

PRELIMINARY DETERMINATION

PERMIT RENEWAL

Rock 'N Bar D, LLC
P.O. Box 279
Hope Hull, Alabama 36043

Rock 'N Bar D Landfill
Permit No. 55-09

March 17, 2026

Rock 'N Bar D, LLC applied to the Alabama Department of Environmental Management (ADEM) for renewal of the Solid Waste Disposal Facility for the Rock 'N Bar D Landfill (Permit 55-09). The waste stream for the Rock 'N Bar D Landfill would remain non-hazardous nonputrescible construction and demolition waste, discarded tires, and rubbish as defined by ADEM Admin. Code 335-13-1-.03. Also, a specific waste stream from the HB&G Incorporated, manufacturing facility which includes decorative building products such as support column caps, balustrades made from wood with fire resistant property materials known as permacast, and process floor sweepings, sand dusts, and miscellaneous paper and plastic would continue to be accepted. The service area for the Rock 'N Bar D Landfill would remain Autauga, Barbour, Bullock, Butler, Coffee, Covington, Crenshaw, Dale, Elmore, Geneva, Henry, Lowndes, Macon, Montgomery, Pike, and Russell counties in Alabama. The maximum average daily volume of waste disposed at the Rock 'N Bar D Landfill would remain 667 cubic yards per day.

The landfill is located in SW $\frac{1}{4}$ of Section 1, Township 9 North, Range 20 East in Pike County Alabama. The permitted facility consists of approximately 59.50 acres with 24.93 acres for disposal operations.

The Land Division has determined that the permit renewal application meets the applicable requirements of ADEM's Administrative Code Division 13 regulations.

Technical Contact:

Isabel Bela
Solid Waste Engineering Section
Land Division
(334) 271-7954



SOLID WASTE DISPOSAL FACILITY PERMIT

PERMITTEE: Rock 'N Bar D, LLC

FACILITY NAME: Rock 'N Bar D Landfill

FACILITY LOCATION: SW ¼ of Section 1, Township 9 North, Range 20 East in Pike County, Alabama. The total permitted area is approximately 59.50 acres with 24.93 acres approved for disposal.

PERMIT NUMBER: 55-09

PERMIT TYPE: Construction/Demolition (C/D) Landfill

WASTE APPROVED FOR DISPOSAL: Non-putrescible and non-hazardous construction and demolition waste, discarded tires, and rubbish as defined by ADEM Admin. Code 335-13-1-.03. Also, a specific waste stream from HB&G Incorporated, manufacturing facility which includes decorative building products such as support column caps, balustrades made from wood with fire resistant property materials known as permacast, and process floor sweepings, sand dusts, and miscellaneous paper and plastic would continue to be accepted.

APPROVED WASTE VOLUME: Maximum Average Daily Volume of 667 cubic yards per day

APPROVED SERVICE AREA: Autauga, Barbour, Bullock, Butler, Coffee, Covington, Crenshaw, Dale, Elmore, Geneva, Henry, Lowndes, Macon, Montgomery, Pike, and Russell counties in Alabama.

In accordance with and subject to the provisions of the Alabama Solid Wastes and Recyclable Materials Management Act, as amended, Code of Alabama 1975, SS 22-27-1 to 22-27-27 ("SWRMMA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, SS 22-22A-1 to 22-22A-15, and rules and regulations adopted thereunder, and subject further to the conditions set forth in this permit, the Permittee is hereby authorized to dispose of the above-described solid wastes at the above-described facility location.

ISSUANCE DATE: XXX XX, 2026

EFFECTIVE DATE: XXX XX, 2026

EXPIRATION DATE: XXX XX, 2036

**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
SOLID WASTE PERMIT**

Permittee: Rock ‘N Bar D, LLC
P.O. Box 279
Hope Hull, Alabama 36043

Landfill Name: Rock ‘N Bar D Landfill

Landfill Location: SW ¼ of Section 1, Township 9 North, Range 20 East in Pike County, Alabama

Permit Number: 55-09

Landfill Type: Construction and Demolition Landfill

Pursuant to the Solid Wastes & Recyclable Materials Management Act, Code of Alabama 1975, §§22-27-1, *et seq.*, as amended (the “Act”), and attendant regulations promulgated thereunder by the Alabama Department of Environmental Management (ADEM), this permit is issued to Rock ‘N Bar D, LLC (hereinafter called the Permittee), to operate a solid waste disposal facility, known as the Rock ‘N Bar D Landfill.

The Permittee must comply with all terms and conditions of this permit. This permit consists of the conditions set forth herein (including those in any attachments), and the applicable regulations contained in Chapters 335-13-1 through 335-13-16 of the ADEM Administrative Code (hereinafter referred to as the "ADEM Admin. Code"). Rules cited are set forth in this document for the purpose of Permittee reference. Any Rule that is cited incorrectly in this document does not constitute grounds for noncompliance on the part of the Permittee. Applicable ADEM Administrative Codes are those that are in effect on the date of issuance of this permit or any revisions approved after permit issuance.

This permit is based on the information submitted to ADEM on December 7, 2023 for permit renewal and as amended and is known as the Permit Application (hereby incorporated by reference and hereinafter referred to as the Application). Any inaccuracies found in this information could lead to the termination or modification of this permit and potential enforcement action. The Permittee must inform ADEM of any deviation from or changes in the information in the Application that would affect the Permittee's ability to comply with the applicable ADEM Admin. Code or permit conditions.

This permit is effective as of **XXX XX, 2026** and shall remain in effect until **XXX XX, 2036**, unless suspended or revoked.

Alabama Department of Environmental Management

Date Signed

SECTION I. STANDARD CONDITIONS

- A. Effect of Permit. The Permittee is allowed to dispose of nonhazardous solid waste in accordance with the conditions of this permit and ADEM Administrative Code, Division 13. Issuance of this permit does not convey property rights of any sort or any exclusive privilege, nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local laws or regulations. Except for actions brought under Code of Alabama 1975, Section 22-27-1, *et seq.*, as amended, compliance with the conditions of this permit shall be deemed to be compliance with applicable requirements in effect as of the date of issuance of this permit and any future revisions.
- B. Permit Actions. This permit may be suspended, revoked or modified for cause. The filing of a request for a permit modification or the notification of planned changes or anticipated noncompliance on the part of the Permittee, and the suspension or revocation does not stay the applicability or enforceability of any permit condition.
- C. Severability. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
- D. Definitions. For the purpose of this permit, terms used herein shall have the same meaning as those in ADEM Administrative Code, Division 13, unless this permit specifically provides otherwise; where terms are not otherwise defined, the meaning associated with such terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.
1. "EPA" for purposes of this permit means the United States Environmental Protection Agency.
 2. "Permit Application" for the purposes of this permit, means all permit application forms, design plans, operational plans, closure plans, technical data, reports, specifications, plats, geological and hydrological reports, and other materials which are submitted to the Department in pursuit of a solid waste disposal permit.
- E. Duties and Requirements.
1. Duty to Comply. The Permittee must comply with all conditions of this permit except to the extent and for the duration such noncompliance is authorized by a variance granted by the Department. Any permit noncompliance constitutes a violation of Code of Alabama 1975, Section 22-27-1 *et seq.*, as amended, and is grounds for enforcement action, permit suspension, revocation, modification, and/or denial of a permit renewal application.
 2. Duty to Reapply. If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The renewal application must be submitted to the Department at least 180 days before this permit expires.
 3. Permit Expiration. This permit and all conditions therein will remain in effect beyond the permit's expiration date if the Permittee has submitted a timely, complete application as required by Section I, Paragraph E, Subparagraph 2, and, through no fault of the Permittee, the Department has not made a final decision regarding the renewal application.
 4. Need to Halt or Reduce Activity Not a Defense. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of this permit.
 5. Duty to Mitigate. In the event of noncompliance with this permit, the Permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

6. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities and systems of control (and related appurtenances) that are installed or used by the Permittee to achieve compliance with the conditions of this permit.
7. Duty to Provide Information. If requested, the Permittee shall furnish to ADEM, within a reasonable time, any information that ADEM may reasonably need to determine whether cause exists for denying, suspending, revoking, or modifying this permit, or to determine compliance with this permit. If requested, the Permittee shall also furnish the Department with copies of records kept as a requirement of this permit.
8. Inspection and Entry. Upon presentation of credentials and other documents as may be required by law, the Permittee shall allow the employees of the Department or their authorized representative to:
 - a. Enter at reasonable times the Permittee's premises where the regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.
 - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit.
 - c. Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.
 - d. Sample or monitor, at reasonable times, any substances or parameters at any location for the purposes of assuring permit compliance or as otherwise authorized by Code of Alabama 1975, Section 22-27-1 *et seq.*
9. Monitoring, Corrective Actions, and Records.
 - a. Samples and measurements taken for the purpose of monitoring or corrective action shall be representative of the monitored activity. The methods used to obtain representative samples to be analyzed must be the appropriate method from ADEM Admin. Code 335-13-4 or the methods as specified in the Application and incorporated by reference. Laboratory methods must be those specified in Standard Methods for the Examination of Water and Wastewater (American Public Health Association, latest edition), Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020), Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Publication SW-846, latest edition), other appropriate EPA methods, or as specified in the Application. All field tests must be conducted using approved EPA test kits and procedures.
 - b. The Permittee shall retain records, at the location specified in Section I, Paragraph I, of all monitoring, or corrective action information, including all calibration and maintenance records, copies of all reports and records required by this permit, and records of all data used to complete the application for this permit for a period of at least three years from the date of the sample, measurement, report or record or for periods elsewhere specified in this permit. These periods may be extended by the request of the Department at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility.
 - c. Records of monitoring and corrective action information shall include:
 - i. The exact place, date, and time of sampling or measurement.
 - ii. The individual(s) and company who performed the sampling or measurements.
 - iii. The date(s) analyses were performed.
 - iv. The individual(s) and company who performed the analyses.

