History of Construction

For Compliance with the EPA Coal Combustion Residuals (CCR) Rule 40 CFR §257.73(c)

Former Erickson Power Station – Former Forebay, Former Retention Basin, and Former Clear Water Pond

August 8, 2025

Prepared for:
Lansing Board of Water & Light
Former Erickson Power Station
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Lansing, Michigan 48917

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1 Introduction

HDR MICHIGAN, Inc. (HDR) has prepared this revised History of Construction for the Former Forebay, Former Retention Basin, and Former Clear Water Pond at the Former Erickson Power Station following the requirements of the Federal Coal Combustion Residuals (CCR) Rule to demonstrate compliance of the Former Erickson Power Station in Lansing, Michigan.

On April 17, 2015, the United States Environmental Protection Agency (EPA) issued the final rule (Ref. [1]) for disposal of Coal Combustion Residuals (CCR) under Subtitle D of the Resource Conservation and Recovery Act (RCRA). CCR Rule 40 CFR §257.73(b) requires that owners or operators of an existing CCR surface impoundment that either 1) has a height of five feet or more and a storage volume of 20 acre-feet or more; or 2) has a height of 20 feet or more compile a history of construction, which shall contain, to the extent feasible, the information specified in 40 CFR §257.73(c)(1)(i) through (xii). It was previously determined that the Former Forebay, Former Retention Basin, and Former Clear Water Pond at the Former Erickson Power Station met the first criteria with heights of five feet or more and storage volumes greater than 20 acre-feet.

The revised History of Construction report presented herein addresses the specific requirements of 40 CFR §257.73(c)(1)(i) through (xii). If there is any significant change to any information compiled under paragraph 40 CFR §257.73(c)(1), the owner or operator of the CCR unit must update the relevant information and place it in the facility's operating record as required by 40 CFR §257.105(f)(9).

This History of Construction was prepared by Mr. Bryce Burkett, P.E., and was reviewed in accordance with HDR's internal review policy by Mr. Andrew Bertapelle, P.E., both of HDR. Mr. Burkett is a registered Professional Engineer in the State of Michigan.

1.1 Site Location

The Former Erickson Power Station was an electrical power generation facility located at 3725 South Canal Road, Lansing, Michigan which is owned and operated by Lansing Board of Water & Light (BWL). The latitude and longitude of the Erickson Power Station are approximately 42.692422 N and 84.657764 W. The site is located southwest of Lansing, Michigan, near the intersection of Interstates 69 and 96, as shown in the site vicinity map, Figure 1.

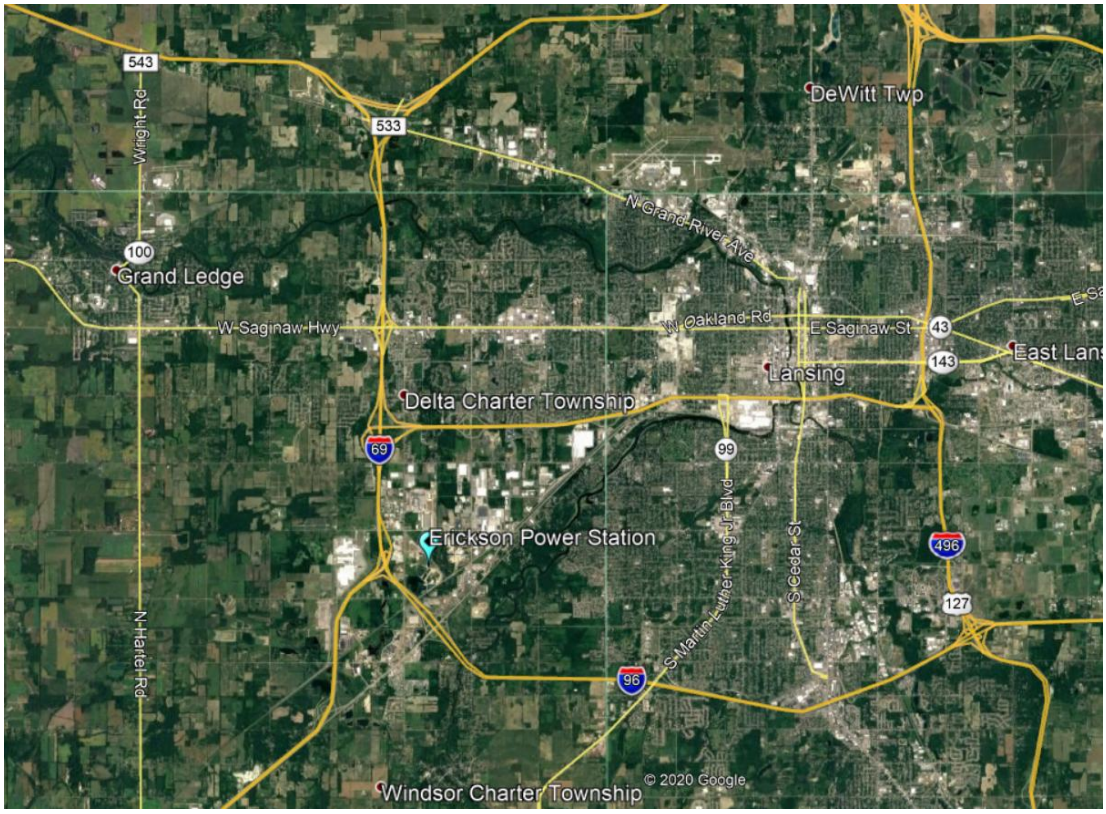


Figure 1. Site Vicinity Map

1.2 Site Description

The Former Erickson Power Station was constructed starting in 1970 and completed in 1973. The Former Station contained a single coal-fired steam turbine/generator capable of producing 165 megawatts of electricity, while it was still in operation. Coal-fired operations at the Former Station and CCR process water discharges ceased in 2022 as part of BWL's move to cleaner energy sources. Closure of the three (3) former regulated CCR surface impoundments began in February 2023. Since then, the former regulated CCR units have been physically closed, and all CCR materials have been removed and appropriately managed. The Former Forebay and Former Retention Basin were then filled with clean fill material and all former impoundments were graded to direct stormwater runoff to the Former Impoundment area. Verification of CCR removal from the regulated former CCR units was completed and documented in the CCR Removal Report, dated November 4, 2024 (Ref. [5]).

Following the decommissioning of the three (3) regulated CCR surface impoundments, the entire impoundment system (including the Former Impoundment) now collectively functions as a limited stormwater collection basin. These former impoundments form a roughly contiguous drainage system. Their only inflow is stormwater from direct rainfall onto the impoundment system.

Figure 2 displays the Former Erickson Power Station site configuration.

Figure 2. Erickson Power Station Site Configuration

2 History of Construction Requirements

The requirements to be included in the History of Construction Report for existing CCR surface impoundments are detailed in 40 CFR §257.73: *Structural integrity criteria for existing CCR surface impoundments*. CCR Rule 40 CFR §257.73(c) states that the history of construction for an existing CCR impoundment (i.e. Former Forebay, Former Retention Basin, and Former Clear Water Pond) is to be compiled and contain the information specified in 40 CFR §257.73(c)(1)(i) through (xii). Table 2-1 summarizes the information from paragraphs 40 CFR §257.73(c)(1)(i) through (xii), as well as the location of the information presented in this document.

Table 2-1. List of History of Construction Requirements

40 CFR Rule	Rule Information	Document Section
§257.73 (c)(1)(i)	Owner/Unit Information	Section 3.1
§257.73 (c)(1)(ii)	USGS Map Location	Section 3.2
§257.73 (c)(1)(iii)	Purpose of CCR Unit	Section 3.3
§257.73 (c)(1)(iv)	Name and Size of Watershed	Section 3.4
§257.73 (c)(1)(v)	Description of Foundation and Abutment Materials	Section 3.5
§257.73 (c)(1)(vi)	Statement of Materials Used in Construction, Method of Site Preparation, Dates of Construction	Section 3.6
§257.73 (c)(1)(vii)	Detailed Drawings of Unit	Section 3.7
§257.73 (c)(1)(viii)	Existing Instrumentation Details	Section 3.8
§257.73 (c)(1)(ix)	Area-Capacity Curves	Section 3.9
§257.73 (c)(1)(x)	Spillway and Diversion Design Features	Section 3.10
§257.73 (c)(1)(xi)	Construction Specifications and Surveillance, Maintenance, and Repair Provisions	Section 3.11
§257.73 (c)(1)(xii)	Structural Instability Records	Section 3.12

3 History of Construction

3.1 §257.73 (c)(1)(i) - Owner and Unit Identification

§257.73 (c)(1)(i): The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and the identification number of the CCR unit if one has been assigned by the state.

The Former Erickson Power Station was an electrical power generation facility located at 3725 South Canal Road, Lansing, Michigan which is owned and operated by Lansing Board of Water & Light (BWL).

The names associated with the former CCR units are the Former Forebay, Former Retention Basin, and Former Clear Water Pond.

The units have not been assigned identification numbers by the State of Michigan.

3.2 §257.73 (c)(1)(ii) - Unit Location on USGS Quadrangle

§257.73 (c)(1)(ii): The location of the CCR unit identified on the most recent U.S. Geological Survey (USGS) 7 ½ minute or 15 minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available.

Attachment 1 presents the *Site Location Map* with the Dimondale Quadrangle, Michigan, Eaton County, 7.5-minute series USGS Quadrangle, dated 2023. The locations of the Former Forebay, Former Retention Basin, and Former Clear Water Pond are shown on the quadrangle.

3.3 §257.73 (c)(1)(iii) - Purpose of the CCR Unit

§257.73 (c)(1)(iii): A statement of the purpose for which the CCR unit is being used.

The Former Erickson Power Station was constructed starting in 1970 and completed in 1973. During active operations, the Former Station contained a single coal-fired steam turbine/generator capable of producing 165 megawatts of electricity and CCR was stored in dewatering tanks (former hydro-bins). After the majority of the CCR was removed from the waste stream at the former hydro-bins, flow was discharged into three CCR impoundments in sequence: the Former Forebay, Former Retention Basin, and Former Clear Water Pond.

The Former Station ceased coal-fired power generation operations in November 2022. In February 2023, closure of the Former Forebay, Former Retention Basin, and Former Clear Water Pond began. Since then, the former regulated CCR units have been physically closed and all CCR materials have been removed and appropriately managed. The Former Forebay and Former Retention Basin were then filled with clean fill material and all former impoundments were graded to direct stormwater runoff to the Former Impoundment area.

Verification of CCR removal from the regulated former CCR units was completed and documented in the CCR Removal Report (Ref. [5]).

The locations of the former conveyances through the former impoundment system can be found on the Mayotte Design & Engineering Drawings (MD&E) (Ref. [13]), provided in Attachment 4. Additional description of these conveyances is also available in the previous History of Construction reports (Ref. [7] and Ref. [8]) for the Former Station. Current and historical grading, as well as locations and elevations of former impoundment system features, may also be found in the HDR Ash Impoundments Closure Drawings (Ref. [6]).

During decommissioning of the Former Forebay, Former Retention Basin, and Former Clear Water Pond, all hydraulic conveyance structures (e.g. inlet and outlet piping) were cut back and/or removed, except for the Emergency Overflow Structure at the Former Clear Water Pond. This outfall structure is located on the northeast corner of the Former Clear Water Pond and discharges to a swale that flows north and east and eventually directs flow to Carrier Creek and then to the Grand River. This structure was previously comprised of a horizontal outfall pipe and a vertical steel standpipe. During decommissioning of the former impoundment system, the vertical standpipe was removed and only the horizontal outfall pipe remains, with an invert elevation of 875.3 feet North American Vertical Datum of 1988 (NAVD 88).

The berm formerly separating the Former Impoundment and the Former Clear Water Pond was also removed during system decommissioning, allowing the Former Clear Water Pond Emergency Overflow Structure to serve as the sole outfall serving the entire former impoundment system. However, hydrologic modelling shows that this outfall would not spill over in a 100-year flood event (Ref. [9]). Additionally, to the best of BWL's knowledge the Emergency Overflow Structure was never utilized, even prior to system decommissioning.

Following decommissioning, the entire former impoundment system (including the Former Impoundment) collectively functions as a limited stormwater collection basin. These former impoundments form a roughly contiguous drainage system. Their only inflow is stormwater from direct rainfall onto the impoundment system.

3.4 §257.73 (c)(1)(iv) – Watershed Information

§257.73 (c)(1)(iv): The name and size in acres of the watershed within which the CCR unit is located.

According to the EPA WATERS GeoViewer (Ref. [2]), the Former Forebay, Former Retention Pond, and Former Clear Water Pond impoundments are located within the Carrier Creek-Grand River subwatershed, which has a size of approximately 22,700 acres. The Former Erickson Power Station is part of the Carrier Creek drainage basin shown in Figure 3.

No natural drainage runs into the Former Forebay, Former Retention Basin, or Former Clear Water Pond. The drainage areas of the Former Forebay, Former Retention Basin, and Former Clear Water Pond are approximately 2.76 acres, 3.73 acres, and 5.74 acres, respectively.

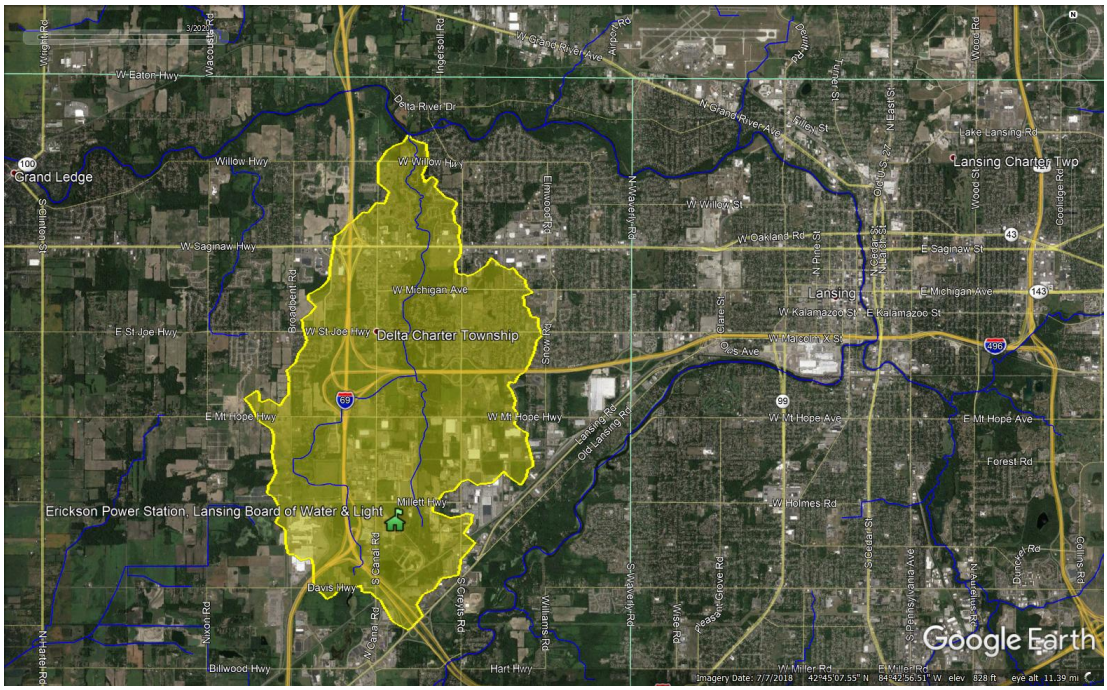


Figure 3. Carrier Creek Drainage Basin

3.5 §257.73 (c)(1)(v) - Foundation and Abutment Materials

§257.73 (c)(1)(v): A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed.

Surficial soils in the area of the Former Forebay, Former Retention Basin, and Former Clear Water Pond are shown to be composed of medium-textured glacial till on the Quaternary Geology of Southern Michigan Map (1982). Glacial till is typically a dense, heterogeneous mixture of soil ranging from clay to cobbles or boulders. Additionally, the map shows that glacial outwash and postglacial alluvium are present close to the site, which is typically comprised of sand or alternating layers of small gravel to heavy cobbles. These soils form the foundations of the Former Forebay, Former Retention Basin, and Former Clear Water Pond. The Former Forebay, Former Retention Basin, and Former

Clear Water Pond were constructed entirely with perimeter embankments, therefore there were no abutments.

Prior to the construction of the former impoundment system, a subsurface investigation program was performed in 1969 by Dames & Moore. The soil boring logs performed for that study are presented in the Location Restrictions Report prepared by Mayotte Design & Engineering (MD&E) (Ref. [12]). In addition to the 1969 soil borings, test pits were performed at the site by MD&E in 2018. In 2018, SME performed three soil borings to the west of the Former Forebay and Former Retention Basin for the new gas-fired combustion turbine power plant for BWL (Ref. [15]). From 2019 to 2025, HDR installed 42 wells at 21 distinct locations across the site. Monitoring wells MW-3 and MW-4 were installed in the vicinity of the Former Forebay and the Former Retention Basin, respectively, and MW-1 and MW-14 were both installed in the vicinity of the Former Clear Water Pond (Ref. [5]).

Table 3-1 details the borings, test pits, and monitoring wells which were reviewed for the physical and engineering properties of the foundation material of the Former Forebay, Former Retention Basin, and Former Clear Water Pond.

Table 3-1. List of Available Borings, Test Pits, Monitoring Wells

ID	Type	Year	Engineering Firm	Reference
AP-3 to AP-6	Geotechnical Borings	1969	Dames & Moore	Ref. [12]
AP-2	Test Pit	1969	Dames & Moore	Ref. [12]
ECT-18-B01 thru ECT-18-B03	Geotechnical Borings	2018	SME	Ref. [15]
CW-SB-01 thru CW-SB-03	Geotechnical Borings	2018	MD&E	Ref. [12]
EW-F-1 thru EW-F-6	Test Pits	2018	MD&E	Ref. [12]
MW-1, MW-3, MW-4, MW-14	Monitoring Wells	2019-2023	HDR	Ref. [5]

The approximate boring, test pit, and monitoring well locations are shown on . The borings logs, test pit records, and monitoring well logs are provided in Attachment 2.

Figure 4. Approximate Boring/Monitoring Well Locations

The physical and engineering properties of the embankment and foundation materials are described in Sections 3.5.1 and 3.5.2.

3.5.1 Physical Properties

The boring logs, test pit records, and monitoring well logs from subsurface investigations (listed in Table 3-1) indicate that the foundations of the Former Forebay, Former Retention Basin, and Former Clear Water Pond are composed primarily of alternating layers of cohesive and granular soils. These include lean clay, sandy clay, clayey sand, silty sand, sand, silt, silty sand, and clayey silt. Gravel, shale fragments, and limestone fragments were observed in these interbedded layers. Sandstone was encountered at the bottom of the deepest boring (AP-5), at El. 810.4 feet NAVD 88, approximately 60 feet below grade.

The foundations of the Former Forebay and Former Retention Basin embankments were cut to approximately El. 870.9 feet NAVD 88 prior to construction of the embankments. There are no records of borings through the embankments of the Former Forebay or Former Retention Basin. However, the installation logs of MW-1 and MW-14 indicate that the embankment of the Former Clear Water Pond is comprised of firm to stiff cohesive material (sandy lean clay). The installation log for MW-1 also indicated the presence of gravel in the embankment material.

Laboratory test results were available for samples taken from Borings ECT-18-B01 through ECT-18-B03, which were performed outside of the footprint of the former impoundments, but in the vicinity of the site (i.e. approximately 300 feet northwest of the former impoundments). Laboratory test results were available for the subsurface foundation material (i.e. below El. 870.9 feet NAVD 88). Undrained shear strengths obtained from field estimates with a hand penetrometer or torvane in the cohesive soils ranged from 1,000 psf (stiff) to greater than 4,500 psf (very stiff). Moisture contents in the cohesive soils ranged between 7 and 13 percent. SPT blow counts indicated that the granular soils ranged from very loose to very dense, with blow counts ranging from 3 to greater than 50 blows per foot. There were no laboratory test results presented on the available boring logs for the Former Clear Water Pond.

3.5.2 Engineering Properties

Engineering properties for the foundation materials assumed for the original design of the Former Forebay, Former Retention Basin, and Former Clear Water Pond are not available. However, field investigations using Standard Penetration Tests (SPTs) provide insight into the properties of the foundation soils.

SPTs were performed at four borings (ECT-18-B01 through ECT-18-B03 and AP-3) in the vicinity of the Former Forebay and Former Retention Basin. These borings included blow counts (N-values) for the foundation materials but were located outside the footprints of the Former Forebay and Former Retention Basin.

The N-values typically ranged from 5 to 20 blows per foot (bpf), from approximately El. 871.5 feet to approximately El. 866 feet, with shear strength values ranging from 1,000 psf to greater than 4,500 psf, as measured in the field with a penetrometer or torvane, indicating stiff to hard cohesive soils (sandy lean clay and lean clay). Underlying the stiff to very stiff cohesive soils, very loose to medium-dense granular soils (clayey sand and some silt), with N-values ranging from 3 to 30 bpf, were encountered to approximately El. 854 feet. Cohesive soils consisting of stiff to very stiff sandy lean clay were observed interbedding the granular soils in some of the borings. Underlying the very loose to medium-dense granular soils, stiff to hard cohesive soils (sandy lean clay) were encountered to approximately El. 850 feet with N-values ranging from 6 to 34 bpf and shear strength values of greater than 4,500 psf, indicating stiff to hard cohesive soils. Below this zone, medium-dense to very dense granular soils were encountered with N-values ranging from 15 to greater than 50 bpf to El. 811 feet, which is where sandstone was encountered. Sandstone was encountered in boring AP-5 (the deepest boring performed) and the boring was ultimately terminated after refusal from the SPT.

SPTs were also performed at three borings (AP-4 through AP-6) in the vicinity of the Former Clear Water Pond, including N-values of the foundation material. The existing ground surface at the time of the field exploration ranged from approximately El. 871 to 873 feet.

The N-values typically ranged from 2 to 7, from the existing ground surface (prior to construction of the embankment) to approximately El. 855, indicating loose granular soils. Underlying the loose granular soils, medium-dense granular soils with N-values ranging from 10 to 27 were encountered to approximately El. 825 to El. 820, where a dense granular layer with an N-value of 47 was encountered. Below the dense granular layer,

medium-dense granular soils were encountered with N-values ranging from 16 to 25 to El. 810 feet, which is where sandstone was encountered, and the boring was ultimately terminated after refusal from the SPT.

HDR is not aware of available data that would allow interpretation of the engineering properties of the embankment soils of the Former Clear Water Pond, other than GZA 2012 (Ref. [3]), which referenced the original specifications for the embankment, and noted that the natural ground surface, which also forms the liner, was stripped and scarified to provide a bond with the first layer of dike fill. The embankment was constructed primarily with selected on-site clay borrow and placed/compacted under controlled conditions.

The boring logs, along with recorded SPT blow counts, performed in the vicinity of the Former Forebay, Former Retention Basin, and Former Clear Water Pond are presented in Attachment 2. For additional discussion of the engineering properties of the embankment and foundation soils, refer to the HDR Initial Structural Stability and Safety Factor Assessment Report (Ref. [10]).

3.6 §257.73 (c)(1)(vi) - Construction, Description of the Materials, Methods, and Timeframe of Construction

§257.73 (c)(1)(vi): A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR unit; the method of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit.

The Former Clear Water Pond was constructed between 1970 and 1973 as part of the original construction of the former impoundment system for the Former Erickson Power Station, for the purpose of storing process water prior to return to the Former Station through the Pump House. The Pump House is located on the northwest side of the Former Clear Water Pond. Construction drawings from 1970 are provided in Attachment 3, and grading profiles from 2018 are provided in Attachment 5. A review of the installation logs of MW-1 and MW-14 indicates that the Former Clear Water Pond embankment generally consists of firm to stiff sandy lean clay. No laboratory tests or construction records were available to confirm the strength or placement methods, other than the reference to the original construction specifications in GZA 2012 (Ref. [3]). A review of the available records and discussions with BWL staff indicate that there were no major modifications made to the Former Clear Water Pond between the original construction and the decommissioning of the former impoundment system.

The Former Forebay and Former Retention Basin were constructed in 2014. Details of the construction procedures and construction materials, as summarized below, can be found in the Construction Documentation Report prepared by Mayotte Design & Engineering, P.C. (May 2015) (Ref. [13]). Construction Drawings and As-Built Drawings are presented in Attachment 4 and Attachment 6 of this report, respectively. Further details of the 2014 former impoundment system reconfiguration can also be found in previous versions of the site History of Construction reports (Ref. [7] and Ref. [8]).

Following the end of coal-fired activities at the Former Station in 2022, the Former Forebay, Former Retention Basin, and Former Clear Water Pond were decommissioned via removal

of coal combustion materials. Closure of these former regulated CCR units began in February 2023. Verification of CCR removal from the regulated former CCR units was completed and documented in the CCR Removal Report (Ref. [5]).

Following excavation, the Former Forebay and Former Retention Basin were filled with clean fill material and all former impoundments were graded to direct stormwater runoff to the Former Impoundment area. The entire former impoundment system area now functions only as a limited stormwater collection basin. These former impoundments form a roughly contiguous drainage system and are no longer connected. Their only inflow is stormwater from direct rainfall onto the former impoundment system. The berm separating the Former Clear Water Pont and the Former Impoundment was also removed. The only outfall serving the former impoundment system is now the Emergency Outfall Structure at the Former Clear Water Pond, which has been modified such that only the horizontal outlet pipe remains, with an invert elevation of El. 875.3 ft NAVD88.

2025 drawings detailing conditions following decommissioning of the former impoundment system are also available in HDR's Ash Impoundments Closure Drawings (Ref. [6]).

3.7 §257.73 (c)(1)(vii) – Drawings

§257.73 (c)(1)(vii): At a scale that details engineering structures and appurtenances relevant to the design, construction, operation, and maintenance of the CCR unit, detailed dimensional drawings of the CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation.

Available construction drawings from 1970, provided by BWL, are presented in Attachment 3. Additionally, grading profiles, along with a plan view locating the sections, developed by NTH Consultants, Ltd. (Ref. [14]), are provided in Attachment 5. The topographic survey used in the development of the grading plans were collected in 2018 by Droneview.

2014 construction drawings prepared by MD&E (Ref. [13]), provided by BWL, are presented in Attachment 4, along with plan views and cross-sectional views of the Former Forebay and Former Retention Basin. As-built drawings are presented in Attachment 6.

2025 drawings detailing conditions following decommissioning of the former impoundment system are also available in HDR's Ash Impoundments Closure Drawings (Ref. [6]).

3.8 §257.73 (c)(1)(viii) - Instrumentation

§257.73 (c)(1)(viii): A description of the type, purpose, and location of existing instrumentation.

In 2019 and 2020, HDR installed six monitoring wells for the Former Erickson Power Station as part of the Hydrogeologic Characterization of the site to monitor the groundwater across the Former Erickson Power Station impoundment system (Ref. [5]). MW-3 and

MW-4 were installed in the vicinity of the Former Forebay and Former Retention Basin, respectively, and MW-1 and MW-14 were installed in the vicinity of the Former Clear Water Pond. The locations of these wells are shown in Figure 4. The installation logs of MW-1, MW-3, MW-4, and MW-14 are provided in Attachment 2.

Two temporary piezometers, designated as RBPZ-1 and RBPZ-2, were installed on March 10, 2023, by SME in the embankment that separates the Retention Basin from Lake Delta. The purpose of the temporary piezometer installation was to verify the previous assumptions regarding ground water level and assumed stratigraphy used in seepage and stability analyses for the CCR removal activities. Using the ground water levels obtained from the two temporary piezometers, the stability of the embankments was monitored during construction and remained at low levels indicating stable embankments. The temporary piezometers were monitored throughout construction and abandoned once the Retention Basin was filled with soil and no further monitoring was required.

3.9 §257.73 (c)(1)(ix) - Area Capacity Data

§257.73 (c)(1)(ix): Area-capacity curves for the CCR unit.

Area capacity curves for the former impoundment system – including the Former Forebay, Former Retention Basin, and Former Clear Water Pond – were developed by HDR and are included in the Inflow Design Flood Control System Plan Report (Ref. [9]). See Attachment 8 for capacity calculations.

3.10 §257.73 (c)(1)(x) - Spillway and Diversion Design Features

§257.73 (c)(1)(x): A description of each spillway and diversion design features and capacities and calculations used in their determination.

The former regulated CCR surface impoundments at the Former Station have been decommissioned. All effluent hydraulic structures from the Former Forebay and Former Retention Basin were removed, and these former units were filled with clean fill material and graded to direct all runoff to the Former Impoundment area.

The Former Clear Water Pond was also decommissioned and the only remaining outfall from this former unit is the Emergency Overflow Structure located between the Former Clear Water Pond and the swale adjacent to the property line and Canadian National Railroad right-of way. This structure was previously comprised of a horizontal outfall pipe and a vertical steel riser pipe. During decommissioning, the vertical riser pipe was removed and only the horizontal outfall pipe remains, with an invert elevation of 875.3 ft NAVD88.

The berm previously separating the Former Clear Water Pond and the Former Impoundment was also removed, and the Emergency Overflow Structure now serves as the sole outfall structure serving the entire former impoundment system. However, hydrologic modelling shows that this outfall would not spill over in a 100-year flood event (Ref. [9]).

3.11 §257.73 (c)(1)(xi) - Construction Specifications and Provisions for Operations and Maintenance

§257.73 (c)(1)(xi): The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.

