STATION

GRADING PLAN

VERTICAL CONTROL & EROSION CONTROL MEASURES

SCALE: 1" = 30'	DR: LAM	ENG: BJB	CH: NCH
AMERICAN ELECTRIC POWER	WO#: 41817935	APPD: BLG	DATE: 4/15/2013
1 RIVERSIDE PLAZA, COLUMBUS, OH 43215	DWG. NO. E-1221	REV 1	

NO	DATE	REVISION DESCRIPTION	APPR	DR	ENG	CK	ISSUE#
1	5/8/2013	MOVED RETENTION POND AND REGRADED AREA AROUND RETENTION POND.	BLG	LAM	BJB	BJB	41817935C

CM 1 2 3 4 5 6 7 — 3/16 INCH 4 8 12 16 — TENTHS 10 20 30 — INCHES 1 2 3

CADFILEPATH

PLOTTED BY: %USER% ON: DD-MMM-YYYY AT: HH:MM STATION ENGINEERING

AEP (G) (30 X 42)

DWG. NO. E-1222

EARTH WORK / TRENCHING NOTES

1.) SATISFACTORY SOIL MATERIALS: ASTM D 2487 SOIL CLASSIFICATION GROUPS GW, GP, GM, SW, SP & SM; FREE OF ROCK OR GRAVEL LARGER THAN 2 INCHES IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION & OTHER DELETERIOUS MATTER.

2.) UNSATISFACTORY SOIL MATERIALS: ASTM D 2487 SOIL CLASSIFICATION GROUPS GC, SC, ML, MH, CL, CH, OL, OH & PT.

3.) BACKFILL & FILL MATERIALS: SATISFACTORY SOIL MATERIALS.

4.) STATION PAD MATERIAL EVENLY GRADED MIXTURE OF CRUSHED STONE AASHTO #57 WASHED LIMESTONE AGGREGATE.

5.) PROVIDE EROSION CONTROL MEASURES TO PREVENT EROSION OR DISPLACEMENT OF SOILS & DISCHARGE OF SOIL-BEARING WATER RUNOFF OR AIRBORNE DUST TO ADJACENT PROPERTIES.

6.) PREVENT SURFACE WATER & SUBSURFACE OR GROUND WATER FROM ENTERING EXCAVATIONS, FROM PONDING ON PREPARED SUBGRADES & FROM FLOODING PROJECT SITE & SURROUNDING AREA. PROTECT SUBGRADES & FOUNDATION SOILS FROM SOFTENING & DAMAGE BY RAIN OR WATER ACCUMULATION.

7.) "UNCLASSIFIED EXCAVATION" EXCAVATION IS UNCLASSIFIED & INCLUDES EXCAVATION TO REQUIRED SUBGRADE ELEVATIONS REGARDLESS OF THE CHARACTER OF MATERIALS & OBSTRUCTIONS ENCOUNTERED.

8.) STOCKPILE EXCAVATED MATERIALS ACCEPTABLE FOR BACKFILL AND FILL SOIL MATERIALS, INCLUDING ACCEPTABLE BORROW MATERIALS. STOCKPILE SOIL MATERIALS IN DESIGNATED AREA. PLACE, GRADE & SHAPE STOCKPILES TO DRAIN SURFACE WATER.

14.) PLACE AND COMPACT FINAL BACKFILL OF SATISFACTORY SOIL MATERIAL TO FINAL SUBGRADE.

15.) PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY APPROPRIATE COMPACTION EQUIPMENT AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND-OPERATED TAMPERS.

16.) PERFORM FIELD IN PLACE DENSITY TESTS ACCORDING TO ASTM D 1556 (SAND CONE METHOD), ASTM D 2167 (RUBBER BALLOON METHOD), OR ASTM D 2937 (DRIVE CYLINDER METHOD), AS APPLICABLE.

17.) DRAINAGE SWALE BACKFILL: IN EACH COMPACTED INITIAL AND FINAL BACKFILL LAYER, PERFORM AT LEAST ONE FIELD IN PLACE DENSITY TEST FOR EACH 150 FEET OR LESS OF SWALE, BUT NO FEWER THAN TWO TESTS.

18.) DISPOSAL: REMOVE SURPLUS SATISFACTORY SOIL AND WASTE MATERIAL, INCLUDING UNSATISFACTORY SOIL, TRASH AND DEBRIS AND DISPOSE OF IT IN SOIL DISPOSAL AREA ON-SITE, UNLESS OTHERWISE AUTHORIZED BY TCR.

EROSION CONTROL LEGEND

MU	MULCH
PS	PERMANENT SEEDING
SF	SILT FENCE
TP	TOP SOIL
TS	TEMPORARY SEEDING
RR	RIP-RAP STONE
CM	CHANNEL MATTING
CD	ROCK CHECK DAM

NORTHING - 492047.4410

NORTH - SOUTH AXIS LINE

EASTING - 1598979.1070

EAST - WEST AXIS LINE

NEW STATION FENCE

NEW STATION PAD

CONSTRUCTION LIMITS

SRP RISER @ EL. 647.00
FLOW IN - ELEV. 647.00

6" DIA. CMP DRAINAGE PIPE W/ PERF. VERTICAL RISER

NOTE:
EXISTING DRAINAGE DITCH ADJACENT TO 400KV YARD SHALL BE CLEANED AND DREDGE FREE OF SILT, DEBRIS, TREE AND OTHER OBSTRUCTIONS.

RETAINING WALL

12" DIA. CMP DRAINAGE PIPE w/ CONC. OUTLET STRUCTURE AND GRAVEL SPLASH PAD

FLOW OUT - ELEV. 545.75

FLOW OUT - ELEV. 646.00

12" DIA. CMP DRAINAGE PIPE w/ PERF. VERTICAL RISER
T.O RISER - ELEV. 656.00
FLOW IN - ELEV. 653.00

DETENTION / RETENTION POND

T. O. POND ELEV. = 656.0

B. O. POND ELEV. = 653.0

INVERT

CB = 642.26

CB = 638.37

INV. OUT = 641.41

INV. OUT = 641.41

STORMWATER CALCULATIONS:

REF: U. S. DEPT. OF AGRICULTURE SOIL CONSERVATION SERVICE, 1986.

RATIONAL METHOD FOR STORMWATER (PRE-DEVELOPMENT):
Q(1) = C I A
C = RUNOFF COEFFICIENT (DIMENSIONLESS)
I = RAINFALL INTENSITY (IN/HR.)
A = WATERSHED AREA (ACRES)
Q(1) = (0.20)(4.15 IN/HR.)(3.76 AC.) + (0.10)(4.15 IN/HR.)(2.72 AC.)
Q(1) = 4.25 CFS

RATIONAL METHOD FOR STORMWATER (POST-FDEVELOPMENT):
Q(2) = C I A
C = RUNOFF COEFFICIENT (DIMENSIONLESS)
I = RAINFALL INTENSITY (IN/HR.)
A = WATERSHED AREA (ACRES)
Q(2) = (0.65)(4.15 IN/HR.)(3.38 AC.) + (0.20)(4.15 IN/HR.)(2.59 AC.) + (0.10)(4.15 IN/HR.)(0.51 AC.)
Q(2) = 11.48 CFS
Q(2) > Q(1); THEREFORE DETENTION IS REQUIRED
PROPOSED DETENTION POND = 113,322 GAL. CAPACITY

FLOOD INFORMATION:
THIS SITE IS LOCATED IN ZONE X (OUTSIDE REGULATORY FLOOD ZONE) PER MARSHALL COUNTY - AREA FLOOD PLAIN MAP, FLOOD PLAIN AREA TO BE CONFIRM USING FEMA'S FLOOD PLAIN MAPPING SYSTEM.
SOIL INVESTIGATION:
SOIL BORINGS SHALL BE PREPARED BY A THIRD-PARTY GEOTECHNICAL ENGINEERING FIRM FOR THE PROPOSED SITE.

REFERENCE DRAWINGS

SITE LAYOUT PLAN	E-1221
EARTHWORK CROSS SECTIONS	E-1223
MISC. SITE / CIVIL DETAILS	E-1224
RETAINING WALL DETAILS	E-1225

2	08/22/3013	LOWERED ELEVATION OF DETENTION POND 1'-0"	BJB	LAM	BJB	BJB	41817935C1
1	5/8/2013	MOVED RETENTION POND AND REGRADED AREA AROUND RETENTION POND.	BLG	LAM	BJB	BJB	41817935C
NO	DATE	REVISION DESCRIPTION	APPR	DR	ENG	CK	ISSUE#

OLD DWG #: | STD DWG #:

OHIO POWER COMPANY

KAMMER 138 kV STATION

CRESAP W.VIRGINIA

138 kV STATION

GRADING PLAN

VERTICAL CONTROL & EROSION CONTROL MEASURES

SCALE: 1" = 30'	DR: LAM	ENG: BJB	CH: NCH
	WO#: 41817935	APPD: BLG	DATE: 4/15/2013
AMERICAN ELECTRIC POWER	1 RIVERSIDE PLAZA, COLUMBUS, OH 43215	DWG. NO. E-1222	REV 2