- v. The analytical techniques or methods used.
 - vi. The results of such analyses.
 - d. The Permittee shall submit all monitoring and corrective action results at the interval specified elsewhere in this permit.
10. Reporting Planned Changes. The Permittee shall notify the Department, in the form of a request for permit modification, at least 120 days prior to any change in the permitted service area, increase in the waste received, or change in the design or operating procedure as described in this permit, including any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
11. Transfer of Permit. This permit may be transferred to a new owner or operator. All requests for transfer of permits shall be in writing and shall be submitted on forms provided by the Department. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of this permit.
12. Certification of Construction. Before the Permittee may commence disposal of waste in any new cell or phase:
- a. The Permittee must submit a letter to the Department signed by both the Permittee and a professional engineer stating that the facility has been constructed in compliance with the permit.
 - b. The Department must inspect the constructed cells of phases unless the permittee is notified that the Department will waive the inspection.
 - c. The Permittee may not commence disposal activities in any new cells or phases until approval of the new cells or phases is granted by the Department.
13. Noncompliance. The Permittee shall report all instances of noncompliance with the permit at the time noncompliance is discovered.
14. Other Information. If the Permittee becomes aware that information required by the Application was not submitted or was incorrect in the Application or in any report to the Department, the Permittee shall promptly submit such facts or information. In addition, upon request, the Permittee shall furnish to the Department, within a reasonable time, information related to compliance with the permit.
- F. Design and Operation of Facility. The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of contaminants (including leachate and explosive gases) to air, soil, groundwater, or surface water, which could threaten human health or the environment.
- G. Inspection Requirements.
- 1. The Permittee shall comply with all requirements of ADEM Admin. Code 335-13-4-.21(1)(b).
 - 2. The Permittee shall conduct random inspections of incoming loads.
 - 3. Records of all inspections shall be included in the operating record.
- H. Recordkeeping and Reporting.
- 1. The Permittee shall maintain a written operating record at the location specified in Section I.,I. The operating record shall include:

- a. Documentation of inspection and maintenance activities.
 - b. Daily Volume reports.
 - c. Personnel training documents and records.
 - d. Solid/Hazardous Waste Determination Forms for Industrial Wastes, and associated ADEM disposal approval correspondence for industrial waste and special waste.
 - e. Groundwater monitoring records.
 - f. Explosive gas monitoring records.
 - g. Surface water and leachate monitoring records.
 - h. Copies of this Permit and the Application.
 - i. Copies of all variances granted by ADEM, including copies of all approvals of special operating conditions.
2. Quarterly Volume Report. Beginning with the effective date of this permit, the Permittee shall submit, within thirty (30) days after the end of each calendar quarter, a report summarizing the daily waste receipts for the previous (just ended) quarter. Copies of the quarterly reports shall be maintained in the operating record.
3. Monitoring and Corrective Action Reports. The Permittee shall submit reports on all monitoring and corrective action activities conducted pursuant to the requirements of this permit, including, but not limited to, groundwater, surface water, explosive gas and leachate monitoring. The groundwater monitoring shall be conducted in March and September of each year, or as directed by ADEM, and the reports shall be submitted at least semi-annually, or as directed by ADEM. The reports should contain all monitoring results and conclusions from samples and measurements conducted during the sampling period. Explosive gas monitoring must be submitted once each year, and the reports should be submitted to ADEM and placed in the operating record within 30 days of the monitoring event. Copies of the groundwater and explosive gas monitoring reports shall be maintained in the operating record.
4. Availability, Retention, and Disposition of Records.
- a. All records, including plans, required under this permit or ADEM Admin. Code 335-13 must be furnished upon request, and made available at reasonable times for inspection by any officer, employee, or representative of ADEM.
 - b. All records, including plans, required under this permit or ADEM Admin. Code 335-13 shall be retained by the Permittee for a period of at least three years. The retention period for all records is extended automatically during the course of any unresolved enforcement action regarding the facility, or as requested by ADEM.
 - c. A copy of records of waste disposal locations and quantities must be submitted to ADEM and local land authority upon closure of the facility.
- I. Documents to be Maintained by the Permittee. The Permittee shall maintain, at the Rock 'N Bar D Landfill office, the following documents and amendments, revisions and modifications to these documents until an engineer certifies closure.
- 1. Operating record.

2. Closure Plan.
- J. Mailing Location. All reports, notifications, or other submissions which are required by this permit should be sent via signed mail (i.e. certified mail, express mail delivery service, etc.) or hand delivered to:
1. Mailing Address.
Chief, Solid Waste Branch
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, AL 36130-1463
 2. Physical Address.
Chief, Solid Waste Branch
Alabama Department of Environmental Management
1400 Coliseum Blvd.
Montgomery, Alabama 36110-2400
- K. Signatory Requirement. All applications, reports or information required by this permit, or otherwise submitted to ADEM, shall be signed and certified by the owner as follows:
1. If an individual, by the applicant.
 2. If a city, county, or other municipality or governmental entity, by the ranking elected official, or by a duly authorized representative of that person.
 3. If a corporation, organization, or other legal entity, by a principal executive officer, of at least the level of Vice President, or by a duly authorized representative of that person.
- L. Confidential Information. The Permittee may claim information submitted as confidential pursuant to ADEM Admin. Code 335-1-1-.06.
- M. State Laws and Regulations. Nothing in this permit shall be construed to preclude the initiation of any legal action or to relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation.

SECTION II. GENERAL OPERATING CONDITIONS.

- A. Operation of Facility. The Permittee shall operate and maintain the disposal facility consistent with the Application, this permit, and ADEM Admin. Code 335-13.
- B. Open Burning. The Permittee shall not allow open burning without prior written approval from ADEM and other appropriate agencies. A burn request should be submitted in writing to ADEM outlining why that burn request should be granted. This request should include, but not be limited to, specifically what areas will be utilized, types of waste to be burned, the projected starting and completion dates for the project, and the projected days and hours of operation. The approval, if granted, shall be included in the operating record.
- C. Prevention of Unauthorized Disposal. The Permittee shall follow the approved procedures as provided in the Application, for detecting and preventing the disposal of free liquids, regulated hazardous waste, PCB's, regulated medical waste, and other unauthorized waste streams at the facility.
- D. Unauthorized Discharge. The Permittee shall operate the disposal facility in such a manner that there will be no water pollution or unauthorized discharge. Any discharge from the disposal facility or practice thereof may require a National Pollutant Discharge Elimination System permit under the Alabama Water Pollution Control Act.

- E. Industrial Waste Disposal. The Permittee shall not dispose of industrial process waste at this landfill. Only those wastes shown in Section III, Paragraph B are allowed for disposal in this landfill.
- F. Boundary Markers. The Permittee shall ensure that the facility is identified with a sufficient number of permanent boundary markers that are at least visible from one marker to the next.
- G. Certified Operator. The Permittee shall be required to have an operator certified by the Department on-site during hours of operation, in accordance with the requirements of ADEM Admin. Code 335-13-12.

SECTION III. SPECIFIC REQUIREMENTS FOR C/D LANDFILLS

- A. Waste Identification and Management
 - 1. Subject to the terms of this permit, the Permittee may dispose of the nonhazardous solid wastes listed in Section III, Paragraph B. Disposal of any other wastes is prohibited, except waste granted a temporary or one time waiver by the Director.
 - 2. The total permitted area for the Rock 'N Bar D Landfill is approximately 59.50 acres, with 24.93 acres approved for disposal.
 - 3. The maximum average daily volume of waste disposed at the facility, as contained in the permit application, shall not exceed 667 cubic yards per day. Should the average daily volume exceed this value by 20% or 100 tons/day, whichever is less, for two (2) consecutive quarters the permittee shall be required to modify the permit in accordance with ADEM Admin. Code 335-13-5-.06(2)(b)2. The average daily volume shall be computed as specified by ADEM Admin. Code 335-13-4-.23(2)(f).
- B. Waste Streams. The Permittee may accept for disposal non-putrescible and non-hazardous construction and demolition waste, discarded tires, and rubbish as defined by ADEM Admin. Code 335-13-1-.03. Also, a specific waste stream from the HB&G Incorporated, manufacturing facility which includes decorative building products such as support column caps, balustrades made from wood with fire resistant property materials known as permacast, and process floor sweepings, sand dusts, and miscellaneous paper and plastic may continue to be accepted.
- C. Service Area. The Permittee is allowed to receive for disposal waste from Autauga, Barbour, Bullock, Butler, Coffee, Covington, Crenshaw, Dale, Elmore, Geneva, Henry, Lowndes, Macon, Montgomery, Pike, and Russell counties in Alabama.
- D. Waste Placement, Compaction, and Cover. All waste shall be confined to an area as small as possible within a single working face and spread to a depth not exceeding two feet prior to compaction, and such compaction shall be accomplished on a face slope not to exceed 4 to 1 (25%) or as otherwise approved by ADEM. All waste shall be spread in layers two feet or less in thickness and thoroughly compacted weekly with adequate landfill equipment prior to placing additional layers of waste or placing the weekly cover. A minimum of six inches of compacted earth or other alternative cover material approved by ADEM and listed in Section VIII shall be added at the conclusion of each week's operation. These are minimum requirements for waste placement, compaction, and cover unless a variance is granted in Section VIII.
- E. Liner Requirements. At this time, the Permittee shall not be required to install a liner system. The bottom of the construction and demolition waste shall be a minimum of five (5) feet above the highest measured groundwater level as determined by ADEM Admin. Code 335-13-4-.11(2)(a).
- F. Security. The Permittee shall provide artificial and/or natural barriers, which prevent entry of unauthorized vehicular traffic to the facility.
- G. All Weather Access Roads. The Permittee shall provide an all-weather access road to the dumping face that is wide enough to allow passage of collection vehicles.