The construction specifications for the Former Forebay and Former Retention Basin are included in the Construction Documentation Report prepared by MD&E (Ref. [13]) and are also presented in Attachment 7. Construction specifications for the Former Clear Water Pond are not available. As noted above, GZA 2012 (Ref. [3]) references the original constructions and presumably had the opportunity to review them.

Prior to the removal of CCR from the former regulated CCR units, BWL performed weekly inspections for the entire former CCR impoundment system, per the requirements of 40 CFR §257.83(a)(1). A typical Weekly Inspection Report is provided in Attachment 9.Following verification of CCR removal (Ref. [5]), and subsequent EGLE approval on November 8, 2024, operating criteria and inspection requirements of 40 CFR §257.83 no longer apply to the former impoundments. However, BWL continues to conduct maintenance on an as-needed basis. BWL also continues to perform corrective action for groundwater, per the post-closure care requirements of 40 CFR §257.83(c)(2).

3.12 §257.73 (c)(1)(xii) - Record of Structural Instability

§257.73 (c)(1)(xii): Any record or knowledge of structural instability of the CCR unit.

Prior to the removal of CCR from the former regulated CCR units, BWL performed weekly inspections for the entire CCR impoundment system. The weekly inspections were completed by qualified individuals to check for potentially hazardous conditions or structural weakness and the results of the inspections are documented internally on Weekly Inspection Reports. As discussed in Section 3.11, above, these weekly inspection requirements are no longer applicable to the former impoundment system, following the verification of CCR removal (Ref. [5]).

An inspection of the Former Clear Water Pond was performed by GZA, referred to as a Round 10 Dam Assessment, at the facility (Ref. [3]). An additional inspection of the Former Clear Water Pond was performed in 2009 by Inspecsol Engineering, Inc. as noted in GZA 2012 (Ref. [3]), however, that report was not available for review.

HDR has also performed annual inspections of the Former Forebay, Former Retention Basin, and Former Clear Water Pond annually since 2020. The results of these inspections are submitted under separate cover, the most recent of which is dated February 20, 2025 (Ref. [4]).

4 References

Ref. [1] Environmental Protection Agency, 40 CFR Parts §257 and §261; Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, Washington D.C., April 2015.

Ref. [2] Environmental Protection Agency, WATERS GeoViewer (2020). https://www.epa.gov/waterdata/waters-geoviewer

Ref. [3] GZA GeoEnvironmental, Inc. Draft Round 10 Dam Assessment Report, Lansing Board of Water & Light, Erickson Station, Ash Pond, April 30, 2012.

Ref. [4] HDR Michigan, Inc. Annual Inspection Report - 2025 – Forebay, Retention Basin, and Clear Water Pond, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, February 20, 2025.

Ref. [5] HDR Michigan, Inc. CCR Removal Report, Forebay, Retention Basin, & Clear Water Pond, Lansing Board of Water & Light, Lansing, Michigan, November 4, 2024.

Ref. [6] HDR Michigan, Inc. Former Erickson Power Station Ash Impoundments Closure Drawings, As-Built, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, July 9, 2025.

Ref. [7] HDR Michigan, Inc. History of Construction, Erickson Power Station – Clear Water Pond, Lansing Board of Water & Light, Lansing, Michigan, June 12, 2020.

Ref. [8] HDR Michigan, Inc. History of Construction, Erickson Power Station – Forebay and Retention Basin, Lansing Board of Water & Light, Lansing, Michigan, August 10, 2020.

Ref. [9] HDR Michigan, Inc. Inflow Design Flood Control System Plan, Former Erickson Power Station – Former CCR Surface Impoundments, Lansing Board of Water & Light, Lansing, Michigan, June 6, 2025.

Ref. [10] HDR Michigan, Inc. Initial Structural Stability and Safety Factor Assessment, Erickson Power Station – CCR Surface Impoundments, Lansing Board of Water & Light, Lansing, Michigan, August 10, 2020.

Ref. [11] HDR Michigan, Inc. Monitoring Wall Installation Report, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, May 15, 2025.

Ref. [12] Mayotte Design & Engineering, P.C. Compliance with 40CFR257-Locations Restrictions. Lansing Board of Water & Light Erickson Station. October 10, 2018.

Ref. [13] Mayotte Design & Engineering, P.C. Construction Documentation Report Ash Impoundment System Reconfiguration, Lansing Board of Water & Light Erickson Station, Lansing, Michigan, May 2015.

Ref. [14] NTH Consultants, Ltd. Closure Plan, CCR Surface Impoundment System, Erickson Power Station, August 16, 2019.

Ref. [15] SME. Geotechnical Data Report, Lansing Board of Water & Light, New Gas Combined Cycle Plant, Delta Township, Michigan. August 16, 2018.

5 Attachments

Attachment 1 Site Location Map

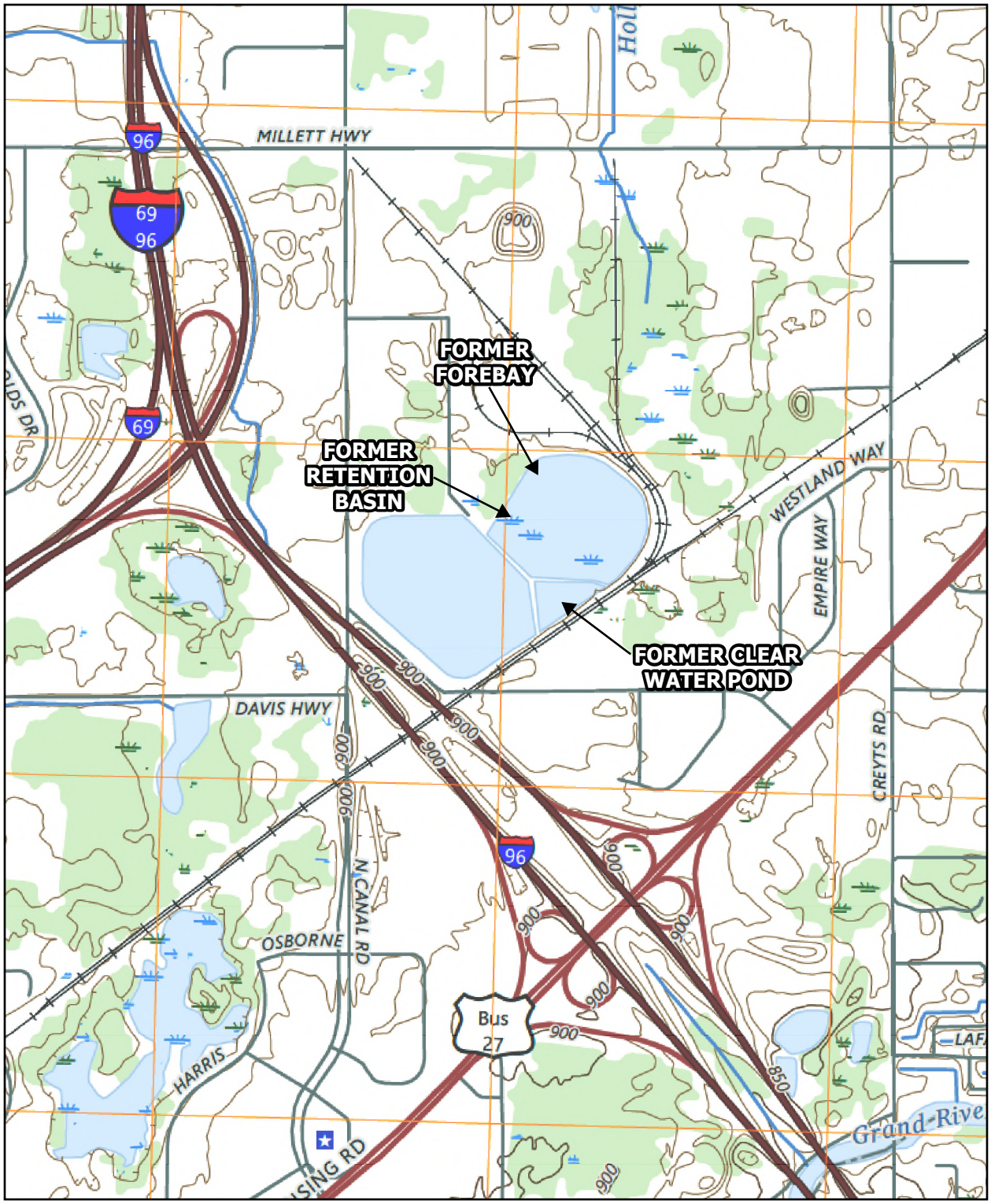
Attachment 2 Boring Logs and Monitoring Well Logs

Attachment 3 1970 Construction Drawings

Attachment 4 Construction Drawings for Former Forebay & Former Retention Basin

Attachment 5	2018 Grading Profiles
Attachment 6	As-Built Drawings for Former Forebay & Former Retention Basin
Attachment 7	Construction Specifications for Former Forebay & Former Retention Basin
Attachment 8	2025 As-Built Drawings for Impoundment Closure
Attachment 9	2025 Capacity Calculations for Former Impoundment System
Attachment 10	Typical BWL Weekly Inspection Report

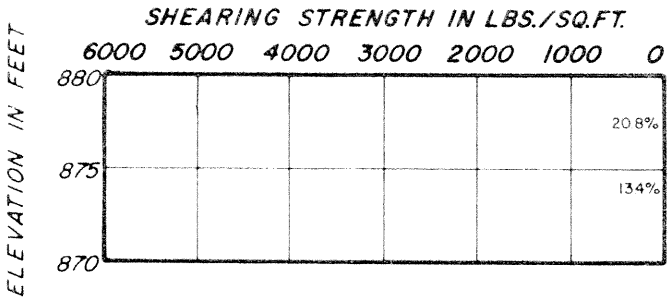
ATTACHMENT 1
SITE LOCATION MAP



DATA SOURCE
7.5 MINUTE USGS QUADRANGLE DIMONDALE, MICHIGAN, 2023.
DOWNLOADED FROM USGS WEBSITE AUGUST 2025.

0 FEET 2,000

ATTACHMENT 2
BORING LOGS AND MONITORING WELL LOGS



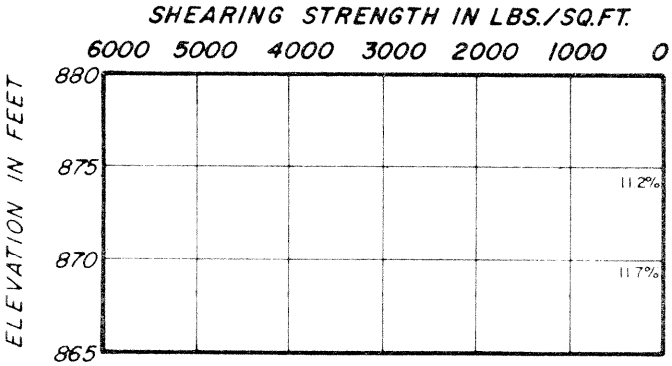
BULK SAMPLES
BAG SAMPLES

TEST PIT AP-1

SURFACE ELEVATION 879.6

SYMBOLS	DESCRIPTIONS
ML	DARK BROWN CLAYEY SILT WITH ROOTS - TOPSOIL (9")
SC	MOTTLED BROWN AND GRAY CLAYEY FINE SAND WITH SOME SMALL GRAVEL ROOTS TO 2'-6"
ML	BROWN FINE SANDY SILT WITH SOME SMALL GRAVEL AND TRACE OF CLAY 3" POCKET OF WATER BEARING FINE SAND ON WEST WALL OF PIT AT 6.0

TEST PIT COMPLETED AT 8.0'
ON 6/23/69
MINOR SEEPAGE WATER FROM POCKET OF SAND AT 6.0'



BULK SAMPLES
BAG SAMPLES

TEST PIT AP-2

SURFACE ELEVATION 877.8

SYMBOLS	DESCRIPTIONS
ML	DARK BROWN CLAYEY SILT WITH ROOTS - TOPSOIL (10")
SC	MOTTLED BROWN AND GRAY CLAYEY SAND
SM	MOTTLED BROWN AND GRAY FINE SILTY SAND WITH SOME CLAY AND SMALL GRAVEL
ML	BROWN SILT 2" SEAM OF BROWN FINE TO COARSE SAND WITH GRAVEL AT 5.5'
ML	GRAY CLAYEY SILT WITH SOME FINE SAND AND SMALL GRAVEL

TEST PIT COMPLETED AT 9.0'
ON 6/23/69
MINOR SEEPAGE WATER AT 5.5'

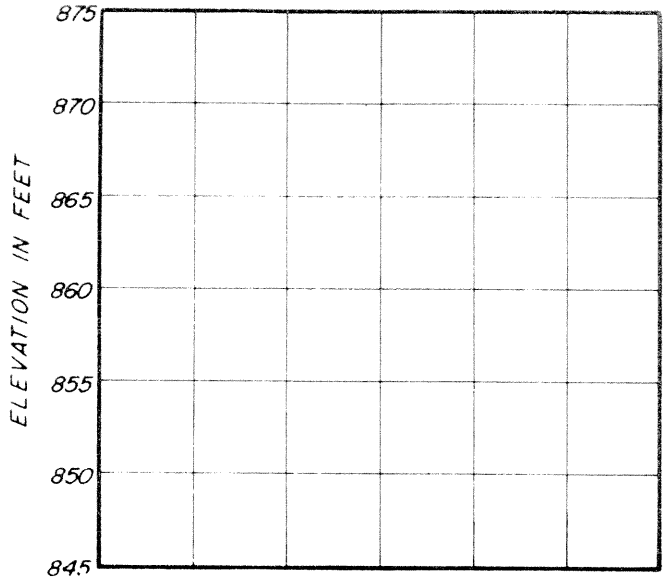
LOG OF TEST PITS

DAMES & MOORE

PLATE A-1T

BY _____ DATE _____
BY _____ DATE _____
PLATE _____ OF _____

BY _____ DATE _____
CHECKED BY _____ DATE _____

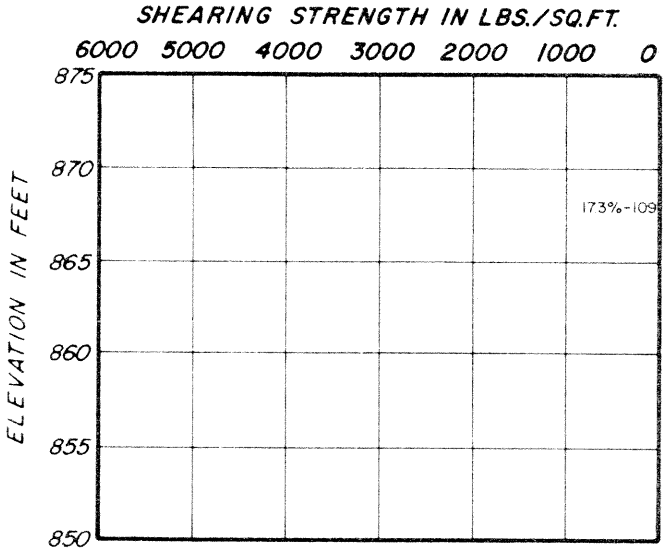


BORING AP-3

SURFACE ELEVATION 872.8

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS
	ML	BROWN SANDY SILT WITH ROOTS – TOPSOIL (6")
7	CL	BROWN SANDY CLAY WITH SOME ROOTS ROOTS GRADING OUT AT 2.5'
5	SC	BROWN CLAYEY SAND GRADING SOME SMALL GRAVEL
17	CL	BROWN SANDY CLAY WITH SOME SMALL GRAVEL
19	SP	BROWN FINE TO MEDIUM SAND SEEPAGE WATER ENCOUNTERED AT 7 - 3' WATER ROSE TO 5 - 10' IN 15 MINUTES
30		
	SP	GRAYISH - BROWN FINE SAND
25	ML	GRAY FINE SANDY SILT
6	SC	GRAY CLAYEY FINE SAND WITH SOME SMALL GRAVEL
21	SP	GRAY SILTY FINE SAND WITH SOME GRAVEL

BORING COMPLETED AT 25.0'
ON 7/8/69
CASING USED TO A DEPTH OF 14.0'
WATER LEVEL NOT RECORDED



BORING AP-4

SURFACE ELEVATION 870.7

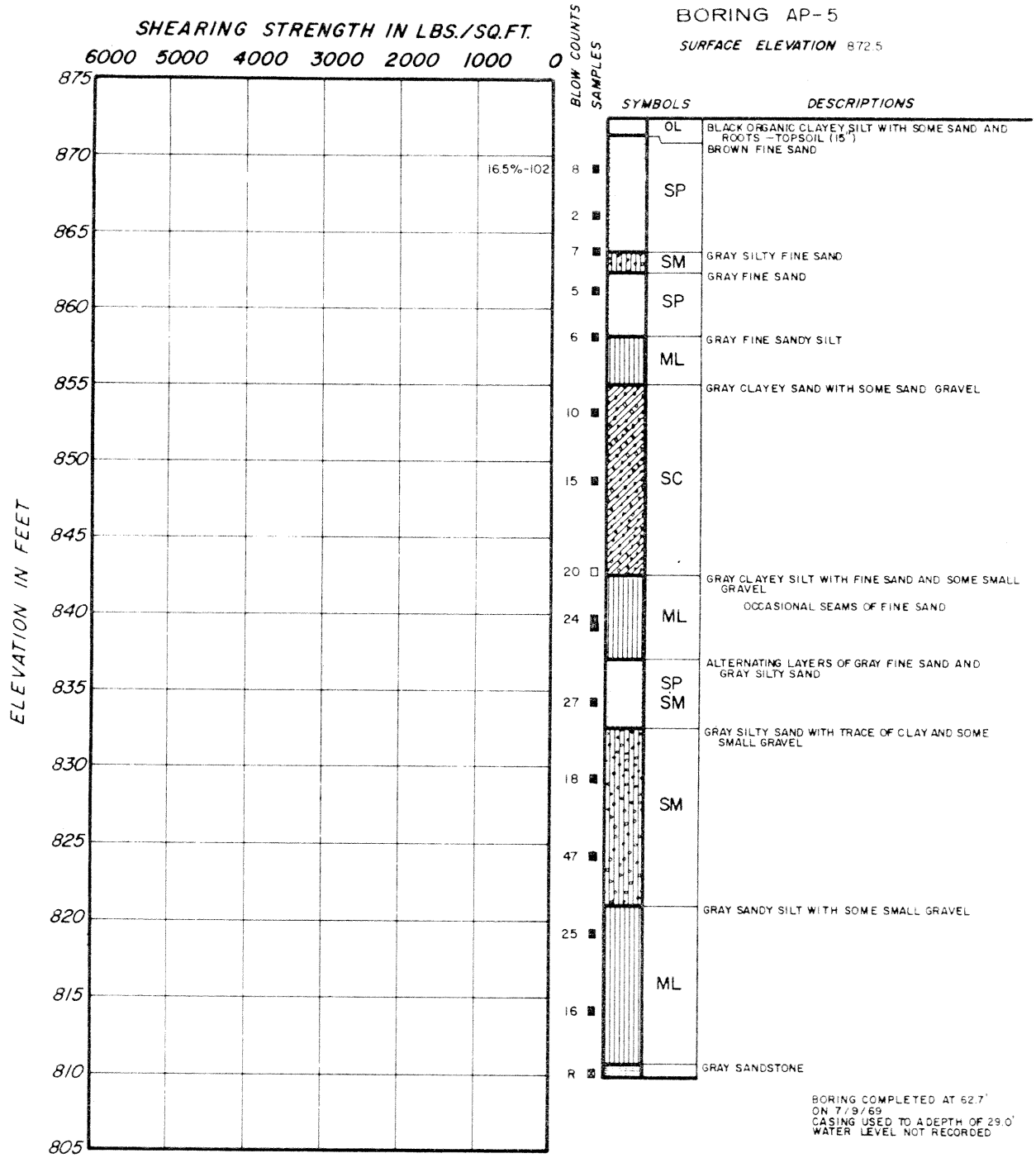
BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS
	OL	BLACK ORGANIC SILT WITH ROOTS – TOPSOIL (12")
	SC	GRAY CLAYEY SAND WITH ORGANIC MATTER SEEPAGE WATER ENCOUNTERED AT 2'-6"
2	SC	MOTTLED BROWN AND GRAY CLAYEY SAND WITH POCKETS OF BROWN FINE SAND
3	ML	MOTTLED BROWN AND GRAY CLAYEY SILT WITH SOME SAND
4	ML	GRAY CLAYEY SILT WITH FINE SAND
	ML	GRAY SILT
5	ML	
	SW	GRAY FINE TO COARSE SAND WITH SOME SMALL GRAVEL
19	ML	GRAY SILT

BORING COMPLETED AT 15.0'
ON 7/11/69
NO CASING USED
WATER LEVEL NOT RECORDED

LOG OF BORINGS

DAMES & MOORE

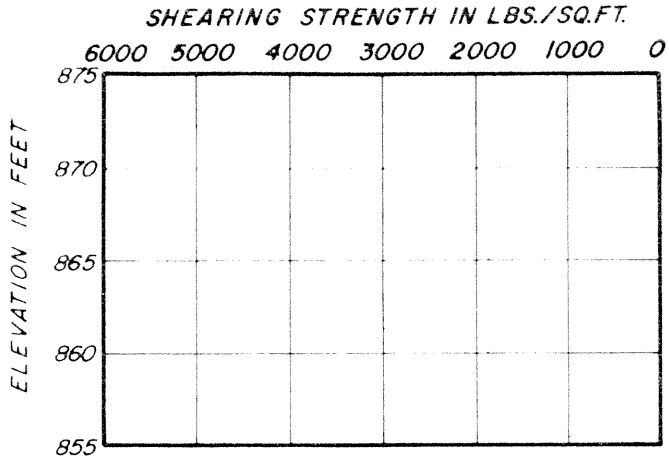
PLATE A-10



LOG OF BORINGS

DAMES & MOORE

PLATE A-IV

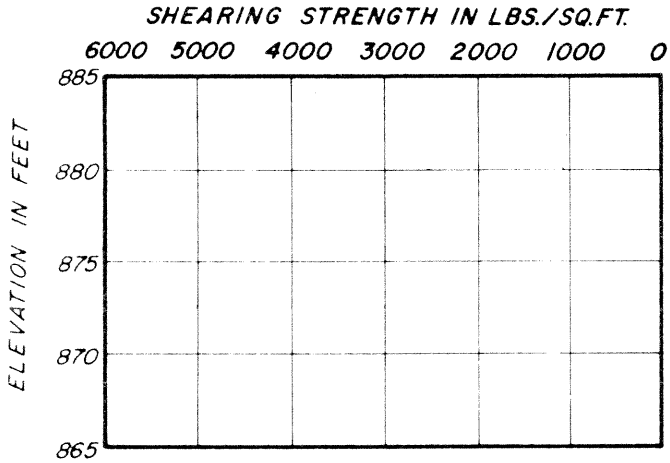


BORING AP-6

SURFACE ELEVATION 872.6

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS
	OL	BLACK ORGANIC CLAYEY SILT WITH ROOTS - TOPSOIL (9")
3	CL	MOTTLED BROWN AND GRAY SANDY CLAY WITH SOME ROOTS
		ROOTS GRADING OUT SEEPAGE WATER ENCOUNTERED AT 3'-6"
2	ML	GRAY CLAYEY SILT WITH ORGANIC MATTER
4	ML	GRAY FINE SANDY SILT
6		
11	SC	GRAY CLAYEY FINE SAND WITH SOME SMALL GRAVEL

BORING COMPLETED AT 15.0'
ON 7/9/69
NO CASING USED
WATER LEVEL NOT RECORDED



BORING AP-7

SURFACE ELEVATION 882.6

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS
	ML	DARK BROWN CLAYEY SILT WITH ROOTS - TOPSOIL (9")
4	CL	MOTTLED BROWN AND GRAY SANDY CLAY
		SEEPAGE WATER ENCOUNTERED AT 3'-1"
11	SM	MOTTLED BROWN AND GRAY SILTY SAND WITH TRACE OF CLAY
19	SP	BROWN FINE TO MEDIUM SAND
		GRAY SANDY CLAY WITH SOME SMALL GRAVEL
13	CL	
		GRAY CLAYEY SILT WITH FINE SAND
9	ML	

BORING COMPLETED AT 15.0'
ON 7/11/69
NO CASING USED
WATER LEVEL NOT RECORDED

LOG OF BORINGS

DAMES & MOORE

PLATE A-1W

MD&E®
Civil & Environmental Engineering

PROJECT:	LBWL - Erickson	PAGE	1 OF 1
PROJECT NO.:		BORING	CW-SB-01
ELEVATION:		DATE	10/2/2018
FIELD GEOLOGIST:	Tim Mayotte	RIG	Geoprobe

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION*			USCS OR ROCK BROKENNESS	REMARKS
				SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
1						Void		
2								
3	NA	2.5 ft	Dry	Stiff	Gray-Brown	Sandy Clay	CL	
4								
5								
6								
7	NA	4 ft	Wet	Loose	Gray-Brown	Fine to Medium Sand	SP	Boring consists
8								of layers of
9								saturated soils
10		4 ft	Dry	Loose		Medium Sand	SP	from a depth of
11								5 ft to EOB.
12								
13								
14		4 ft	Moist	Loose		Medium to Coarse Sand	SP	
15								
16			Wet	Stiff		Sandy Clay	SC-CL	
17						End of boring = 16 feet.		
18								
19								
20								
21								
22								
23								
24								
25								
26								
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37								
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39								
40								

REMARKS Boring backfilled with bentonite chips.

MD&E®
Civil & Environmental Engineering

PROJECT:	LBWL - Erickson	PAGE	1 OF 1
PROJECT NO.:		BORING	CW-SB-02
ELEVATION:		DATE	10/2/2018
FIELD GEOLOGIST:	Tim Mayotte	RIG	Geoprobe

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION*			USCS OR ROCK BROKENNESS	REMARKS
				SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
1						Void		
2								
3	NA	3 ft	Dry	Stiff	Gray-Brown/	Clay	CL	
4					Black			
5								
6								
7	NA	4 ft	Wet	Loose	Gray-Brown	Medium Sand	SP	Boring consists
8								of layers of
9								saturated soils
10		4 ft	Moist	Loose	Gray-Brown	Medium Sand	SP	from a depth of
11								5 ft to EOB.
12								
13			Wet					
14		4 ft		Loose	Gray-Brown	Medium Sand	SP	
15			Moist					
16								
17						End of boring = 16 feet.		
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
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35								
36								
37								
38								
39								
40								

REMARKS Boring backfilled with bentonite chips.

MD&E®
Civil & Environmental Engineering

PROJECT:	LBWL - Erickson	PAGE	1 OF 1
PROJECT NO.:		BORING	CW-SB-03
ELEVATION:		DATE	10/2/2018
FIELD GEOLOGIST:	Tim Mayotte	RIG	Geoprobe

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION*			USCS OR ROCK BROKENNESS	REMARKS
				SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
1						Void		
2								
3	NA	2.25 ft	Dry	Stiff	Gray-Brown	Clay	CL	
4								
5								
6			Moist -					
7	NA	3 ft	Wet	Loose	Gray-Brown	Medium Sand	SP	Boring consists
8								of layers of
9								saturated soils
10		4 ft	Wet	Loose	Gray-Brown	Medium Sand	SP	from a depth of
11								5 ft to EOB.
12								
13								
14		4 ft	Moist -	Loose	Gray-Brown	Medium Sand	SP	
15			Wet					
16								
17						End of boring = 16 feet.		
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

REMARKS Boring backfilled with bentonite chips.

GEOTECHNICAL TESTING SUMMARY

LBWL - Erickson Station - Foundation Samples

MD&E Project No.