\\VMAEPHQPR003\ics_workdir\10\393319_391\E1222.dgn

AEP (1:30 X 46) PLOTTED BY:MAEPHQPR003\A 3/17/2016 AT 3:09:43 PM STATION ENGINEERING

APPENDIX C

RAINFALL

NOAA Atlas 14, Volume 2, Version 3
Location name: Proctor, West Virginia, USA*
Latitude: 39.8413°, Longitude: -80.8216°
Elevation: 632 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.328** (0.292-0.370)	**0.392** (0.349-0.442)	**0.472** (0.421-0.532)	**0.535** (0.476-0.601)	**0.614** (0.544-0.689)	**0.675** (0.596-0.756)	**0.733** (0.645-0.819)	**0.792** (0.693-0.885)	**0.871** (0.758-0.972)	**0.928** (0.804-1.04)
10-min	**0.510** (0.454-0.575)	**0.612** (0.545-0.690)	**0.734** (0.655-0.827)	**0.825** (0.734-0.928)	**0.940** (0.833-1.05)	**1.02** (0.903-1.14)	**1.10** (0.970-1.23)	**1.18** (1.04-1.32)	**1.28** (1.11-1.43)	**1.35** (1.17-1.51)
15-min	**0.625** (0.556-0.704)	**0.748** (0.667-0.843)	**0.902** (0.804-1.02)	**1.02** (0.903-1.14)	**1.16** (1.03-1.30)	**1.27** (1.12-1.42)	**1.37** (1.20-1.53)	**1.47** (1.29-1.64)	**1.60** (1.39-1.78)	**1.69** (1.46-1.89)
30-min	**0.826** (0.736-0.932)	**1.00** (0.892-1.13)	**1.24** (1.10-1.39)	**1.41** (1.25-1.59)	**1.64** (1.45-1.84)	**1.81** (1.60-2.03)	**1.98** (1.74-2.21)	**2.14** (1.88-2.40)	**2.37** (2.06-2.64)	**2.53** (2.19-2.83)
60-min	**1.01** (0.899-1.14)	**1.23** (1.10-1.38)	**1.55** (1.38-1.74)	**1.79** (1.60-2.02)	**2.13** (1.88-2.38)	**2.38** (2.11-2.67)	**2.65** (2.33-2.96)	**2.91** (2.55-3.25)	**3.27** (2.85-3.66)	**3.56** (3.08-3.97)
2-hr	**1.16** (1.04-1.32)	**1.41** (1.26-1.61)	**1.79** (1.59-2.03)	**2.07** (1.84-2.35)	**2.47** (2.18-2.79)	**2.79** (2.45-3.14)	**3.11** (2.72-3.50)	**3.44** (2.99-3.87)	**3.90** (3.37-4.37)	**4.25** (3.65-4.76)
3-hr	**1.24** (1.11-1.41)	**1.50** (1.34-1.71)	**1.90** (1.69-2.15)	**2.20** (1.95-2.49)	**2.63** (2.32-2.97)	**2.97** (2.61-3.34)	**3.33** (2.90-3.73)	**3.70** (3.21-4.14)	**4.20** (3.62-4.69)	**4.60** (3.94-5.14)
6-hr	**1.49** (1.34-1.68)	**1.79** (1.61-2.02)	**2.24** (2.00-2.52)	**2.60** (2.32-2.92)	**3.11** (2.76-3.48)	**3.52** (3.11-3.93)	**3.95** (3.48-4.40)	**4.41** (3.86-4.89)	**5.04** (4.36-5.59)	**5.56** (4.78-6.14)
12-hr	**1.75** (1.58-1.95)	**2.09** (1.89-2.33)	**2.59** (2.33-2.88)	**2.99** (2.69-3.32)	**3.57** (3.20-3.95)	**4.05** (3.61-4.47)	**4.55** (4.03-5.01)	**5.09** (4.48-5.58)	**5.84** (5.09-6.38)	**6.45** (5.58-7.04)
24-hr	**2.08** (1.93-2.27)	**2.48** (2.30-2.70)	**3.03** (2.81-3.30)	**3.47** (3.21-3.78)	**4.10** (3.78-4.45)	**4.61** (4.24-5.00)	**5.14** (4.71-5.56)	**5.70** (5.20-6.16)	**6.47** (5.86-6.98)	**7.10** (6.39-7.65)
2-day	**2.44** (2.26-2.64)	**2.90** (2.70-3.14)	**3.51** (3.26-3.79)	**4.00** (3.70-4.31)	**4.68** (4.32-5.03)	**5.22** (4.80-5.61)	**5.78** (5.30-6.21)	**6.36** (5.81-6.82)	**7.14** (6.49-7.67)	**7.76** (7.02-8.34)
3-day	**2.62** (2.44-2.81)	**3.11** (2.90-3.34)	**3.73** (3.48-4.01)	**4.24** (3.94-4.55)	**4.93** (4.57-5.28)	**5.48** (5.07-5.86)	**6.04** (5.58-6.46)	**6.62** (6.09-7.08)	**7.40** (6.77-7.92)	**8.02** (7.29-8.57)
4-day	**2.80** (2.62-2.99)	**3.31** (3.10-3.54)	**3.96** (3.70-4.23)	**4.47** (4.18-4.78)	**5.18** (4.83-5.53)	**5.74** (5.34-6.12)	**6.31** (5.85-6.72)	**6.89** (6.37-7.34)	**7.67** (7.06-8.17)	**8.27** (7.57-8.81)
7-day	**3.39** (3.19-3.60)	**4.01** (3.77-4.26)	**4.73** (4.45-5.03)	**5.31** (4.99-5.64)	**6.07** (5.69-6.44)	**6.68** (6.25-7.08)	**7.28** (6.79-7.72)	**7.88** (7.33-8.36)	**8.68** (8.04-9.20)	**9.28** (8.57-9.84)
10-day	**3.92** (3.69-4.16)	**4.61** (4.34-4.91)	**5.40** (5.08-5.74)	**6.01** (5.65-6.40)	**6.83** (6.41-7.25)	**7.45** (6.99-7.91)	**8.07** (7.55-8.57)	**8.69** (8.10-9.22)	**9.49** (8.81-10.1)	**10.1** (9.34-10.7)
20-day	**5.50** (5.20-5.83)	**6.45** (6.10-6.84)	**7.45** (7.04-7.89)	**8.21** (7.76-8.70)	**9.21** (8.70-9.75)	**9.97** (9.40-10.5)	**10.7** (10.1-11.3)	**11.4** (10.7-12.1)	**12.3** (11.5-13.0)	**13.0** (12.1-13.7)
30-day	**6.93** (6.56-7.33)	**8.10** (7.68-8.57)	**9.26** (8.76-9.80)	**10.2** (9.60-10.7)	**11.3** (10.7-11.9)	**12.2** (11.5-12.8)	**13.0** (12.2-13.7)	**13.8** (12.9-14.5)	**14.8** (13.8-15.6)	**15.5** (14.5-16.4)
45-day	**8.89** (8.45-9.34)	**10.4** (9.85-10.9)	**11.7** (11.1-12.3)	**12.7** (12.1-13.4)	**14.0** (13.3-14.7)	**14.9** (14.2-15.7)	**15.8** (15.0-16.6)	**16.6** (15.7-17.5)	**17.7** (16.7-18.6)	**18.4** (17.3-19.3)
60-day	**10.7** (10.2-11.2)	**12.4** (11.8-13.0)	**13.9** (13.3-14.6)	**15.0** (14.3-15.7)	**16.4** (15.6-17.2)	**17.4** (16.6-18.3)	**18.3** (17.4-19.2)	**19.2** (18.2-20.1)	**20.2** (19.2-21.2)	**20.9** (19.8-22.0)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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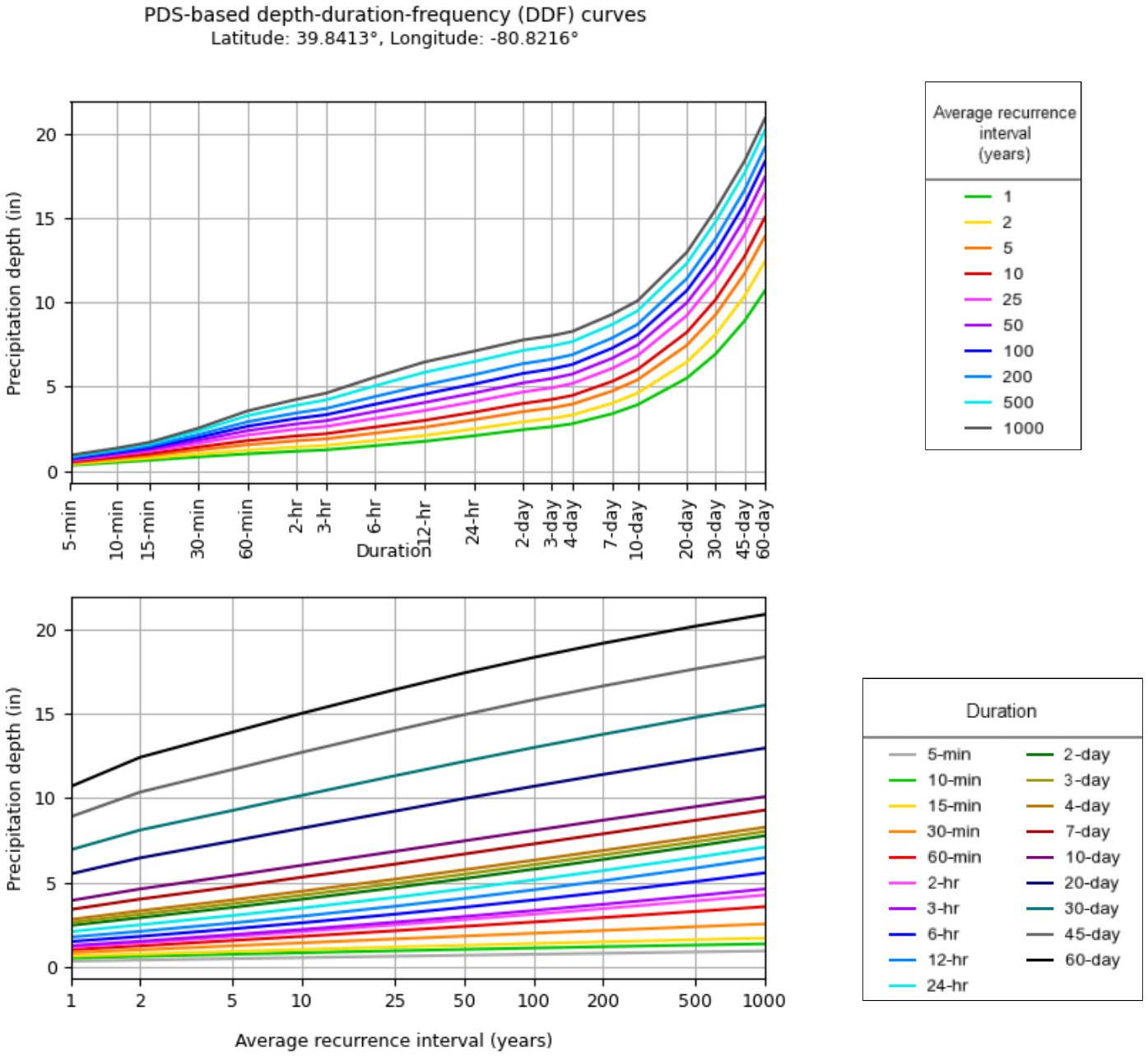
PF graphical



NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Thu Dec 4 20:27:15 2025

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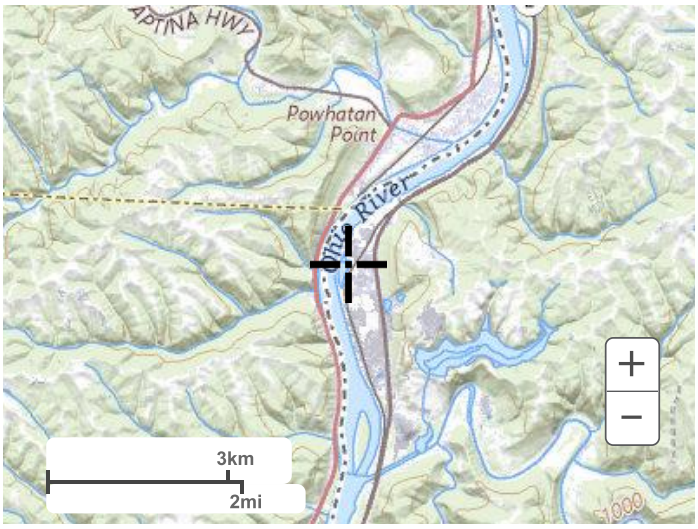
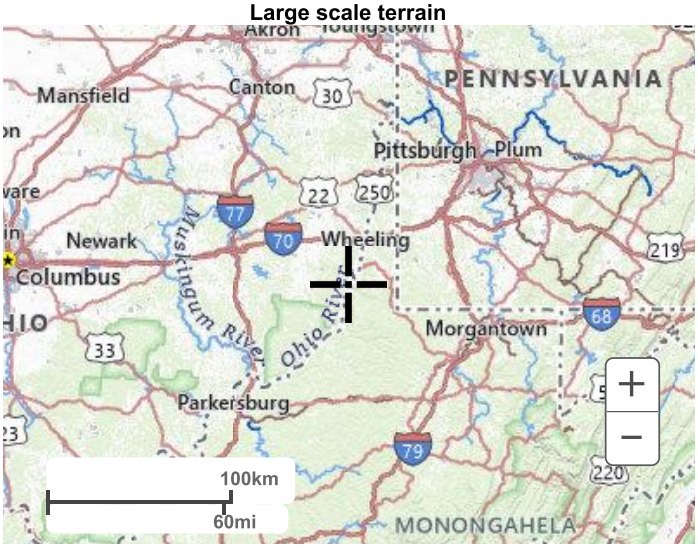
Maps & aerials

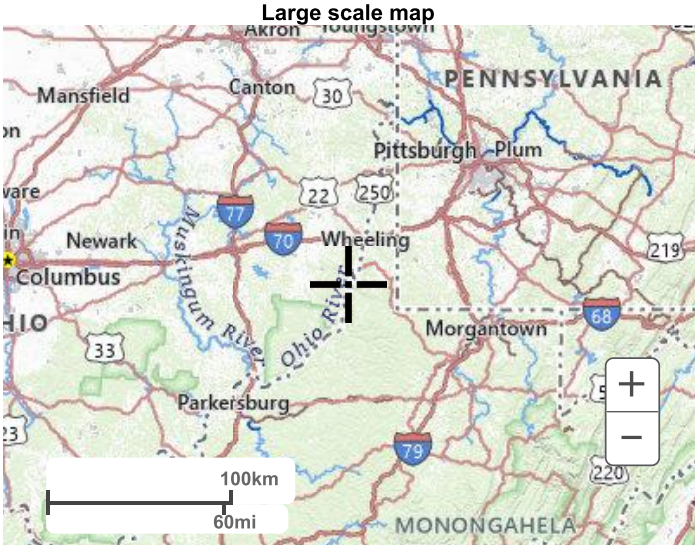
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

APPENDIX D

SITE LAYOUT PLAN

NORTH

CONTROL POINT TABLE–US SURVEY FEET			
Point #	Northing	Easting	Elevation
100	491558.50	1597093.72	644.74
101	492052.40	1597231.33	641.96
102	492484.40	1597598.51	644.64
500	490293.40	1597046.61	638.48
501	490840.02	1597371.91	638.82
502	491426.19	1597714.98	641.34
503	491779.28	1597254.28	640.07
504	492330.62	1597431.99	642.48
505	491401.99	1596896.85	641.40
506	490700.75	1596842.57	639.26

CONTROL POINT 506
CONTROL POINT 505
CONTROL POINT 500
CONTROL POINT 100
CONTROL POINT 503
CONTROL POINT 101
CONTROL POINT 501
CONTROL POINT 504
CONTROL POINT 502
CONTROL POINT 102

AP–6S
AP–6D
AP–7S
AP–7D
AP–4D
AP–4S
MW–1S
AP–2D
AP–2S
AP–1D
AP–1S
BG–2S
BG–2D

WATER ELEVATION: 629.9'
WATER ELEVATION: 630.1'
WATER ELEVATION: 630.2'
WATER ELEVATION: 638.2'
WATER ELEVATION: 638.8'

MONITORING WELL POINT TABLE–US SURVEY FEET				
Point #	Northing	Easting	Elevation	Raw Description
12001	491977.4830	1597009.3890	643.590	MWP AP–3S
12005	491966.4890	1597006.0770	643.305	MWC AP–3D
12030	492216.7660	1597325.8310	644.151	MWP AP–2S
12032	492207.3770	1597319.2000	644.332	MWC AP–2D
12035	491535.7530	1596950.3860	642.959	MWC MW–1S
12039	491496.2450	1596848.2160	640.355	MWP MW–1D
12042	491244.2610	1596846.3900	642.085	MWP AP–4S
12044	491233.0630	1596841.4260	641.995	MWP AP–4D
12047	490776.1130	1596848.6310	641.877	MWC AP–5D
12049	490765.0670	1596849.5900	641.767	MWC AP–5S
12054	490313.0720	1596904.6330	641.635	MWP AP–6D
12056	490323.7760	1596901.3010	641.874	MWP AP–6S
12060	490271.8000	1597154.5350	642.462	MWP AP–7D
12061	490270.8990	1597142.2570	642.994	MWC AP–7S
12002	491977.5120	1597009.3310	643.951	MWC AP–3S
12004	491966.5200	1597006.0390	642.921	MWP AP–3D
12017	491013.2020	1597725.8520	654.931	MWP BG–2S
12018	491918.3813	1598172.9839	655.316	MWC BG–2S
12021	491024.4190	1597731.1000	655.241	MWC BG–2D
12022	491024.3670	1597731.0920	654.897	MWP BG–2D
12023	490913.3080	1598535.6870	669.890	MWC BG–4S
12024	490913.3530	1598535.6520	669.536	MWP BG–4S
12027	492105.7040	1598168.9740	647.321	MWC BG–1D
12028	492105.7550	1598168.8930	646.939	MWP BG–1D
12029	492216.8320	1597325.7970	644.546	MWC AP–2S
12031	492207.4200	1597319.2780	643.986	MWP AP–2D
12036	491535.6780	1596950.4330	642.806	MWP MW–1S
12038	491496.2830	1596848.2400	640.719	MWC MW–1D
12041	491244.1410	1596846.4450	642.422	MWC AP–4S
12043	491233.1420	1596841.4330	642.354	MWC AP–4D
12048	490776.0870	1596848.6840	641.543	MWP AP–5D
12050	490765.0280	1596849.6700	641.424	MWP AP–5S
12053	490313.1060	1596904.6970	641.994	MWC AP–6D
12055	490323.7910	1596901.2600	642.209	MWC AP–6S
12059	490271.8250	1597154.6130	642.787	MWC AP–7D
12062	490270.8330	1597142.2390	642.668	MWP AP–7S