- H. Adverse Weather Disposal. The Permittee shall provide for disposal activities in adverse weather conditions.
- I. Personnel. The Permittee shall maintain adequate personnel to ensure continued and smooth operation of the facility.
- J. Environmental Monitoring and Treatment Structures. The Permittee shall provide protection and proper maintenance of environmental monitoring and treatment structures.
- K. Vector Control. The Permittee shall provide for vector control as required by ADEM Admin. Code 335-13.
- L. Bulk or Noncontainerized Liquid Waste. The Permittee shall not dispose of bulk or noncontainerized liquid waste, or containers capable of holding liquids, unless the conditions of ADEM Admin. Code 335-13-4-.23(1)(j) are met.
- M. Empty Containers. Empty containers larger than 10 gallons in size must be rendered unsuitable for holding liquids prior to disposal in the landfill unless otherwise approved by ADEM.
- N. Other Requirements. ADEM may enhance or reduce any requirements for operating and maintaining the landfill as deemed necessary by the Land Division.
- O. Other Permits. The Permittee shall operate the landfill according to this and any other applicable permits.
- P. Scavenging and Salvaging Operations. The Permittee shall prevent scavenging and salvaging operations, except as part of a controlled recycling effort. Any recycling operation must be in accordance with plans submitted and approved by ADEM.
- Q. Signs. If the landfill is available to the public or commercial haulers, the Permittee shall provide a sign outlining instructions for use of the site. The sign shall be posted and have the information required by ADEM Admin. Code 335-13-4-.23(1)(f).
- R. Litter Control. The Permittee shall control litter.
- S. Fire Control. The Permittee shall provide fire control measures.

SECTION IV. GROUNDWATER MONITORING REQUIREMENTS:

Groundwater monitoring is not being required at this landfill provided that the waste stream is in accordance with Section III, Paragraph B. Should any waste be disposed other than the waste streams indicated in Section III, Paragraph B, the Department may require that groundwater-monitoring wells be installed.

SECTION V. GAS MONITORING REQUIREMENTS

The permittee must install and maintain an explosive gas monitoring system in accordance with ADEM Administrative Code, Division 13.

SECTION VI. SURFACE WATER MANAGEMENT

The permittee shall construct and maintain run-on and run-off control structures. Any discharges from drainage control structures shall be permitted through a discharge permit issued by the ADEM Water Division.

SECTION VII. CLOSURE AND POST-CLOSURE REQUIREMENTS

The Permittee shall close the landfill and perform post-closure care of the landfill in accordance with ADEM Admin. Code 335-13.

- A. Final Cover. The Permittee shall grade final soil cover such that surface water does not pond over the permitted area as specified in the Application.
- B. Vegetative Cover. The Permittee shall establish a vegetative or other appropriate cover, as approved by the Department, within 90 days after completion of final grading requirements in the Application. Preparation of a vegetative cover shall include, but not be limited to, the placement of seed, fertilizer, mulch, and water.
- C. Notice of Intent. The Permittee shall place in the operating record and notify ADEM of their intent to close the landfill prior to beginning closure.
- D. Completion of Closure Activities. The Permittee must complete closure activities of each landfill unit in accordance with the Closure Plan within 180 days of the last known receipt of waste.
- E. Certification of Closure. Following closure of each unit, the Permittee must submit to ADEM a certification, signed by a registered professional engineer, verifying the closure has been completed according to the Closure Plan.
- F. Post-Closure Care Period. Post-closure care activities shall be conducted after closure of each unit throughout the life of this permit and continuing for a period of a minimum of thirty (30) years following closure of the facility. ADEM may shorten or extend the post-closure care period applicable to the solid waste disposal facility.
- G. Post-Closure Maintenance. The Permittee shall provide post closure maintenance of the facility to include regularly scheduled inspections. This shall include maintenance of the cover, vegetation, monitoring devices and pollution control equipment and correction of other deficiencies that may be observed by ADEM. Monitoring requirements shall continue throughout the post closure period as determined by ADEM unless all waste is removed and no unpermitted discharge to waters of the State have occurred.
- H. Post-Closure Use of Property. The Permittee shall ensure that post closure use of the property never be allowed to disturb the integrity of the final cover, liner, or any other component of the containment system. This shall preclude the growing of deep-rooted vegetation on the closed area.
- I. Certification of Post-Closure. Following post-closure of each unit, the Permittee must submit to ADEM a certification, signed by a registered professional engineer, verifying the post-closure has been completed according to the Post-Closure Plan.
- J. Recording Instrument. The Permittee must provide documentation of compliance with the requirements of the Uniform Environmental Covenants Program in ADEM Admin. Code 335-5 and shall execute the following:
 - 1. Record a notation onto the land deed within 90 days from the certification of closure. This notation shall state that the land has been used as a solid waste disposal facility, the name of the Permittee, type of disposal activity, location of the disposal facility, and beginning and closure dates of the disposal activity.
 - 2. File the covenant at the courthouse where the land deed is held thirty (30) days of receipt of the covenant signed by ADEM's Land Division Chief.
 - 3. The Permittee shall submit a certified copy of the recording instrument to ADEM within 120 days after permit expiration, revocation, or as directed by ADEM as described in the Application.
- K. Removal of Waste. If the Permittee, or any other person(s), wishes to remove waste, waste residues, or any liner or contaminated soils, the owner must request and receive prior approval from ADEM.

SECTION VIII. VARIANCES

There is no approved variance for Rock 'N Bar D Landfill.

Any variance granted by the Department may be terminated by the Department whenever the Department finds, after notice and opportunity for hearing, that the petitioner is in violation of any requirement, condition, schedule, limitation or any other provision of the variance, or that operation under the variance does not meet the minimum requirements established by state and federal laws and regulations or is unreasonably threatening the public health.



December 6, 2023

Mr. Jared Kelly
Chief of Solid Waste
ADEM Land Division
1400 Coliseum Boulevard
Montgomery, AL 36110

**Re: Rock 'N Bar D, LLC
Solid Waste Permit Renewal
Permit Number: 55-09**

Dear Mr. Kelly:

The Solid Waste Permit for the subject facility expires on June 4, 2024. As required by ADEM regulations, a renewal application is required to be filed for permit renewal at least 180 days prior to the permit expiration (December 7, 2023). To satisfy this requirement, Rock 'N Bar D, LLC has enclosed the renewal application, which includes:

1. Completed application form for renewal (ADEM Form 439)
2. Fee in the amount of \$5,400 for the 10-year renewal application fee has been paid via the ADEM Online ePay website (receipt attached);
3. A list of adjacent property owners and a map showing the location of each property; and
4. A list of previously submitted and approved technical documents.

No modifications to operations or engineering designs are being requested with this renewal application.

If you have any questions regarding this matter, please feel free to contact me.

Sincerely,

Rock 'N Bar D, LLC


Jerry Cox (Dec 7, 2023 07:59 CST)

Jerry Cox
Landfill General Manager II

Enclosure

cc: Batini Robinson (w/o enclosure)
Ed Hood (w/o enclosure)

SOLID WASTE APPLICATION

**PERMIT APPLICATION
SOLID WASTE DISPOSAL FACILITY
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
(Submit in Triplicate)**

1. **Facility type:** Municipal Solid Waste Landfill (MSWLF)
 Industrial Landfill (ILF)
 Construction and Demolition Landfill (C/DLF)
 CCR Landfill (CCRLF)
 CCR Surface Impoundment (CCRSI)
 Other (explain) _____

2. **Facility Name** Rock 'N Bar D Landfill

3. **Applicant/Permittee:**

Name: Rock 'N Bar D, LLC

Address: 634 County Rd #2210
Troy, Alabama 36081

Telephone: 228-363-0253

If applicant/permittee is a Corporation, please list officers:

Patrick Dovigi - President, Mindy Gilbert - Secretary, Jonathan Lucas Pelosi - Treasurer,

Melissa Bachhuber - Assistant Secretary

4. **Location: (include county highway map or USGS map)**

Township 9 North **Range** 20 East
Section 1 **County** Pike

5. **Land Owner:**

Name: Rock 'N Bar D, LLC

Address: 634 County Rd #2210
Troy, Alabama 36081

Telephone: 228-363-0253

(Attach copy of agreement from landowner if applicable.)

Solid Waste Permit Application
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6. Contact Person:

Name Jerry Cox

Position or Affiliation Landfill General Manager II

Address: 634 County Rd #2210
Troy, Alabama 36081

Telephone: 228-363-0253

7. Size of Facility: 59.50 Acres Size of Disposal Area(s): 24.93 Acres

8. Identify proposed service area or specific industry that waste will be received from:
The service area for Rock 'N Bar D Landfill would include Autauga, Barbour,
Bullock, Butler, Coffee, Covington, Crenshaw, Dale, Elmore, Geneva,
Henry, Lowndes, Macon, Montgomery, Pike, and Russell counties in
Alabama.

9. Proposed maximum average daily volume to be received at landfill (choose one):
 Tons/Day 667 Cubic Yards/Day

10. List all waste streams to be accepted at the facility (i.e., household solid waste, wood boiler ash, tires, trees, limbs, stumps, etc.):
The waste stream for the Rock 'N Bar D Landfill would remain non-hazardous non putrescible construction and demolition waste, discarded
tires, and rubbish as defined by ADEM Rule 335-13-1-03. Also, continues to be accepted is a specific stream from the HB&G Incorporated,
manufacturing facility which includes decorative building products such as support column caps, balustrades made from wood products
with fire resistant property materials known as permacast, and process floor sweepings, sand dusts, and miscellaneous paper and plastics.

SIGNATURE (Responsible official of permit applicant):

Jerry Cox
Jerry Cox (Dec 7, 2023 07:59 CST)

TITLE: Landfill General Manager II

Jerry Cox
(please print or type name)

DATE: Dec 7, 2023

Robert Heller

Subject: FW: Rock n Bar D LLC - ADEM General Payment

From: receipts@alabamainteractive.org <receipts@alabamainteractive.org>

Sent: Wednesday, November 29, 2023 7:58 AM

To: Jerry Cox <jerry.cox@gflenv.com>

Subject: ADEM - ADEM General Payment

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Payment Receipt

11/29/2023 07:58 AM

Thank you for completing your transaction.
Please save a copy of this receipt for your records.