MD&E®
Civil & Environmental Engineering

SAMPLE	CLASSIFICATION	%Fines	LL%	PI%	$w\%_{field}$	$w\%_{opt}$	ρ_d (lbs/ft^3)	K (cm/s)
EW-F-01	Clayey Sand	29.50	NA	NA	NA	9.20	124.24	NA
EW-F-02	Clayey Sand	14.10	NA	NA	NA	8.25	129.23	NA
EW-F-03	Clayey Sand	9.70	NA	NA	NA	12.00	121.11	NA
EW-F-04	Clayey Sand	9.80	NA	NA	NA	8.50	125.92	NA
EW-F-05	Clayey Sand	16.30	NA	NA	NA	8.30	126.86	NA
EW-F-06	Clayey Sand	12.20	NA	NA	NA	7.85	131.10	NA
EW-T-01	Clayey Sand	NA	NA	NA	NA	10.00	133.60	NA
EW-T-02	Clayey Sand	NA	NA	NA	NA	9.80	127.67	NA
EW-T-03	Clayey Sand	NA	NA	NA	NA	9.30	127.98	NA
West Floor	Clayey Sand	13.10	NA	NA	NA	9.00	128.61	NA
South Floor	Clayey Sand	17.60	NA	NA	NA	7.95	129.98	NA
Ranges/Averages:								

NOTES:

BORING ECT-18-B01

PROJECT NAME: LBWL New Gas Combined Cycle Plant
PROJECT NUMBER: 079295.00
CLIENT: Lansing Board of Water & Light
PROJECT LOCATION: Delta Township, Michigan
DATE STARTED: 6/28/18 **COMPLETED:** 6/28/18
BORING METHOD: Hollow-stem Augers
DRILLER: BS (Strata) **RIG NO.:** CME 55 - ATV
LOGGED BY: JAR **CHECKED BY:** JSW

SURFACE ELEVATION: 881.5 FT

ELEVATION (FEET)	DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES
880	0	0.9 11 inches of TOPSOIL 880.6			
		Sandy LEAN CLAY- Occasional Roots- Occasional Wet Sand Seams from 5 feet to 8 feet- Brown- Hard to Stiff (CL)	SB1	16	2 4 6
			SB2	18	6 8 9
875	5		SB3	18	4 6 7
			SB4	18	6 6 11
870	10	11.0 870.5			
		Sandy LEAN CLAY- Gray- Stiff (CL)	SB5	18	3 4 4
		13.5 868.0			
		Fine to Medium SILTY CLAYEY SAND- Brown- Wet- Very Loose (SM-SC)	SB6	18	1 1 2
865	15	15.5 866.0			
		Sandy SILT- Little Clay- Brown to Gray at 18 feet- Wet- Medium Dense (ML)	SB7	18	3 6 8
			SB8	18	4 5 7
860	20	23.5 858.0			
		Sandy LEAN CLAY- Gray- Stiff (CL)	SB9	18	4 7 6
855	25	25.5 856.0			
		Fine to Coarse SAND- Grayish Brown- Wet- Medium Dense to Very Dense (SP)	SB10	12	10 35 16
	30				

N-VALUE -- ○ (10 20 30 40)

DRY DENSITY (pcf) -- ■ (90 100 110 120)

MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)

▽ HAND PENE.
⊠ TORVANE SHEAR
○ UNC.COMP.
⊡ VANE SHEAR (PK)
× VANE SHEAR (REM)
⊕ TRIAXIAL (UU)
SHEAR STRENGTH (KSF) (1 2 3 4)

REMARKS

GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	13.5	868.0
▼ AT END OF BORING:	27.0	854.5

BACKFILL METHOD: Cement- Bentonite Grout

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
2. Bulk sample obtained from auger cuttings while drilling from 0' to 10'

(Continued Next Page)

BORING ECT-18-B01

PROJECT NAME: LBWL New Gas Combined Cycle Plant **PROJECT NUMBER:** 079295.00

CLIENT: Lansing Board of Water & Light **PROJECT LOCATION:** Delta Township, Michigan

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	SURFACE ELEVATION: 881.5 FT PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES	N-VALUE -- ○ (10 20 30 40)	DRY DENSITY (pcf) -- ■ (90 100 110 120) MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)	▽ HAND PENE. ⊠ TORVANE SHEAR ○ UNC.COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ⊕ TRIAXIAL (UU) SHEAR STRENGTH (KSF) (1 2 3 4)	REMARKS
850	30									
				SB11	12	8 12 14	26			
845	35		Fine to Coarse SAND- Grayish Brown- Wet- Medium Dense to Very Dense (SP) *(continued)*							
				SB12	6	8 17 55	72			
840	40									Driller reported hard drilling from 41.0 feet to 43.5 feet.
	43.8		837.7	SB13	0	100/3"	100+			Driller reported no recovery for Sample SB13.
			END OF BORING AT 43.8 FEET.							
835	45									
830	50									
825	55									
820	60									
815	65									
	70									

BORING ECT-18-B02

PROJECT NAME: LBWL New Gas Combined Cycle Plant
PROJECT NUMBER: 079295.00
CLIENT: Lansing Board of Water & Light
PROJECT LOCATION: Delta Township, Michigan
DATE STARTED: 6/29/18 **COMPLETED:** 6/29/18
BORING METHOD: Hollow-stem Augers
DRILLER: BS (Strata) **RIG NO.:** CME 55 - ATV
LOGGED BY: JAR **CHECKED BY:** JSW

SURFACE ELEVATION: 880.2 FT

ELEVATION (FEET)	DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES
880	0	0.8 10 inches of TOPSOIL 879.4			
		Sandy LEAN CLAY- Occasional Roots- Brown and Gray- Hard to Very Stiff (CL)	SB1	18	3 4 5
			SB2	18	3 4 5
875	5	5.5 874.7			
		Sandy LEAN CLAY- Occasional Wet Sand Seams- Brown- Stiff (CL)	SB3	18	3 4 4
		8.5 871.7			
		Sandy LEAN CLAY- Brown- Hard (CL)	SB4	1	5 9 11
870	10	10.5 869.7			
		Sandy LEAN CLAY- Gray- Very Stiff (CL)	SB5	8	4 6 7
		12.0 868.2			
		Sandy SILT- Trace Clay- Gray- Wet- Loose to Medium Dense (ML)	SB6	18	4 4 4
865	15		SB7	6	4 6 8
		18.5 861.7			
		Sandy LEAN CLAY- Occasional Shale Fragments- Dark Gray- Very Stiff to Hard (CL)	SB8	18	3 4 6
860	20	23.0 857.2			
		Sandy LEAN CLAY- Frequent Sand Seams- Brown- Hard (CL)	SB9	18	12 19 26
855	25	28.5 851.7			
			SB10		8 16 18
	30				

N-VALUE -- ○ (10 20 30 40)

DRY DENSITY (pcf) -- ■ (90 100 110 120)

MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)

▽ HAND PENE.
⊠ TORVANE SHEAR
○ UNC.COMP.
⊡ VANE SHEAR (PK)
× VANE SHEAR (REM)
⊕ TRIAXIAL (UU)
SHEAR STRENGTH (KSF) (1 2 3 4)

REMARKS

Loss-on-ignition (LOI) test performed on Sample SB1 indicates an organics content of about 2.2 percent. Loss-on-ignition (LOI) test performed on Sample SB2 indicates an organics content of about 1.3 percent.

GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)	ELEV (FT)
▽ **DURING BORING:**	12.0	868.2
▼ **AT END OF BORING:**	14.5	865.7

BACKFILL METHOD: Cement- Bentonite Grout

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

(Continued Next Page)

BORING ECT-18-B02

PROJECT NAME: LBWL New Gas Combined Cycle Plant **PROJECT NUMBER:** 079295.00

CLIENT: Lansing Board of Water & Light **PROJECT LOCATION:** Delta Township, Michigan

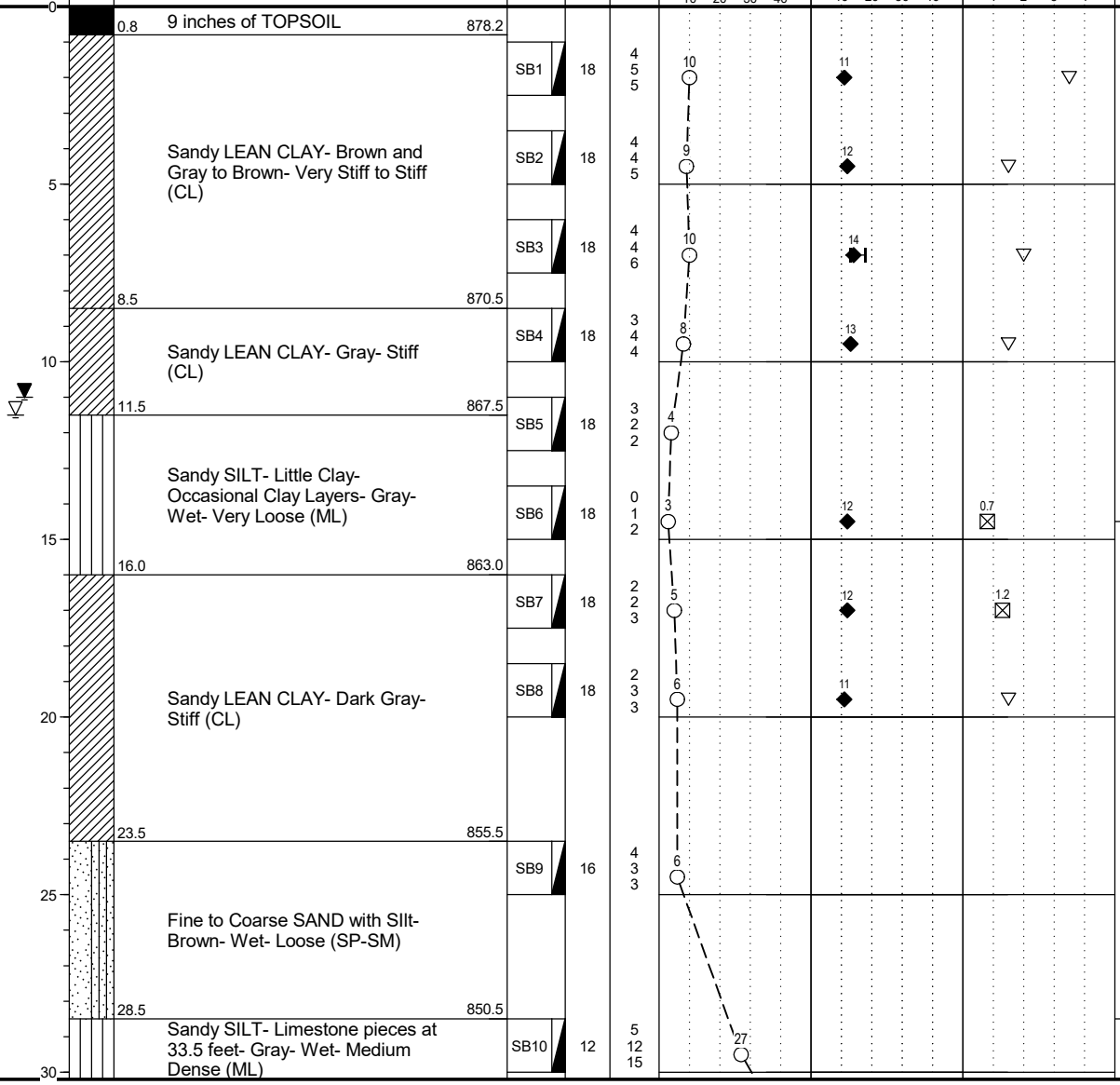
ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	SURFACE ELEVATION: 880.2 FT PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES	N-VALUE -- ○ (10 20 30 40)	DRY DENSITY (pcf) -- ■ (90 100 110 120) MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)	▽ HAND PENE. ⊠ TORVANE SHEAR ○ UNC.COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ⊕ TRIAXIAL (UU) SHEAR STRENGTH (KSF) (1 2 3 4)	REMARKS
850	30		Fine to Coarse SAND with Silt and Gravel- Limestone pieces at 33.5 feet- Brown and Gray- Wet- Medium Dense (SP-SM) *(continued)*							
			33.6	846.6 SB11	1	50/1"	50+			
			END OF BORING AT 33.6 FEET.							
845	35									
840	40									
835	45									
830	50									
825	55									
820	60									
815	65									
	70									

BORING ECT-18-B03

PROJECT NAME: LBWL New Gas Combined Cycle Plant
PROJECT NUMBER: 079295.00
CLIENT: Lansing Board of Water & Light
PROJECT LOCATION: Delta Township, Michigan
DATE STARTED: 6/28/18 **COMPLETED:** 6/28/18
BORING METHOD: Hollow-stem Augers
DRILLER: BS (Strata) **RIG NO.:** CME 55 - ATV
LOGGED BY: JAR **CHECKED BY:** JSW

SURFACE ELEVATION: 879 FT

ELEVATION (FEET)	DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES	REMARKS
879	0	0.8 9 inches of TOPSOIL				
878.2	0.8		SB1	18	4 5 5	
875	5	Sandy LEAN CLAY- Brown and Gray to Brown- Very Stiff to Stiff (CL)	SB2	18	4 4 5	
			SB3	18	4 4 6	
870.5	8.5		SB4	18	3 4 4	
870	10	Sandy LEAN CLAY- Gray- Stiff (CL)				
867.5	11.5		SB5	18	3 2 2	
865	15	Sandy SILT- Little Clay- Occasional Clay Layers- Gray- Wet- Very Loose (ML)	SB6	18	0 1 2	Shear strength test performed on clay layer.
863.0	16.0		SB7	18	2 2 3	
860	20	Sandy LEAN CLAY- Dark Gray- Stiff (CL)	SB8	18	2 3 3	
855.5	23.5		SB9	16	4 3 3	
855	25	Fine to Coarse SAND with SIlt- Brown- Wet- Loose (SP-SM)				
850.5	28.5		SB10	12	5 12 15	Driller reported cobbles from 28.5 feet to 32.0 feet.
850	30	Sandy SILT- Limestone pieces at 33.5 feet- Gray- Wet- Medium Dense (ML)				



GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	11.5	867.5
▼ AT END OF BORING:	11.0	868.0

BACKFILL METHOD: Cement- Bentonite Grout

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
2. Bulk sample obtained from auger cuttings while drilling from 0' to 10'

(Continued Next Page)

BORING ECT-18-B03

PROJECT NAME: LBWL New Gas Combined Cycle Plant

PROJECT NUMBER: 079295.00

CLIENT: Lansing Board of Water & Light

PROJECT LOCATION: Delta Township, Michigan

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	SURFACE ELEVATION: 879 FT **PROFILE DESCRIPTION**	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES	N-VALUE -- ○ (10 20 30 40)	DRY DENSITY (pcf) -- ■ (90 100 110 120) MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)	▽ HAND PENE. ⊠ TORVANE SHEAR ○ UNC.COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ⊕ TRIAXIAL (UU) SHEAR STRENGTH (KSF) (1 2 3 4)	REMARKS
			Sandy SILT- Limestone pieces at 33.5 feet- Gray- Wet- Medium Dense (ML) *(continued)*							Driller reported hard dilling from 32.0 feet to 33.7 feet.
			33.7	845.3 SB11	1	50/2"	50+			
845	35		END OF BORING AT 33.7 FEET.							
840	40									
835	45									
830	50									
825	55									
820	60									
815	65									
810	70									

MW-1

CLIENT Lansing Board of Water and Light
PROJECT NAME LBWL Confidential
PROJECT NUMBER 10173187
PROJECT LOCATION Erickson Power Station, Lansing, MI
DATE STARTED 10/15/19 11:00 **COMPLETED** 10/15/19 12:30
GROUND ELEVATION 885.97 ft MSL **HOLE DIAMETER** 7"
DRILLING CONTRACTOR SME **DRILLER** Rudy Musulin
GROUND WATER LEVELS:
DRILLING METHOD HSA **EQUIPMENT** Track-Mounted CME 55
AT TIME OF DRILLING 17.50 ft / Elev 868.47 ft
LOGGED BY Emily Munoz **CHECKED BY**
75 HRS AFTER DRILLING 11.85 ft / Elev 874.12 ft
NOTES Sample ID prefix LBWL-MW1-. Driller recorded blow counts on SME logs.

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
0					Casing Top Elev: 888.74 (ft) Casing Type: 2" Sch 40 PVC
			0.5 SANDY LEAN CLAY WITH GRAVEL, (CL) brown (10YR 5/3), dry, stiff, low plasticity	885.5	
			SANDY LEAN CLAY WITH GRAVEL, (CL) yellowish brown (10YR 5/4), dry, medium stiff, mottled, low plasticity		
5					Bentonite Chips (Hydrated in Lifts)
10			11.0 SANDY LEAN CLAY WITH GRAVEL, (CL) yellowish brown (10YR 5/4), moist, medium stiff, mottled, low plasticity	875.0	
15			15.0 SANDY LEAN CLAY, (CL) very dark gray (2.5Y 3/1), moist, stiff, low plasticity	871.0	
			16.0 CLAYEY SAND, (SC) dark greenish gray (10GY 4/1), poorly graded, fine grained, moist, medium dense, iron oxide staining	870.0	
			17.5 ▽	868.5	
			18.0 CLAYEY SAND, (SC) dark greenish gray (10GY 4/1), poorly graded, fine grained, wet, medium dense, iron oxide staining	868.0	
20	SS 20-22		POORLY GRADED SAND WITH CLAY, (SP) gray (5Y 5/1), fine to medium grained, wet, medium dense		Silica Sand Filter Pack
			23.5 CLAYEY SAND, (SC) gray (5Y 5/1), poorly graded, fine grained, wet, medium dense	862.5	
25					Screen, 0.010" Slot Size
	SS 26-28		26.0 LEAN CLAY WITH SAND, SILTY, (CL) gray (5Y 5/1), fine grained, wet, soft, low plasticity	860.0	
30			30.0 FAT CLAY, (CH) gray (5Y 5/1), wet, stiff, medium plasticity	856.0	Endcap
			31.0 LEAN CLAY WITH SAND, SILTY, (CL) gray (5Y 5/1), fine to medium grained, wet, soft, low plasticity	855.0	
			32.0	854.0	

Bottom of borehole at 32.0 feet.

MW-3

CLIENT Lansing Board of Water and Light
PROJECT NAME LBWL Confidential
PROJECT NUMBER 10173187
PROJECT LOCATION Erickson Power Station, Lansing, MI
DATE STARTED 10/15/19 10:36 **COMPLETED** 10/15/19 12:30
GROUND ELEVATION 885.12 ft MSL **HOLE DIAMETER** 8"
DRILLING CONTRACTOR SME **DRILLER** Derek Blackburn
GROUND WATER LEVELS:
DRILLING METHOD HSA **EQUIPMENT** Truck-Mounted CME 55
▽ **AT TIME OF DRILLING** 15.00 ft / Elev 870.12 ft
LOGGED BY Emily Munoz **CHECKED BY**
▼ **72 HRS AFTER DRILLING** 15.21 ft / Elev 869.91 ft
NOTES Sample ID prefix LBWL-MW3-. Driller recorded blow counts on SME logs.

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
0					Casing Top Elev: 884.81 (ft) Casing Type: 2" Sch 40 PVC
			CLAYEY SAND, (SC) brown (10YR 4/3), poorly graded, fine grained, moist, dense	883.6	
1.5					
2.0			LEAN CLAY, (CL) grayish brown (10YR 5/2), moist, medium stiff, low plasticity, sand	883.1	
4.0			POORLY GRADED SAND, (SP) brown (10YR 4/3), fine to medium grained, moist, dense, clay	881.1	
4.5				880.6	
5			LEAN CLAY, SILTY, (CL) very dark grayish brown (2.5Y 3/2), moist, soft, low plasticity, sand		
6.0				879.1	
7.0			LEAN CLAY, (CL) yellowish brown (10YR 5/4), moist, medium stiff, mottled, low plasticity	878.1	
8.0				877.1	
8.5			LEAN CLAY, (CL) very dark grayish brown (2.5Y 3/2), moist, medium stiff, low plasticity, sand	876.6	
10					Bentonite Chips, Hydrated in Lifts
10.0			LEAN CLAY, (CL) yellowish brown (10YR 5/4), moist, stiff, mottled, low plasticity, gravel	875.1	
10.8				874.4	
12.0			LEAN CLAY, SANDY, (CL) very dark grayish brown (2.5Y 3/2), moist, soft, low plasticity	873.1	
			LEAN CLAY, (CL) yellowish brown (10YR 5/4), moist, soft, mottled, low plasticity, sand		
15			LEAN CLAY, SANDY, (CL) very dark grayish brown (2.5Y 3/2), moist, soft, low plasticity	870.1	
15.0					
16.0			LEAN CLAY, SANDY, (CL) yellowish brown (10YR 5/4), moist, soft, low plasticity, fine gravel	869.1	
			LEAN CLAY, (CL) yellowish brown (10YR 5/4), moist, medium stiff, low plasticity, sand, gravel		
19.5			CLAYEY SAND, (SC) yellowish brown (10YR 5/4), poorly graded, fine grained, wet, loose	865.6	
20			LEAN CLAY, SANDY, (CL) very dark grayish brown (10YR 3/2), wet, soft, low plasticity		
			CLAYEY SAND, (SC) very dark grayish brown (10YR 3/2), poorly graded, fine grained, wet, loose, gravel		
25					
	SS 26-28				Silica Sand Filter Pack
	SS 28-30				Slot Size 0.010"
30					
34.5				850.6	Endcap
35			POORLY GRADED SAND WITH CLAY, (SP) very dark grayish brown (10YR 3/2), fine to medium grained, wet, loose	849.6	
35.5				849.1	
36.0			LEAN CLAY, SILTY, (CL) very dark grayish brown (10YR 3/2), moist, soft, low plasticity, fine sand, Stiff, plastic fat clay (CH) in shoe.		

Bottom of borehole at 36.0 feet.

MW-4

CLIENT Lansing Board of Water and Light
PROJECT NAME LBWL Confidential
PROJECT NUMBER 10173187
PROJECT LOCATION Erickson Power Station, Lansing, MI
DATE STARTED 01/06/20 10:09 **COMPLETED** 01/06/20 11:05
GROUND ELEVATION 885.23 ft MSL **HOLE DIAMETER** 8"
DRILLING CONTRACTOR SME **DRILLER** Derek Blackburn
GROUND WATER LEVELS:
DRILLING METHOD HSA **EQUIPMENT** Truck-Mounted CME 55
AT TIME OF DRILLING 13.00 ft / Elev 872.23 ft
LOGGED BY Emily Munoz **CHECKED BY**
94.3 HRS AFTER DRILLING 11.51 ft / Elev 873.72 ft
NOTES

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
0					Casing Top Elev: 889.15 (ft) Casing Type: 2" Sch 40 PVC
			LEAN CLAY, SILTY, (CL) very dark brown (7.5YR 2.5/2), moist, soft, low plasticity, fine sand	884.2	
			LEAN CLAY, SILTY, (CL) brown (10YR 4/3), moist, soft, low plasticity		
5				880.2	
			LEAN CLAY, SILTY, (CL) dark brown (7.5YR 3/2), moist, soft, low plasticity, fine sand	879.2	
			LEAN CLAY, SILTY, (CL) brown with dark brown (10YR 5/3), moist, medium stiff, mottled, low plasticity, fine sand, fine gravel	878.2	
			LEAN CLAY, SILTY, (CL) dark yellowish brown with dark grayish brown (10YR 4/6), moist, soft, mottled, low plasticity, fine sand, fine gravel	876.2	Hydrated bentonite chips
10			LEAN CLAY, SILTY, (CL) yellowish brown (10YR 5/4), moist, soft, medium plasticity, fine sand, fine gravel		
				872.2	
			LEAN CLAY, SILTY, (CL) yellowish brown (10YR 5/4), wet, soft, medium plasticity, fine sand, fine gravel	871.2	
			WELL GRADED SAND WITH GRAVEL, (SW) brown (10YR 4/3), fine to coarse grained, wet, loose	870.7	
15			LEAN CLAY, SILTY, (CL) yellowish brown (10YR 5/4), wet, stiff, medium plasticity, fine sand, fine gravel	869.7	
			CLAYEY SAND, (SP) yellowish brown (10YR 5/4), fine grained, wet, loose, fine gravel	868.7	
			LEAN CLAY, (CL) brown (7.5YR 4/2), wet, medium stiff, low plasticity, fine sand, fine gravel	865.5	
20			CLAYEY SAND, (SP) brown (7.5YR 5/2), fine to coarse grained, wet, loose, fine gravel	865.2 865.0	
			CLAYEY SAND, (SP) brown (7.5YR 5/2), fine grained, wet, loose	864.2	
			LEAN CLAY, (CL) brown (7.5YR 5/2), wet, soft, low plasticity, fine sand	863.2	
	GB		POORLY GRADED SAND, (SP) dark gray (7.5YR 4/1), coarse grained, wet, loose, fine gravel	862.2	0.010" Slotted PVC Screen
25			LEAN CLAY, (CL) gray (7.5YR 5/1), moist, stiff, low plasticity, fine sand, fine gravel		
			LEAN CLAY, (CL) brown (7.5YR 5/2), wet, stiff, low plasticity, fine sand	859.0	
			LEAN CLAY, SANDY, (CL) dark gray to black (7.5YR 4/1), wet, medium stiff, low plasticity	857.2	

Bottom of borehole at 28.0 feet.

MW-14

CLIENT Lansing Board of Water & Light
PROJECT NAME Erickson Power Station
PROJECT NUMBER 10173187
PROJECT LOCATION Eaton County, MI
DATE STARTED 01/09/23 08:00 **COMPLETED** 01/09/23 13:00
GROUND ELEVATION 885.028 ft MSL **HOLE DIAMETER** 6"
DRILLING CONTRACTOR Cascade **DRILLER**
GROUND WATER LEVELS:
DRILLING METHOD Sonic **EQUIPMENT**
▽ **AT TIME OF DRILLING** 19.00 ft / Elev 866.03 ft
LOGGED BY Tanten Buszka **CHECKED BY**
▼ **AFTER DRILLING** 15.48 ft / Elev 869.55 ft
NOTES

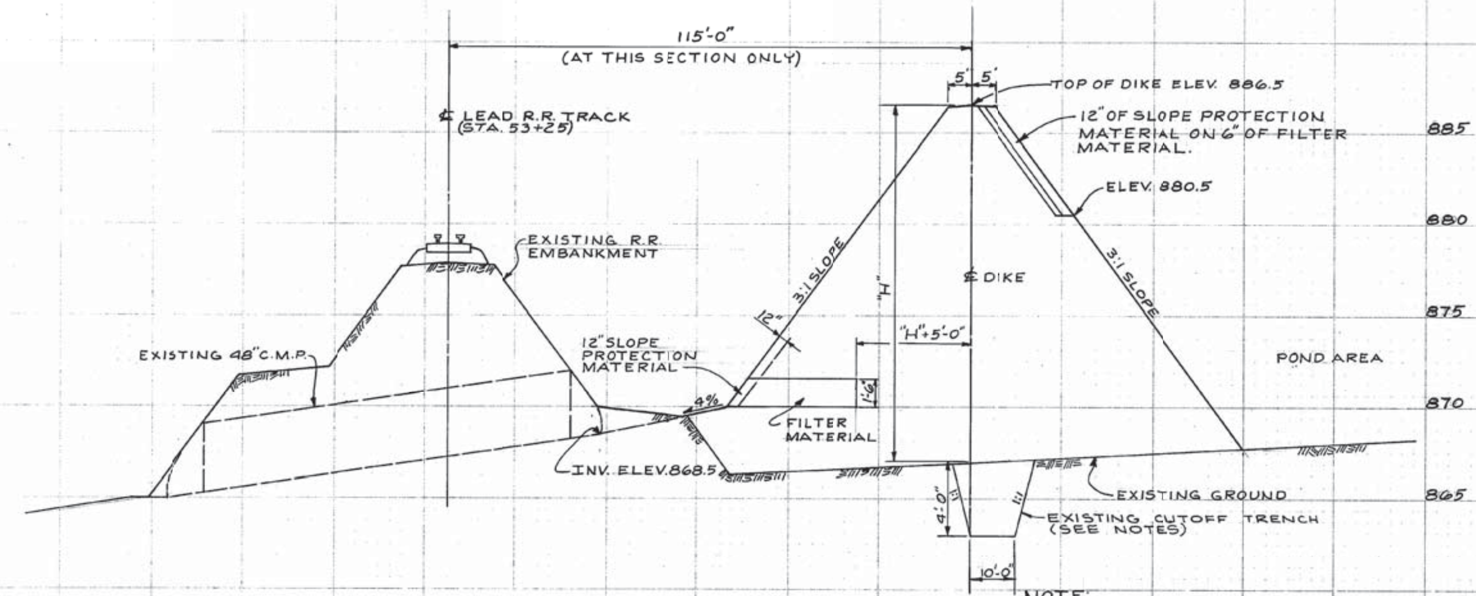
DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
0					Casing Top Elev: 884.594 (ft) Casing Type: 2" Sch 40 PVC
			SANDY LEAN CLAY, (CL) brown (10YR 5/4), poorly graded, fine to medium grained, dry, stiff, low plasticity, Gravel noted at 10 - 15'		
15				870.0	
			▼ SANDY LEAN CLAY, (CL) brown (10YR 5/4), poorly graded, fine to medium grained, dry, loose, high plasticity		
			▽	866.0	
20			POORLY GRADED SAND, (SP) gray (GLEY 1 5/N), poorly graded, fine to medium grained, wet	865.0	
			SANDY LEAN CLAY, (CL) gray (GLEY 1 5/2), poorly graded, fine grained, wet, loose, low plasticity, Trace silt		
30				855.0	

Bentonite Chip
Well Casing
Filter Pack
Well Screen

15.0
19.0
20.0
30.0

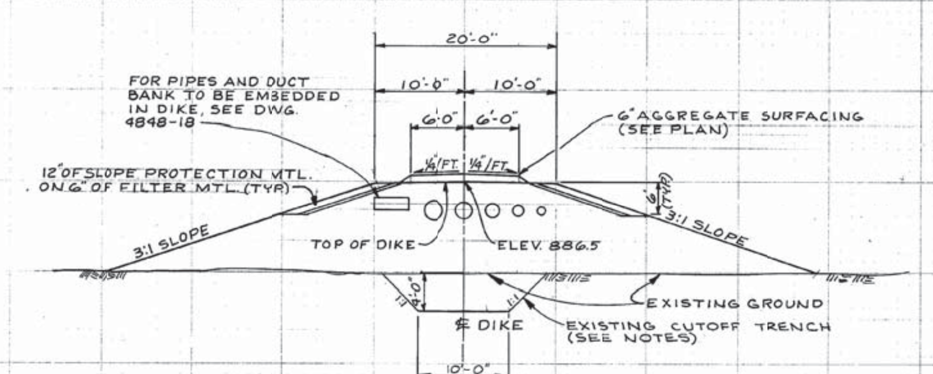
Bottom of borehole at 30.0 feet.

ATTACHMENT 3
1970 CONSTRUCTION DRAWINGS



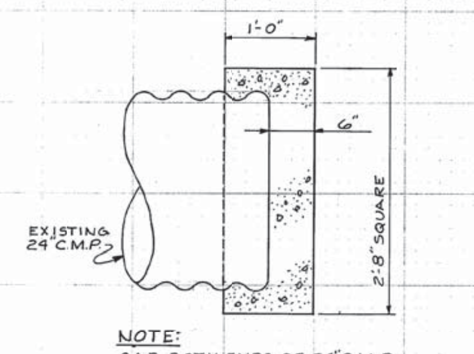
SECTION (E212/212)
SCALES: HORZ. 1"=20' VERT. 1"=5'

NOTE:
THIS DIKE SECTION APPLIES TO ALL DIKES ADJACENT TO R.R.