MONITORING WELL POINT TABLE–US SURVEY FEET				
Point #	Northing	Easting	Elevation	Raw Description
12065	492525.3340	1598013.5340	652.333	MWC BSP–4D
12066	492525.3590	1598013.4730	651.986	MWP BSP–4D
12067	492536.9280	1598019.3160	652.393	MWC BSP–4S
12068	492537.0010	1598019.3420	652.043	MWP BSP–4S
12071	492620.4990	1598069.1830	651.468	MWC BSP–3D
12072	492620.5050	1598069.1830	651.126	MWP BSP–3D
12073	492631.3830	1598079.0390	651.979	MWC BSP–3S
12074	492631.3050	1598079.0140	651.641	MWP BSP–3S
12077	492728.1990	1598190.0970	652.818	MWC BSP –2D
12078	492728.1780	1598190.0830	652.444	MWP BSP –2D
12079	492739.8750	1598191.0200	652.984	MWC BSP –2S
12080	492739.8770	1598191.0820	652.643	MWP BSP –2S
12083	492488.9030	1598439.8770	650.928	MWC BSP–1D
12084	492488.9330	1598439.8410	650.577	MWP BSP–1D
12086	492475.0900	1597658.1190	647.370	MWC AP–1S
12087	492475.0710	1597658.0990	647.048	MWP AP–1S
12088	492485.2840	1597661.3650	647.620	MWC AP–1D
12089	492485.3260	1597661.3920	647.286	MWP AP–1D

EXISTING LEGEND:

- AERIAL CONTROL POINT
- REBAR IRON PIN SET & CAP
- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- EXISTING MONITORING WELL

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
1		

ENGINEERING, SURVEYING AND LANDSCAPE ARCHITECTURE IN THE STATE OF NORTH CAROLINA WILL BE PROVIDED BY CEC SURVEYING AND LANDSCAPE ARCHITECTS OF NC, PLLC. LANDSCAPE ARCHITECTURAL SERVICES PROVIDED BY CEC LANDSCAPE ARCHITECTS, PLLC. ENGINEERING SERVICES PROVIDED BY CEC ENGINEERS, PLLC. SURVEYING SERVICES PROVIDED BY CEC SURVEYING & MAPPING, PLLC. ALL SERVICES PERFORMED IN THE STATE OF NORTH CAROLINA WILL BE PERFORMED BY, OR UNDER THE DIRECT SUPERVISION OF, PERSONNEL LICENSED TO PRACTICE IN THE STATE OF NORTH CAROLINA BY THE NORTH CAROLINA BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS OR THE NORTH CAROLINA BOARD FOR LICENSING OF LANDSCAPE ARCHITECTS.

120 Genesis Boulevard
Bridgeport, WV 26330
Ph: 304.933.3119
www.cecinc.com

Civil & Environmental Consultants, Inc.

SITE LAYOUT PLAN
AEP KAMMER
345-817 AEP KAMMER

EXISTING CONDITIONS

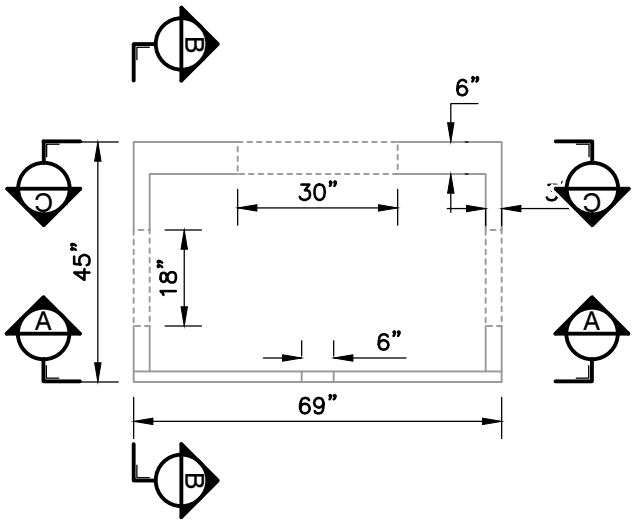
DATE:	SEP. 2025
DRAWN BY:	DSC
CHECKED BY:	ZRH
DWG SCALE:	1"=80'
PROJECT NO:	345-817
APPROVED BY:	MKB

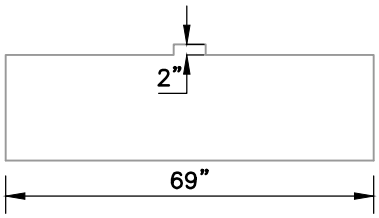
DRAWING NO.:
SV01
SHEET 1 OF 1

P:\340-2001\345-817_Survey\Dwg\Xref\345817XR-2101-EXISTING_L_1X48L.dwg#345817XR-2101-EXISTING_L_1X48L_ab9681b.ix#$dwg(LAYOUT) LS(10/9/2025 - dcallaghan) - LP: 10/10/2025 11:07 AM

APPENDIX E

OUTLET CONTROL STRUCTURE





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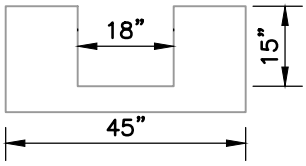

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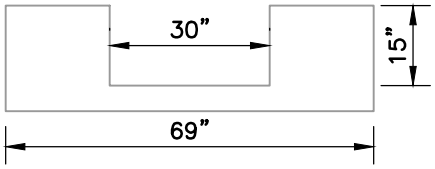


SECTION C–C

SCALE IN FEET

0 3 6

ENGINEERING, SURVEYING AND LANDSCAPE ARCHITECTURE IN THE STATE OF NORTH CAROLINA WILL BE PROVIDED BY CEC SURVEYING AND LANDSCAPE ARCHITECTS OF NC, PLLC. SERVICES IN PUERTO RICO WILL BE PROVIDED BY CEC ENGINEERS & CONSULTANTS, LLC. LANDSCAPE ARCHITECTURE SERVICES IN THE STATE OF OHIO WILL BE PROVIDED BY CEC LANDSCAPE ARCHITECTS, LLC.

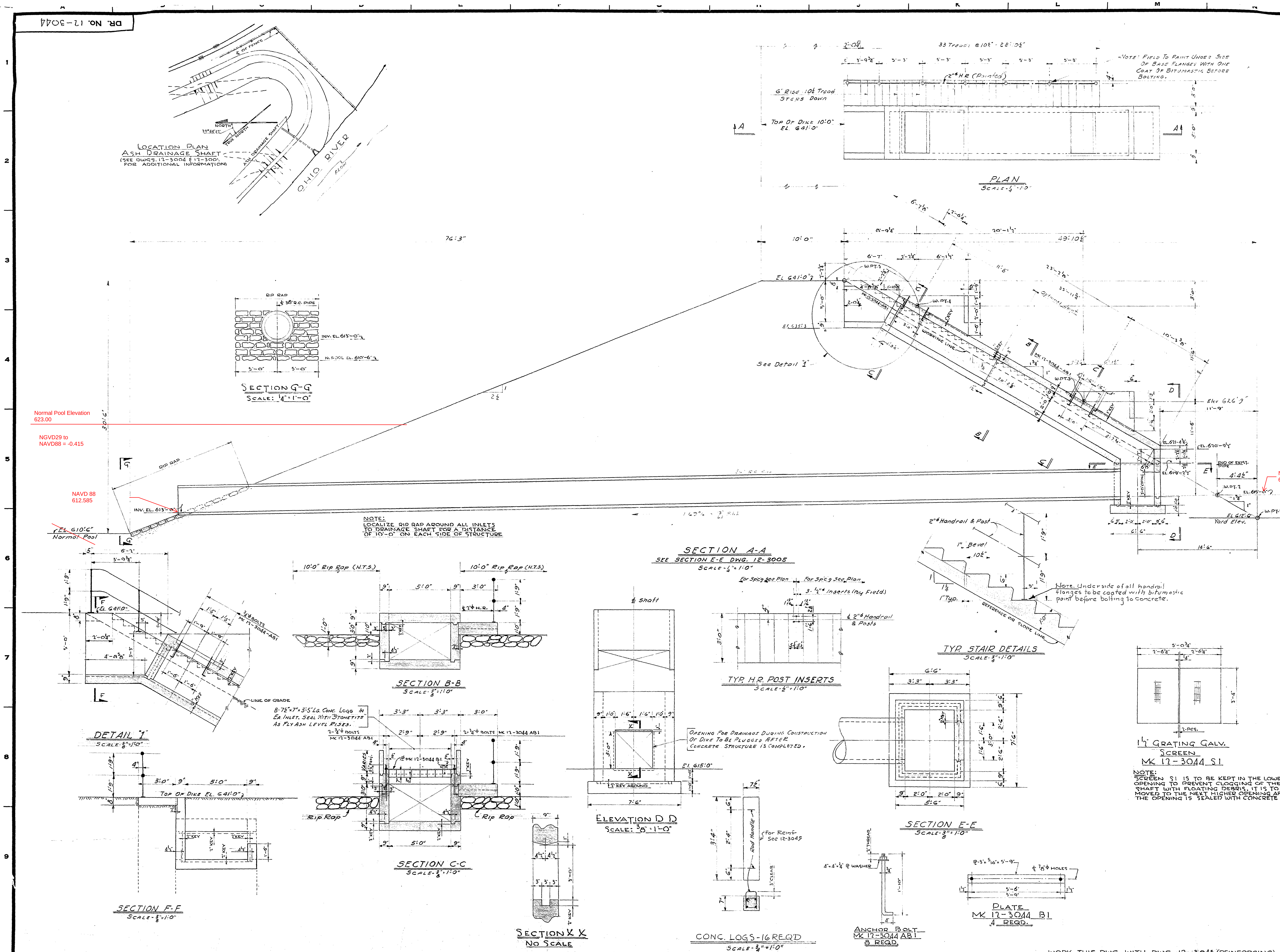
Civil & Environmental Consultants, Inc.

10300 Alliance Road
Suite 300
Cincinnati, OH 45242
Ph: 513.985.0226
www.cecinc.com

AMERICAN ELECTRIC POWER
ASH POND FLOOD CONTROL PLAN
AEP KAMMER PLANT
MOUNDSVILLE, WEST VIRGINIA

OUTLET CONTROL STRUCTURE

DRAWN BY:	ACG	CHECKED BY:	KAG	APPROVED BY:	CJG	ATTACHMENT:	E
DATE:	DEC. 2025	DWG SCALE:	1" = 3'	PROJECT NO:	345-817		



GENERAL NOTES

ALL CONCRETE MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE A.G.&E.S. CORP. SPECIFICATIONS #1001.
DIMENSIONS GIVEN FOR REINFORCING STEEL ARE TO CENTER LINE OF BARS.
CONSTRUCTION JOINTS MAY BE OMITTED WITH THE APPROVAL OF THE SUPERVISING ENGINEER, PROVIDED THAT THE CONTRACTOR'S MIXING AND PLACING EQUIPMENT IS PROPERLY SIZED SO THAT NO COLD JOINTS WILL RESULT IN THE CONCRETE.
CONSTRUCTION JOINTS SHALL NOT BE [illegible] UNLESS PERMISSION IS GRANTED BY THE NEW YORK ENGINEERING DEPARTMENT.
EXPANSION JOINTS MUST BE LOCATED AS SHOWN.
ALL EXPOSED EDGES SHALL HAVE A ONE INCH [illegible]
FLOOR FINISH SHALL CONFORM TO THE A.G.&E.S. CORP'S. SPEC. AND SHALL BE PLACED [illegible]
ALL EXPOSED CONCRETE SURFACES TO HAVE [illegible] FINISH

NGVD29 to NAVD88 = -0.415

LIST OF MATERIALS

Concrete 27 Cu. Yds.
Handrail By Logan Co. OPKX-4542
Misc Steel By Esco Iron Wks. OPKX-6552
Grating By Std. Stl. Spring OPKX-4542

REFERENCE DRAWINGS

Excav. Plan	12-3004
" " Units 1 & 2	12-3005
Reinforcing " "	12-3045
F.A. Pipe Discharge Trestle	12-3496

DATE	No.	DESCRIPTION	APPD.