Receipt Confirmation Number: 2023112900001654

Agency: Alabama Department Of Environmental
Management

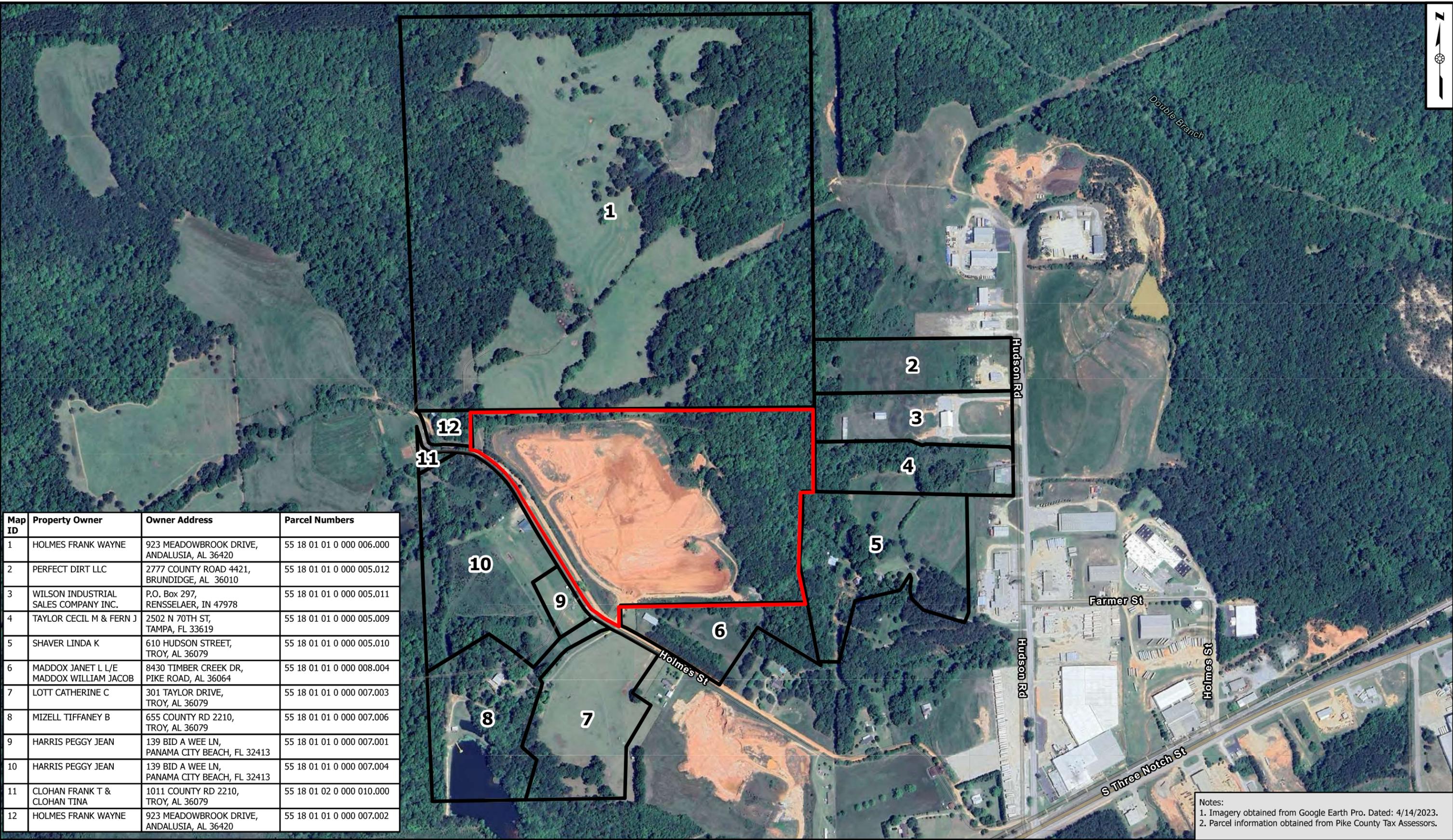
Application: ADEM General Payment

Payment Item	Fee
Application Fee	\$5,400.00
Total Fee through Alabama.gov <i>(learn more)</i>	\$5,564.00

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Please do not reply to this email.





Map ID	Property Owner	Owner Address	Parcel Numbers
1	HOLMES FRANK WAYNE	923 MEADOWBROOK DRIVE, ANDALUSIA, AL 36420	55 18 01 01 0 000 006.000
2	PERFECT DIRT LLC	2777 COUNTY ROAD 4421, BRUNDIDGE, AL 36010	55 18 01 01 0 000 005.012
3	WILSON INDUSTRIAL SALES COMPANY INC.	P.O. Box 297, RENSSELAER, IN 47978	55 18 01 01 0 000 005.011
4	TAYLOR CECIL M & FERN J	2502 N 70TH ST, TAMPA, FL 33619	55 18 01 01 0 000 005.009
5	SHAVER LINDA K	610 HUDSON STREET, TROY, AL 36079	55 18 01 01 0 000 005.010
6	MADDOX JANET L L/E MADDOX WILLIAM JACOB	8430 TIMBER CREEK DR, PIKE ROAD, AL 36064	55 18 01 01 0 000 008.004
7	LOTT CATHERINE C	301 TAYLOR DRIVE, TROY, AL 36079	55 18 01 01 0 000 007.003
8	MIZELL TIFFANEY B	655 COUNTY RD 2210, TROY, AL 36079	55 18 01 01 0 000 007.006
9	HARRIS PEGGY JEAN	139 BID A WEE LN, PANAMA CITY BEACH, FL 32413	55 18 01 01 0 000 007.001
10	HARRIS PEGGY JEAN	139 BID A WEE LN, PANAMA CITY BEACH, FL 32413	55 18 01 01 0 000 007.004
11	CLOHAN FRANK T & CLOHAN TINA	1011 COUNTY RD 2210, TROY, AL 36079	55 18 01 02 0 000 010.000
12	HOLMES FRANK WAYNE	923 MEADOWBROOK DRIVE, ANDALUSIA, AL 36420	55 18 01 01 0 000 007.002

Notes:
 1. Imagery obtained from Google Earth Pro. Dated: 4/14/2023.
 2. Parcel information obtained from Pike County Tax Assessors.

Adjacent Property Owners Map

Rock 'N Bar D C&D Landfill
 Pike County, Alabama
 11/27/2023



DISCLAIMER:
 This drawing and the information contained herein is for general presentation purposes only and is a compilation of shapefile(s) provided by various source(s). The source and accuracy of the file(s) has not been verified by HHNT and therefore the drawing is not intended for use as a engineering drawing or for design purposes.

Legend
 Property Boundary
 Adjacent Parcels



Path: I:\GFI - Pike County\Maps\Adjacent Property Owner Map.aprx User: brcgee

Rock 'N Bar D Landfill- Permit No. 55-09
List of Previously Submitted Technical Documents - December 2023

Engineering Drawings / Plans	Name	Date	Prepared By	Submittal Date(s)	ADEM Approval Date	Descriptions
	C-100 Title Sheet	7/25/2018	CDG	10/15/2018	6/5/2019	2018 Major Modification and Solid Waste Permit Renewal
	C-101 Boundary Survey	7/25/2018	CDG	10/15/2018	6/5/2019	
	C-102 Site Layout	7/25/2018	CDG	10/15/2018	6/5/2019	
	C-301 Base Grading Plan	7/25/2018	CDG	10/15/2018	6/5/2019	
	C-302 Final Grading Plan	7/25/2018	CDG	10/15/2018	6/5/2019	
	C-303 Cross Sections	7/25/2018	CDG	10/15/2018	6/5/2019	
	C-801 Details	7/25/2018	CDG	10/15/2018	6/5/2019	
	C-802 Details	7/25/2018	CDG	10/15/2018	6/5/2019	
Supplemental Technical Reports	Name	Date	Prepared By	Submittal Date(s)	ADEM Approval Date	Descriptions
Boundary Plat / Legal Description	C-101 Boundary Survey	7/25/2018	CDG	10/15/2018	6/5/2019	
Operations Plan	C-101 Boundary Survey	7/25/2018	CDG	10/15/2018	6/5/2019	
Closure Plan	Closure / Post-Closure Care Narrative	5/1/1997	Polyengineering, Inc.	4/28/1999		May 1997 Engineering Plans and Operational Narrative
Post Closure Plan	Closure / Post-Closure Care Narrative	5/1/1997	Polyengineering, Inc.	4/28/1999		May 1997 Engineering Plans and Operational Narrative
Final QA/QC Plan						
Technical Specifications Plan						
Gas Monitoring Plan	Explosive Gas Monitoring Plan	5/1/1997	Polyengineering, Inc.	4/28/1999		May 1997 Engineering Plans and Operational Narrative
Groundwater Monitoring Plan				N/A		
Stormwater Design Calcs	Design of all stormwater control features are located in the permit plans listed above	7/25/2018	CDG	10/15/2018	6/5/2019	
Local approval	Local Approval	5/16/1997	Pike County Commision	5/29/1997		Included in Original 1997 Solid Waste Permit Application
Statement of Consistency	Clearinghouse Report	6/2/1997	SCADC	6/17/1997		
Hydrogeological Evaluation	Hydrogeological Investigation Report	5/29/1997	Polyengineering, Inc.	5/29/1997		Submitted Separately from Solid Waste Permit Application
Wetlands, T&E, Cultural Study	Cultural Resource Assessment	5/22/1997	Alabama Historical Commission	5/29/1997		Included in Original 1997 Solid Waste Permit Application
contd.	Wetland Delineation and Endangered Species Survey	5/22/1997	Environmental Resource Analysts, INC	5/29/1997		Included in Original 1997 Solid Waste Permit Application
contd.	Endangered Species Act Letter	6/4/1997	United States Department of the Interior	6/17/1997		Submitted Separately from Solid Waste Permit Application
contd.	Wetland Delineation Confirmation Letter	6/17/1997	Department of the Army	7/7/1997		Submitted Separately from Solid Waste Permit Application
Stability Report						
Liner and Leachate QA/QC Plan				N/A		
Alternative Liner / Cover Systems				N/A		
Soil borings and analysis				N/A		
Other	EJ Screen	3/5/2019	US EPA	5/9/2019		Submitted Separately from Solid Waste Permit Application

Notes:
1. Document list is based solely on review of available documents on ADEM E-File website that were tagged under Category/Type "permitting".