TYPICAL SECTION-DIKE ACCESS ROAD
NO SCALE

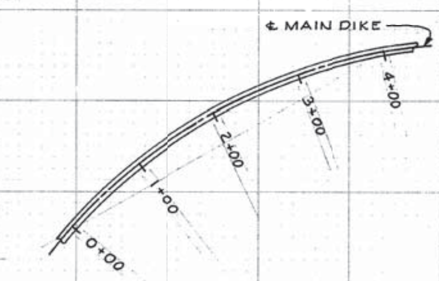
NOTE:
THIS DIKE SECTION APPLIES TO NEW DIKES ALONG THE NORTH AND WEST SIDES OF THE CLEAR WATER POND AND TO THE DIKE BETWEEN THE ASH POND AND THE WATER STORAGE POND.



NOTE:
CAP BOTH ENDS OF 24" C.M.P. AT R.R. LEAD TRACK STA. 53+50.

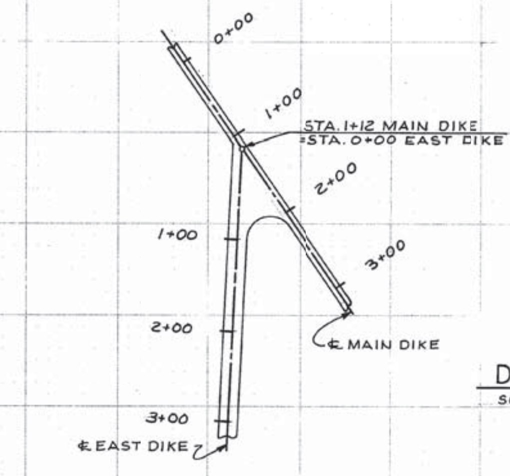
C.M.P. CONCRETE CAP DETAIL
SCALE: 1"=1'-0"

℄ MAIN DIKE			
STA.	ELEV.	STA.	ELEV.
0+00	886.5	2+31	866.3
0+50	886.6	2+50	868.2
0+60	885.8	2+75	869.9
1+00	880.4	2+91	872.5
1+37	874.7	3+00	875.0
1+50	872.0	3+50	882.1
1+60	870.7	3+83	885.1
1+65	868.8	4+00	886.7
1+83	866.6		
2+00	866.3		



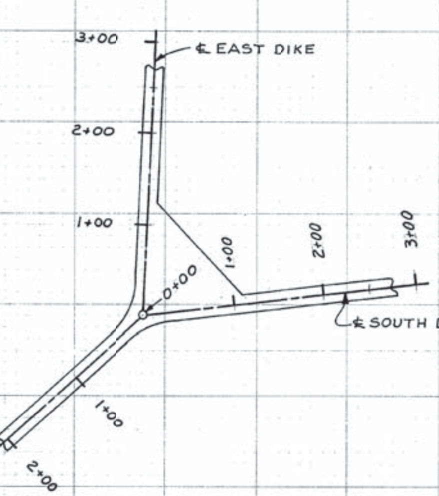
DETAIL (D212/212)
SCALE: 1"=100'

℄ NORTHWEST DIKE		℄ SOUTH DIKE		℄ EAST DIKE	
STA.	ELEV.	STA.	ELEV.	STA.	ELEV.
0+00		0+00	871.0	0-15	870.7
0+11	869.2	0+30	875.2	0-90	875.7
0+17	869.2	0+50	875.6	0+00	870.0
0+27	874.7	1+00	876.4	0+10	879.1
0+50	874.7	1+35	878.5	0+25	879.7
0+87	885.5	1+50	879.8	0+50	874.5
1+00	888.1	2+00	885.8	1+00	875.5
1+45	885.5	2+14	886.8	1+30	876.1
1+50	886.1	2+50	886.7	1+50	879.7
2+00	886.5			1+80	885.2
				2+00	886.1
				2+50	886.5

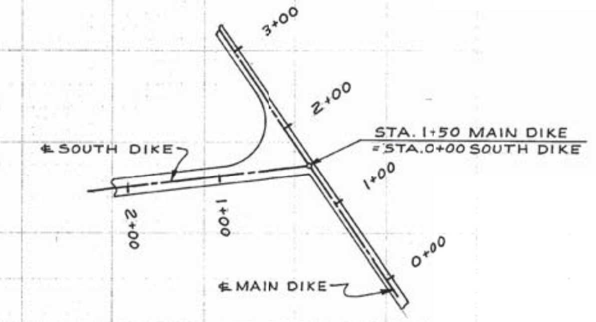


℄ MAIN DIKE		℄ EAST DIKE	
STA.	ELEV.	STA.	ELEV.
0+00	886.5	0+00	873.1
0+50	883.7	0+50	873.1
1-00	875.0	1+00	873.9
1+12	873.2	1+25	877.2
1+50	873.6	1+50	876.7
2+00	874.6	2+00	873.8
2+50	884.5	2+25	886.3
3+00	886.9	2+50	886.9

DETAIL (C212/212)
SCALE: 1"=100'



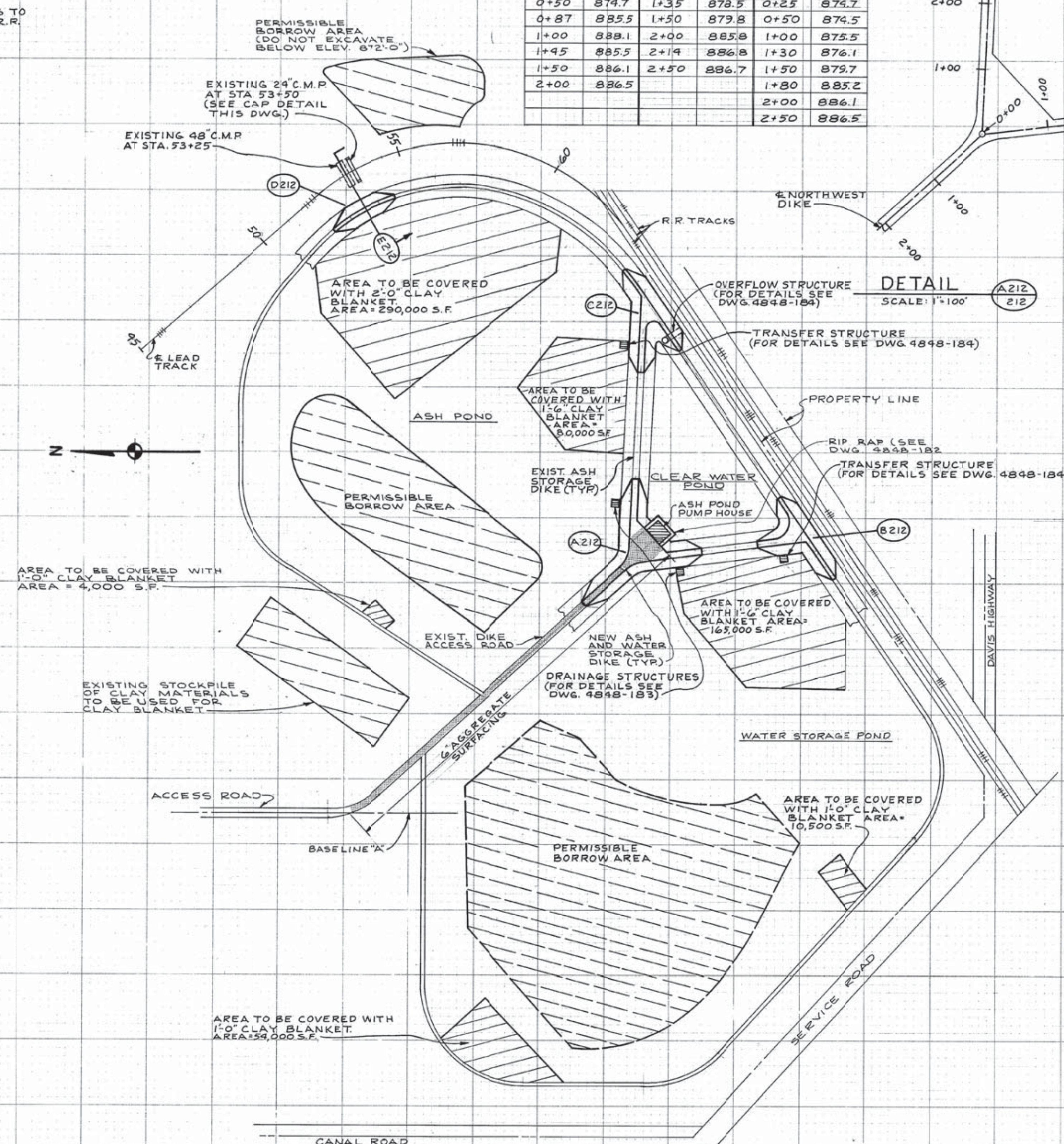
DETAIL (A212/212)
SCALE: 1"=100'



℄ MAIN DIKE		℄ SOUTH DIKE	
STA.	ELEV.	STA.	ELEV.
0+00	886.5	0+00	874.3
0+40	885.9	0+50	873.9
0+50	884.8	0+78	874.8
1+00	878.0	1+00	877.7
1+50	874.3	1+50	886.4
1+93	874.6	1+57	886.8
2+00	875.5	2+00	886.9
2+50	883.7		
2+77	886.3		
3+00	886.7		

DETAIL (B212/212)
SCALE: 1"=100'

EXISTING SURFACE ELEVATIONS



PLAN
ASH POND AREA
SCALE: 1"=200'

REFERENCE DRAWINGS
PLANT SITE GRADING —— 4848-14
SECURITY FENCING —— 4848-213

NOTES:
ALL WORK ON THIS DRAWING BY CONTRACT 57, UNLESS OTHERWISE NOTED.
THE 1ST PHASE OF ASH POND EARTHWORK IS SHOWN ON DRAWING 4848-14.
ALL ELEVATIONS SHOWN REFER TO SITE GRADING DATUM - SITE GRADING ELEV. 882'-0" = PLANT DATUM 100'-0".
EXACT BOUNDARIES OF AREAS TO BE COVERED BY CLAY BLANKET WILL BE DETERMINED BY ENGINEER.
S.F. AREA OF CLAY BLANKET SHOWN DOES NOT INCLUDE SLOPING EDGES.
EXISTING CUTOFF TRENCHES:
1. CLEAN SAND AND LOOSE SOIL OFF BEFORE SCARIFYING TO PROVIDE BOND FOR FIRST LAYER OF FILL.
2. WHERE EXISTING TEMPORARY DRAINAGE DITCHES CUT THRU CUTOFF TRENCH, FILL DITCH WITH COMPACTED CLAY.

REVISIONS	DATE	DWN.	APP.	REVISIONS	DATE	DWN.	APP.	REVISIONS	DATE	DWN.	APP.
								1 FINAL	4-18-74		

DRAWN RON DICKES
CHECKED DC Petersen
APPROVED DC Petersen
APPROVED
DATE SEPT. 4, 1970

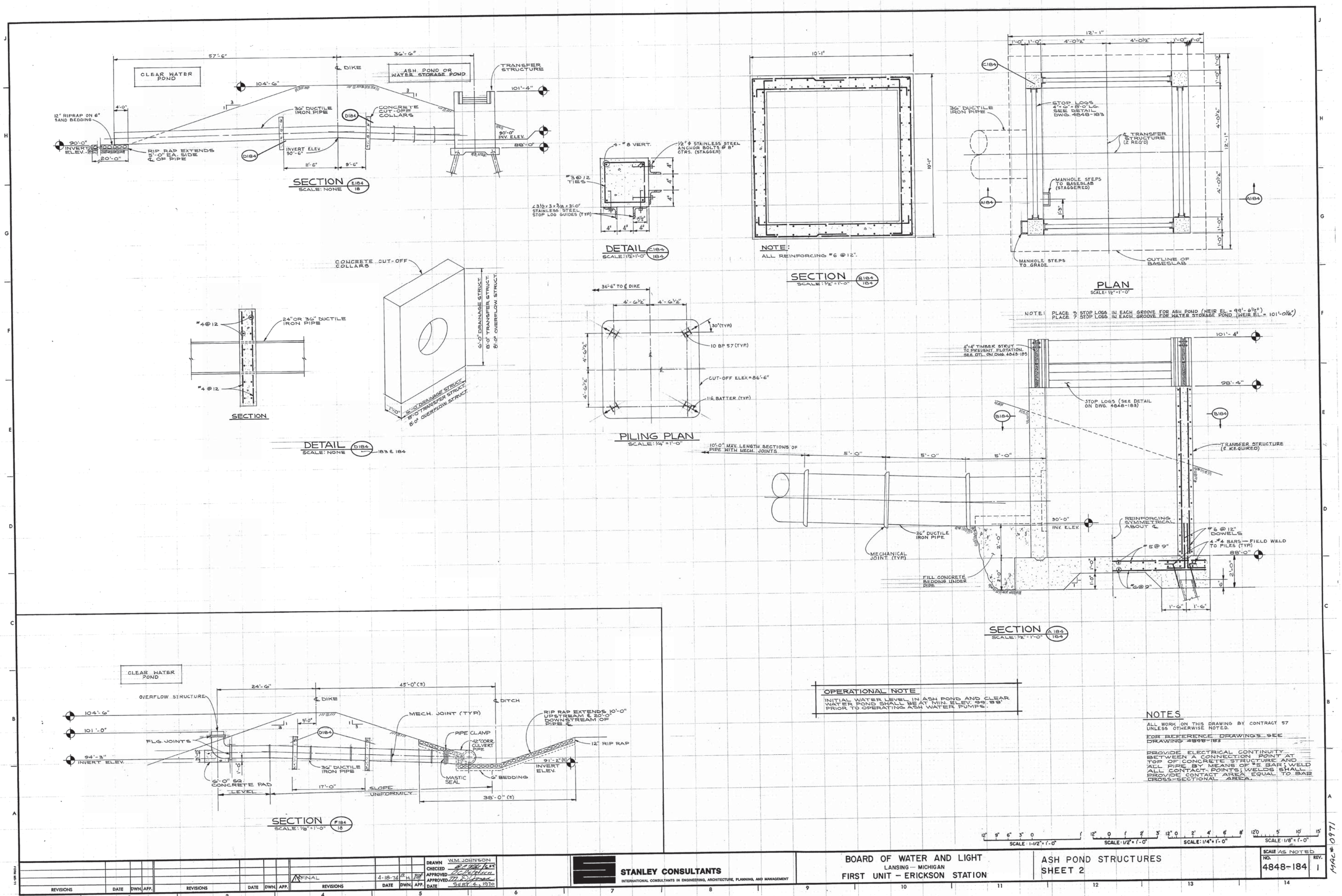
STANLEY CONSULTANTS
INTERNATIONAL CONSULTANTS IN ENGINEERING, ARCHITECTURE, PLANNING, AND MANAGEMENT

BOARD OF WATER AND LIGHT
LANSING — MICHIGAN
FIRST UNIT — ERICKSON STATION

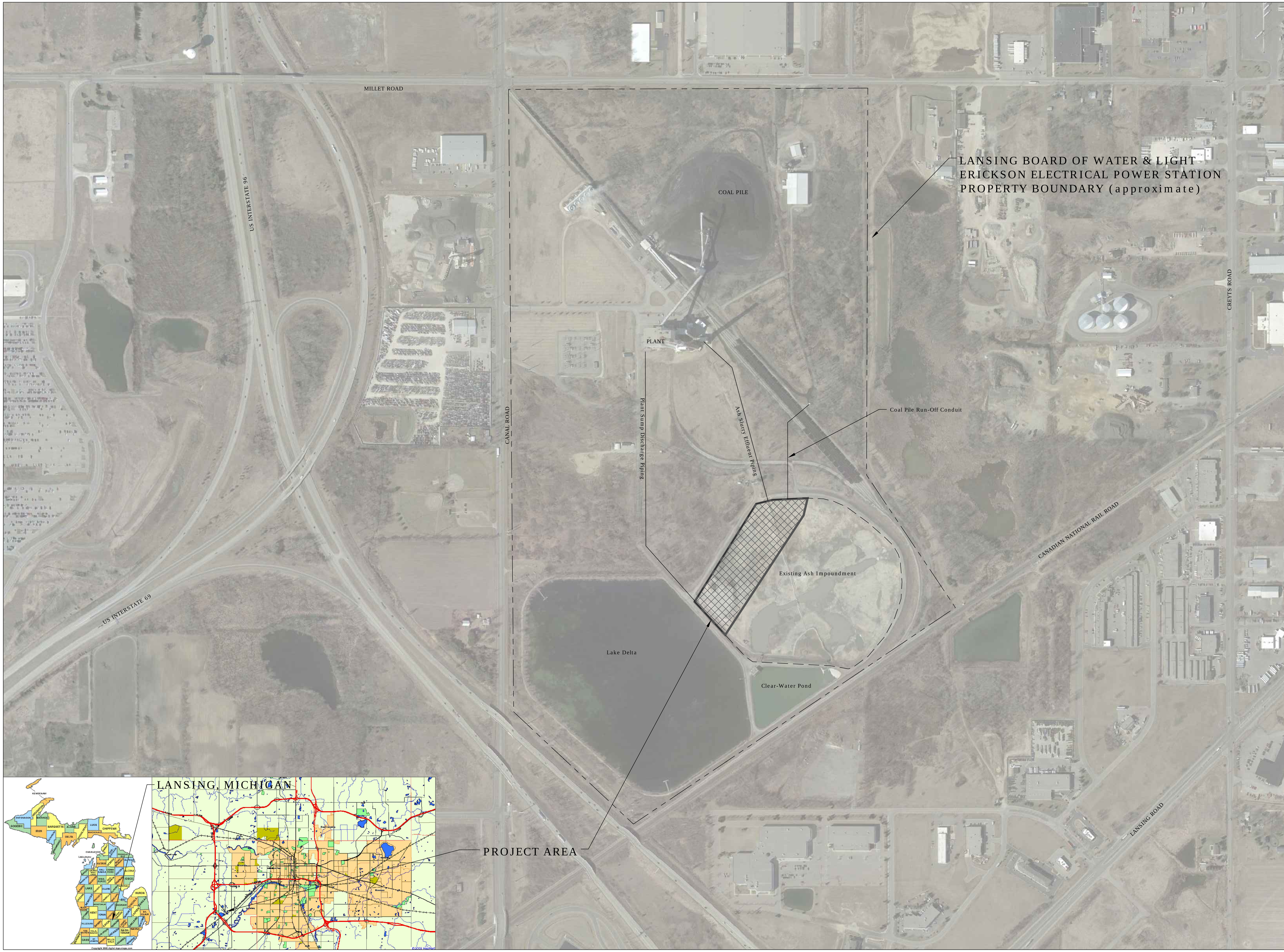
ASH POND EARTHWORK - CONTRACT 57

SCALE AS NOTED
NO. 4848-212
REV. 1

MAC #0998


SECTION E184 / 18
SCALE: NONE
CLEAR WATER POND
ASH POND OR WATER STORAGE POND
TRANSFER STRUCTURE
CONCRETE CUT-OFF COLLARS
36" DUCTILE IRON PIPE
12" RIPRAP ON 6" SAND BEDDING
RIP RAP EXTENDS 5'-0" EA. SIDE ℄ OF PIPE
DETAIL C184 / 184
SCALE: 1 1/2"=1'-0"
SECTION B184 / 184
SCALE: 1/2"=1'-0"
NOTE: ALL REINFORCING #6 @ 12".
PLAN
SCALE: 1/2"=1'-0"
NOTE: PLACE 3 STOP LOGS IN EACH GROOVE FOR ASH POND (WEIR EL. = 99'-6 1/2")
PLACE 7 STOP LOGS IN EACH GROOVE FOR WATER STORAGE POND (WEIR EL. = 101'-0 1/2")
SECTION
DETAIL D184 / 183 & 184
SCALE: NONE
PILING PLAN
SCALE: 1/4"=1'-0"
SECTION A184 / 184
SCALE: 1/2"=1'-0"
SECTION F184 / 18
SCALE: 1/8"=1'-0"
OPERATIONAL NOTE
INITIAL WATER LEVEL IN ASH POND AND CLEAR WATER POND SHALL BE AT MIN. ELEV. 99.88' PRIOR TO OPERATING ASH WATER PUMPS.
NOTES
ALL WORK ON THIS DRAWING BY CONTRACT 57 UNLESS OTHERWISE NOTED.
FOR REFERENCE DRAWINGS SEE DRAWING 4848-183
PROVIDE ELECTRICAL CONTINUITY BETWEEN A CONNECTION POINT AT TOP OF CONCRETE STRUCTURE AND ALL PIPE BY MEANS OF #5 BAR; WELD ALL CONTACT POINTS; WELDS SHALL PROVIDE CONTACT AREA EQUAL TO BAR CROSS-SECTIONAL AREA.
SCALE: 1-1/2"=1'-0"
SCALE: 1/2"=1'-0"
SCALE: 1/4"=1'-0"
SCALE: 1/8"=1'-0"
FINAL 4-18-74
DRAWN W.M. JOHNSON
DATE SEPT. 4, 1970
STANLEY CONSULTANTS
INTERNATIONAL CONSULTANTS IN ENGINEERING, ARCHITECTURE, PLANNING, AND MANAGEMENT
BOARD OF WATER AND LIGHT
LANSING — MICHIGAN
FIRST UNIT — ERICKSON STATION
ASH POND STRUCTURES
SHEET 2
SCALE AS NOTED
NO. 4848-184
REV. 1
MAC# 0971

ATTACHMENT 4
CONSTRUCTION DRAWINGS FOR FORMER FOREBAY AND FORMER RETENTION BASIN



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East Lansing, Michigan 48823
Phone: (517) 367-2674
Fax: (517) 367-2674
Web: www.mayottdesign.com

N

NOTES:

1. Project requires the reconfiguration of the existing LBWL ash impoundment.
2. The reconfiguration will entail construction of an impoundment encompassing approximately 5-acres of the existing impoundment, as depicted.
3. The reconfigured impoundment will consist of a sedimentation forebay hydraulically connected to a downstream retention basin by a culvert outlet structures.
4. Effluent from the retention basin will overflow to the existing Clear-Water Pond through a culvert and existing Monk-type outlet structure.
5. The volume of the existing ash impoundment that remains after the reconfiguration will be allowed to naturally fill with precipitation and groundwater infiltration. The resulting pond will drain to the retention basin through culvert outlet structures.

Background graphics provided by Google Earth.

No.	Revision/Issue	Date

PROJECT NAME AND ADDRESS:
Lansing Board of Water & Light
Erickson Station
Ash Impoundment Modifications
3725 South Canal Road
Lansing, Michigan 48917

PROJECT DETAIL:
Project Site Diagram

SCALE:
1" = 300'

DATE:
June 30, 2014

DRAWN BY:
TJM

FILE NAME:
Ash Pond Reconfiguration A 6-29-14.dwg

COVER

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Civil & Environmental Engineering

Mayotte Design & Engineering, PC
1130 Hitching Post Road
East Lansing, Michigan 48823
Phone: (517) 367-2674
Fax: (517) 367-2674
Web: www.mayottdesign.com

N

NOTES:

1. Dewater designated area for ash pond reconfiguration.
2. Re-located temporary ash pond to designated proposed area.
3. Backfill trucked to the project site or existing fill to be re-located may be staged within the designated stockpiling areas.
4. Extend temporary piping of appropriate size for maximum effluent throughput along designated transects.
5. Note that temporary sump effluent piping must cross the existing ash impoundment embankment at the northwest corner of the structure. The crossing shall be completed in accordance with project specifications.

Background graphics provided by Google Earth.

No.	Revision/Issue	Date

PROJECT NAME AND ADDRESS:

Lansing Board of Water & Light
Erickson Station
Ash Impoundment Modifications
3725 South Canal Road
Lansing, Michigan 48917

PROJECT DETAIL:
Pre-Construction Activities

SCALE:
1" = 60'

DATE:
June 15, 2014

DRAWN BY:
TJM

FILE NAME:
Ash Pond Reconfiguration A 6-29-14.dwg

SHEET 1

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NOTES:

Background graphics provided by Google Earth.

No.	Revision/Issue	Date

PROJECT NAME AND ADDRESS:

Lansing Board of Water & Light
Erickson Station
Ash Impoundment Modifications
3725 South Canal Road
Lansing, Michigan 48917

PROJECT DETAIL:
Pre-Construction Grades

SCALE:
1" = 60'

DATE:
June 30, 2014

DRAWN BY:
TJM

FILE NAME:
Ash Pond Reconfiguration A 6-29-14.dwg

SHEET 2

Cut–Off Trench Alignments

Point #	Northing	Easting	Description
828	433220.26	13045654.65	Short Trench – 0+00
829	433190.82	13045695.06	Short Trench – 0+50
830	433161.38	13045735.48	Short Trench – 1+00
831	433131.94	13045775.89	Short Trench – 1+50
832	433102.50	13045816.31	Short Trench – 2+00
833	433086.93	13045837.68	Short Trench – 2+26

Cut–Off Trench Alignments

Point #	Northing	Easting	Description
834	433506.11	13046092.17	Long Trench – 0+00
835	433460.12	13046078.41	Long Trench – 0+50
836	433418.10	13046051.31	Long Trench – 1+00
837	433376.09	13046024.21	Long Trench – 1+50
838	433334.07	13045997.10	Long Trench – 2+00
839	433292.05	13045970.00	Long Trench – 2+50
840	433250.04	13045942.90	Long Trench – 3+00
841	433208.02	13045915.79	Long Trench – 3+50
842	433166.00	13045888.69	Long Trench – 4+00
843	433123.99	13045861.59	Long Trench – 4+50
844	433081.97	13045834.48	Long Trench – 5+00
845	433039.95	13045807.38	Long Trench – 5+50
846	432997.94	13045780.28	Long Trench – 6+00
847	432955.92	13045753.17	Long Trench – 6+50
848	432913.90	13045726.07	Long Trench – 7+00
849	432871.89	13045698.97	Long Trench – 7+50
850	432829.87	13045671.86	Long Trench – 8+00
851	432787.85	13045644.76	Long Trench – 8+50
852	432745.84	13045617.66	Long Trench – 9+00
853	432703.82	13045590.55	Long Trench – 9+50
854	432661.80	13045563.45	Long Trench – 10+00
855	432640.89	13045549.96	Long Trench – 10+25

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NOTES:

1. Cut and fill surface to from toe of existing embankment surface to elevation of 871.5 feet NGVD.
2. Use cut approved cut materials for fill, where needed. Refer to Cut-and-Fill estimates provided on Sheet 4A.
3. Excavate Cut-Off Trench to specified elevation and dimensions.
4. Prepare Impoundment Foundation surface in accordance with specifications to ensure bond with Impoundment Embankment and Liner fill materials.

Background graphics provided by Google Earth.