REVISIONS

UNITS 1 & 2
FLY ASH DRAINAGE SHAFT
MASONRY

OHIO POWER COMPANY
KAMMER PLANT
CRESAP, WEST VIRGINIA

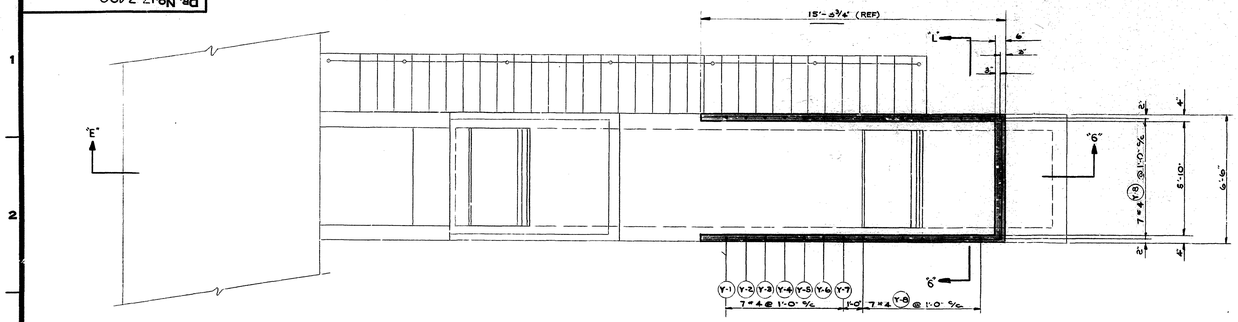
DR. No. 12-3044

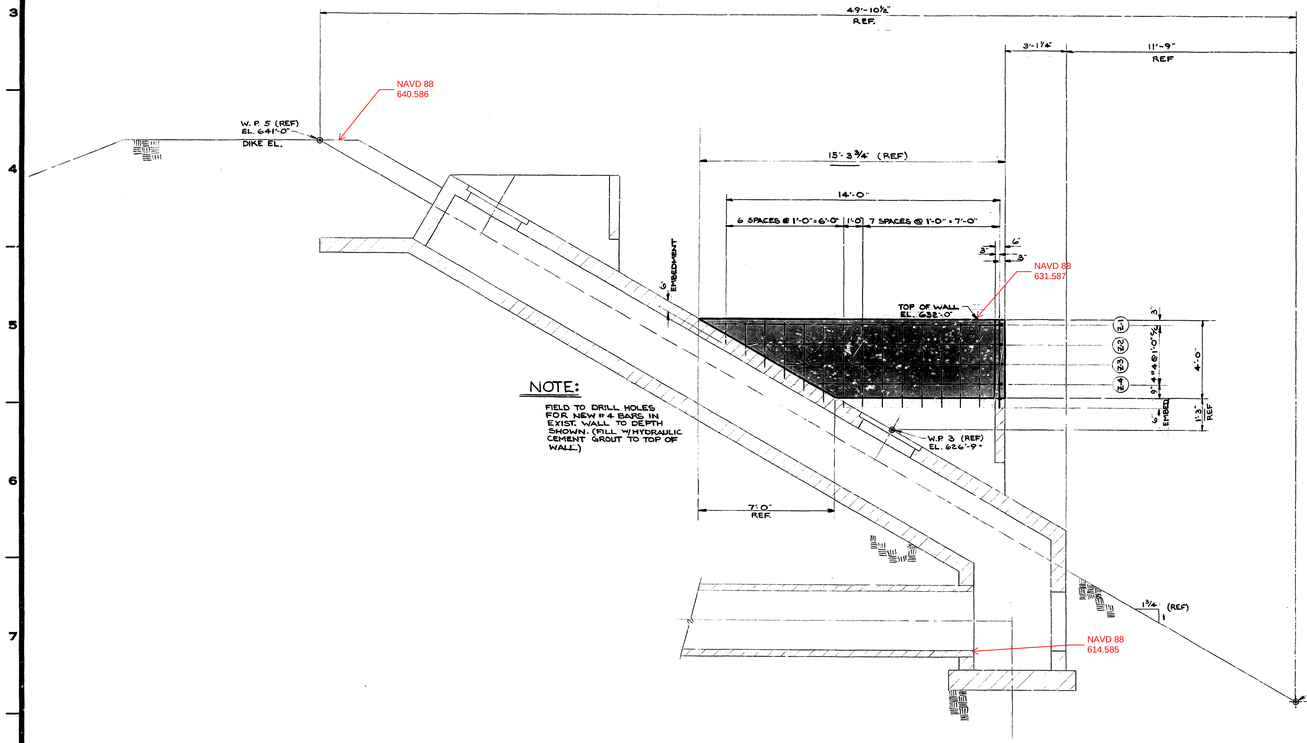
ARCH.	ELEC.	MECH.	STR.

SCALE As Shown
DR. W.B.
CH. G.O.
DATE 7-25-57
APPROVED

AMERICAN GAS & ELECTRIC SERVICE CORP.
30 CHURCH STREET NEW YORK

DR. No. 13-3490

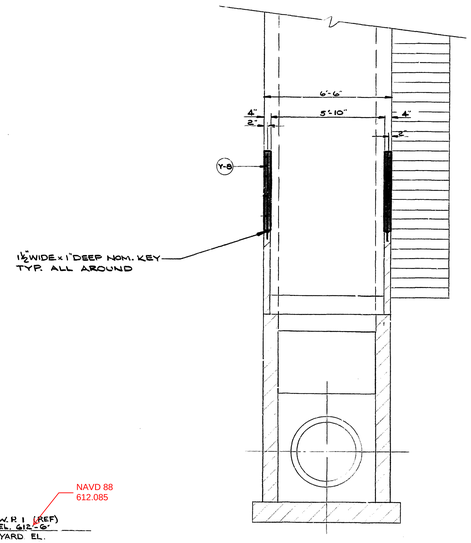




NOTE:

FIELD TO DRILL HOLES FOR NEW # 4 BARS IN EXIST. WALL TO DEPTH SHOWN. (FILL W/HYDRAULIC CEMENT GROUT TO TOP OF WALL.)

SECTION "E-6"
SCALE: 3/8" = 1'-0"



SECTION "L-6"
SCALE: 3/8" = 1'-0"

GENERAL NOTES

ALL REINFORCING TO BE NEW (MEET SPEC. A-615/616/617 OF THE A.S.T.M. GRADE 60).

REINFORCING TO BE PLACED, LAPPED & WIRED IN ACCORDANCE WITH THE A.C.I. MANUAL 315-72.

PROVIDE A MIN. COVER OF 2" UNLESS NOTED OTHERWISE.

(○) FOR IDENTIFICATION, SEE RB-00.1 REBAR LIST.

ALL NEW CEMENT TO BE 3000 P.S.I. @ 28 DAYS.

REBARS = 172.91 LBS.
D.E.C. UNDERWATER CEMENT = 1.482 CU.YDS.

REFERENCE DRAWINGS

12-3044 FLYASH DRAINAGE SHAFT MASONRY

12-3045 FLY ASH DRAINAGE SHAFT REINFORCING

C.I.A. 80666
W.O. 703 8010

DATE	NO.	DESCRIPTION	APPD.

REVISIONS

OHIO POWER COMPANY
KAMMER PLANT
CRESAP, WEST VIRGINIA

MODIFICATION OF ASH POND SKIMMER CONCRETE & REINFORCING

DR. NO. 13-3490-0

ARCH.	ELEC.	MECH.	STR.
SCALE: AS NOTED		ENGINEERING DIV.	C. P. Lugo
DR. DAVIS		DESIGN DIV.	
CH. [illegible]			
SQ. LDR			
DATE: 8/74			

AMERICAN ELECTRIC POWER SERVICE CORP.

APPROVED
Maier and Associates, Inc.
North Canton, Ohio
Date: AUG 9 1974 By: [signature]

STATE OF OHIO
FRANKLYN R. SCHUBERT
31257
REGISTERED PROFESSIONAL ENGINEER
8/9/74

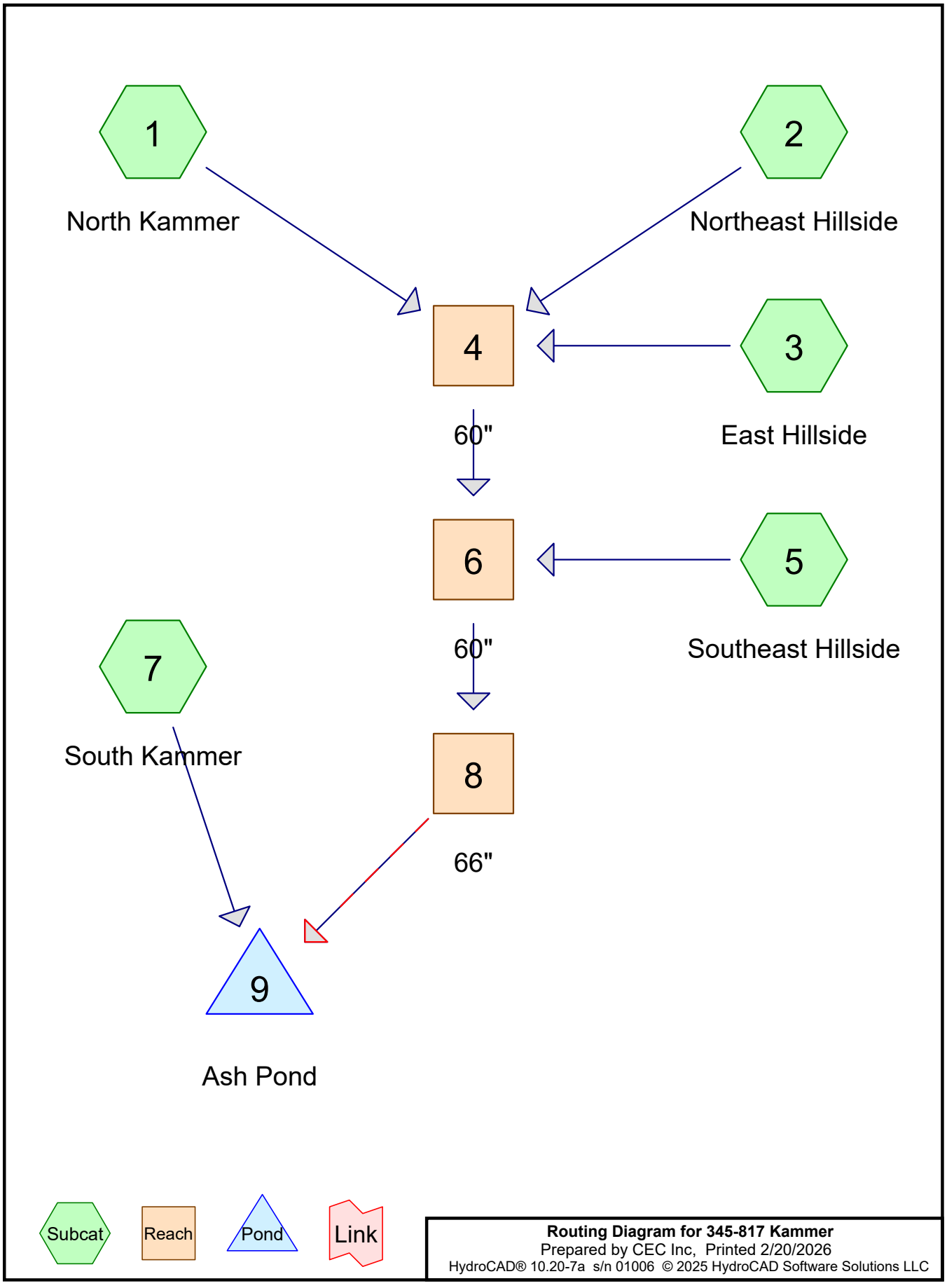
MAIER & ASSOCIATES INC.
NORTH CANTON, OHIO
OHIO ENG. REG. NO. 25789
JOB ORDER NO. J-1704
DWG. NO.:

APPENDIX F

HYDROCAD REPORT

TABLE OF CONTENTS

Table of Contents moved from original location at end of report.



Routing Diagram for 345-817 Kammer
Prepared by CEC Inc, Printed 2/20/2026

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1: North Kammer Runoff Area=27.214 ac 0.00% Impervious Runoff Depth=4.46"
Flow Length=2,169' Tc=57.1 min CN=77 Runoff=67.18 cfs 10.105 af

Subcatchment 2: Northeast Hillside Runoff Area=41.723 ac 0.00% Impervious Runoff Depth=4.13"
Flow Length=2,956' Tc=47.4 min CN=74 Runoff=109.04 cfs 14.357 af

Subcatchment 3: East Hillside Runoff Area=47.763 ac 0.00% Impervious Runoff Depth=4.24"
Flow Length=2,676' Tc=30.8 min CN=75 Runoff=172.27 cfs 16.867 af

Subcatchment 5: Southeast Hillside Runoff Area=43.380 ac 44.22% Impervious Runoff Depth=5.35"
Flow Length=3,362' Tc=42.8 min CN=85 Runoff=156.17 cfs 19.334 af

Subcatchment 7: South Kammer Runoff Area=51.334 ac 78.16% Impervious Runoff Depth=6.27"
Flow Length=2,064' Tc=61.3 min CN=93 Runoff=161.46 cfs 26.823 af

Reach 4: 60" Inflow=313.08 cfs 41.329 af
Outflow=313.08 cfs 41.329 af Overflow=0.00 cfs 0.000 af

Reach 6: 60" Inflow=467.78 cfs 60.663 af
Outflow=467.78 cfs 60.663 af Overflow=0.00 cfs 0.000 af

Reach 8: 66" Inflow=467.78 cfs 60.663 af
Outflow=467.78 cfs 60.663 af Overflow=0.00 cfs 0.000 af

Pond 9: Ash Pond Peak Elev=632.61' Storage=337.911 af Inflow=601.26 cfs 87.487 af
Outflow=182.51 cfs 85.323 af

Total Runoff Area = 211.414 ac Runoff Volume = 87.487 af Average Runoff Depth = 4.97"
71.95% Pervious = 152.110 ac 28.05% Impervious = 59.304 ac