Rock 'N Bar D - Permit No. 55-09
List of Previously Submitted Technical Documents - Dec 2023

Cell Approval (Most Recent)			
Description	Submittal Date	Approval Date	Notes
Cells 2A and 4A	6/15/2021	7/1/2021	
10/24/14 Cell	11/3/2014	11/10/2014	
2/28/2013 Cell	4/22/2013	4/24/2013	
August 2010 "Area A" Cell	8/24/2010	9/27/2009	
March 2009 "Area A" Cell	3/25/2009	7/14/2009	
List of Variances			
Description	Submittal Date	Approval Date	Notes
N/A	N/A	N/A	N/A
Leachate Disposal Description			
N/A			

**Rock N' Bar D Landfill
Permit No. 55-09
Troy, AL**



Special Waste Plan



CDG Engineers and Associates, Inc.
| cdge.com

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APPENDIXES

Appendix A – Waste Load Inspection Form

1.0 Purpose

The purpose of this Plan is to outline the steps for acceptance of special waste and ensure only approved wastes are disposed of at the Rock N' Bar D Landfill, Permit No. 55-09. The Rock N' Bar D Landfill is located at 634 County Road 2210, Troy, AL and is owned by Rock N' Bar D, LLC. Special waste intended for disposal must undergo the approval process described in this plan prior to acceptance.

2.0 Special Waste Definition

The Alabama Department of Environmental Management (ADEM) defines Special Waste as "those wastes requiring specific processing, handling or disposal techniques as determined necessary by the Department which are different from the techniques normally utilized for handling or disposal. Examples of such waste types may include, but are not limited to: mining waste; fly ash; bottom ash; sludges; friable asbestos; industrial waste; liquid waste; large dead animals or large quantities of dead animals and residue, medical waste, foundry waste, petroleum contaminated wastes, municipal solid waste ash, or contaminated soil and water from the cleanup of a spill."

3.0 Unapproved Wastes

The following is a list of wastes that are NOT accepted at the Rock N' Bar D Landfill as detailed in the facility's Permit:

- wet paint
- used oil
- free liquids or bulk containerized liquids
- batteries
- untreated medical waste
- hazardous waste
- regulated PCB wastes
- friable asbestos
- Household garbage
- Industrial waste

4.0 Pre-Approval of Waste

The following steps are to be taken prior to wastes loads being transported to the landfill:

- Generator is to make a waste determination for each waste stream
- Form 300 is to be completed
- Forms, with appropriate supporting documentation and fee, are to be submitted to ADEM
- ADEM will issue waste disposal approval
- ADEM approval must be submitted to the facility

5.0 Waste Load Inspections

Landfill personnel will inspect all special waste loads and perform random inspections of waste during the day. All waste load inspections shall be supervised by trained personnel and shall be performed in a designated area of the facility. The results of each inspection will be recorded and a Waste Load Inspection Form (WLIF) filed at

the landfill office. A copy of the WLIF can be found in Appendix A. The information recorded from each inspection shall include the waste origin, the waste transporter, and any certifications provided by the waste generator. Copies of the Forms shall be included in the Operating Record.

5.1 Types of Inspections

- Initial – All new special waste loads will require a visual inspection. This includes a new generator, waste stream, hauler, or renewal of a previous approval.
- Random – The facility may at any time, require an inspection of a load. This could occur at the scale house or the working face.
- Suspicious – If for any reason landfill personnel feel uncomfortable about a load, an inspection may be required.

5.2 Inspection Procedures

The following steps are to be taken during each inspection:

- Each truck is to be weighed at the scale house
- The scale house operator is to review and approve documentation provided by the transporter
- The scale house operator is to instruct the driver to the inspection area
- The inspector is to complete the Waste Load Inspection Form
- Once approved, the inspector is to direct the driver to the working face
- All inspection documentation will be filed in the operating record

Upon discovering restricted wastes, the landfill operator will immediately notify the generator and/or transporter that the material is restricted from disposal at the facility and landfill personnel will contact ADEM for the appropriate action to be taken.

The landfill operator shall notify ADEM’s Waste Programs Branch and the transporter of the waste, if any hazardous or restricted waste is discovered.

The landfill operator shall notify ADEM prior to allowing the disposal of any questionable waste stream in the disposal area.

If there are questions regarding any incoming waste stream, landfill personnel have been instructed to notify ADEM’s solid waste branch at (334)271-7700 prior to allowing the disposal of the waste at the landfill.

6.0 Rejected Wastes

The facility has the right to reject a load of waste for any of the following reasons:

- Load arrives without proper approval documentation
- Waste does not match description
- Information is incomplete or incorrect
- Load does not pass inspection

7.0 Employee Training

Site personnel conducting inspections at the Rock N' Bar D Landfill are to successfully complete ADEM's Certified Operators Course to detect restricted waste as indicated by the Department. Records of landfill personnel's certification of successfully completion are to be kept in the operating record.

Appendix A

Waste Load Inspection Form

STORMWATER MANAGEMENT REPORT

STORMWATER DETENTION BASIN REDESIGN

ROCK 'N BAR D C&D LANDFILL

PERMIT NO. 55-09

PIKE COUNTY, ALABAMA

FOR

GFL ENVIRONMENTAL

DECEMBER 2024



HODGES, HARBIN,
NEWBERRY & TRIBBLE, INC.

Consulting Engineers

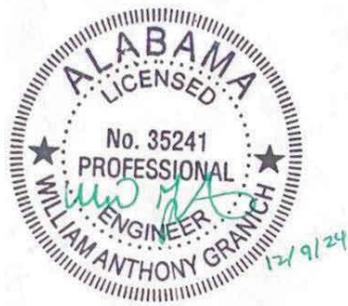


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2.3	Basin Dewatering from 24-Hour, 10-Year Rainfall Event
2.4	Reservoir Routing
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2.6	Overflow Structure Base Foundation Design
2.7	Outlet Protection

1.0 STORMWATER MANAGEMENT SYSTEM CALCULATIONS

1.1 General

The purpose of the stormwater conveyance and erosion/sediment control system is to divert stormwater run-on away from the landfill and collect and transport stormwater runoff from the landfill to the stormwater detention basin. Basin design is based on the Final Grading Plan prepared by Others. These calculations are solely intended for the stormwater detention basin design and does not include design for stormwater terraces, flumes, and ditches.

Regulatory Compliance

The stormwater detention basin was developed to meet or exceed the requirements of the Alabama Department of Environmental Management (ADEM) NPDES General Permit (ALG160000) and the Alabama Handbook for Erosion Control, Sediment Control, and Stormwater Management on Construction Sites and Urban Areas. Design for the stormwater detention basin meets or exceeds the requirements for a run-off control system from the active and/or closed portions of the landfill to collect and control at least the water volume resulting from a 24-hour, 25-year storm (ADEM Admin. Code r. 335-13-4-.17 (2)). Additionally, erosion and sediment control devices shall be designed and installed at the time of each specific construction project and shall meet or exceed the NPDES and ADEM requirements.

1.2 Design Assumptions and Information

The following assumptions are used to design all components of the stormwater detention basin.

1. Stormwater detention basin design completed for the entire 33.5 acre drainage area and accounted for the runoff from the landfill at final grade (Final Grading Plan prepared by CDG Engineers & Associates, Inc.)
2. Design calculations have been completed assuming all stormwater run-off will be directed to the stormwater detention basin using stormwater conveyance as shown on the final grading sheet of the approved permit plans
3. Stormwater detention basin has been designed to dewater the 24-hour, 10-year storm through the skimmer while maintaining peak elevation below the top of the overflow structure
4. Stormwater detention basin has been designed to dewater the 24-hour, 25-year storm through the overflow structure (emergency spillway) while maintaining 1' of freeboard below the top of dam

5. SCS Method - Hydrologic Data:

- a. Curve Number (CN) 74 (estimated value for final cover of landfill)
- b. Storm Distribution Type III
- c. Time interval 1 minute

- d. Precipitation depths: National Oceanic and Atmospheric Administration
(NOAA) Atlas 14, Volume 9 Version 2
 - 24 hr. Precipitation – 10-year Storm Event 6.75 inches
 - 24 hr. Precipitation – 25-year Storm Event 8.48 inches