No.	Revision/Issue	Date

PROJECT NAME AND ADDRESS:

Lansing Board of Water & Light
Erickson Station
Ash Impoundment Modifications
3725 South Canal Road
Lansing, Michigan 48917

PROJECT DETAIL:
Impoundment Foundation Details

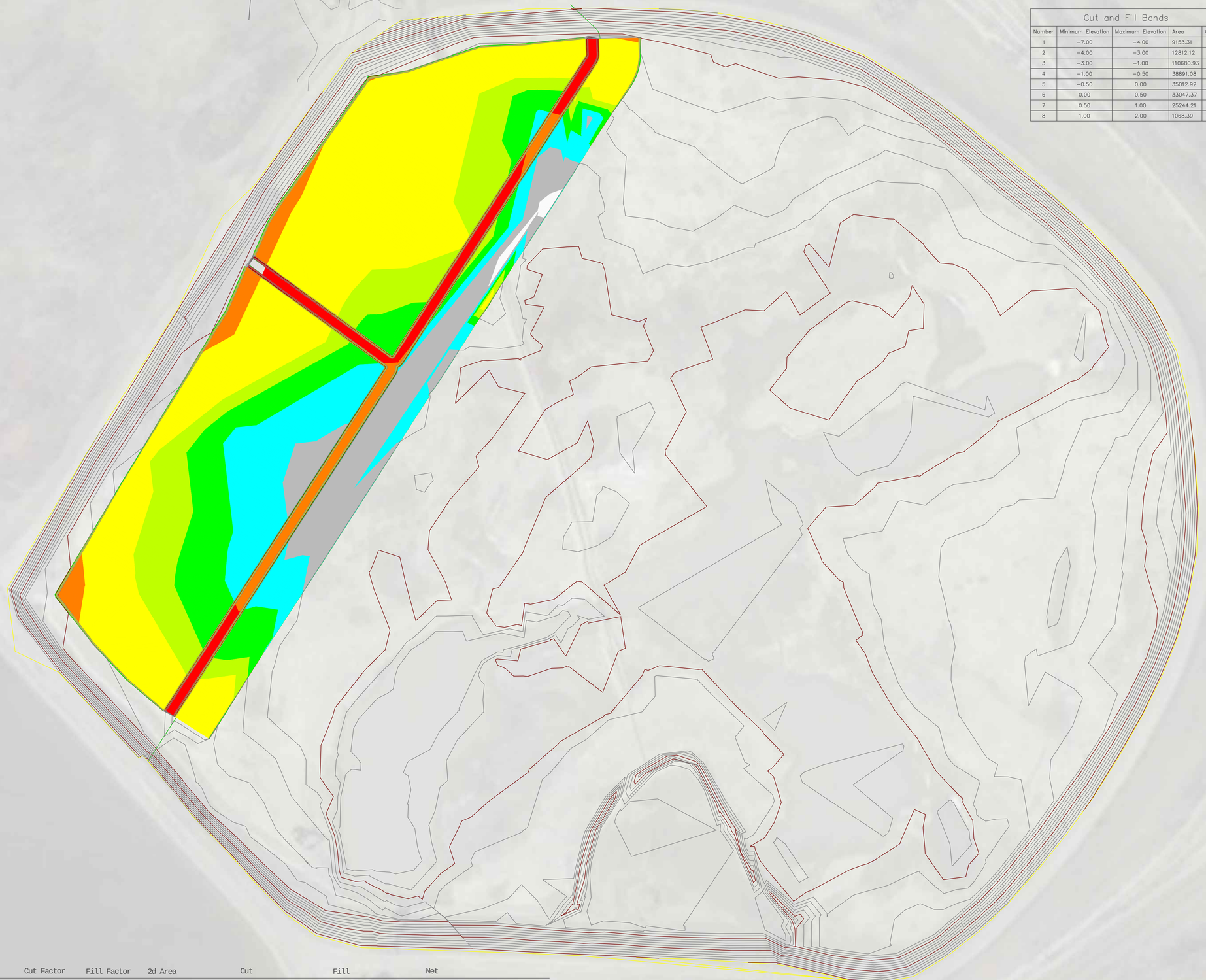
SCALE:
1" = 60'

DATE:
June 30, 2014

DRAWN BY:
TJM

FILE NAME:
Base Grading.dwg

SHEET 3



Cut and Fill Bands				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	−7.00	−4.00	9153.31	
2	−4.00	−3.00	12812.12	
3	−3.00	−1.00	110680.93	
4	−1.00	−0.50	38891.08	
5	−0.50	0.00	35012.92	
6	0.00	0.50	33047.37	
7	0.50	1.00	25244.21	
8	1.00	2.00	1068.39	

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
Foundation Cut and Fill	1.000	1.000	266119.61 Sq. Ft.	12219.80 Cu. Yd.	1032.36 Cu. Yd.	11187.44 Cu. Yd.<Cut>
Embankment Cut and Fill	1.000	1.000	330418.17 Sq. Ft.	524.11 Cu. Yd.	54613.88 Cu. Yd.	54089.78 Cu. Yd.<Fill>
Totals			596537.78 Sq. Ft.	12743.91 Cu. Yd.	55646.25 Cu. Yd.	42902.34 Cu. Yd.<Fill>

1" = 60'

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Web: www.mayottdesign.com

NOTES:

1. Cut and fill surface to from toe of existing embankment surface to elevation of 871.5 feet NGVD.
2. Use cut approved cut materials for fill, where needed. Refer to Cut-and-Fill estimates provided on Sheet 4A.
3. Excavate Cut-Off Trench to specified elevation and dimensions.
4. Prepare Impoundment Foundation surface in accordance with specifications to ensure bond with Impoundment Embankment and Liner fill materials.

Background graphics provided by Google Earth.

No.	Revision/Issue	Date

PROJECT NAME AND ADDRESS:

Lansing Board of Water & Light
Erickson Station
Ash Impoundment Modifications
3725 South Canal Road
Lansing, Michigan 48917

PROJECT DETAIL:
Foundation Cut and Fill

SCALE:
1" = 60'

DATE:
June 30, 2014

DRAWN BY:
TJM

FILE NAME:
Cut and Fill.dwg

SHEET 4

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NOTES:

1. Modify the Existing Ash Impoundment to configuration depicted on this sheet.
2. Reconfigured Ash Impoundment will consist of the Forebay for solids settling and a Retention Basin for additional sedimentation and nutrient uptake.
3. Base grading and foundation preparation details are summarized on Sheet 3. Associated Cut-and-Fill details are provided on Sheet 4.
4. Embankment details are provided on Sheet 6.
5. Route Coal Run-Off Discharge piping, Hydro-Bin Effluent piping, and Plant Sump Effluent piping to Forebay at the approximate points identified on this sheet and in accordance with the details provided on Sheet 7 and associated specifications.
6. Overflow from Forebay will be conveyed to the Retention Basin through a gang of three 24-inch CPP diameter culverts, as depicted on Sheet 7.
7. Existing Ash Impoundment shall drain to the Retention Basin through one 24-inch diameter CPP culvert, as depicted on Sheet 7.
8. Overflow from the Retention Basin will be conveyed to the Clear-Water Pond through 36" CPP (N-12) to the existing Overflow riser, as noted.

Background graphics provided by Google Earth.

No.	Revision/Issue	Date
1	Inlet Elevations	Jul 7, 2014

PROJECT NAME AND ADDRESS:

Lansing Board of Water & Light
Erickson Station
Ash Impoundment Modifications
3725 South Canal Road
Lansing, Michigan 48917

PROJECT DETAIL:
Impoundment Reconfiguration Plan

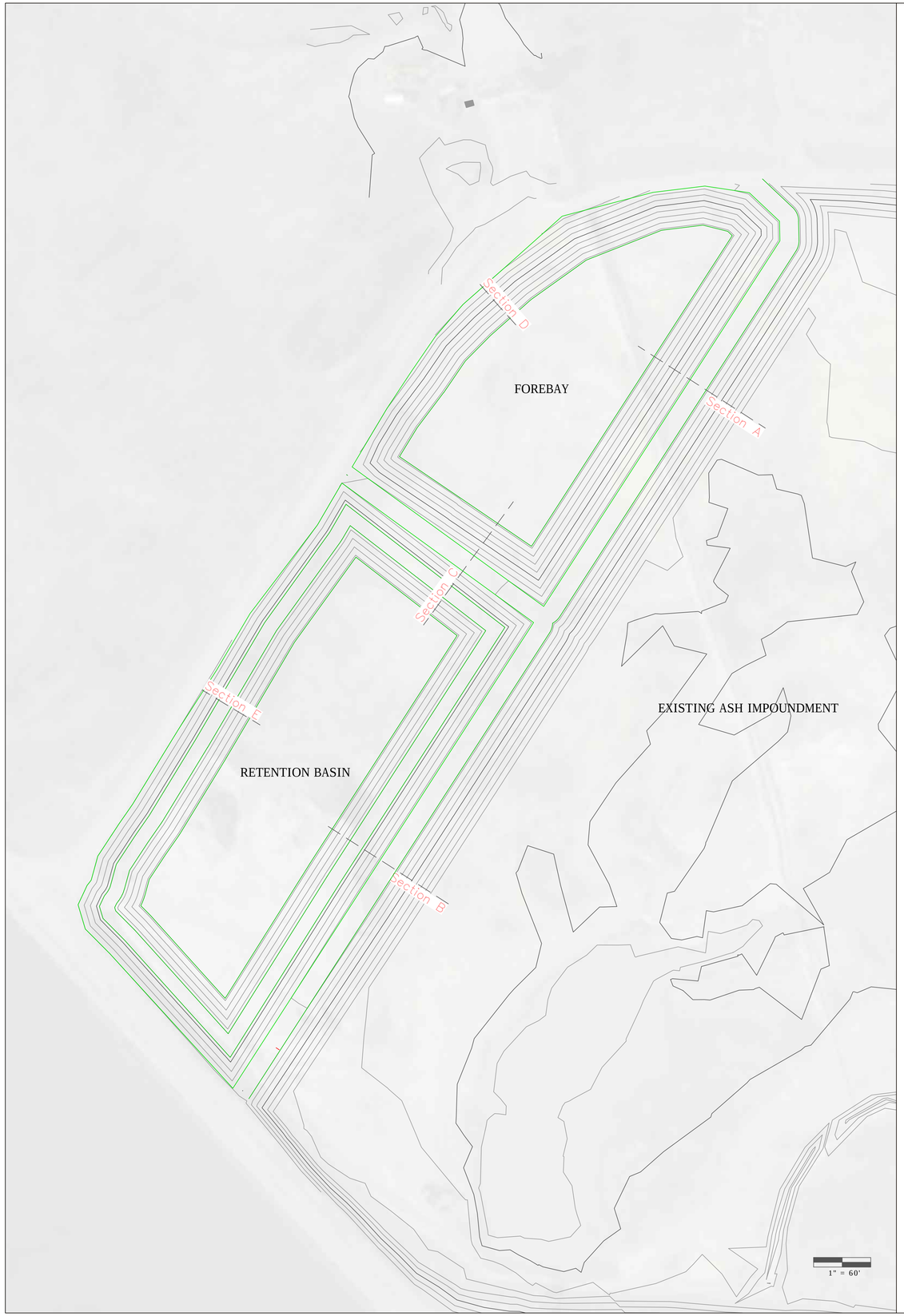
SCALE:
1" = 60'

DATE:
June 30, 2014

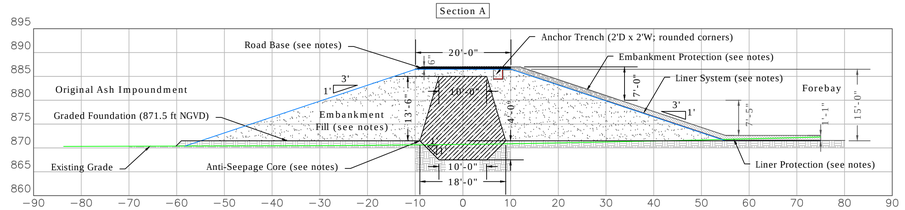
DRAWN BY:
TJM

FILE NAME:
Ash Pond Reconfiguration A 6-29-14.dwg

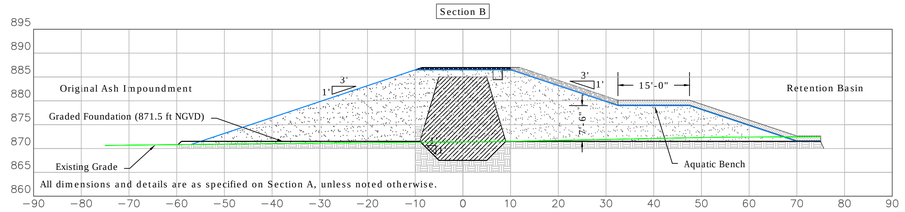
SHEET 5



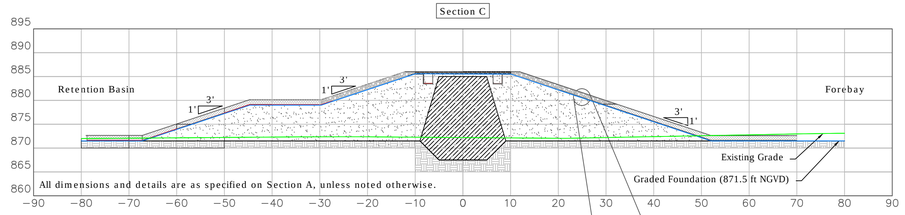
Section A



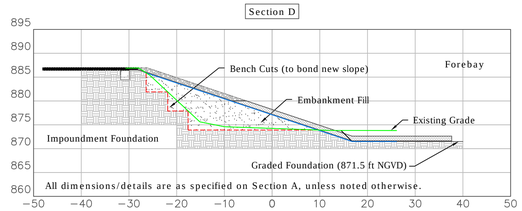
Section B



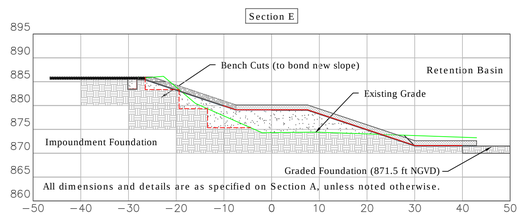
Section C

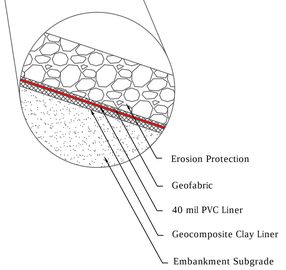


Section D



Section E





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NOTES:

1. All dimensions are in feet and inches.
2. Embankment Fill material: should conform to Unified Soil Classification SP or SC.
3. Anti-Seepage Core material: should conform to Unified Soil Classification GC, SC, CL or CH and maintain a permeability of less than 10E-7 cm/s following compaction.
4. Synthetic Liner System: 40 mil PVC liner over Geocomposite clay liner (Bentomat ST).
5. Existing embankments shall be benched per specifications to create a bond with new embankment fill.
6. Embankment protection materials shall be 2" x 5" crushed concrete over a suitable geotextile mat.
7. Liner protection materials shall consist of fine-grained granular aggregate over a suitable geotextile mat.
8. Road Base materials: should be 22-1A crushed concrete placed to a depth of 4-6".
9. See specifications for placement, compaction and testing requirements for the materials specified above.

Background graphics provided by Google Earth.

No.	Revision/Issue	Date

PROJECT NAME AND ADDRESS:

Lansing Board of Water & Light
Erickson Station
Ash Impoundment Modifications
3725 South Canal Road
Lansing, Michigan 48917

PROJECT DETAIL:
Typical Embankment Details

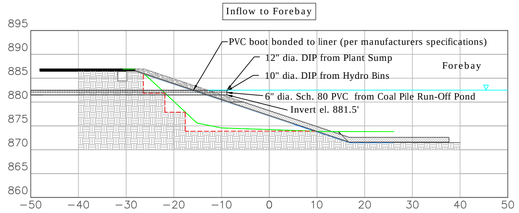
SCALE:
1" = 60'

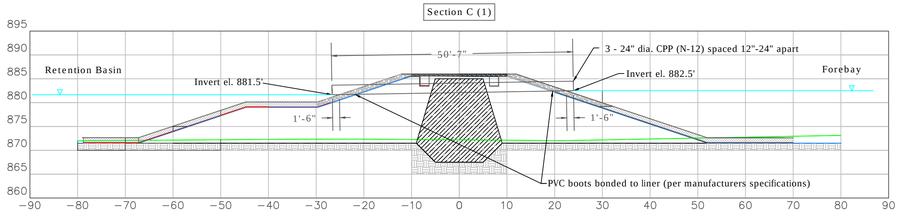
DATE:
June 30, 2014

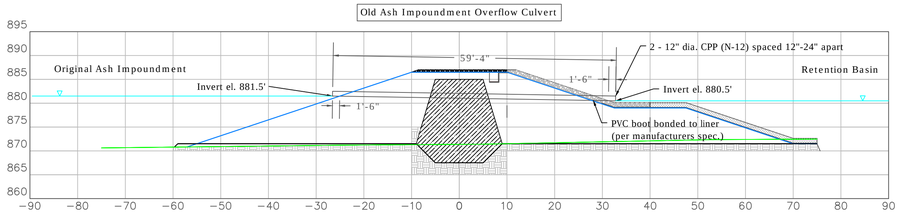
DRAWN BY:
TJM

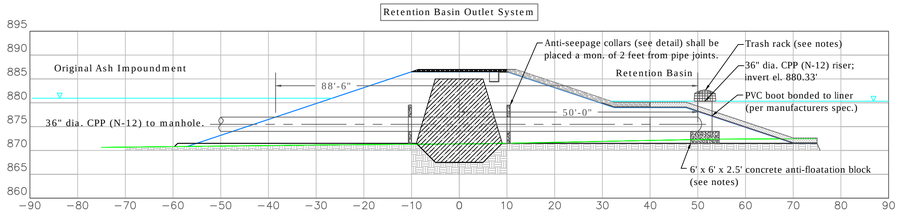
FILE NAME:
Ash Pond Reconfiguration A Profiles.dwg

SHEET 6



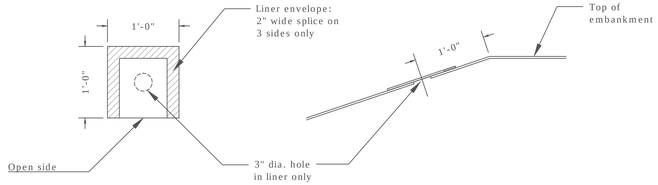




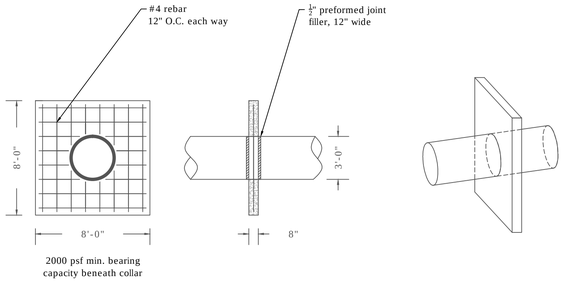


PLAN

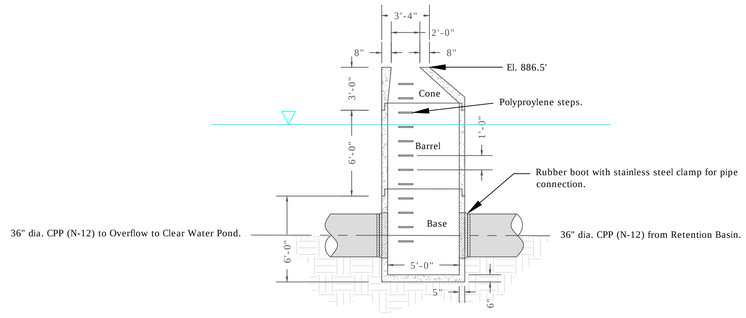
SECTION



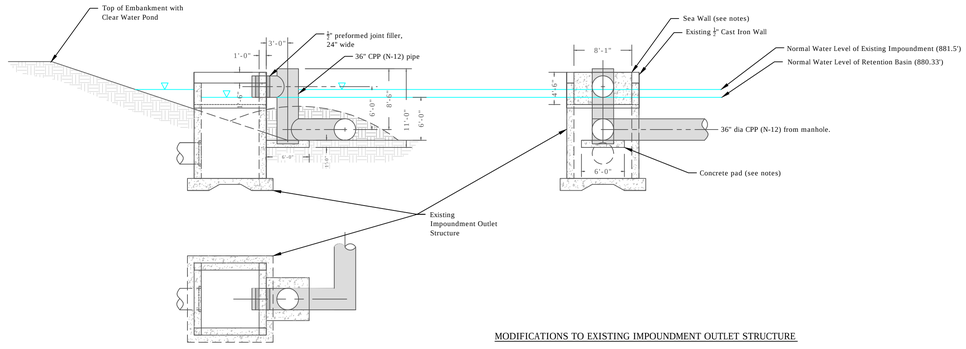
AIR/GAS VENT DETAIL



ANTI-SEEPAGE COLLAR



PRE-CAST MANHOLE



MODIFICATIONS TO EXISTING IMPOUNDMENT OUTLET STRUCTURE

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N

NOTES:

1. All poured concrete shall be min. 3,000 psi (28 day), unless noted otherwise.
2. Concrete anti-floatation block shall be integrally attached to riser base to prevent riser/block separation.
3. Trash Rack: Contech Construction Products Inc. Round Series, RS-48.
4. Air/Gas Vents to be positioned as detailed on 30' centers around both the Forebay and Retention Basin.
5. Pre-cast manhole to be constructed of 4000 psi concrete (at 28 days).
6. Manhole to be designed for H-20 wheel loading.
7. Manhole construciton to conform to ASTM C-478 and MDOT specifications.
8. Manhole concrete to be reinformced to 0.12 in sq/L.F.
9. Mahole shiplap joints to be sealed with butyl rubber gaskets.
10. Concrete block for overflow structure shall be integrally attached to riser base to prevent riser/block separation.
11. Sea Wall shall be reinforced with #4 rebar, 12" O.C. each direction.

Background graphics provided by Google Earth.

No.	Revision/Issue	Date

PROJECT NAME AND ADDRESS:

Lansing Board of Water & Light
Erickson Station
Ash Impoundment Modifications
3725 South Canal Road
Lansing, Michigan 48917

PROJECT DETAIL:
As Noted

SCALE:
Varies

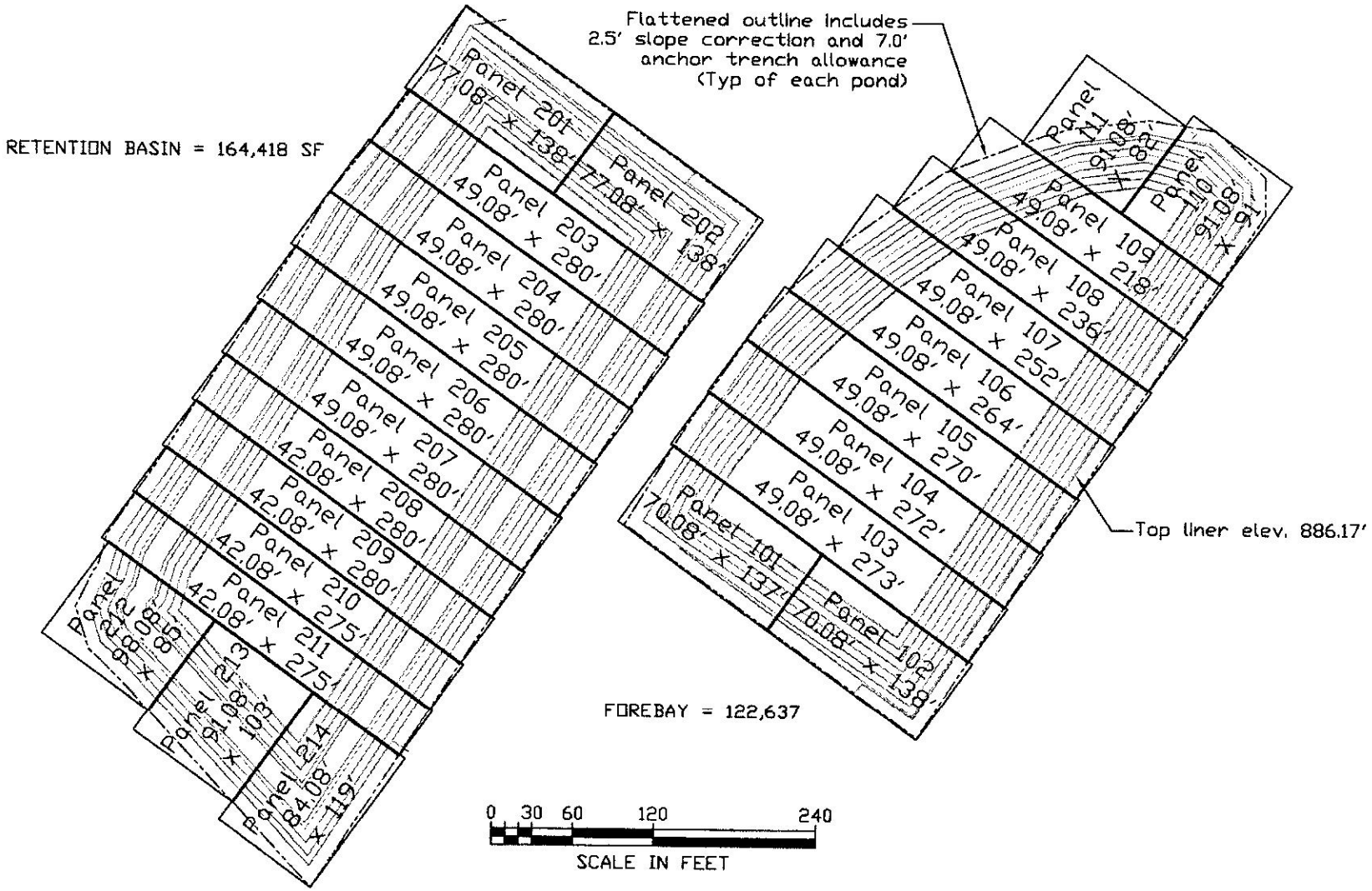
DATE:
June 30, 2014

DRAWN BY:
TJM

FILE NAME:
Ash Pond Reconfiguration A Profiles.dwg

SHEET 7

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



TOTAL AREA OF LINER REQUIRED: 287,055 SF

NORTH

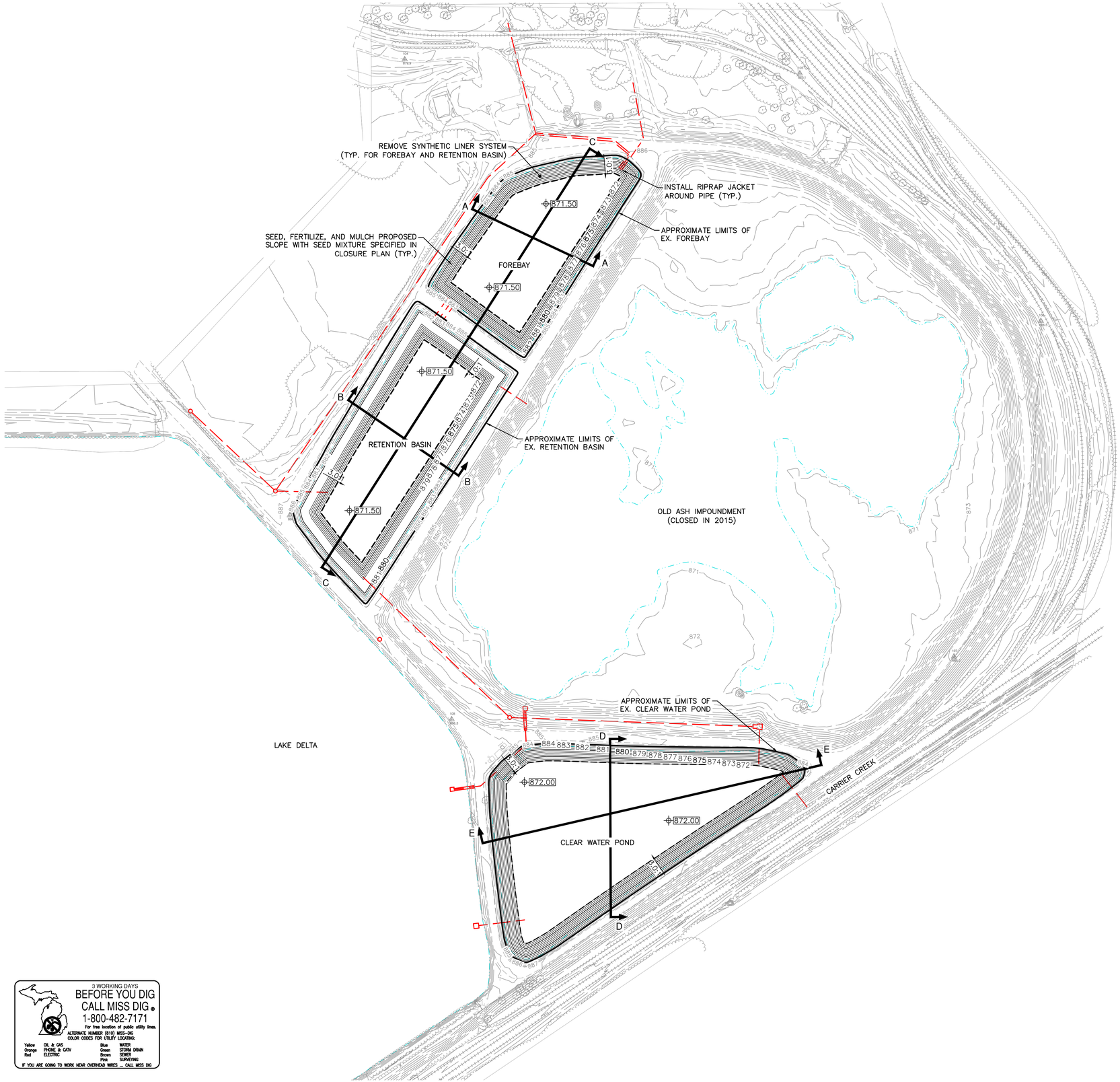
LANGE CONTAINMENT SYSTEMS, INC.
5150 RACE COURT
DENVER, CO 80216
(303) 446-8644 FAX (303) 446-8798

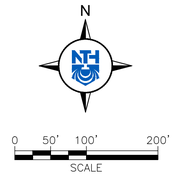
Lansing Water & Light

40 Mil PVC Liner for Retention and Forebay Basins

SIZE: A	DRAWN BY: C. Thomas	APPROVED BY: _____	REV: 7/25
SCALE: NTS	DWG NO: 114-0110A_LansingWater&Light		DATE: 7/22/14

ATTACHMENT 5
2018 GRADING PROFILES





LEGEND

- EXISTING CONTOURS
- EXISTING RAILROAD TRACK
- EXISTING FENCE
- EXISTING EDGE OF WATER
- EXISTING CONVEYANCE PIPE
- EXISTING DRIVEWAY
- EXISTING VEGETATION
- EXISTING TREE
- PROPOSED CONTOURS
- PROPOSED SPOT ELEVATION
- PROPOSED SLOPE

NOTES:

1. EXISTING TOPOGRAPHIC SURVEY COMPLETED BY DRONEVIEW ON SEPTEMBER 26, 2018. VERTICAL DATUM IS IN NAVD 88.
2. NO POND BOTTOM SOUNDING WAS PERFORMED FOR THE FOREBAY AND RETENTION BASIN. ASH VOLUME ESTIMATED BASED ON REMOVAL EFFICIENCY OF PLANT HYDROBINS.
3. BOTTOM OF ASH LIMITS FOR FOREBAY AND RETENTION BASIN BASED ON INFORMATION PROVIDED IN THE CONSTRUCTION DOCUMENTATION REPORT FOR THE ASH IMPOUNDMENT RECONFIGURATION BY MAYOTTE DESIGN AND ENGINEERING, P.C., DATED MAY 2015.
4. BOTTOM OF ASH LIMITS FOR CLEAR WATER POND BASED ON HISTORICAL PLANT DRAWINGS 4848-183 "ASH POND STRUCTURES SHEET 1" AND 4848-184 "ASH POND STRUCTURES SHEET 2".