Summary for Subcatchment 1: North Kammer

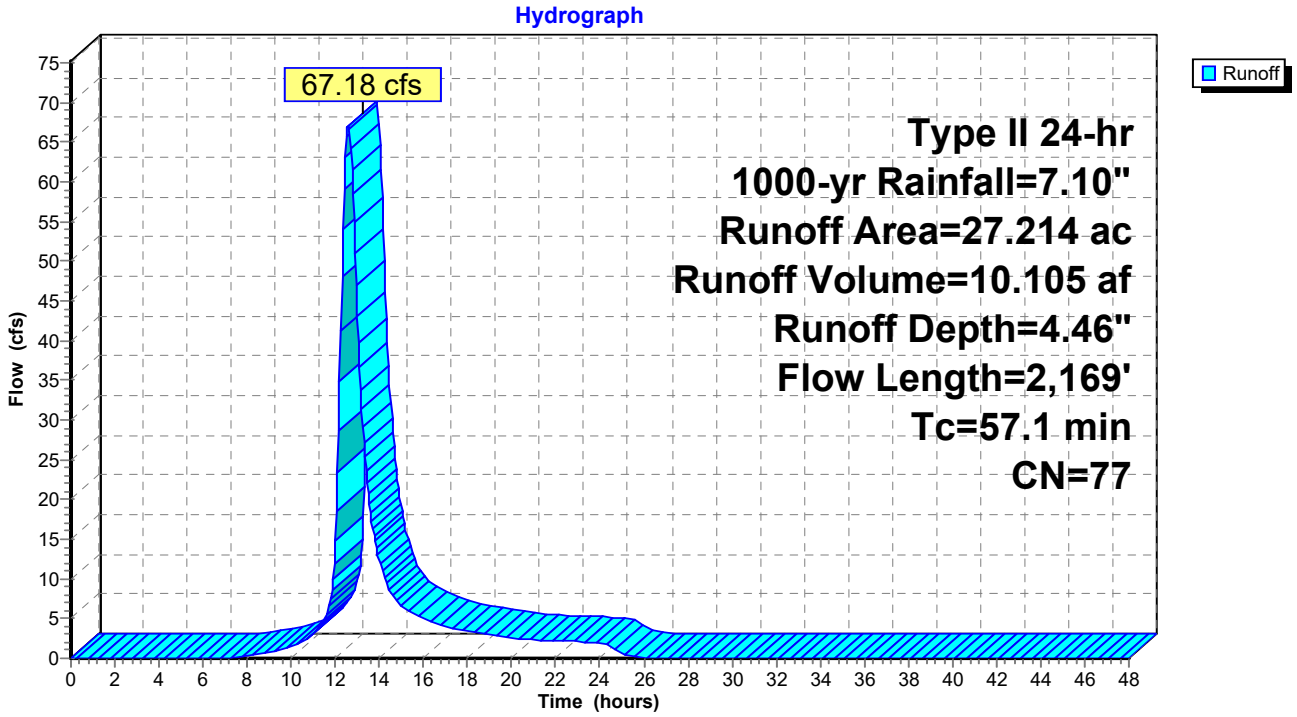
Runoff = 67.18 cfs @ 12.58 hrs, Volume= 10.105 af, Depth= 4.46"
Routed to Reach 4 : 60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 1000-yr Rainfall=7.10"

Area (ac)	CN	Description
27.214	77	Brush, Poor, HSG C
27.214		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	195	0.1450	0.26		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 2.48"
22.0	715	0.0060	0.54		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
18.3	594	0.0060	0.54		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
1.5	175	0.0040	1.95	3.45	**Pipe Channel, Corrugated Steel Pipe** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.025 Corrugated metal
1.2	150	0.0040	2.17	5.21	**Pipe Channel, Corrugated Steel Pipe** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.025 Corrugated metal
1.0	175	0.0070	2.87	6.89	**Pipe Channel, Corrugated Steel Pipe** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.025 Corrugated metal
0.6	165	0.0130	4.27	13.41	**Pipe Channel, Corrugated Steel Pipe** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
57.1	2,169	Total			

Subcatchment 1: North Kammer



Summary for Subcatchment 2: Northeast Hillside

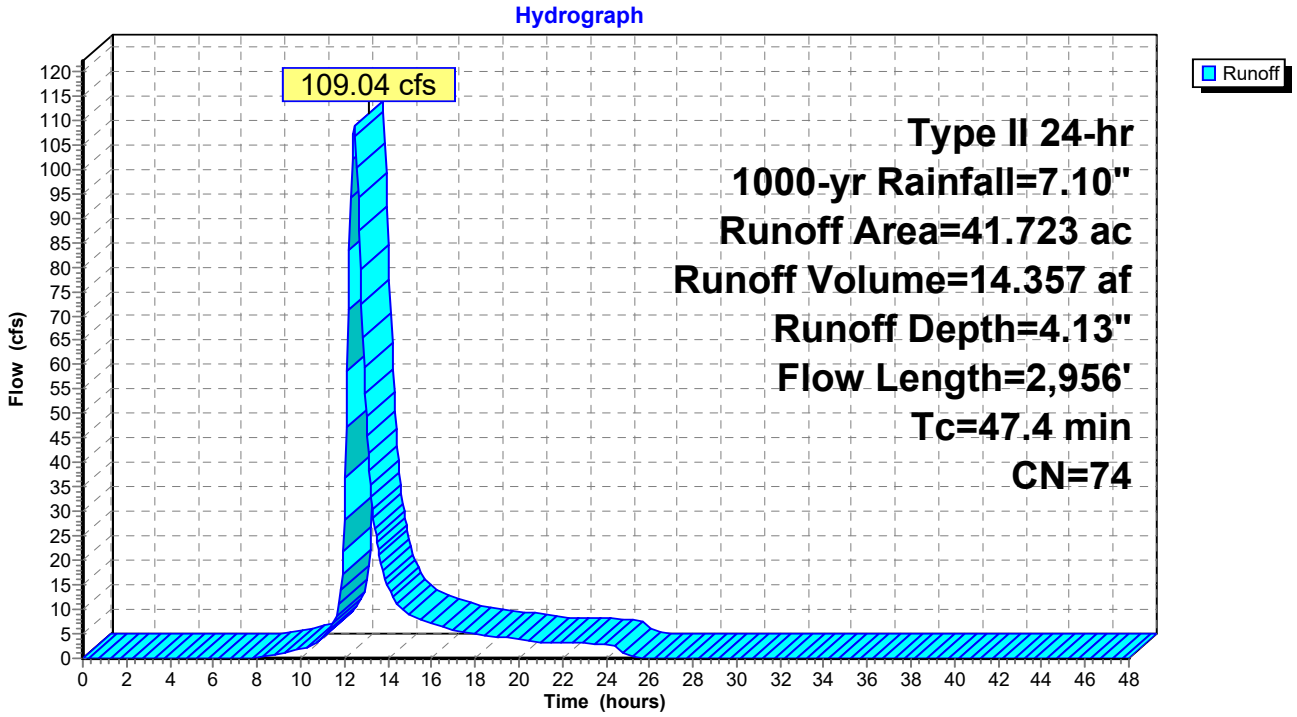
Runoff = 109.04 cfs @ 12.46 hrs, Volume= 14.357 af, Depth= 4.13"
Routed to Reach 4 : 60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 1000-yr Rainfall=7.10"

Area (ac)	CN	Description
0.680	76	Woods/grass comb., Fair, HSG C
13.414	76	Woods/grass comb., Fair, HSG C
3.878	70	Brush, Fair, HSG C
5.342	76	Woods/grass comb., Fair, HSG C
7.290	76	Woods/grass comb., Fair, HSG C
1.144	78	Meadow, non-grazed, HSG D
9.975	71	Meadow, non-grazed, HSG C
41.723	74	Weighted Average
41.723		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	164	0.0625	0.12		**Sheet Flow, Woods/Grass** Woods: Light underbrush n= 0.400 P2= 2.48"
3.4	478	0.2200	2.35		**Shallow Concentrated Flow, Woods/Grass** Woodland Kv= 5.0 fps
4.0	678	0.3250	2.85		**Shallow Concentrated Flow, Woods/Grass** Woodland Kv= 5.0 fps
4.9	502	0.0600	1.71		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.2	186	0.0500	15.71	27.76	**Pipe Channel, Roadway Culvert** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
8.4	578	0.0520	1.14		**Shallow Concentrated Flow, Woods/Grass** Woodland Kv= 5.0 fps
3.5	370	0.0140	1.77		**Shallow Concentrated Flow, Grass** Grassed Waterway Kv= 15.0 fps
47.4	2,956	Total			

Subcatchment 2: Northeast Hillside



Summary for Subcatchment 3: East Hillside

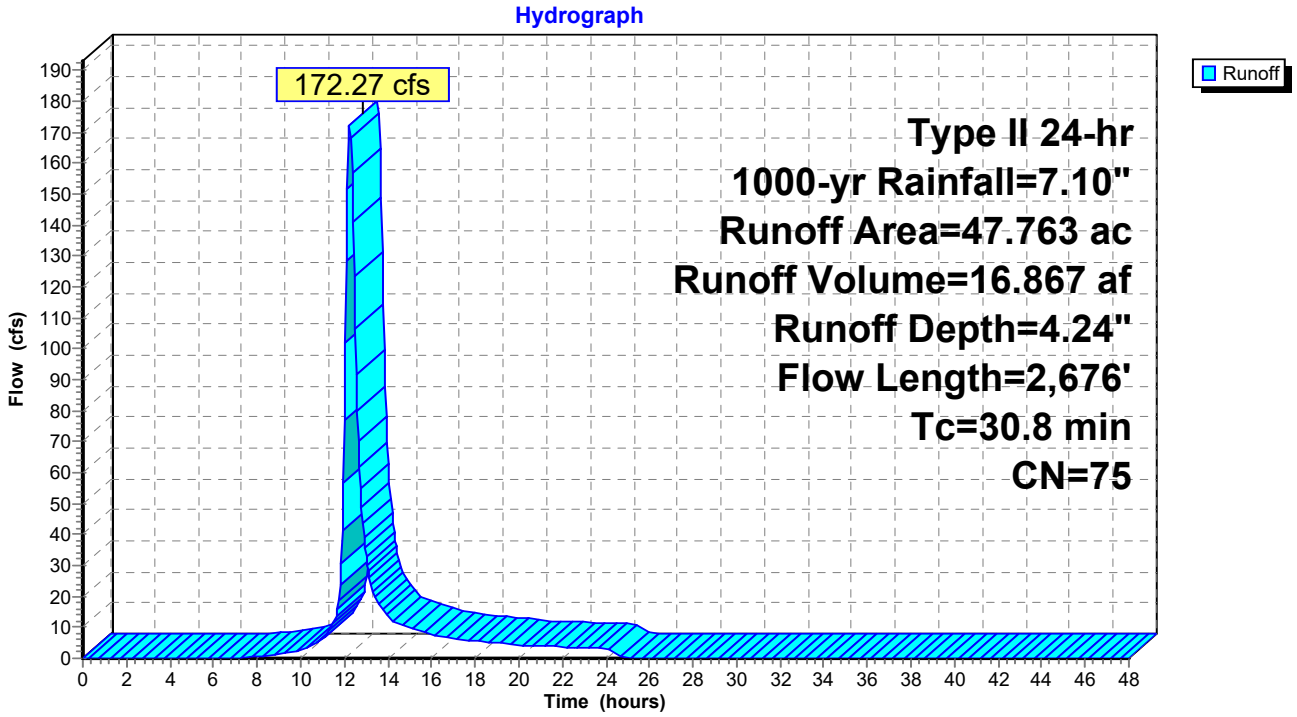
Runoff = 172.27 cfs @ 12.25 hrs, Volume= 16.867 af, Depth= 4.24"
Routed to Reach 4 : 60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 1000-yr Rainfall=7.10"

Area (ac)	CN	Description
5.819	76	Woods/grass comb., Fair, HSG C
7.401	76	Woods/grass comb., Fair, HSG C
0.709	76	Woods/grass comb., Fair, HSG C
20.017	76	Woods/grass comb., Fair, HSG C
1.692	70	Brush, Fair, HSG C
1.864	76	Woods/grass comb., Fair, HSG C
0.298	71	Meadow, non-grazed, HSG C
1.211	82	Woods/grass comb., Fair, HSG D
8.752	70	Brush, Fair, HSG C
47.763	75	Weighted Average
47.763		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	154	0.2140	0.29		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 2.48"
7.1	566	0.0710	1.33		**Shallow Concentrated Flow, Woods/Grass** Woodland Kv= 5.0 fps
4.7	556	0.1530	1.96		**Shallow Concentrated Flow, Woods/Grass** Woodland Kv= 5.0 fps
5.1	817	0.2820	2.66		**Shallow Concentrated Flow, Woods/Grass** Woodland Kv= 5.0 fps
0.2	165	0.0300	12.17	21.50	**Pipe Channel, Roadway Culvert** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
2.3	266	0.1500	1.94		**Shallow Concentrated Flow, Woods/Grass** Woodland Kv= 5.0 fps
1.2	80	0.0300	1.07	1.89	**Pipe Channel, Railroad Crossing** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.125
1.3	72	0.0040	0.95		**Shallow Concentrated Flow, Grass** Grassed Waterway Kv= 15.0 fps
30.8	2,676	Total			