NOAA Atlas 14, Volume 9, Version 2
Location name: Troy, Alabama, USA*
Latitude: 31.7842°, Longitude: -86.0061°
Elevation: 502 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.484 (0.413-0.580)	0.551 (0.468-0.660)	0.657 (0.557-0.789)	0.744 (0.626-0.897)	0.860 (0.692-1.07)	0.948 (0.742-1.19)	1.03 (0.776-1.34)	1.12 (0.798-1.49)	1.23 (0.836-1.68)	1.31 (0.865-1.83)
10-min	0.709 (0.604-0.849)	0.806 (0.686-0.966)	0.962 (0.815-1.16)	1.09 (0.916-1.31)	1.26 (1.01-1.56)	1.39 (1.09-1.75)	1.51 (1.14-1.96)	1.64 (1.17-2.18)	1.80 (1.22-2.46)	1.92 (1.27-2.68)
15-min	0.865 (0.737-1.04)	0.983 (0.836-1.18)	1.17 (0.994-1.41)	1.33 (1.12-1.60)	1.54 (1.24-1.90)	1.69 (1.33-2.13)	1.85 (1.39-2.38)	2.00 (1.42-2.66)	2.19 (1.49-3.00)	2.34 (1.54-3.27)
30-min	1.26 (1.08-1.51)	1.45 (1.23-1.73)	1.74 (1.47-2.09)	1.98 (1.66-2.38)	2.29 (1.84-2.84)	2.53 (1.98-3.18)	2.76 (2.07-3.57)	2.99 (2.13-3.97)	3.28 (2.23-4.49)	3.49 (2.31-4.88)
60-min	1.65 (1.41-1.98)	1.89 (1.61-2.26)	2.29 (1.94-2.75)	2.63 (2.21-3.17)	3.11 (2.51-3.89)	3.49 (2.74-4.43)	3.88 (2.92-5.05)	4.29 (3.07-5.74)	4.85 (3.31-6.67)	5.28 (3.48-7.38)
2-hr	2.04 (1.75-2.43)	2.34 (2.00-2.78)	2.84 (2.42-3.39)	3.28 (2.78-3.93)	3.93 (3.20-4.90)	4.46 (3.53-5.63)	5.01 (3.80-6.49)	5.60 (4.03-7.46)	6.41 (4.41-8.80)	7.06 (4.69-9.80)
3-hr	2.28 (1.96-2.71)	2.60 (2.24-3.09)	3.18 (2.72-3.78)	3.71 (3.15-4.43)	4.51 (3.70-5.64)	5.18 (4.13-6.56)	5.91 (4.51-7.67)	6.70 (4.86-8.94)	7.82 (5.41-10.7)	8.73 (5.82-12.1)
6-hr	2.75 (2.38-3.24)	3.14 (2.71-3.69)	3.86 (3.32-4.56)	4.56 (3.89-5.40)	5.65 (4.70-7.08)	6.60 (5.30-8.35)	7.65 (5.88-9.91)	8.80 (6.44-11.7)	10.5 (7.31-14.3)	11.9 (7.96-16.3)
12-hr	3.31 (2.88-3.87)	3.79 (3.29-4.43)	4.71 (4.07-5.52)	5.60 (4.80-6.59)	7.00 (5.86-8.74)	8.24 (6.66-10.4)	9.60 (7.44-12.4)	11.1 (8.18-14.7)	13.3 (9.35-18.1)	15.1 (10.2-20.7)
24-hr	3.91 (3.42-4.54)	4.51 (3.93-5.24)	5.65 (4.91-6.58)	6.75 (5.82-7.89)	8.48 (7.14-10.5)	10.0 (8.13-12.5)	11.7 (9.09-14.9)	13.5 (10.0-17.8)	16.2 (11.5-21.9)	18.4 (12.5-25.0)
2-day	4.55 (4.00-5.24)	5.24 (4.60-6.05)	6.57 (5.74-7.59)	7.85 (6.81-9.11)	9.87 (8.35-12.1)	11.6 (9.52-14.4)	13.6 (10.6-17.3)	15.7 (11.7-20.6)	18.9 (13.4-25.3)	21.5 (14.7-28.9)
3-day	5.01 (4.41-5.74)	5.70 (5.01-6.54)	7.03 (6.16-8.10)	8.34 (7.26-9.65)	10.4 (8.89-12.8)	12.3 (10.1-15.2)	14.4 (11.3-18.2)	16.7 (12.5-21.7)	20.1 (14.3-26.8)	22.9 (15.7-30.7)
4-day	5.37 (4.75-6.14)	6.06 (5.34-6.93)	7.40 (6.50-8.50)	8.73 (7.62-10.1)	10.9 (9.28-13.3)	12.8 (10.5-15.8)	14.9 (11.8-18.9)	17.3 (13.0-22.5)	20.8 (14.9-27.7)	23.6 (16.3-31.7)
7-day	6.21 (5.52-7.07)	6.98 (6.18-7.94)	8.44 (7.45-9.63)	9.85 (8.63-11.3)	12.1 (10.3-14.6)	14.0 (11.6-17.2)	16.2 (12.8-20.3)	18.6 (14.0-24.0)	22.1 (15.9-29.2)	24.9 (17.3-33.2)
10-day	6.94 (6.18-7.86)	7.80 (6.93-8.84)	9.38 (8.30-10.7)	10.9 (9.55-12.4)	13.2 (11.3-15.8)	15.2 (12.6-18.4)	17.3 (13.8-21.6)	19.7 (14.9-25.2)	23.1 (16.7-30.4)	25.9 (18.0-34.4)
20-day	9.11 (8.16-10.2)	10.2 (9.10-11.5)	12.1 (10.7-13.6)	13.8 (12.2-15.6)	16.3 (13.9-19.2)	18.3 (15.2-22.0)	20.5 (16.4-25.3)	22.9 (17.4-29.0)	26.2 (19.0-34.2)	28.9 (20.3-38.1)
30-day	11.0 (9.91-12.4)	12.3 (11.0-13.8)	14.4 (12.9-16.2)	16.3 (14.4-18.4)	18.9 (16.2-22.2)	21.1 (17.6-25.1)	23.3 (18.6-28.5)	25.7 (19.5-32.3)	28.9 (21.0-37.4)	31.5 (22.1-41.3)
45-day	13.6 (12.2-15.1)	15.1 (13.6-16.8)	17.5 (15.7-19.6)	19.6 (17.4-22.0)	22.5 (19.2-26.1)	24.7 (20.6-29.1)	27.0 (21.6-32.6)	29.3 (22.3-36.5)	32.4 (23.6-41.6)	34.7 (24.5-45.4)
60-day	15.8 (14.3-17.6)	17.5 (15.8-19.5)	20.3 (18.2-22.7)	22.5 (20.1-25.3)	25.6 (21.9-29.5)	27.9 (23.3-32.7)	30.2 (24.2-36.3)	32.4 (24.7-40.2)	35.3 (25.8-45.1)	37.5 (26.6-48.8)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

1.3 Hydrographs and Design Runoff Flows

The design runoff from the landfill final cover conditions was determined for the 24-hour, 10-year storm event and the 24-hour, 25-year storm event. The determination of the design runoff flow assumed one 33.5 acre drainage area. The time of concentration data based on the Lag Method¹ and using the final cover contributing drainage area maximum flow lengths and slopes. A curve number (CN) of 74 was assumed for the final cover of the landfill to calculate the flow from the drainage area. This curve number is a conservative assumption after the landfill is closed and vegetated. The hydrograph was developed based on the SCS TR55 Method² for the drainage area using the Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2022 program.

The hydrograph summary report is included on the following pages.

¹ United States Department of Agriculture Natural Resources Conservation Service, Part 630 Hydrology National Engineering Handbook Chapter 15 Time of Concentration, (210-VI-NEH, May 2010)

² 210-VI-TR-55 Reference Manual. 2nd Edition. USDA Soil Conservation Service. June 1986.

Table 2-2a Runoff curve numbers for urban areas ^{1/}

Cover description	Average percent impervious area ^{2/}	Curve numbers for hydrologic soil group			
		A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
Open space (lawns, parks, golf courses, cemeteries, etc.) ^{3/} :					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) ^{4/}		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
<i>Developing urban areas</i>					
Newly graded areas (pervious areas only, no vegetation) ^{5/}					
		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

¹ Average runoff condition, and $I_a = 0.2S$.² The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.³ CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.⁴ Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.⁵ Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	105.53	1	734	465,552	-----	-----	-----	DA-To Basin
2	Reservoir	1.134	1	1436	154,989	1	448.51	407,366	Basin 1
RNB D-Basin 1 Redesign.gpw					Return Period: 10 Year		Monday, 12 / 9 / 2024		

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	147.35	1	733	652,037	-----	-----	-----	DA-To Basin
2	Reservoir	12.65	1	850	334,407	1	448.91	431,748	Basin 1
RNB D-Basin 1 Redesign.gpw					Return Period: 25 Year		Monday, 12 / 9 / 2024		

2.0 STORMWATER DETENTION BASIN

2.1 General

The purpose of the stormwater detention basin is to detain runoff and trap sediment from erodible areas in order to protect properties and drainage ways downstream from damage by excessive flow rates, erosion and sedimentation. The stormwater detention basin is designed to have an overflow structure that is designed to be the basin outlet and serve as an emergency spillway.

It has been demonstrated in these design calculations that the proposed overflow structure is adequately designed to accommodate the 10-year storm dewatered through the skimmer and handle the 25-year storm event through the overflow structure. The overflow structure has 1 eight (8) inch skimmer dewatering orifice designed to slowly discharge stormwater down to the permanent pool from the 10-year storm without overtopping the overflow structure. The 25-year storm will be dewatered using the eight (8) inch skimmer while also draining stormwater through the top of the overflow structure when the basin water levels rise above the crest. The skimmer and overflow structure dewatering will retain the 25-year storm with a minimum 1' of freeboard below the top of the dam.

2.2 Sediment Storage Calculation

Assume maximum sediment from 33.5-acre drainage area.

$$33.5 \text{ Acres} \times \frac{1}{2} \text{ inch/acre} = 61,289 \text{ c.f.}$$

This sediment volume corresponds to a depth of 2.43 ft. or Elev. 438.43.

The 1 eight (8) inch skimmer dewatering orifice opening is set at Elev. 439.50. Therefore, ample sediment storage volume is available.

2.3 Basin Dewatering from 24-Hour, 10-Year Rainfall Event

Retention time within the basin is an important factor in effective sediment retention. The proposed stormwater detention basin will utilize a 5'x5' square concrete overflow structure with (1) eight inch skimmer dewatering orifice set at an elevation of 439.50 for dewatering at a slow flow rate.

The calculation below has been performed to confirm that the dewatering (retention) time within the basin is between 48 and 120 hours for a 10-year storm event. This dewatering time will ensure the stormwater is retained for an adequate length of time to allow the sediment to settle (minimum 48 hours) and is also discharged gradually in an acceptable length of time to allow storage for future storm events (maximum 120 hours).

Top of Overflow Structure Elevation	=	448.60
Top of Permanent Pool Elevation	=	439.50
10-Year Storm Max Elevation	=	448.51
Volume to be Dewatered	=	407,366 cf (Volume from El. 448.51 – El. 439.50)
8" Skimmer Dewatering Rate	=	97,978 cf/day

$$\frac{407,366 \text{ cf}}{(97,978 \text{ cf/day})} = 4.16 \text{ days}$$

Total Basin Dewatering Time for a 10-year storm = **99.84 hrs** is greater than 48 hours and less than 120 hours

2.4 Reservoir Routing

Reservoir routing was performed by using the HydraFlow Hydrographs Extension for AutoCAD Civil 3D 2022 Computer Program.