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		Pink	SURVEYING

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Detroit, MI	313.237.3900
Lansing, MI	517.484.6900
Grand Rapids, MI	616.451.6270
Cleveland, OH	216.334.4040

SUBMITTAL

REV	DESCRIPTION	DATE	BY

PROJECT NAME:
ERICKSON STATION ASH IMPOUNDMENT CLOSURE

PROJECT LOCATION:
ERICKSON STATION
LANSING, MICHIGAN

NTH PROJECT NO.: 73-180055	CAD FILE NAME: 180055-CLS
DESIGNED BY: SLG	INCEP DATE: 12/19/2018
DRAWN BY: SLG	DRAWING SCALE: 1" = 100'
CHECKED BY: DRL	SUBMITTED DATE: 8/15/2019

SHEET TITLE:
PROPOSED GRADING PLAN

SHEET REFERENCE NUMBER:
3

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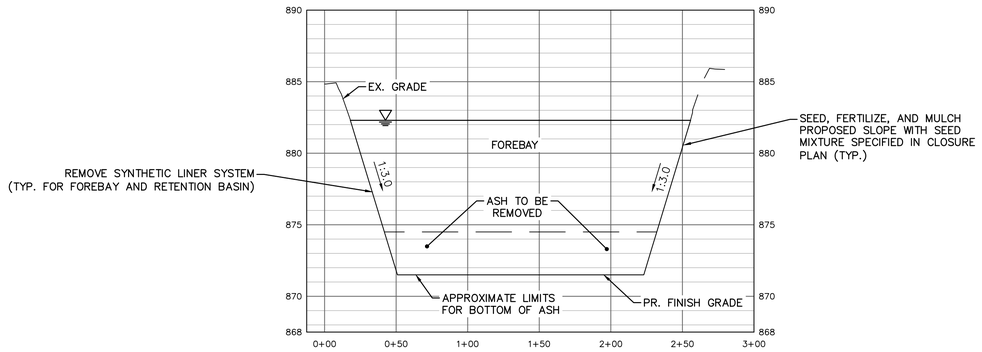
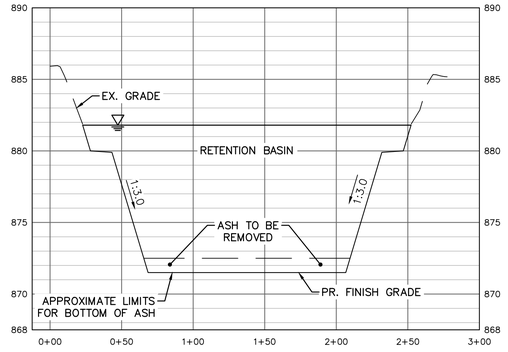


SECTION A-A

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

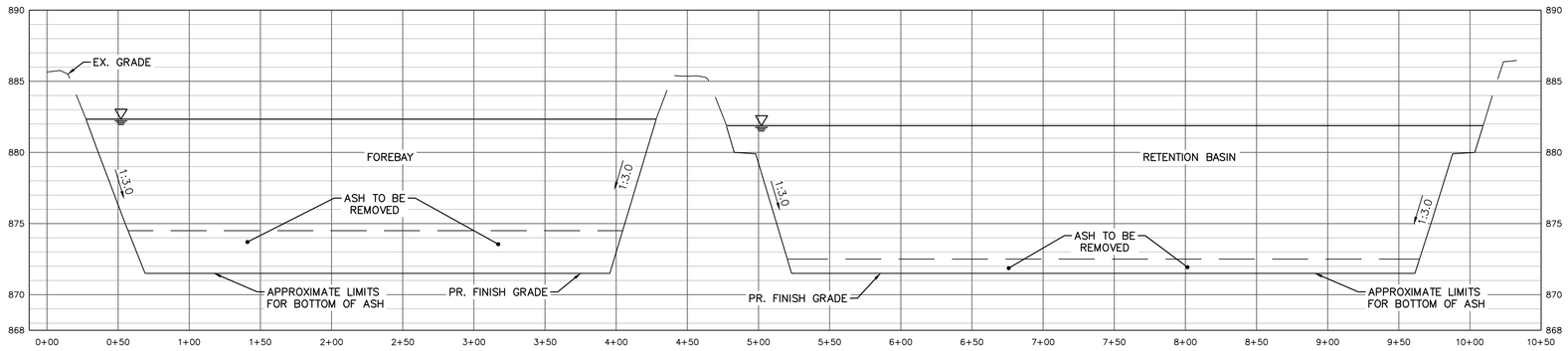


SECTION B-B

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

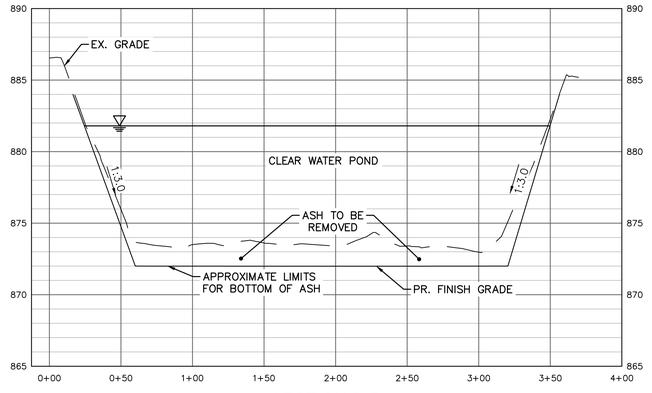
NOTES:

1. EXISTING TOPOGRAPHIC SURVEY COMPLETED BY DRONEVIEW ON SEPTEMBER 26, 2018. VERTICAL DATUM IS IN NAVD 88.
2. NO POND BOTTOM SOUNDING WAS PERFORMED FOR THE FOREBAY AND RETENTION BASIN. ASH VOLUME ESTIMATED BASED ON REMOVAL EFFICIENCY OF PLANT HYDROBINS.
3. BOTTOM OF ASH LIMITS FOR FOREBAY AND RETENTION BASIN BASED ON INFORMATION PROVIDED IN THE CONSTRUCTION DOCUMENTATION REPORT FOR THE ASH IMPOUNDMENT RECONFIGURATION BY MAYOTTE DESIGN AND ENGINEERING, P.C., DATED MAY 2015.
4. BOTTOM OF ASH LIMITS FOR CLEAR WATER POND BASED ON HISTORICAL PLANT DRAWINGS 4848-183 "ASH POND STRUCTURES SHEET 1" AND 4848-184 "ASH POND STRUCTURES SHEET 2".



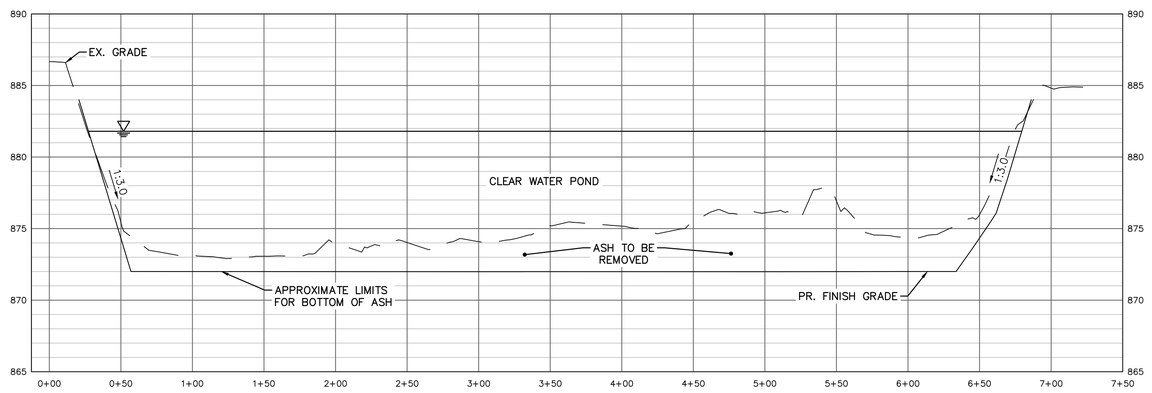
SECTION C-C

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



SECTION D-D

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



SECTION E-E

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

3 WORKING DAYS
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CALL MISS DIG
1-800-482-7171
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ALTERNATE NUMBER (810) MISS-DIG
COLOR CODES FOR UTILITY LOCATING:

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Red	ELECTRIC	Brown	SEWER
		Pink	SURVEYING

IF YOU ARE GOING TO WORK NEAR OVERHEAD WIRES ... CALL MISS DIG

NTH Consultants, Ltd.
Infrastructure Engineering and Environmental Services

Northville, MI	248.553.6300
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Lansing, MI	517.484.6900
Grand Rapids, MI	616.451.6270
Cleveland, OH	216.334.4040

SUBMITTAL

REV	DESCRIPTION	DATE	BY

PROJECT NAME:

ERICKSON STATION ASH IMPOUNDMENT CLOSURE

PROJECT LOCATION:

ERICKSON STATION
LANSING, MICHIGAN

NTH PROJECT NO.: 73-180055	CAD FILE NAME: 180055-CLS
DESIGNED BY: SLG	INCEP DATE: 12/19/2018
DRAWN BY: SLG	DRAWING SCALE: 1" = 50'
CHECKED BY: DRL	SUBMITTED DATE: 8/15/2019

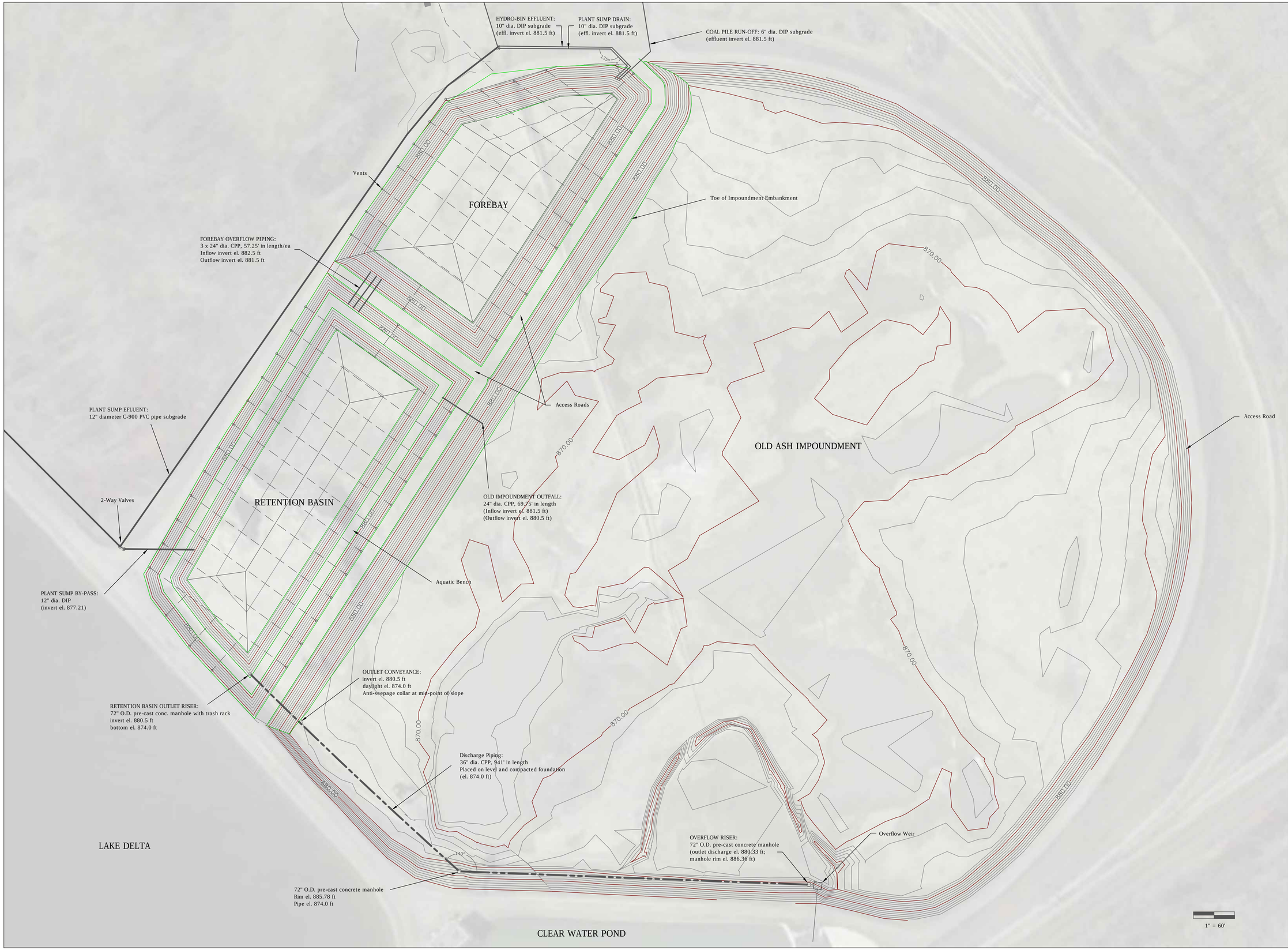
SHEET TITLE:

PROPOSED GRADING PROFILES

SHEET REFERENCE NUMBER:

4

ATTACHMENT 6
AS-BUILT DRAWINGS FOR FORMER FOREBAY & FORMER RETENTION BASIN



MD&E®
Civil & Environmental Engineering

Mayotte Design & Engineering, PC
1130 Hitching Post Road
East Lansing, Michigan 48823
Phone: (517) 367-2674
Fax: (517) 367-2674
Web: www.mayottdesign.com

N

NOTES:

1. Grading of old ash pond floor was completed during the reconfiguration of the Ash Impoundment System. However, no survey data was avaialble for the surface of the old ash pond floor. Elevations of the old ash pond floor depicted on this sheet were interpolated from data collected in 2012.

Background graphics provided by Google Earth.

No.	Revision/Issue	Date
1	Inlet Elevations	Jul 7, 2014

PROJECT NAME AND ADDRESS:

Lansing Board of Water & Light
Erickson Station
Ash Impoundment Modifications
3725 South Canal Road
Lansing, Michigan 48917

PROJECT DETAIL:
As-Built Ash Impoundment System

SCALE:
1" = 60'

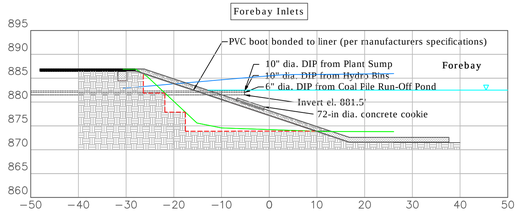
DATE:
May 22, 2015

DRAWN BY:
TJM

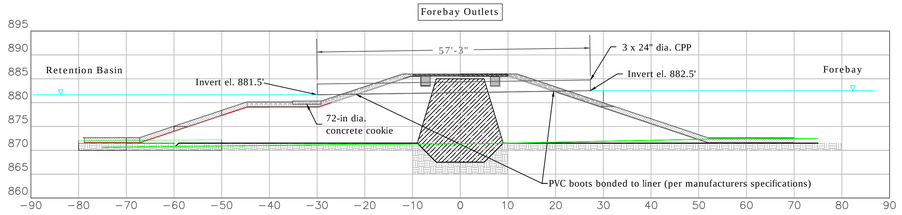
FILE NAME:
Ash Pond Reconfiguration A Floor Regrading.dwg

SHEET 5AB

Forebay Inlets

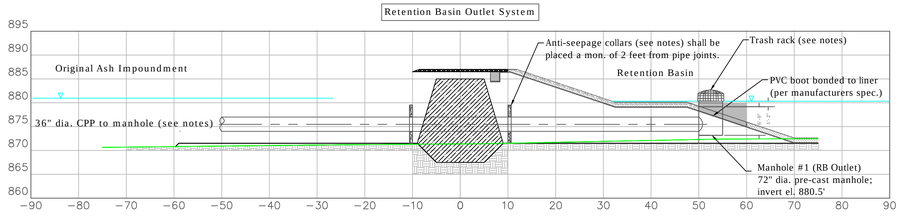


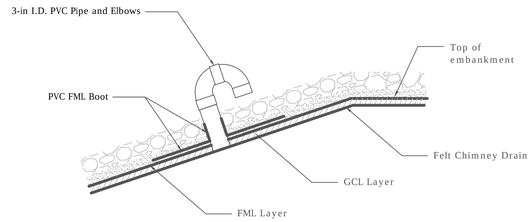
Forebay Outlets



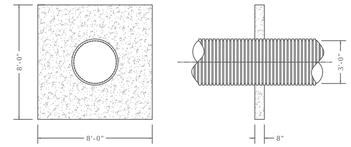
Old Ash Impoundment Outlet

Retention Basin Outlet System



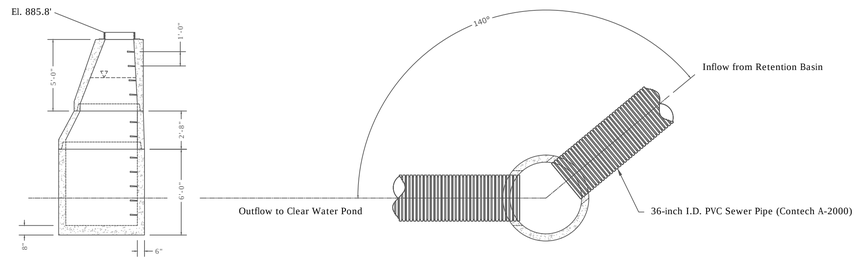


AIR/GAS VENT DETAIL

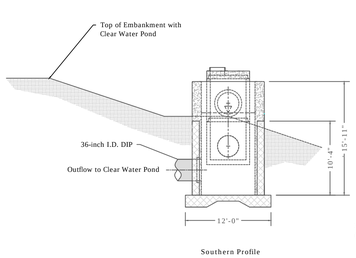


2000 psf min. bearing capacity beneath collar

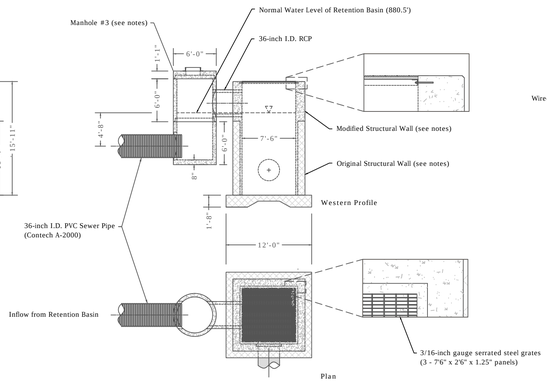
ANTI-SEEPAGE COLLARS



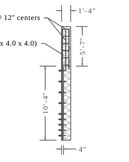
PRE-CAST MANHOLE #2



Southern Profile



Plan



Concrete Reinforcement Plan

ASH IMPOUNDMENT OVERFLOW STRUCTURE - DECEMBER 2014

MD&E®
Civil & Environmental Engineering
Mayotte Design & Engineering, PC
1130 Hitching Post Road
East Lansing, Michigan 48823
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Fax: (517) 367-2674
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NOTES:

1. All poured concrete is 3000 psi (28 day), unless noted otherwise.
2. Trash Rack: Contech Construction Products Inc. Round Series, RS-60.
3. Air/Gas Vents are positioned at the perimeters of the Forebay and Retention Basins as depicted on SHEET 5AB.
4. Pre-cast manholes constructed of 4000 psi concrete (at 28 days).
5. Manholes designed for H-20 wheel loading.
6. Manholes constructed to conform to ASTM C-478 and MDOT specifications.
7. Manhole concrete to reinforced to 0.12 in sq/L.F.
8. Mahole shiplap joints sealed with butyl rubber gaskets.
9. PVC and concrete pipe sealed in manhole structures with cement/grout mixture.
10. Manhole covers and frames are Model 1040 from East Jordan Iron Works, Inc.
11. Dimensions for Anti-Seepage Collars are approximate.
12. Details of the original concrete and piping elements of the Overflow Weir are summarized on Ash Pound Structures SHEET 2, BWL Drawing No. 4848-184, approved Sept. 4, 1970.

No.	Revision/Issue	Date

PROJECT NAME AND ADDRESS:

Lansing Board of Water & Light
Erickson Station
Ash Impoundment Modifications
3725 South Canal Road
Lansing, Michigan 48917

PROJECT DETAIL: As Noted

SCALE: Varies

DATE: May 22, 2015

DRAWN BY: TJM

FILE NAME: As-Built Profiles.dwg

SHEET 7AB

ATTACHMENT 7

CONSTRUCTION SPECIFICATIONS FOR FORMER FOREBAY & FORMER RETENTION BASIN

LANSING BOARD OF WATER & LIGHT
ERICKSON STATION ASH POND RECONFIGURATION

Foundation Preparation

1.0 Scope

1.1 The work consists of the preparation of a level foundation for the construction of the reconfigured ash pond (POND).

1.2 Earthfill is composed of natural earth materials that can be placed and compacted by construction equipment operated in a conventional manner.

1.3 Earth backfill is composed of natural arth material placed and compacted in confined spaces or adjacent to structures (including pipes) by hand tamping, manually directed power tampers or vibrating plates, o their equivalent.

2.0 Material

2.1 All fill material shall be obtain d from pre-approved borrow sources. The selection, ble ding, routing, and disposition of material in the arious fills shall be subject to approval by the SITE ENGINEER.

2.2 Fill materials shall contain no frozen soil, sod, brush, roots, or other erishable material. Rock particles larger than the maximum size specified for each type of fill shall be removed prior to compa tion of the fill.

2.3 The types of material used in the various fills shall be as listed and described in the specifications and drawings.

3.0 Pre-Construction Operations

3.1 Dewater the foundation area for the reconfigured ash pond (POND) depicted on Sheets 1 and 2:

3.1.1 Furnish, install, operate and remove dewatering equipment necessary to drain and keep POND foundation area and associated excavations free of water under all circumstances.

3.1.2 Prevent surface water from flowing into excavations and promptly remove any accumulated water.

3.1.3 Where appropriate, dewatering equipment shall remain in-place until construction work below the ground water table is complete.

3.2 Relocate the temporary ash pond to area designated on Sheet

3.2 Re-route the plant sump effluent piping to connect with existing Hydro-Bin temporary discharge piping.

3.2.1 To facilitate the connection to the Hydro-Bin effluent piping, the plant sump effluent plumbing must be re-directed to the northeast along the north side of the access road, as depicted on Sheet 1.

3.2.2 The sump piping is to penetrate the road/pond embankment at the appr ximate location identified on Sheet 1. The pipe penetration shall consist of a trench 4-6 feet deep and at least 36 inches wide. Compacted sand shall be placed ver the trench base to a depth of at least 6 inches. pe shall be placed over compacted sand base layer. Compacted sand shall be placed to a minimum pth of 6 inches above top of pipe. Earthfill deemed uitable by the engineer shall be backfilled compacted to the surface elevation of the embankment.

4.0 Pond Foundation Preparation

4.1 Except as ot erwise specified, the POND foundation area designated on Sheet 2 shall be graded to remove surface irregularities and to establish a level elevation of 871.5 feet NGVD.

4.1.1 The foundation area shall be stripped to remove vegetation, coal ash and other unsuitable material. Strip topsoil, vegetation and other objectionable material to a minimum depth of 6 inches. Dispose residual ash. Stockpile clean topsoil in areas designated on Sheet 1 for potential use for subsequent construction activities.

4.1.2 Excavate soil in the Cut areas identified on Sheet 3 to an elevation of 871.5 feet NGVD.

4.1.3 Scrape 6 inches of pond footprint in the Fill areas identified on Sheet 3 areas to remove residual ash, verify foundation conditions and scarify ground surface to facilitate bond for backfill. Dispose residual ash. Stockpile excavated soil in areas designated on Sheet 1.

4.1.4 The SITE ENGINEER shall inspect and approve the structural competence of the exposed Cut and Fill surfaces prior to scarification or placement of any backfill.

4.1.5 Upon approval by SITE ENGINEER, Cut and Fill areas that are deemed competent to support compaction equipment shall be scarified to a depth of 2 inches and compacted to within 95% of the maximum dry density of the foundation soils, as determined by the SITE ENGINEER.

4.1.6 Place backfill in the Fill areas designated on Sheet 3 to achieve a level surface elevation of 871.5 feet NGVD. Initial lifts of backfill shall be shall be placed within Fill areas of lowest elevations. Backfill lifts shall be no greater than 8 inches in thickness uncompacted and must be parallel to the target foundation surface. Backfill shall be compacted to within 95% of the maximum dry density of the backfill, as determined by the SITE ENGINEER. Backfill layers shall be continuously manipulated to provide uniform layers approximately parallel to the finished grade.

4.1.7 After stripping and cut and fill operations have resulted in a contiguous level surface, the foundation shall be scarified parallel to the axis of the placement of fill material or otherwise acceptably scored and loosened to a minimum depth of 2 inches. The moisture content of the loosened material shall be controlled as specified for the backfill, and the surface material of the foundation shall be compacted and bonded with the first layer of backfill to within 95% of the maximum dry density of the backfill, as determined by the SITE ENGINEER.

4.1.8 Excavate cut-off trenches along the alignments and to the specifications designated on Sheet 2. Stockpile acceptable excavated materials in areas designated on Sheet 1.

4.1.9 Ensure that cut-off trenches are adequately dewatered to facilitate placement and compaction of designated backfill to within 95% of the maximum dry density of the material, as determined by SITE ENGINEER.

ATTACHMENT 8
2025 AS-BUILT DRAWINGS FOR IMPOUNDMENT CLOSURE

VICINITY MAP

SCALE: 1" = 500'

Contract Drawings For

Lansing Board of Water & Light

Former Erickson Power Station Ash Impoundments Closure

Issued for As-Built

Project No.
10338772

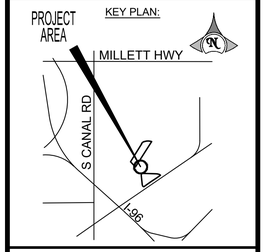
Lansing, Michigan
July 2025

INDEX OF DRAWINGS

LANSING BWL
Hometown People. Hometown Power.

PROJECT ENGINEERING DEPARTMENT
1201 S. WASHINGTON AVE., LANSING, MICHIGAN 48910

KEY PLAN:



REVISIONS:

REV.	DESCRIPTION	BY	CHK	DATE
0	ISSUED FOR BID	BB	LZ	10-12-2022
1	ISSUED FOR CONSTRUCTION	BB	LZ	01-31-2023
2	AS-BUILT	BB	LZ	07-09-2025

THIS DOCUMENT WAS ORGINALLY ISSUED AND SEALED TERRY BRYCE BURKETT, LICENSE NO. 6201066757 ON JANUARY 31, 2023.