Subcatchment 3: East Hillside



Summary for Subcatchment 5: Southeast Hillside

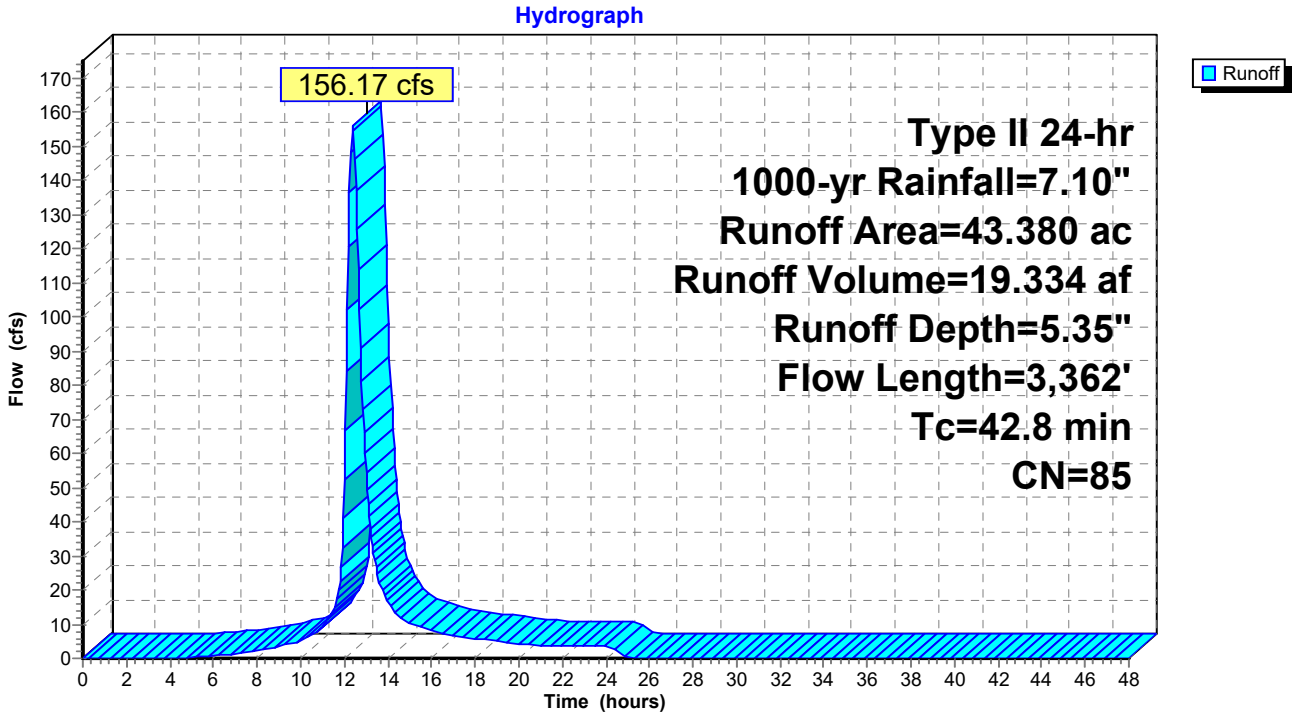
Runoff = 156.17 cfs @ 12.39 hrs, Volume= 19.334 af, Depth= 5.35"
Routed to Reach 6 : 60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 1000-yr Rainfall=7.10"

Area (ac)	CN	Description
5.526	76	Woods/grass comb., Fair, HSG C
2.736	76	Woods/grass comb., Fair, HSG C
0.181	76	Woods/grass comb., Fair, HSG C
7.129	72	Woods/grass comb., Good, HSG C
0.353	76	Woods/grass comb., Fair, HSG C
0.356	76	Woods/grass comb., Fair, HSG C
0.456	82	Woods/grass comb., Fair, HSG D
26.643	91	Urban industrial, 72% imp, HSG C
43.380	85	Weighted Average
24.197		55.78% Pervious Area
19.183		44.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.7	165	0.0730	0.13		**Sheet Flow, Woods/Grass** Woods: Light underbrush n= 0.400 P2= 2.48"
10.4	1,575	0.2540	2.52		**Shallow Concentrated Flow, Woods/Grass** Woodland Kv= 5.0 fps
0.1	125	0.0400	14.05	24.83	**Pipe Channel, Roadway Culvert** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
7.0	755	0.0660	1.80		**Shallow Concentrated Flow, Grass/Paved** Short Grass Pasture Kv= 7.0 fps
0.7	77	0.0020	1.94	9.54	**Pipe Channel, Railroad Crossing** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.025 Corrugated metal
2.9	665	0.0030	3.78	74.18	**Pipe Channel, 60" CSP** 60.0" Round Area= 19.6 sf Perim= 15.7' r= 1.25' n= 0.025 Corrugated metal
42.8	3,362	Total			

Subcatchment 5: Southeast Hillside



Summary for Subcatchment 7: South Kammer

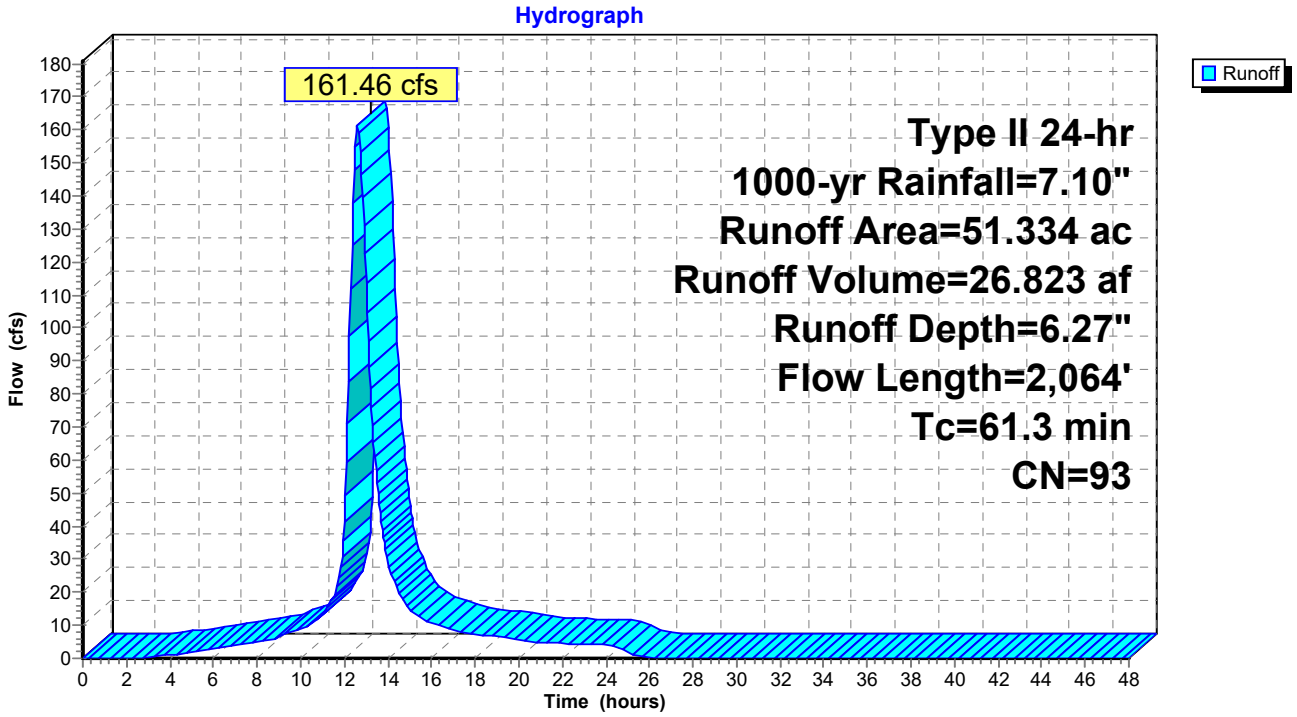
Runoff = 161.46 cfs @ 12.61 hrs, Volume= 26.823 af, Depth= 6.27"
Routed to Pond 9 : Ash Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 1000-yr Rainfall=7.10"

	Area (ac)	CN	Description
*	11.287	100	Ash Pond
	40.047	91	Urban industrial, 72% imp, HSG C
	51.334	93	Weighted Average
	11.213		21.84% Pervious Area
	40.121		78.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	106	0.0470	0.15		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 2.48"
25.2	474	0.0020	0.31		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
13.6	718	0.0030	0.88		**Shallow Concentrated Flow, Unpaved** Unpaved Kv= 16.1 fps
9.9	490	0.0030	0.82		**Shallow Concentrated Flow, Grass** Grassed Waterway Kv= 15.0 fps
0.2	44	0.0110	3.24	5.73	**Pipe Channel, Railroad Crossing** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.025 Corrugated metal
0.3	232	0.0230	11.15	264.83	**Pipe Channel, 66"** 66.0" Round Area= 23.8 sf Perim= 17.3' r= 1.38' n= 0.025 Corrugated metal
61.3	2,064	Total			

Subcatchment 7: South Kammer

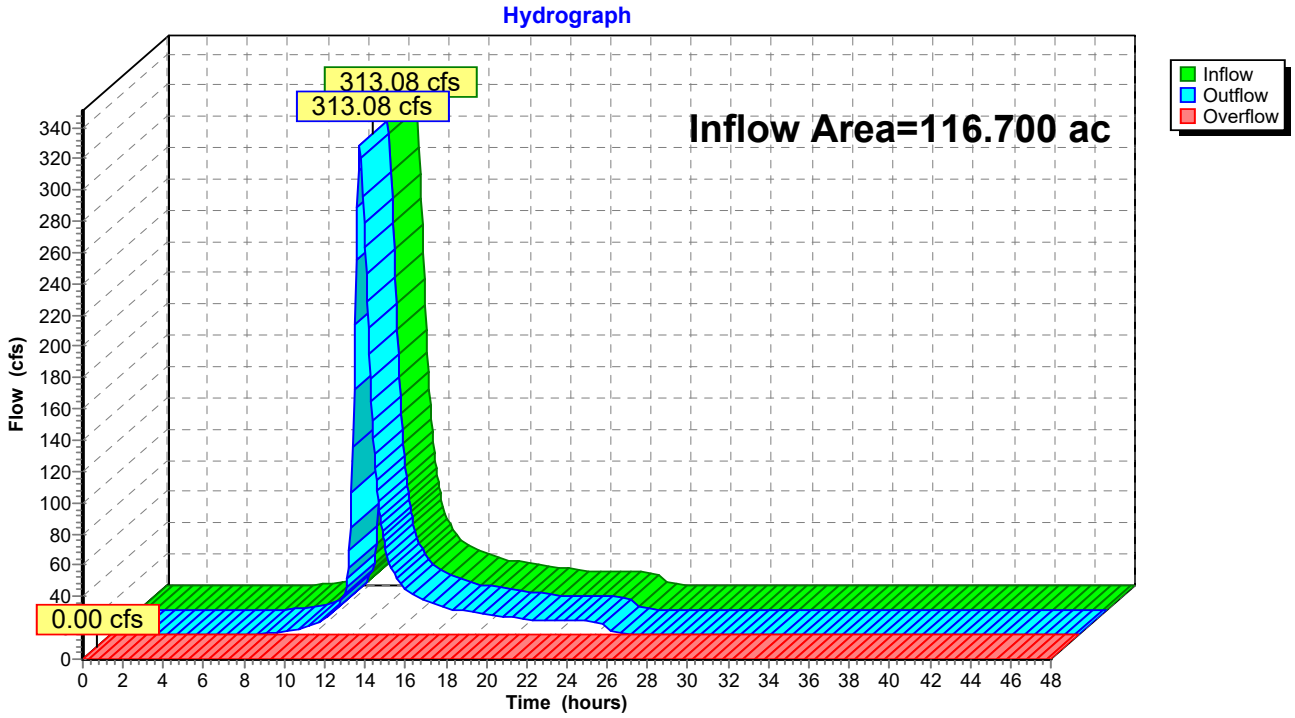


Summary for Reach 4: 60"

Inflow Area = 116.700 ac, 0.00% Impervious, Inflow Depth = 4.25" for 1000-yr event
Inflow = 313.08 cfs @ 12.34 hrs, Volume= 41.329 af
Outflow = 313.08 cfs @ 12.34 hrs, Volume= 41.329 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 6 : 60"
Overflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach 4: 60"

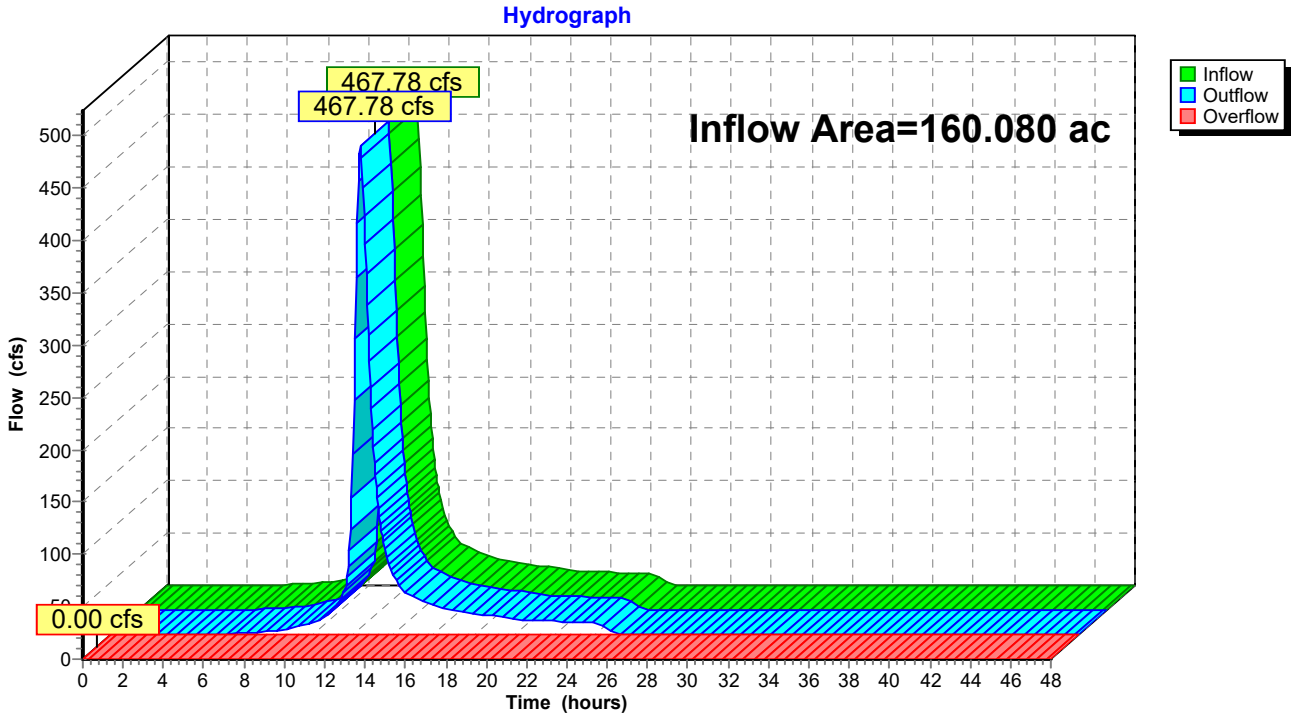


Summary for Reach 6: 60"