Peak inflow rate (Q) to the proposed stormwater detention basin for the 24-hour, 10-year and the 24-hour, 25-year storm event is calculated using the SCS Method and HydraFlow computer program and these rates are listed below:

$$Q_{10} = \underline{105.53} \text{ cfs}$$

$$Q_{25} = \underline{147.35} \text{ cfs}$$

The bottom of the basin has been set at 436.00. Dewatering of the basin is accomplished by 1 eight (8) inch skimmer dewatering orifice set at an elevation of 439.50, and by the 5'x5' square overflow structure with a top elevation of 448.60. The top of the berm around the stormwater detention basin is at an elevation of 450.00.

Based on the above information, the reservoir routing calculations are summarized below:

STORM DURATION (yr-24 hr.)	PEAK INFLOW (CFS)	PEAK OUTFLOW (CFS)	PEAK ELEV. (FEET)
10 -	105.53	1.134	448.51
25 -	147.35	12.65	448.91

Based on these routing calculations, the stormwater detention basin is large enough and has sufficient storage volume to retain the sediment from 33.5 disturbed acres plus maintaining the 10-year storm below the crest of the overflow structure by dewatering the 10-year storm event using an eight-inch skimmer. The 5' x 5' square concrete structure will maintain a minimum 1' of freeboard below the top of dam during a 25-year storm event with a starting elevation of 439.50. Based on a peak elevation of 448.91 and a top of basin elevation of 450.00, 1.09' of freeboard is maintained which is sufficient to utilize the overflow structure as the emergency spillway.

Pond Report

Basin 1 - Perm Pool

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 439.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	439.50	31,419	0	0
0.50	440.00	32,836	16,061	16,061
2.50	442.00	38,781	71,527	87,588
4.50	444.00	44,981	83,677	171,265
6.50	446.00	51,419	96,319	267,584
8.50	448.00	58,092	109,432	377,016
9.10	448.60	60,164	35,472	412,488
10.50	450.00	64,999	87,584	500,071

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	Inactive	Inactive	0.00
Span (in)	= 24.00	0.00	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 439.50	0.00	0.00	0.00
Length (ft)	= 79.00	0.00	0.00	0.00
Slope (%)	= 1.89	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	0.00	0.00	0.00
Crest El. (ft)	= 448.60	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	439.50	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.50	16,061	440.00	0.00	---	---	---	0.00	---	---	---	---	1.134	1.134
2.50	87,588	442.00	0.00	---	---	---	0.00	---	---	---	---	1.134	1.134
4.50	171,265	444.00	0.00	---	---	---	0.00	---	---	---	---	1.134	1.134
6.50	267,584	446.00	0.00	---	---	---	0.00	---	---	---	---	1.134	1.134
8.50	377,016	448.00	0.00	---	---	---	0.00	---	---	---	---	1.134	1.134
9.10	412,488	448.60	0.00	---	---	---	0.00	---	---	---	---	1.134	1.134
10.50	500,071	450.00	46.37 ic	---	---	---	46.36 s	---	---	---	---	1.134	47.50

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
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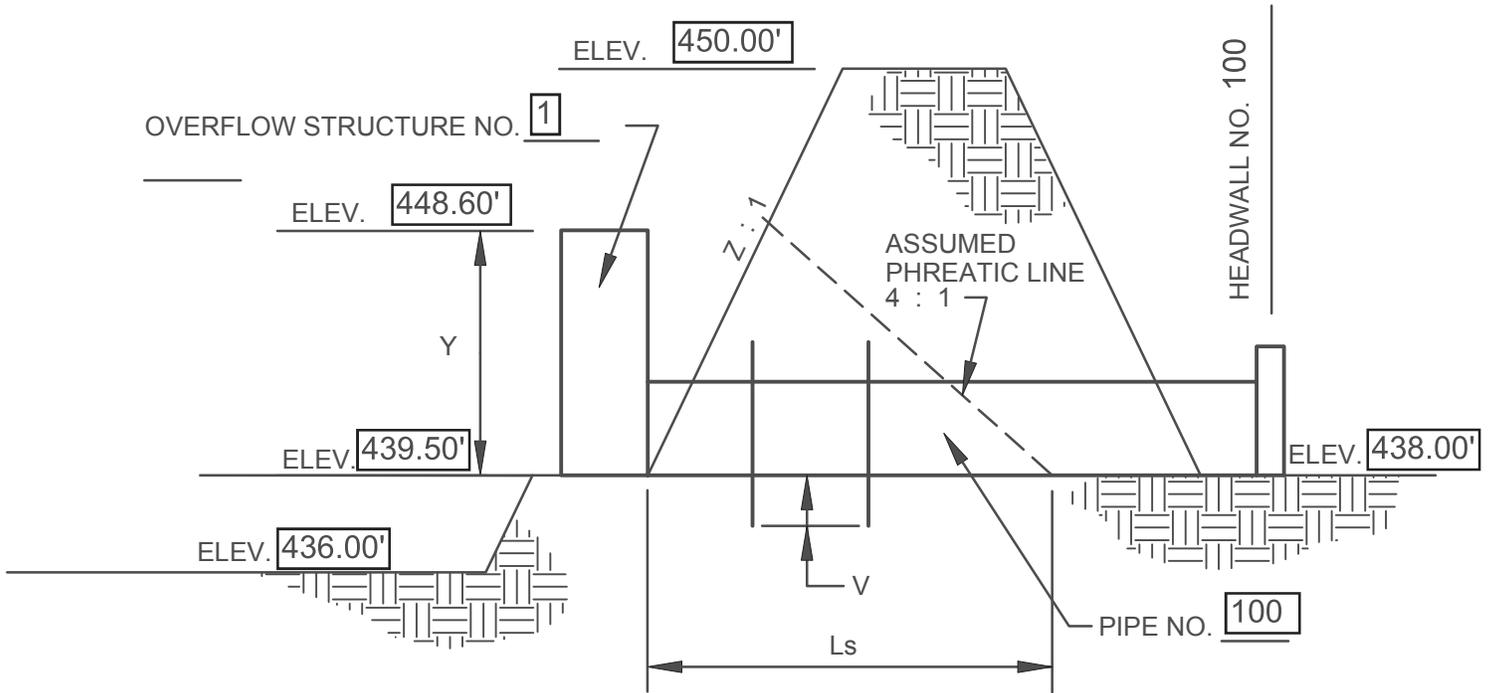
Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
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RNB D-Basin 1 Redesign.gpw					Return Period: 25 Year			Monday, 12 / 9 / 2024	

2.5 Anti-Seep Collar Design

ANTI - SEEP COLLAR DESIGN



L_s = LENGTH IN SATURATION ZONE

Y = OVERFLOW STRUCTURE HEIGHT = 9.1 FEET

Z = INSIDE SLOPE OF LEVEE = 3

PIPE SLOPE = 1.89 % = 0.0189 FEET / FEET

$$L_s = Y(Z + 4) \left(1 + \frac{\text{PIPE SLOPE}}{0.25 - \text{PIPE SLOPE}} \right)$$

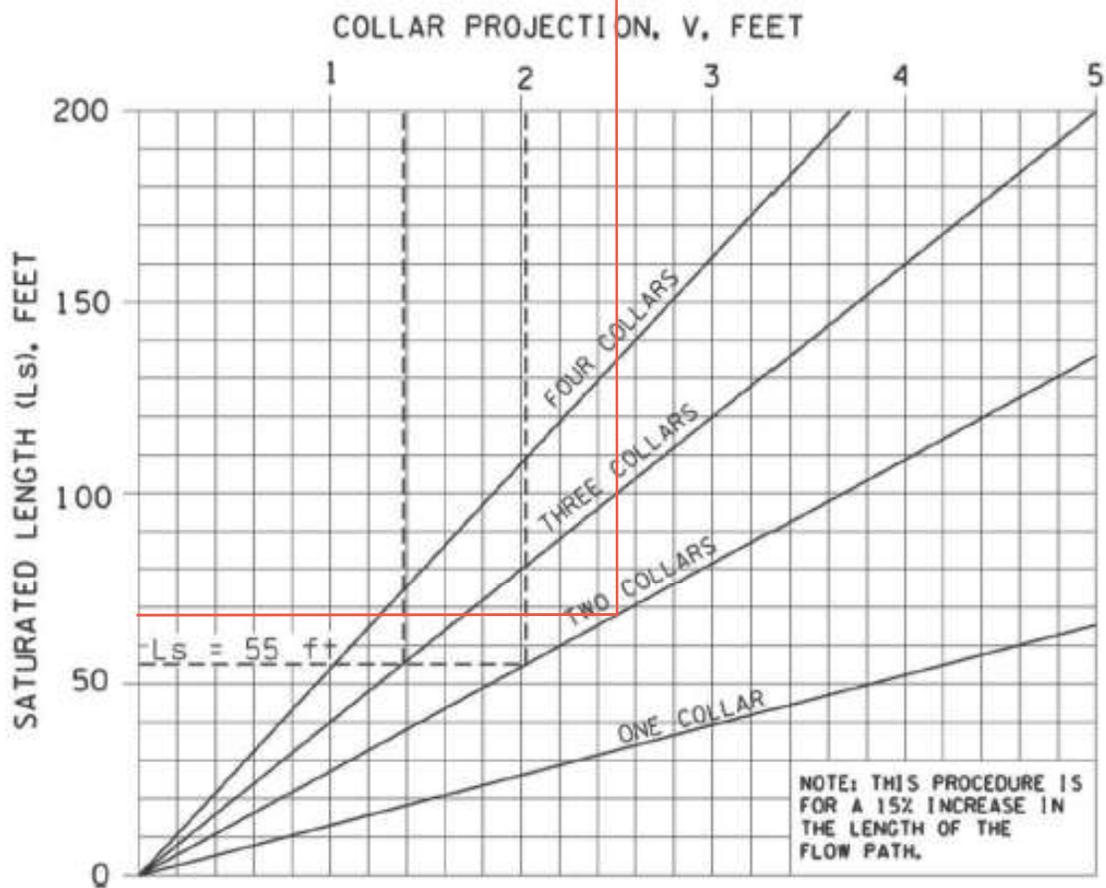
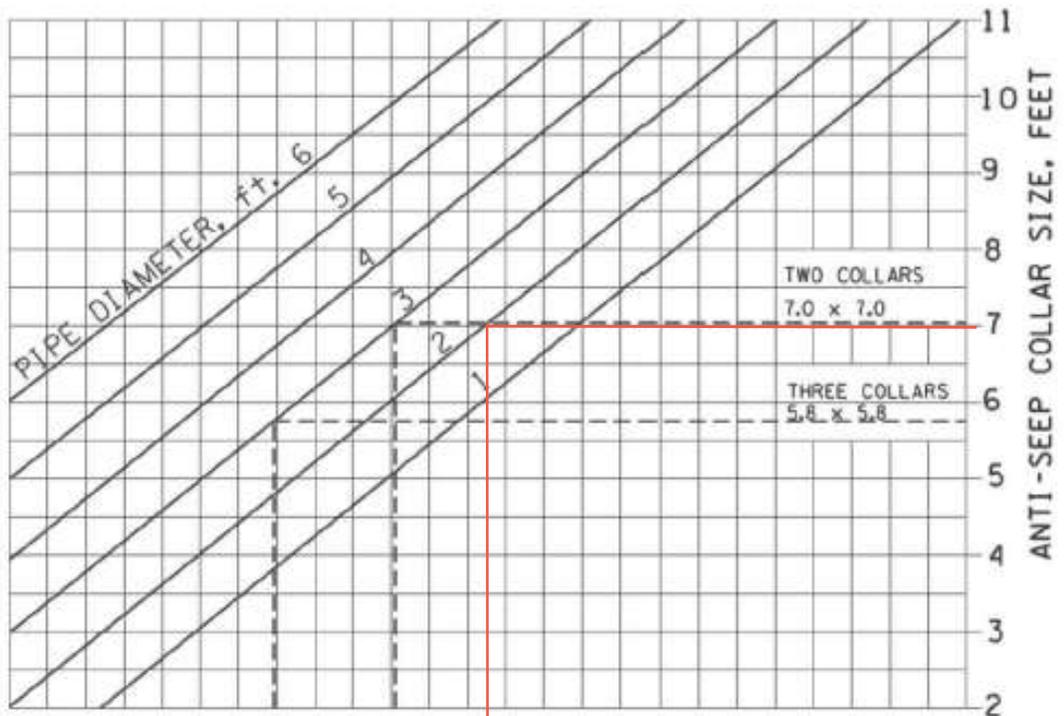
L_s = 68.91 FEET