HDR

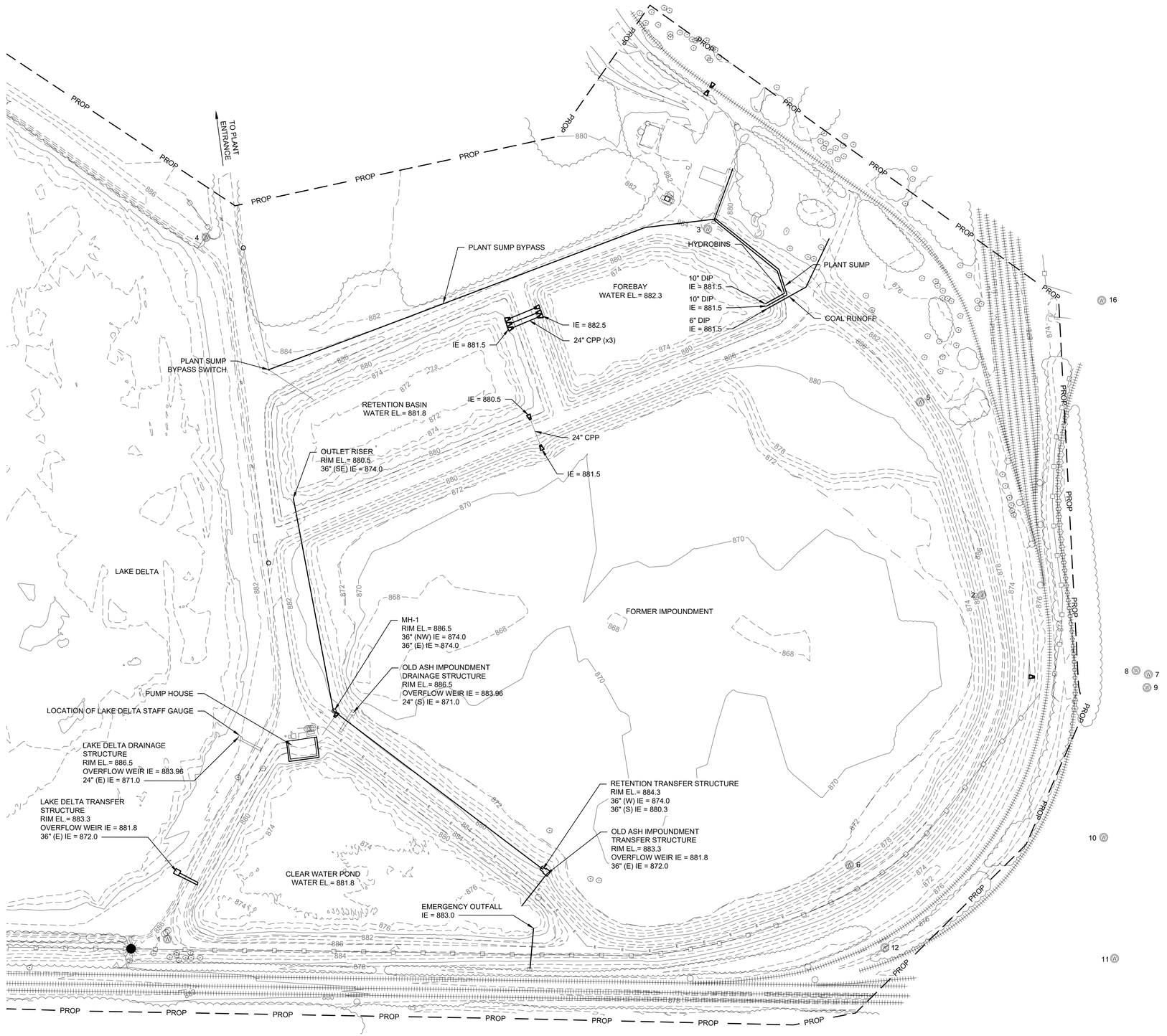
DATE:	07/09/2025	DWG BY:	C. ABBOTT
CHK BY:	B. BURKETT	APPR BY:	B. BURKETT
PROJ NO:	10338772	STATUS:	AS-BUILT

PROJECT NAME:
FORMER ERICKSON POWER STATION ASH IMPOUNDMENTS CLOSURE

DRAWING TITLE:
COVER SHEET

SITE:	ERICKSON
STR/AREA:	GENERAL SITE (ALL SHEETS)
DISCIPLINE:	CIVIL
FLOOR:	N/A

BWL DRAWING NUMBER: G-1000
REVISION: 2



HISTORICAL CONDITIONS

SCALE: 1" = 100'

0 1" 2"

LEGEND

- PROPERTY BOUNDARY
- EXISTING VEGETATION
- EXISTING FENCE LINE
- EXISTING EDGE OF WATER
- EXISTING RAILROAD SPUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING ELECTRICAL
- EXISTING MONITORING WELL

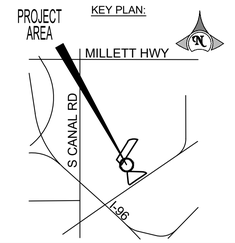
NOTES

1. EXISTING CONTOURS PREPARED BY DRONEVIEW, DATED SEPTEMBER 26, 2018. EXISTING SURVEY WAS PREPARED USING NAVD 88.
2. BOTTOM OF FOREBAY, RETENTION BASIN AND CLEAR WATER POND ESTABLISHED FROM BATHYMETRIC SURVEY DATA PROVIDED BY AFFILIATED RESEARCHERS DATED JULY 2021.

LANSING BWL
Hometown People. Hometown Power.

PROJECT ENGINEERING DEPARTMENT
1201 S. WASHINGTON AVE., LANSING, MICHIGAN 48910

KEY PLAN:



REVISIONS:

REV.	DESCRIPTION	BY	CHK	DATE
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1	ISSUED FOR CONSTRUCTION	BB	LZ	01-31-2023
2	AS-BUILT	BB	LZ	07-09-2025

HDR

DATE:	07/09/2025	DWG BY:	C. ABBOTT
CHK BY:	B. BURKETT	APPR BY:	B. BURKETT
PROJ NO:	10338772	STATUS:	AS-BUILT

PROJECT NAME:
FORMER ERICKSON POWER STATION ASH IMPOUNDMENTS CLOSURE

DRAWING TITLE:
HISTORICAL CONDITIONS

SITE:	ERICKSON
STR/AREA:	ASH POND
DISCIPLINE:	CIVIL
FLOOR:	N/A

BWL DRAWING NUMBER: E-3000

REVISION: 2

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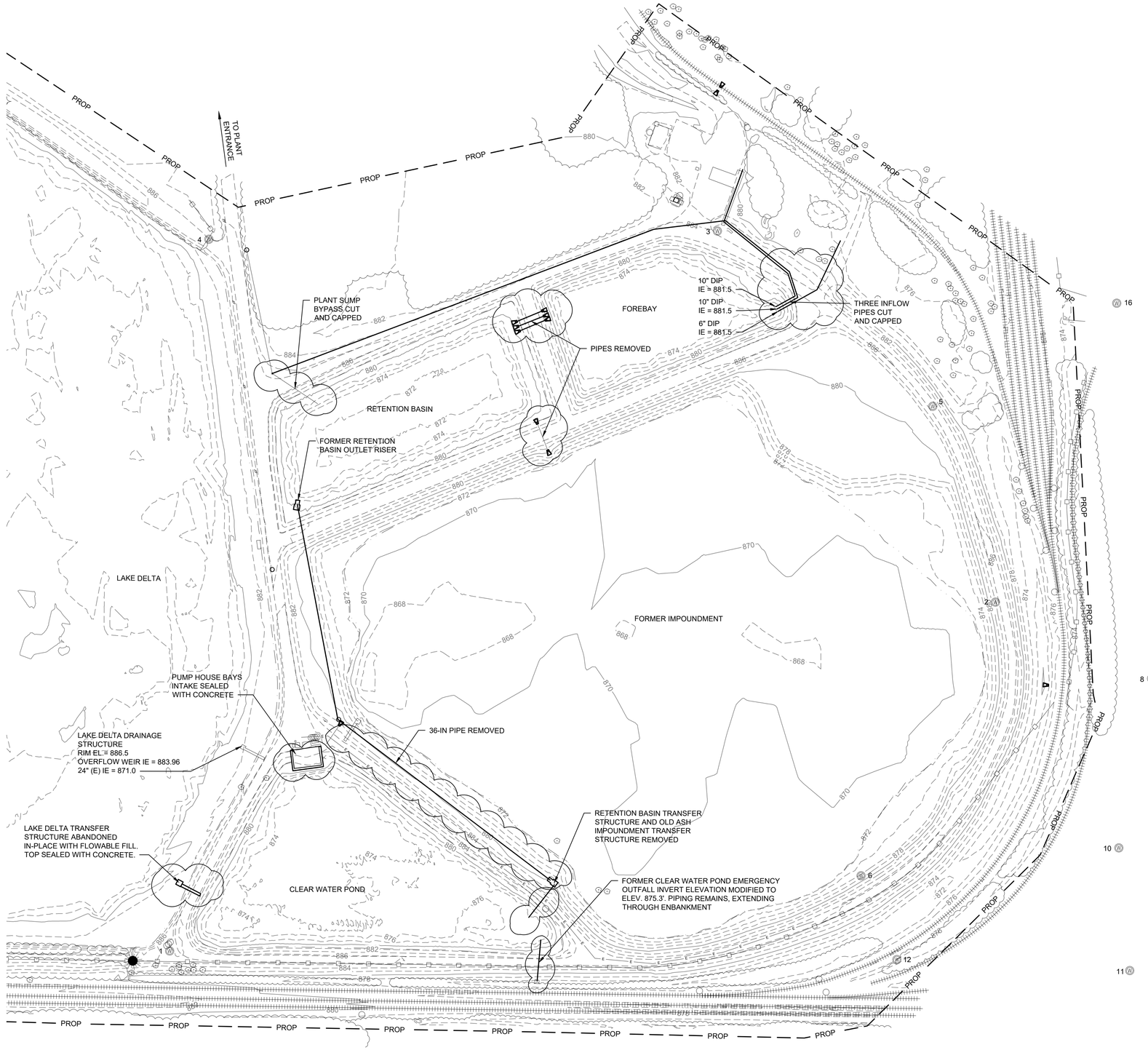


ABANDONMENT PLAN VIEW

SCALE: 1" = 100'

0 1" 2"

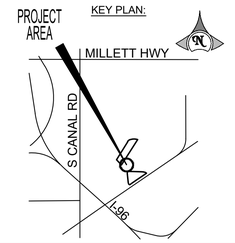
LEGEND

- PROP — PROPERTY BOUNDARY
- EXISTING VEGETATION
- EXISTING FENCE LINE
- EXISTING EDGE OF WATER
- EXISTING RAILROAD SPUR
- 880 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- (W) EXISTING MONITORING WELL

LANSING BWL
Hometown People. Hometown Power.

PROJECT ENGINEERING DEPARTMENT
1201 S. WASHINGTON AVE., LANSING, MICHIGAN 48910

KEY PLAN:



REVISIONS:

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1	ISSUED FOR CONSTRUCTION	BB	LZ	01-31-2023
2	AS-BUILT	BB	LZ	07-09-2025

HDR

DATE:	07/09/2025	DWG BY:	C. ABBOTT
CHK BY:	B. BURKETT	APPR BY:	B. BURKETT
PROJ NO:	10338772	STATUS:	AS-BUILT

PROJECT NAME:
FORMER ERICKSON POWER STATION ASH IMPOUNDMENTS CLOSURE

DRAWING TITLE:
ABANDONMENT PLAN VIEW

SITE:	ERICKSON
STR/AREA:	ASH POND
DISCIPLINE:	CIVIL
FLOOR:	N/A

BWL DRAWING NUMBER: X-5000

REVISION: 2

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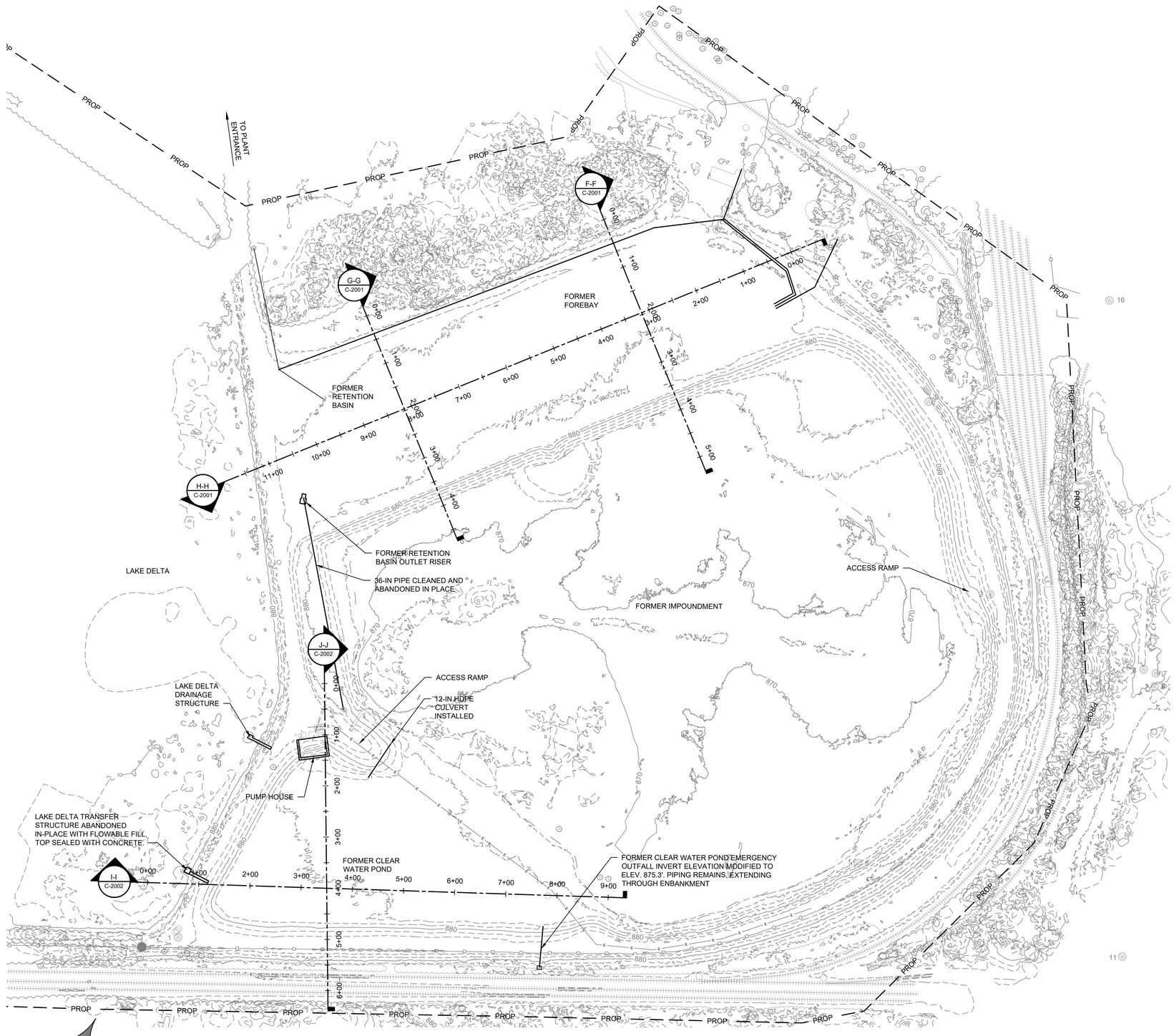


FINAL CONDITIONS

SCALE: 1" = 100'

LEGEND

- PROP — PROPERTY BOUNDARY
- EXISTING VEGETATION
- EXISTING FENCE LINE
- EXISTING EDGE OF WATER
- EXISTING RAILROAD SPUR
- 880 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- W — EXISTING MONITORING WELL
- 880 — PROPOSED MAJOR CONTOUR

NOTES

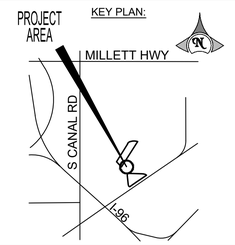
1. FINAL SURVEY PROVIDED BY TL CONTRACTING, INC DATED JUNE 11, 2025.

0 1" 2"

BWL LANSING
Hometown People. Hometown Power.

PROJECT ENGINEERING DEPARTMENT
1201 S. WASHINGTON AVE., LANSING, MICHIGAN 48910

KEY PLAN:



REVISIONS:

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0	ISSUED FOR BID	BB	LZ	10-12-2022
1	ISSUED FOR CONSTRUCTION	BB	LZ	01-31-2023
2	AS-BUILT	BB	LZ	07-09-2025

HDR

DATE:	07/09/2025	DWG BY:	C. ABBOTT
CHK BY:	B. BURKETT	APPR BY:	B. BURKETT
PROJ NO:	10338772	STATUS:	AS-BUILT

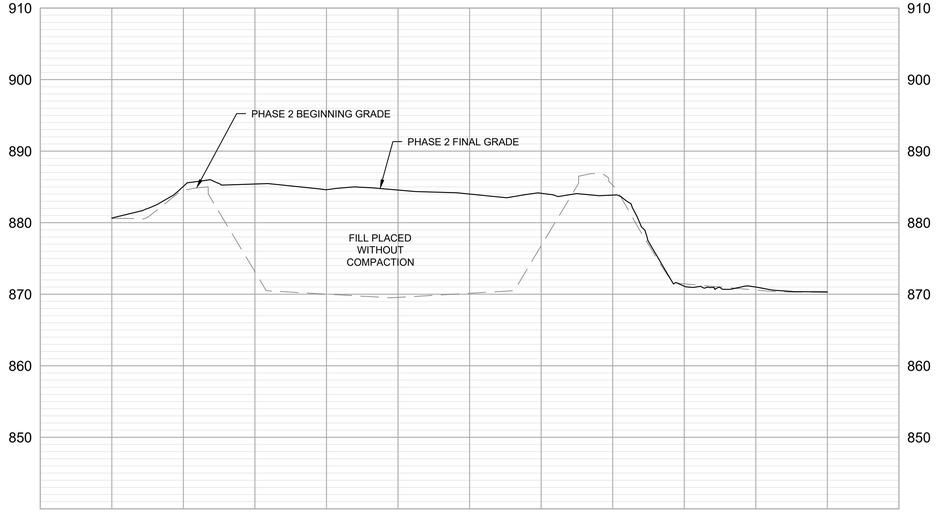
PROJECT NAME:
FORMER ERICKSON POWER STATION ASH IMPOUNDMENTS CLOSURE

DRAWING TITLE:
FINAL CONDITIONS

SITE:	ERICKSON
STR/AREA:	ASH POND
DISCIPLINE:	CIVIL SITE GRADING
FLOOR:	N/A

BWL DRAWING NUMBER: C-2000

REVISION: 2



F-F C-2000 SECTION F-F - FORMER FOREBAY
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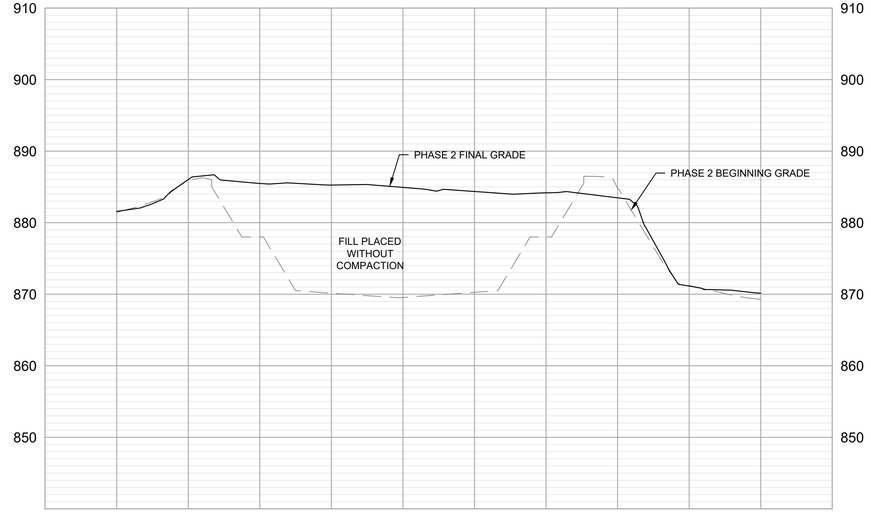

G-G C-2000 SECTION G-G - FORMER RETENTION BASIN
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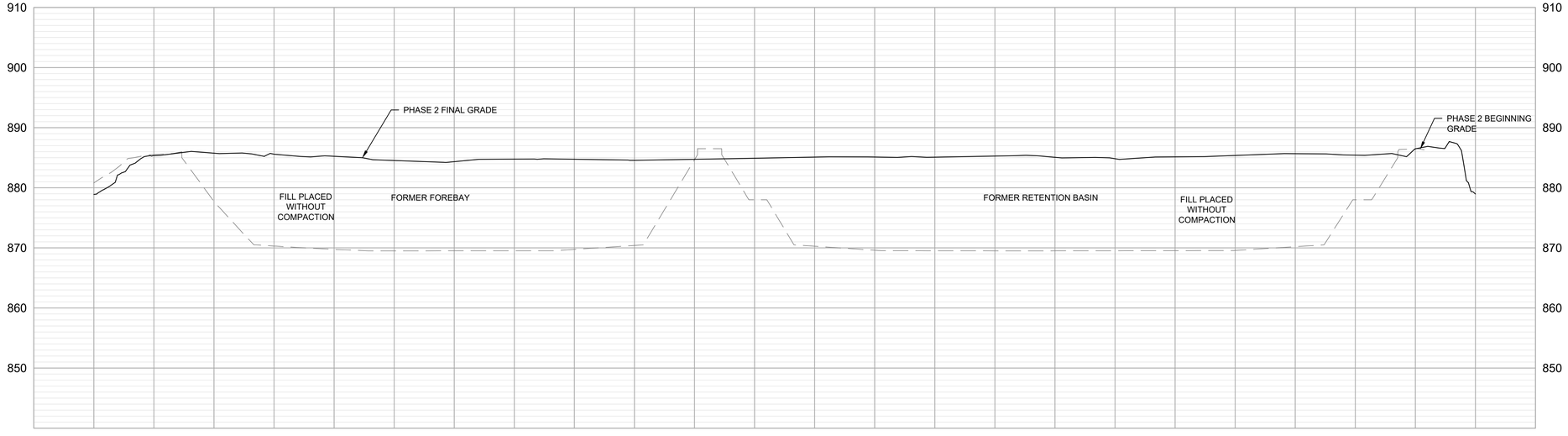

H-H C-2000 SECTION H-H
FORMER RETENTION BASIN - FORMER FOREBAY
HORIZ: 1" = 50' | VERT: 1" = 10'

0 1" 2"

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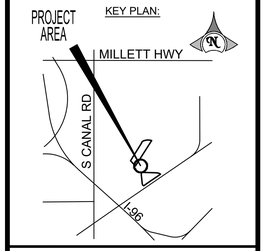
BWL LANSING
Hometown People. Hometown Power.

PROJECT ENGINEERING DEPARTMENT
1201 S. WASHINGTON AVE., LANSING, MICHIGAN 48910

KEY PLAN:



REVISIONS:

REV.	DESCRIPTION	BY	CHK	DATE
0	ISSUED FOR BID	BB	LZ	10-12-2022
1	ISSUED FOR CONSTRUCTION	BB	LZ	01-31-2023
2	AS-BUILT	BB	LZ	07-09-2025

HDR

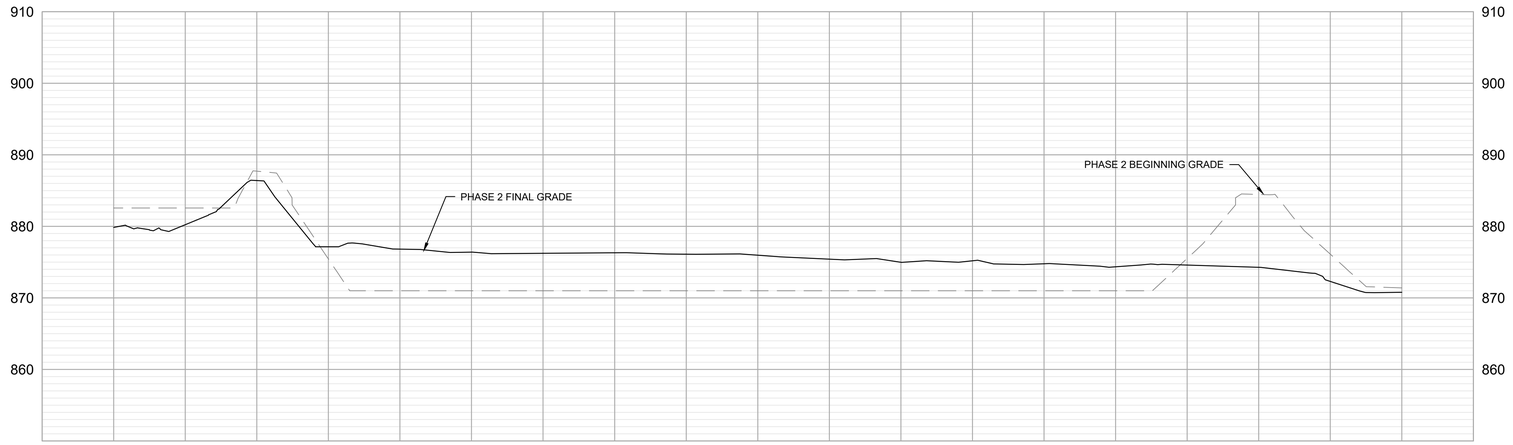
DATE:	07/09/2025	DWG BY:	C. ABBOTT
CHK BY:	B. BURKETT	APPR BY:	B. BURKETT
PROJ NO:	10338772	STATUS:	AS-BUILT

PROJECT NAME:
FORMER ERICKSON POWER STATION ASH IMPOUNDMENTS CLOSURE

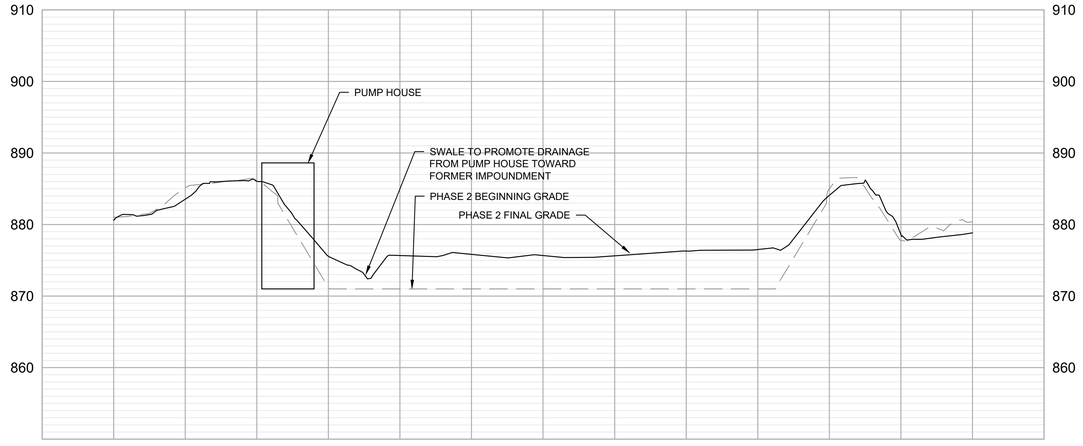
DRAWING TITLE:
FINAL GRADING CROSS SECTIONS

SITE:	ERICKSON
STR/AREA:	ASH POND
DISCIPLINE:	CIVIL SITE GRADING
FLOOR:	N/A

BWL DRAWING NUMBER: C-2001
REVISION: 2



I-I / C-2000 SECTION I-I FORMER CLEAR WATER POND
HORIZ: 1" = 50' | VERT: 1" = 10'



J-J / C-2000 SECTION J-J FORMER CLEAR WATER POND
HORIZ: 1" = 50' | VERT: 1" = 10'

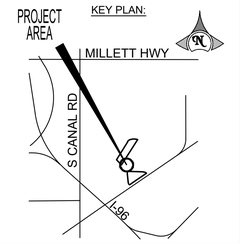
0 1" 2"

FILE NAME: C:\pwworking\centra01\d5176956\140-954-6.dwg ■ PLOTTED DATE: 7/9/2025 10:19 AM ■ PLOTTED BY: Abbott, Chris

LANSING BWL
Hometown People. Hometown Power.