Inflow Area = 160.080 ac, 11.98% Impervious, Inflow Depth = 4.55" for 1000-yr event
Inflow = 467.78 cfs @ 12.36 hrs, Volume= 60.663 af
Outflow = 467.78 cfs @ 12.36 hrs, Volume= 60.663 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 8 : 66"
Overflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach 6: 60"

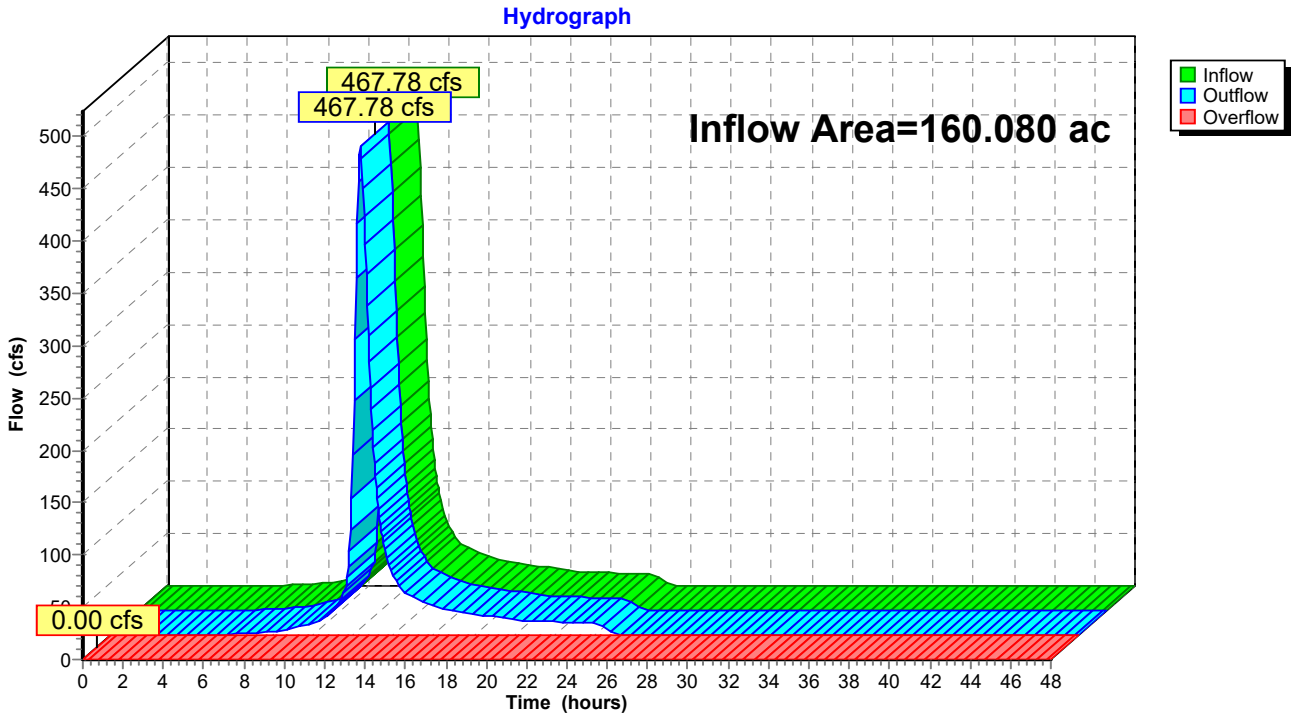


Summary for Reach 8: 66"

Inflow Area = 160.080 ac, 11.98% Impervious, Inflow Depth = 4.55" for 1000-yr event
Inflow = 467.78 cfs @ 12.36 hrs, Volume= 60.663 af
Outflow = 467.78 cfs @ 12.36 hrs, Volume= 60.663 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 9 : Ash Pond
Overflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 9 : Ash Pond

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach 8: 66"



Summary for Pond 9: Ash Pond

Inflow Area = 211.414 ac, 28.05% Impervious, Inflow Depth = 4.97" for 1000-yr event
Inflow = 601.26 cfs @ 12.41 hrs, Volume= 87.487 af
Outflow = 182.51 cfs @ 13.30 hrs, Volume= 85.323 af, Atten= 70%, Lag= 53.8 min
Primary = 182.51 cfs @ 13.30 hrs, Volume= 85.323 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 630.34' Surf.Area= 18.192 ac Storage= 296.076 af
Peak Elev= 632.61' @ 13.30 hrs Surf.Area= 18.599 ac Storage= 337.911 af (41.835 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 270.3 min (1,104.5 - 834.2)

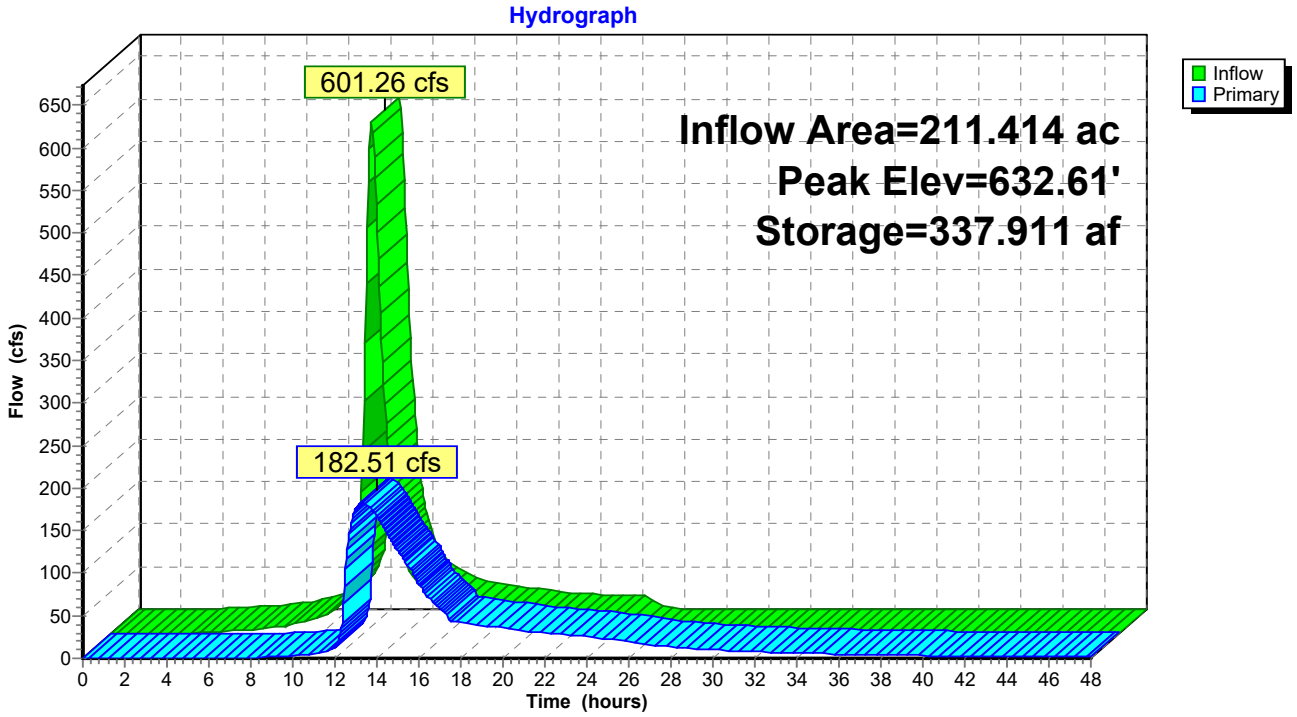
Volume	Invert	Avail.Storage	Storage Description
#1	612.50'	500.175 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
612.50	15.000	0.000	0.000
641.00	20.100	500.175	500.175

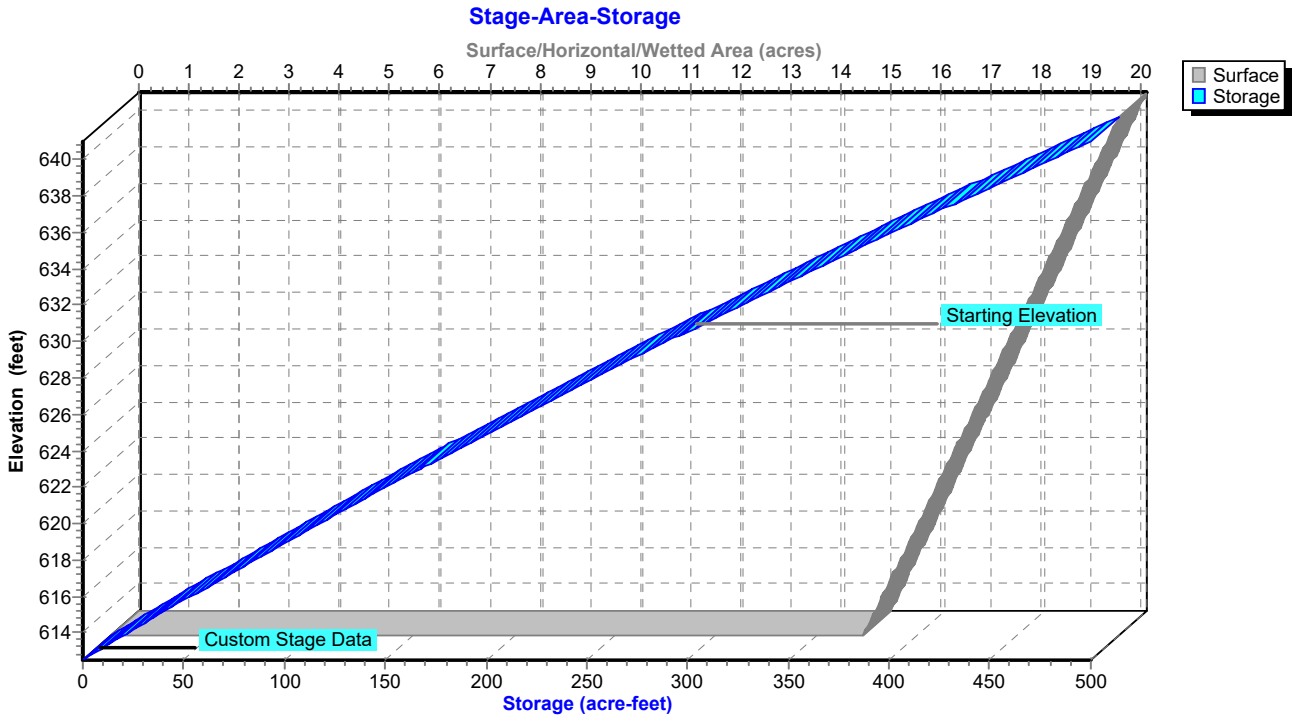
Device	Routing	Invert	Outlet Devices
#1	Primary	614.59'	**36.0" Round Culvert** L= 120.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 614.59' / 612.59' S= 0.0167 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Primary	630.34'	**1.5' long 2 - 18" Weirs X 2.00** 2 End Contraction(s)
#3	Primary	630.34'	**2.5' long x 0.5' breadth 30" Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	630.34'	**4.7' long Steel Side** 2 End Contraction(s)
#5	Device 1	631.59'	**39.0" x 63.0" Horiz. Top of Structure** C= 0.600

Primary OutFlow Max=182.65 cfs @ 13.30 hrs HW=632.61' TW=623.00' (Fixed TW Elev= 623.00')
- **1=Culvert** (Passes 83.14 cfs of 93.12 cfs potential flow)
  - **5=Top of Structure** (Orifice Controls 83.14 cfs @ 4.87 fps)
- **2=2 - 18" Weirs** (Weir Controls 23.44 cfs @ 4.93 fps)
- **3=30" Weir** (Weir Controls 28.46 cfs @ 5.01 fps)
- **4=Steel Side** (Weir Controls 47.60 cfs @ 4.93 fps)

Pond 9: Ash Pond



Pond 9: Ash Pond



Stage-Discharge for Pond 9: Ash Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
612.50	0.00	622.90	0.00	633.30	237.30
612.70	0.00	623.10	0.00	633.50	250.55
612.90	0.00	623.30	0.00	633.70	263.83
613.10	0.00	623.50	0.00	633.90	277.11
613.30	0.00	623.70	0.00	634.10	290.45
613.50	0.00	623.90	0.00	634.30	305.71
613.70	0.00	624.10	0.00	634.50	321.20
613.90	0.00	624.30	0.00	634.70	336.90
614.10	0.00	624.50	0.00	634.90	352.80
614.30	0.00	624.70	0.00	635.10	368.88
614.50	0.00	624.90	0.00	635.30	385.13
614.70	0.00	625.10	0.00	635.50	401.54
614.90	0.00	625.30	0.00	635.70	418.10
615.10	0.00	625.50	0.00	635.90	434.80
615.30	0.00	625.70	0.00	636.10	451.63
615.50	0.00	625.90	0.00	636.30	468.56
615.70	0.00	626.10	0.00	636.50	485.61
615.90	0.00	626.30	0.00	636.70	502.75
616.10	0.00	626.50	0.00	636.90	519.97
616.30	0.00	626.70	0.00	637.10	537.28
616.50	0.00	626.90	0.00	637.30	554.65
616.70	0.00	627.10	0.00	637.50	572.09
616.90	0.00	627.30	0.00	637.70	589.57
617.10	0.00	627.50	0.00	637.90	607.10
617.30	0.00	627.70	0.00	638.10	624.67
617.50	0.00	627.90	0.00	638.30	642.27
617.70	0.00	628.10	0.00	638.50	659.89
617.90	0.00	628.30	0.00	638.70	677.52
618.10	0.00	628.50	0.00	638.90	695.16
618.30	0.00	628.70	0.00	639.10	712.81
618.50	0.00	628.90	0.00	639.30	730.44
618.70	0.00	629.10	0.00	639.50	748.07
618.90	0.00	629.30	0.00	639.70	765.68
619.10	0.00	629.50	0.00	639.90	783.26
619.30	0.00	629.70	0.00	640.10	800.81
619.50	0.00	629.90	0.00	640.30	818.33
619.70	0.00	630.10	0.00	640.50	835.81
619.90	0.00	630.30	0.00	640.70	853.23
620.10	0.00	630.50	2.04	640.90	**870.61**
620.30	0.00	630.70	6.85		
620.50	0.00	630.90	13.28		
620.70	0.00	631.10	21.09		
620.90	0.00	631.30	29.71		
621.10	0.00	631.50	38.98		
621.30	0.00	631.70	76.11		
621.50	0.00	631.90	105.01		
621.70	0.00	632.10	128.78		
621.90	0.00	632.30	150.54		
622.10	0.00	632.50	171.20		
622.30	0.00	632.70	191.15		
622.50	0.00	632.90	210.59		
622.70	0.00	633.10	224.12		

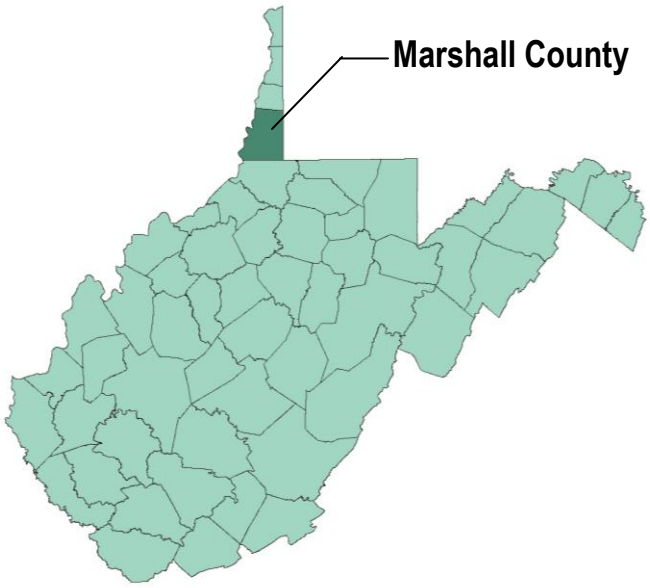
APPENDIX G

FEMA INFORMATION

FLOOD INSURANCE STUDY

MARSHALL COUNTY, WEST VIRGINIA
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
BENWOOD, CITY OF	540108
CAMERON, CITY OF	540287
GLEN DALE, CITY OF	540109
McMECHEN, CITY OF	540110
MOUNDSVILLE, CITY OF	540111
MARHALL COUNTY (UNINCORPORATED AREAS)	540107

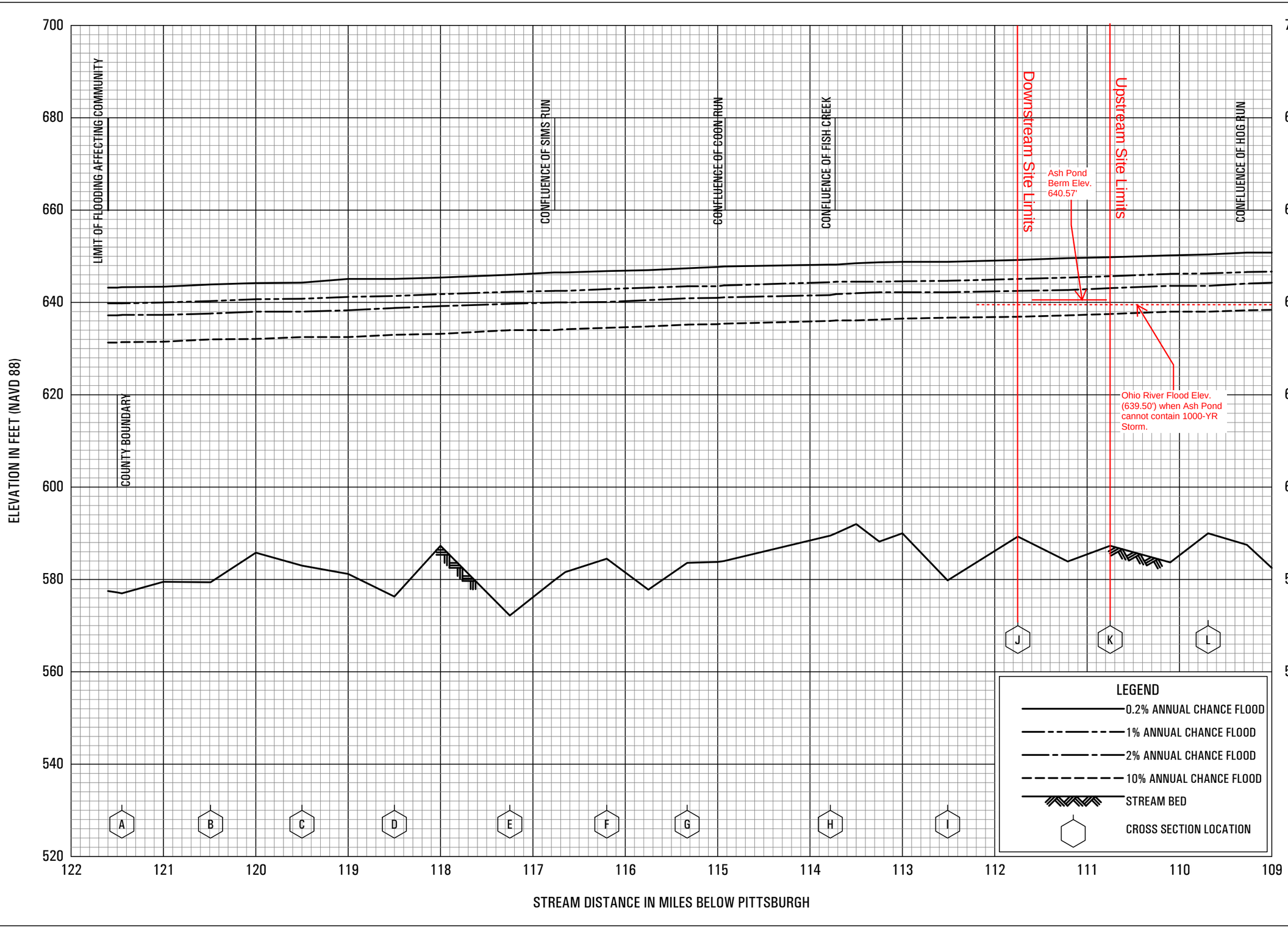


EFFECTIVE: SEPTEMBER 25, 2009

Reprinted with corrections on July 23, 2021

Federal Emergency Management Agency

COMMUNITY NUMBER – 54051CV000A



FLOOD PROFILES

OHIO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARSHALL COUNT, WV

AND INCORPORATED AREAS

09P

National Flood Hazard Layer FIRMette

FEMA

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/12/2025 at 5:05 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX H

PHOTOGRAPH LOG

P:\340-000\345-817\-GIS\Maps\WR01_AEPKammer_Hydrology\345817_WR01_AEPKammer_Hydrology.aprx [345817_WR01_AEPKammer_PhotographLocationMap] 1/16/2026 8:45 AM (acgray)

LEGEND

○ PHOTOGRAPH LOCATION

REFERENCES
1. WEST VIRGINIA GIS TECHNICAL CENTER
LEAF OFF MOSAIC IMAGERY FOR MARSHALL COUNTY, 2024

ENGINEERING, SURVEYING AND LANDSCAPE ARCHITECTURE IN THE STATE OF NORTH CAROLINA WILL BE PROVIDED BY CEC SURVEYING AND LANDSCAPE ARCHITECTS OF NC, PLLC. SERVICES IN PUERTO RICO WILL BE PROVIDED BY CEC ENGINEERS & CONSULTANTS, LLC. LANDSCAPE ARCHITECTURE SERVICES IN THE STATE OF OHIO WILL BE PROVIDED BY CEC LANDSCAPE ARCHITECTS, LLC.

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AMERICAN ELECTRIC POWER
INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN
AEP KAMMER POWER PLANT
MOUNDSVILLE, WEST VIRGINIA

PHOTOGRAPH LOCATION MAP

DRAWN BY:	ACG	CHECKED BY:	KAG	APPROVED BY:	CJG*	FIGURE NO:	H-1
DATE:	1/16/2026	SCALE:	1" = 200'	PROJECT NO:	345-817		

*Hand Signature on file

Photograph 1. Ash pond outlet control structure.


Photograph 2. Ash pond outlet control structure.

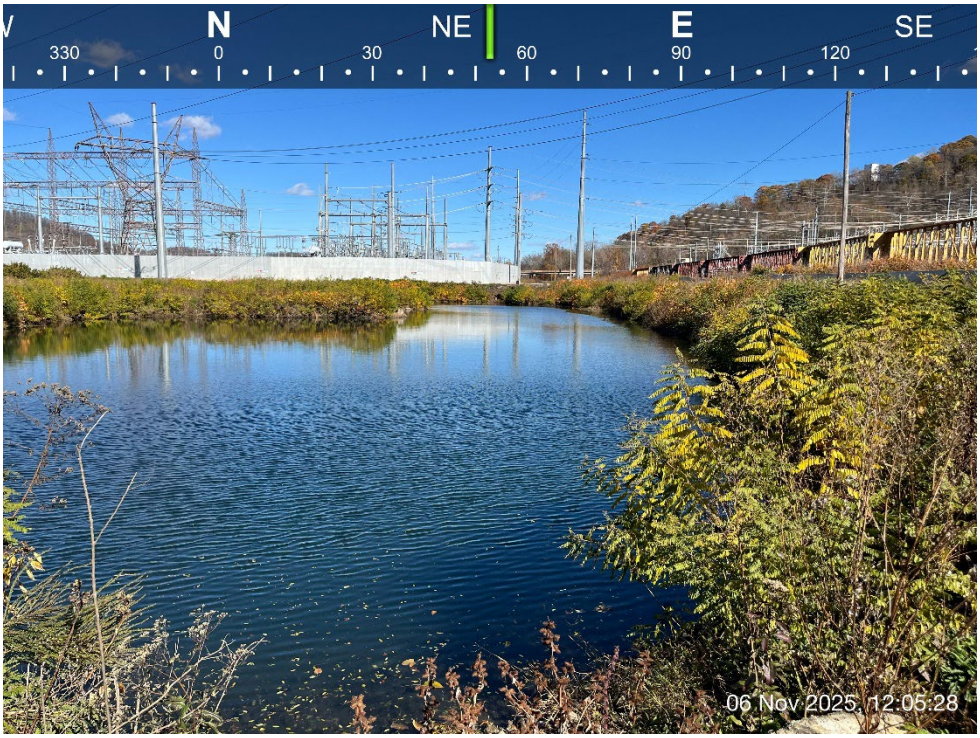
Photograph 3. Ash pond outlet control structure.

Photograph 4. Ash pond outlet control structure.

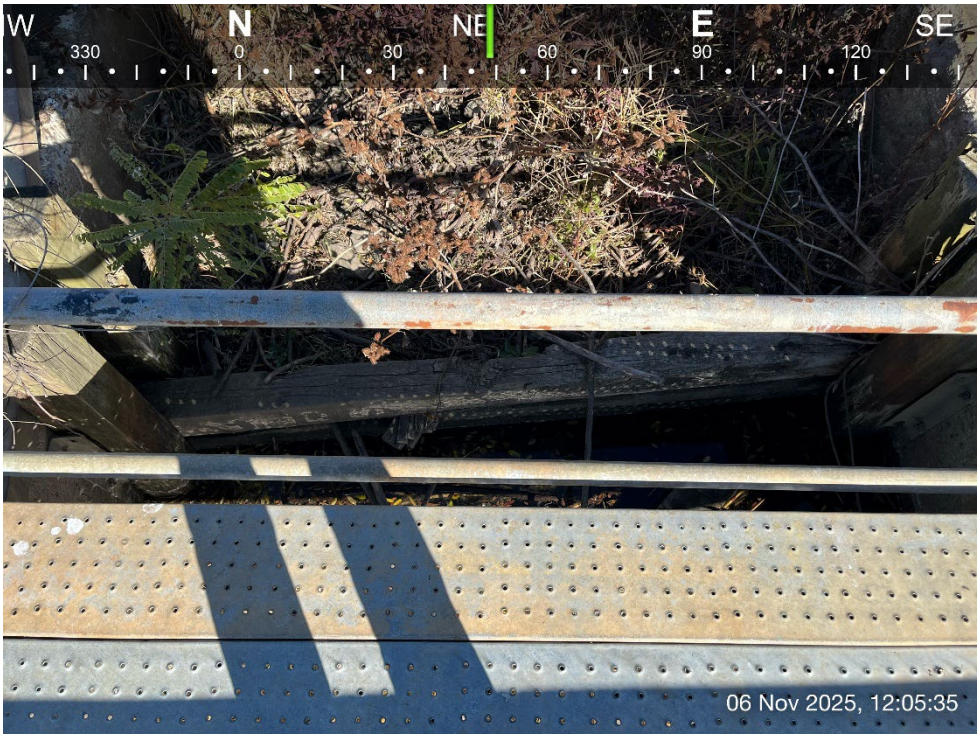
Photograph 5. View of Kammer 345 kV Station.

Photograph 6. View of Kammer 345 kV Station.

Photograph 7. View of northern section of ash pond.



Photograph 8. View of northern portion of ash pond.



Photograph 9. View of stop log weir separating northern and southern ash pond basins.