PROJECT ENGINEERING DEPARTMENT
1201 S. WASHINGTON AVE., LANSING, MICHIGAN 48910

KEY PLAN:



REVISIONS:

REV.	DESCRIPTION	BY	CHK	DATE
0	ISSUED FOR BID	BB	LZ	10-12-2022
1	ISSUED FOR CONSTRUCTION	BB	LZ	01-31-2023
2	AS-BUILT	BB	LZ	07-09-2025

HDR

DATE:	07/09/2025	DWG BY:	C. ABBOTT
CHK BY:	B. BURKETT	APPR BY:	B. BURKETT
PROJ NO:	10338772	STATUS:	AS-BUILT

PROJECT NAME:
FORMER ERICKSON POWER STATION ASH IMPOUNDMENTS CLOSURE

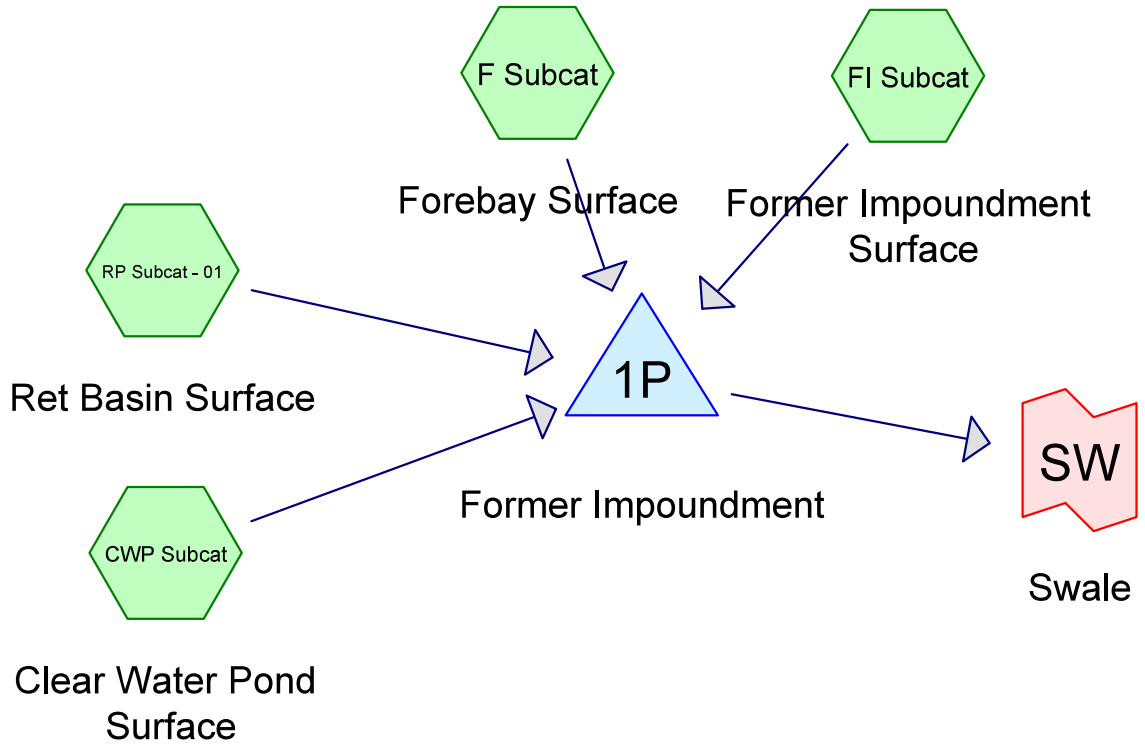
DRAWING TITLE:
FINAL GRADING CROSS SECTIONS

SITE:	ERICKSON
STR/AREA:	ASH POND
DISCIPLINE:	CIVIL SITE GRADING
FLOOR:	N/A

BWL DRAWING NUMBER: C-2002
REVISION: 2

ATTACHMENT 9

2025 CAPACITY CALCULATIONS FOR FORMER IMPOUNDMENT SYSTEM



Subcat Reach Pond Link

Routing Diagram for Erickson Power Station 06-02-25
Prepared by HDR, Inc, Printed 6/2/2025

Project Notes

For drainage areas:

The Former Forebay receives water
from the Forebay surface area

The Former Retention Pond receives water
from Retention Pond surface area

The Former Clear Wastewater Pond receives
water from Clear Water Pond surafce area

The Former Impoundment receives water from
the Former Impoundment surface area

The swale receives water from the Former Clear
Water Pond outfall (does not spill over in 100-yr event)

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
31.249	61	>75% Grass cover, Good, HSG B (CWP Subcat, F Subcat, FI Subcat, RP Subcat - 01)
6.180	98	Impoundment (FI Subcat)
37.429	**67**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
31.249	HSG B	CWP Subcat, F Subcat, FI Subcat, RP Subcat - 01
0.000	HSG C	
0.000	HSG D	
6.180	Other	FI Subcat
37.429		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	31.249	0.000	0.000	0.000	31.249	>75% Grass cover, Good	CWP Subcat, F Subcat, FI Subcat, RP Subcat - 01
0.000	0.000	0.000	0.000	6.180	6.180	Impoundment	FI Subcat
0.000	**31.249**	**0.000**	**0.000**	**6.180**	**37.429**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	1P	875.30	875.30	50.0	0.0000	0.011	0.0	36.0	0.0	

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentCWP Subcat: Clear Water Runoff Area=5.739 ac 0.00% Impervious Runoff Depth>1.59"
Flow Length=100' Slope=0.0200 '/' Tc=16.4 min CN=61 Runoff=10.74 cfs 0.762 af

SubcatchmentF Subcat: Forebay Surface Runoff Area=2.760 ac 0.00% Impervious Runoff Depth>1.59"
Flow Length=100' Slope=0.0200 '/' Tc=16.4 min CN=61 Runoff=5.16 cfs 0.366 af

SubcatchmentFI Subcat: Former Runoff Area=25.200 ac 24.52% Impervious Runoff Depth>2.31"
Flow Length=115' Slope=0.0200 '/' Tc=16.8 min CN=70 Runoff=70.98 cfs 4.853 af

SubcatchmentRP Subcat - 01: Ret Basin Runoff Area=3.730 ac 0.00% Impervious Runoff Depth>1.59"
Flow Length=100' Slope=0.0200 '/' Tc=16.4 min CN=61 Runoff=6.98 cfs 0.495 af

Pond 1P: Former Impoundment Peak Elev=869.06' Storage=6.476 af Inflow=93.85 cfs 6.476 af
36.0" Round Culvert n=0.011 L=50.0' S=0.0000 '/' Outflow=0.00 cfs 0.000 af

Link SW: Swale Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 37.429 ac Runoff Volume = 6.476 af Average Runoff Depth = 2.08"
83.49% Pervious = 31.249 ac 16.51% Impervious = 6.180 ac

Summary for Subcatchment CWP Subcat: Clear Water Pond Surface

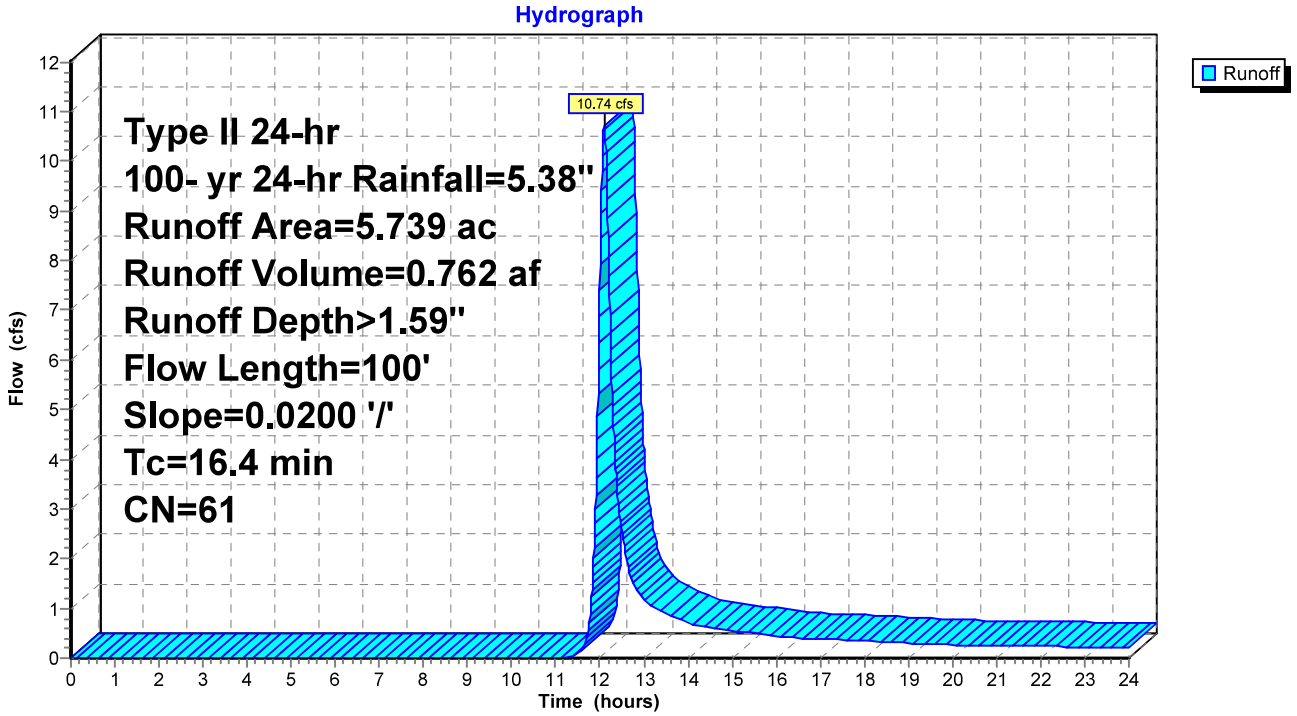
Runoff = 10.74 cfs @ 12.10 hrs, Volume= 0.762 af, Depth> 1.59"
Routed to Pond 1P : Former Impoundment

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100- yr 24-hr Rainfall=5.38"

Area (ac)	CN	Description
5.739	61	>75% Grass cover, Good, HSG B
5.739		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	100	0.0200	0.10		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.42"

Subcatchment CWP Subcat: Clear Water Pond Surface



Summary for Subcatchment F Subcat: Forebay Surface

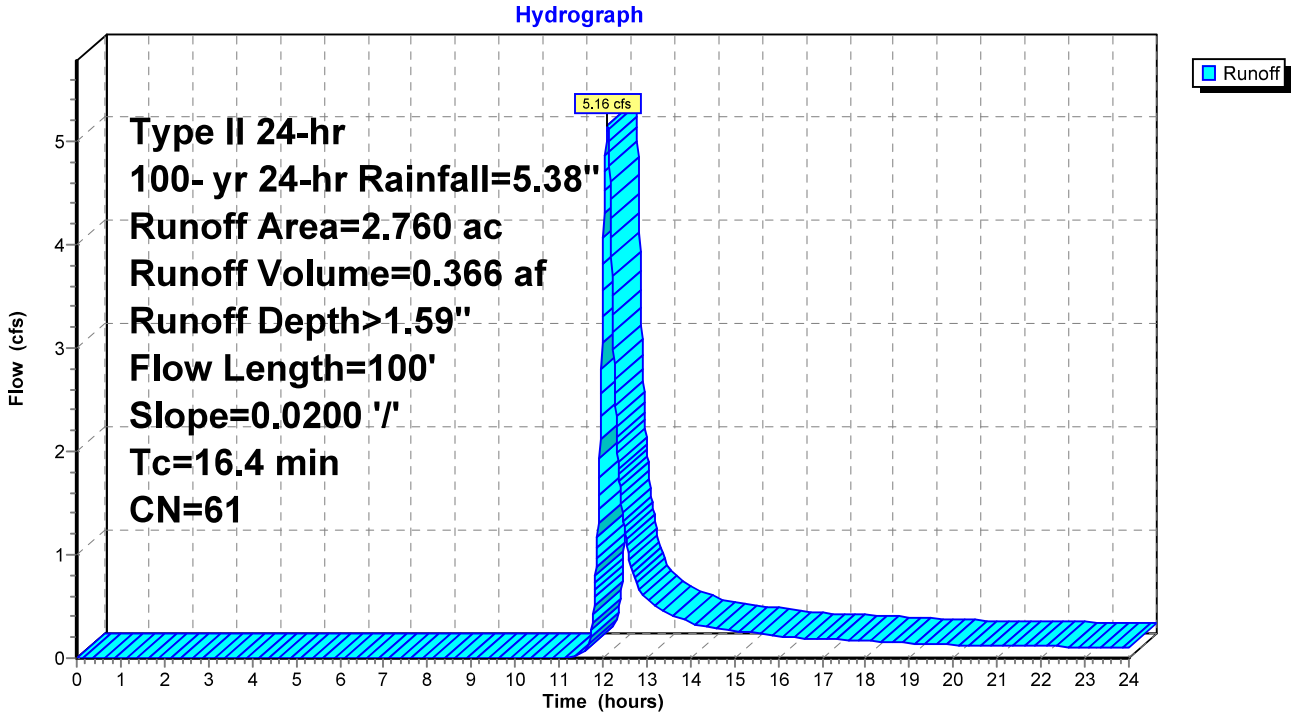
Runoff = 5.16 cfs @ 12.10 hrs, Volume= 0.366 af, Depth> 1.59"
Routed to Pond 1P : Former Impoundment

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100- yr 24-hr Rainfall=5.38"

Area (ac)	CN	Description
2.760	61	>75% Grass cover, Good, HSG B
2.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	100	0.0200	0.10		**Sheet Flow, Forebay Surface** Grass: Dense n= 0.240 P2= 2.42"

Subcatchment F Subcat: Forebay Surface



Summary for Subcatchment FI Subcat: Former Impoundment Surface

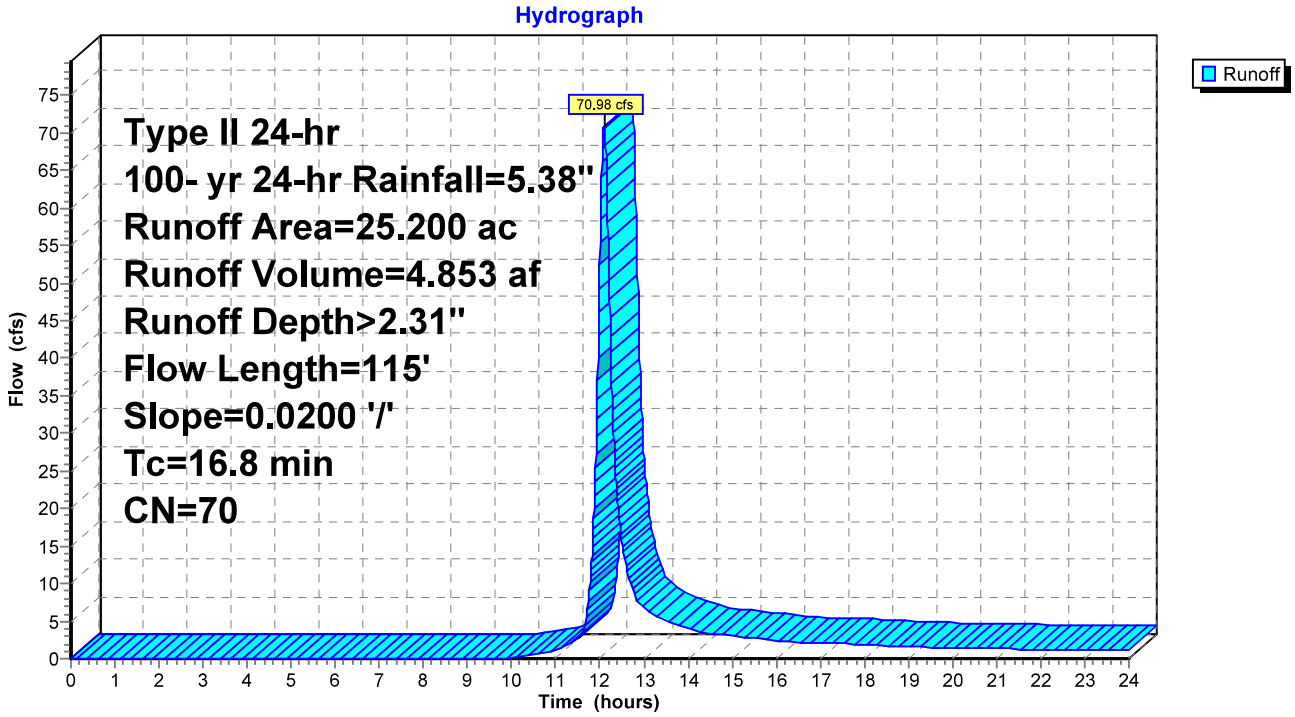
Runoff = 70.98 cfs @ 12.10 hrs, Volume= 4.853 af, Depth> 2.31"
Routed to Pond 1P : Former Impoundment

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100- yr 24-hr Rainfall=5.38"

	Area (ac)	CN	Description
*	6.180	98	Impoundment
	19.020	61	>75% Grass cover, Good, HSG B
	25.200	70	Weighted Average
	19.020		75.48% Pervious Area
	6.180		24.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	15		0.63		**Direct Entry, OAI Subcat**
16.4	100	0.0200	0.10		**Sheet Flow, Sheet Flow**
					Grass: Dense n= 0.240 P2= 2.42"
16.8	115	Total			

Subcatchment FI Subcat: Former Impoundment Surface



Summary for Subcatchment RP Subcat - 01: Ret Basin Surface

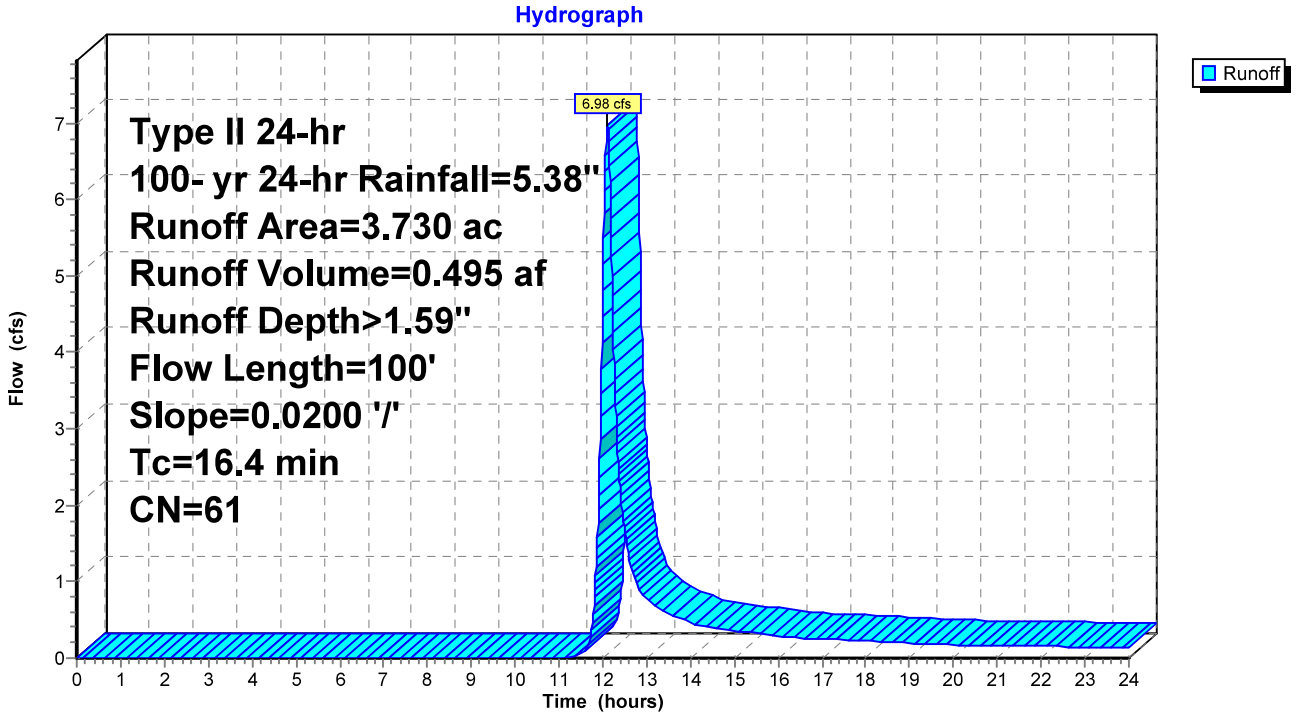
Runoff = 6.98 cfs @ 12.10 hrs, Volume= 0.495 af, Depth> 1.59"
Routed to Pond 1P : Former Impoundment

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100- yr 24-hr Rainfall=5.38"

Area (ac)	CN	Description
3.730	61	>75% Grass cover, Good, HSG B
3.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	100	0.0200	0.10		**Sheet Flow, Retention Basin - Sheet Flow** Grass: Dense n= 0.240 P2= 2.42"

Subcatchment RP Subcat - 01: Ret Basin Surface



Summary for Pond 1P: Former Impoundment

Inflow Area = 37.429 ac, 16.51% Impervious, Inflow Depth > 2.08" for 100- yr 24-hr event
Inflow = 93.85 cfs @ 12.10 hrs, Volume= 6.476 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link SW : Swale

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 869.06' @ 24.00 hrs Surf.Area= 6.152 ac Storage= 6.476 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

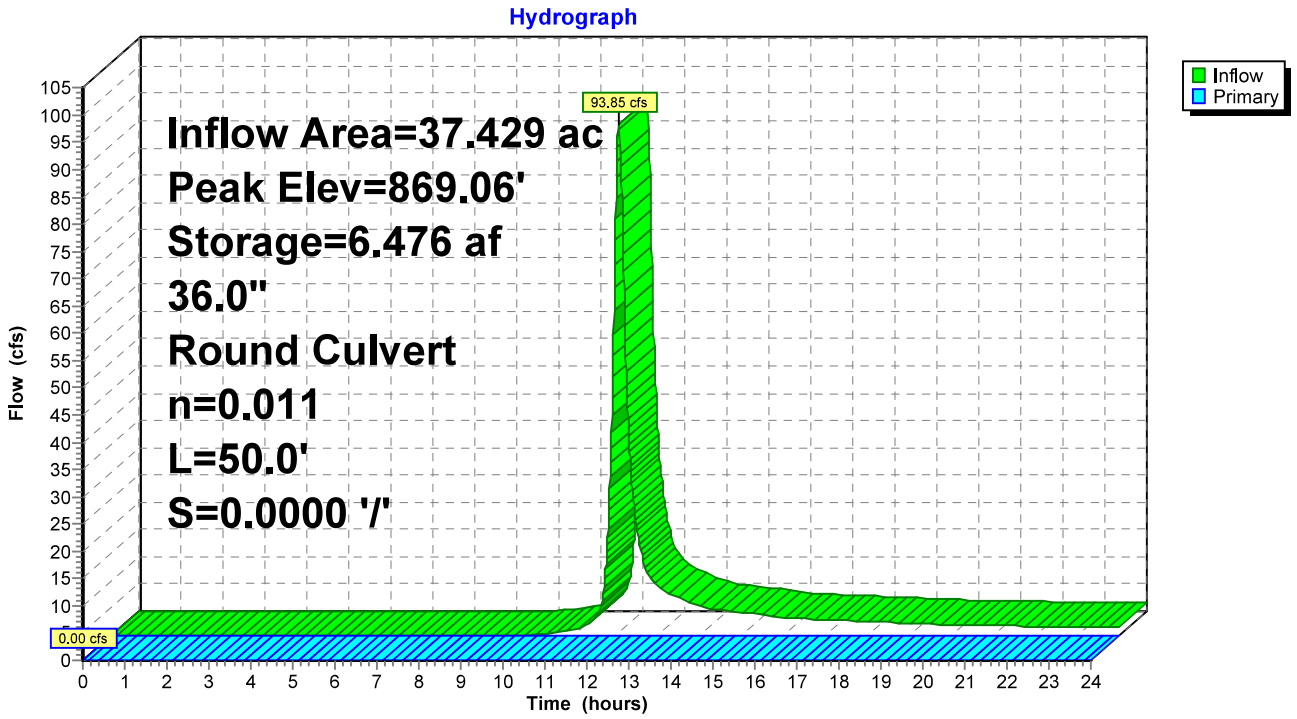
Volume	Invert	Avail.Storage	Storage Description
#1	868.00'	122.463 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
868.00	6.118	0.000	0.000
870.00	6.183	12.301	12.301
871.00	15.930	11.056	23.358
872.00	19.380	17.655	41.012
874.00	20.690	40.070	81.083
875.00	20.690	20.690	101.773
876.00	20.690	20.690	122.463

Device	Routing	Invert	Outlet Devices
#1	Primary	875.30'	**36.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 875.30' / 875.30' S= 0.0000 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=868.00' (Free Discharge)
↑—**1=Culvert** (Controls 0.00 cfs)

Pond 1P: Former Impoundment

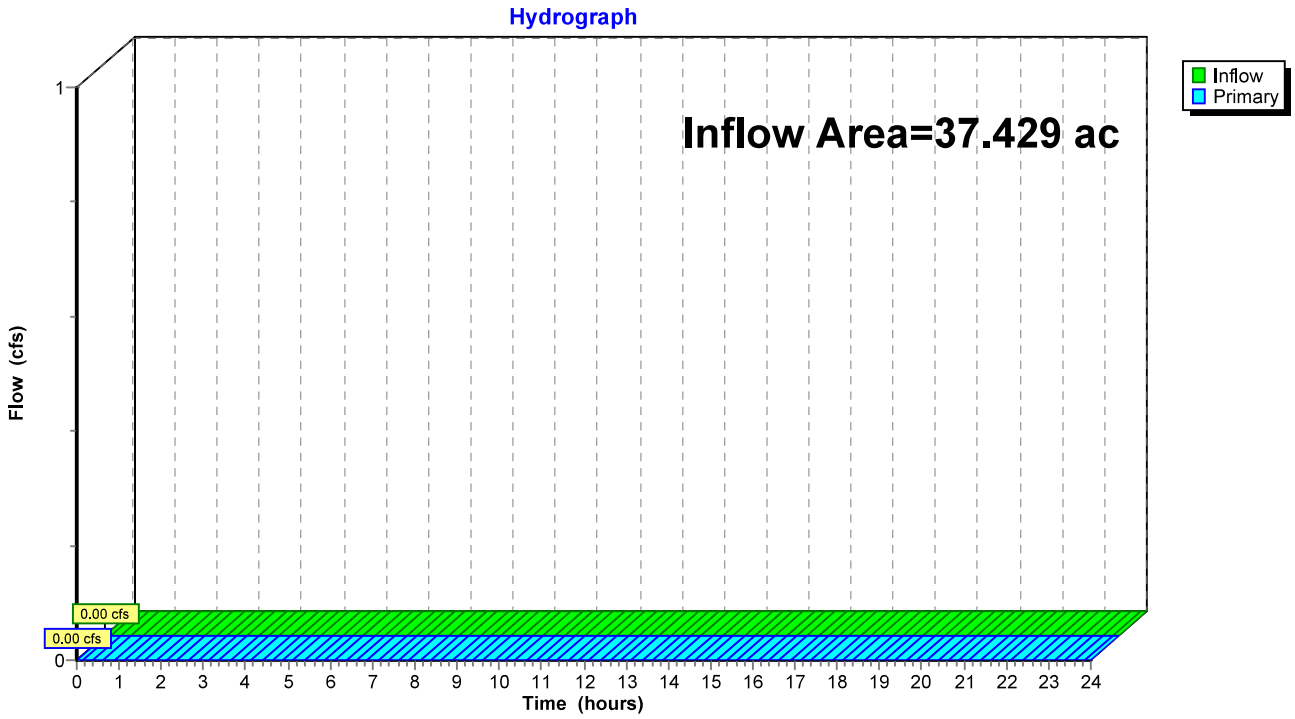


Summary for Link SW: Swale

Inflow Area = 37.429 ac, 16.51% Impervious, Inflow Depth = 0.00" for 100- yr 24-hr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link SW: Swale



ATTACHMENT 10
TYPICAL BWL WEEKLY INSPECTION REPORT

LBWL - WEEKLY INSPECTION REPORT - CCR SURFACE IMPOUNDMENT SYSTEM

Name:	ROBERT L. ALLEN	**Weather:**	SUNNY 43°
Date & Time:	3-5-20 1210	**Site Conditions:**	

If you answer "Yes" to any of the following questions, describe and call Environmental Services.

I. SURFACE IMPOUNDMENT

Description	Forebay Yes	Forebay No	Forebay Not Visible	Retention Basin Yes	Retention Basin No	Retention Basin Not Visible	Clearwater Pond Yes	Clearwater Pond No	Clearwater Pond Not Visible
1. Is there any erosion around the impoundment?		X				X		X	
2. Is there excessive CCR (ash) build-up above the water surface?		X				X		X	

II. CREST

Forebay	Retention Basin	Clearwater Pond
1. Describe vegetation on the crest: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the crest: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the crest: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):

Description	Forebay Yes	Forebay No	Forebay Not Visible	Retention Basin Yes	Retention Basin No	Retention Basin Not Visible	Clearwater Pond Yes	Clearwater Pond No	Clearwater Pond Not Visible
2. Any trees or undesired vegetation on crest?		X				X		X	
3. Any depressions, cracks, animal burrows, ruts, or holes on crest?		X				X		X	

III. SLOPES – ABOVE THE WATER LEVEL

Forebay	Retention Basin	Clearwater Pond
1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):

Description	Forebay Yes	Forebay No	Forebay Not Visible	Retention Basin Yes	Retention Basin No	Retention Basin Not Visible	Clearwater Pond Yes	Clearwater Pond No	Clearwater Pond Not Visible
2. Any depressions, cracks, animal burrows, ruts, or holes?		X				X		X	
3. Above the water level, are there any cracks, evidence of erosion, sloughs or indication of slope distress?		X				X		X	

IV. EXTERIOR SLOPES

Forebay	Retention Basin	Clearwater Pond
1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):

Description	Forebay Yes	Forebay No	Forebay Not Visible	Retention Basin Yes	Retention Basin No	Retention Basin Not Visible	Clearwater Pond Yes	Clearwater Pond No	Clearwater Pond Not Visible
2. Any areas of water-loving, (ex. cattails, grasses, etc.) vegetation?		X				X		X	
3. Any depressions, bulges, holes, animal burrows, or erosion on slope?		X				X		X	

4. Are there any cracks, sloughs or indication of slope distress?		X			X			X			
5. Do any wet areas indicate potential seepage through the dike?		X			X			X			
6. Are there any active seeps (flowing water) from the **slope or toe** of the dike? If yes, describe area, location, flow quantity, color etc.		X			X			X			

V. INLET AND OUTLET STRUCTURES

1. What is the ESTIMATED free water level in the surface impoundment today?

Forebay	Retention Basin	Clearwater Pond
Design Water Level: 100.5 ft gauge / 882.5 ft. X At Design Water Level ___ Above Design Water Level ___ Below Design Water Level	Design Water Level: 99.5 ft gauge/880.5 ft. X At Design Water Level ___ Above Design Water Level ___ Below Design Water Level	Design Water Level: 99 ft gauge / 880.0 ft. X At Design Water Level ___ Above Design Water Level ___ Below Design Water Level
2. How would you describe the overall condition of the inlet structures? ☒ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☐ Not Visible ☐ Other (describe):	2. How would you describe the overall condition of the inlet structures? ☒ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☐ Not Visible ☐ Other (describe):	2. How would you describe the overall condition of the inlet structures? ☒ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☐ Not Visible ☐ Other (describe):
3. How would you describe the overall condition of the outlet structures? ☒ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☐ Not Visible ☐ Other (describe):	3. How would you describe the overall condition of the outlet structures? ☒ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☐ Not Visible ☐ Other (describe):	3. How would you describe the overall condition of the outlet structures? ☐ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☒ Not Visible ☐ Other (describe):
4. If observable, describe any discharge from the outlet structure (turbidity, depth, etc.):	4. If observable, describe any discharge from the outlet structure (turbidity, depth, etc.):	4. If observable, describe any discharge from the outlet structure (turbidity, depth, etc.):
5. Is there evidence of damage, erosion, or obstruction around the **INLET** and **OUTLET** structures? If yes, describe: ☐ Yes ☒ No ☐ Not Visible	5. Is there evidence of damage, erosion, or obstruction around the **INLET** and **OUTLET** structures? If yes, describe: ☐ Yes ☐ No ☐ Not Visible	5. Is there evidence of damage, erosion, or obstruction around the **INLET** and **OUTLET** structures? If yes, describe: ■ Yes ■ No ■ Not Visible

VI. NOTES

ITEM	Description/Location

✓ RLA

VII. PHOTOGRAPHS – HAS ENVIRONMENTAL SERVICES TAKEN PHOTOGRAPHS DURING THE QUARTER? (AT A MINIMUM ON A QUARTERLY BASIS AND WHENEVER NEEDED TO DOCUMENT ISSUES)

At a minimum, photographs should be taken of the crest, interior and exterior slopes, and any other notable features.