FROM ANTI - SEEP COLLAR DESIGN CHART ON THE NEXT PAGE:

V = COLLAR PROJECTION = 2.5 FEET

DIMENSIONS OF 12" THICK COLLAR = 7.0' X 7.0'

NUMBER OF REQUIRED COLLARS = 2



2.6 Overflow Structure Base Foundation Design

OVERFLOW STRUCTURE BUOYANCY FORCE

I. Buoyancy Force from Riser Structure

Step 1. Calculate the Buoyancy Force from Riser Structure		
$F_R = (L_R)(W_R)(H_R)(\rho_w) * 1.5$ (Factor of Safety)		
where:		
L_R = Length of Riser Structure (ft)	=	6
W_R = Width of Riser Structure (ft)	=	6
H_R = Height of Riser Structure (ft)	=	9.1
ρ_w = Density of Water (lb/ft ³)	=	62.4
F_R = Buoyancy Force from Riser Structure (lb)	=	30,663

II. Weight of Concrete Available to Overcome the Buoyancy Force from Riser Structure

Step 2. Weight of Concrete from Riser Structure (6" Thick walls)		
$W_{RS} = \{[(L_R)(W_R) - (L_i)(W_i)] * H_R - \pi(0.5)(r_p)^2\} \times (\rho_c)$		
where:		
L_R = Overall Length of Overflow Structure (ft)	=	6.00
W_R = Overall Width of Overflow Structure (ft)	=	6.00
H_R = Height of Overflow Structure (ft)	=	9.10
L_i = Inside Length of Overflow Structure (ft)	=	5.00
W_i = Inside Width of Overflow Structure (ft)	=	5.00
r_p = Inside Radius of Carrier Pipe (ft)	=	1
ρ_c = Density of Concrete (lb/ft ³)	=	150
W_{RS} = Weight of Riser Structure (lb)	=	14,779

Step 3. Weight of Concrete from Riser Structure Base		
$W_{SB,min} = F_R - W_{RS}$		
$W_{SB} = (L_B \times W_B \times H_B) \times \rho_{c,w}$		
where:		
F_R = Buoyancy Force from Riser Structure (lb)	=	30663
W_{RS} = Weight of Riser Structure (lb)	=	14779
$W_{SB,min}$ = Minimum Weight of Riser Structure Base Required (lb)	=	15,884
L_B = Length of Base (ft)	=	7.25
W_B = Width of Base (ft)	=	7.25
H_B = Height of Base (ft)	=	3.5
$\rho_{c,w}$ = Density of Concrete in Water (lb/ft ³)	=	87.6
W_{SB} = Weight of Riser Structure Base (lb)	=	16,116

III. Total Weight of Riser and Base is Greater than Buoyancy Force from Riser Structure

Step 4: Check that the Total Weight of Concrete from the Riser Structure and Base is Greater than the Buoyancy Force from Riser Structure		
TOTAL REQUIRED WEIGHT (lb)	=	30663
Actual Total		
Riser Structure (lb)	=	14779
Riser Structure Base (lb)	=	16116
TOTAL (lb)	=	30,895
(Actual) c.f. > (Required) c.f.	=	OK

IV. Buoyancy Force from Carrier Pipe

Step 5. Calculate the Buoyancy Force from Carrier Pipe $F_p = (\pi)(R_p)^2(L_s)(\rho) * 1.5$ (Factor of Safety)		
where:		
R_p = Outside Radius of Carrier Pipe (ft)	=	1.25
L_s = Length of Pipe in Saturation Zone (ft)	=	68.15
ρ_w = Density of Water (lb/ft ³)	=	62.4
F_p = Buoyancy Force from Carrier Pipe (lb)	=	31,312

V. Weight of Concrete/Soil Available to Overcome the Buoyancy Force from Carrier Pipe

Step 6: Calculate the Total Weight of Concrete/Soil Available

This Weight of Concrete Required will be made up from Four Areas:

- Weight of Concrete from the Anti-Seep Collars
- Weight of Concrete from Carrier Pipe
- Weight of Concrete from Carrier Pipe Encasement
- Weight of Saturated Soil above the Carrier Pipe

A. Weight of Concrete from Anti-Seep Collars $W_{AS} = [(L_A \times W_A) - (\pi)(R_p^2)] \times 1' \text{ thick} \times \# \text{ of collars} \times \rho_{c,w}$		
where:		
L_A = Length of Anti-Seep Collar (ft)	=	7
W_A = Width of Anti-Seep Collar (ft)	=	7
R_p = Outside Radius of Carrier Pipe (ft)	=	1.25
# of Collars	=	2
$\rho_{c,w}$ = Density of Concrete in Water (lb/ft ³)	=	87.6
W_{AS} = Weight of Concrete from Anti-Seep Collars (lb)	=	7,725

V. Weight of Concrete/Soil Available to Overcome the Buoyancy Force from Carrier Pipe

B. Weight of Concrete from Carrier Pipe		
$W_p = \pi(R_p^2 - r_p^2)L_s \times \rho_c$		
R_p = Outside Radius of Carrier Pipe (ft)	=	1.25
r_p = Inside Radius of Carrier Pipe (ft)	=	1
L_s = Length in Saturation Zone (ft)	=	68.15
ρ_c = Density of Concrete (lb/ft ³)	=	150
W_p = Weight of Concrete From Carrier Pipe (lb)	=	18,065

C. Weight of Concrete from Carrier Pipe Encasement		
$W_{EC} = [(L_E \times W_E \times H_E) - (\pi)(R_p)^2(L_E)] \times \rho_{c,w}$		
$F_{E,FT} = W_E \times H_E \times 1' \times \rho_w \times 1.5$ (Factor of Safety)		
$W_{EC,FT} = [(W_E \times H_E) - (\pi)(r_p)^2] \times 1' \times \rho_c$		
where:		
L_E = Length of Encasement (ft)	=	8
W_E = Width of Encasement (ft)	=	3
H_E = Height of Encasement (ft)	=	3
R_p = Outside Radius of Carrier Pipe (ft)	=	1.25
r_p = Inside Radius of Carrier Pipe (ft)	=	1.00
ρ_w = Density of Water (lb/ft ³)	=	62.4
$\rho_{c,w}$ = Density of Concrete in Water (lb/ft ³)	=	87.6
ρ_c = Density of Concrete in (lb/ft ³)	=	150
W_{EC} = Weight of Carrier Pipe Encasement (lb)	=	2,867
$F_{E,FT}$ = Buoyancy Force from Encasement per Foot (lb/ft)	=	842
$W_{EC,FT}$ = Carrier Pipe Encasement Weight per Foot (lb/ft)	=	879

D. Weight of Saturated Soil above the Carrier Pipe		
ρ_s = Density of Soil (lbs/ft ³)	=	100
W_{sat} = Weight of Saturated Soil		
ρ_{sat} = Density of Soil - Specific Weight of Water = $W_s - 62.4$ (lbs/ft ³)	=	37.6
$V_s = (A_c)(W_p)$		
where:		
A_c = Cross-sectional Profile Area of soil above pipe within the Saturation Zone (ft ²)	=	112.54
W_p = Width/Diameter of Pipe (ft)	=	2.5
V_s = Volume of soil in the Length of saturation over the carrier pipe	=	281
Weight of soil above pipe = $(V_s) \times (W_{sat})$ (lbs)	=	10,579

VI. Total Weight of Concrete/Soil from Four Areas is Greater than Required Weight

Step 7: Check that the Total Weight of Concrete/Soil from the Four Areas is Greater than the Buoyancy Force from Carrier Pipe		
TOTAL REQUIRED WEIGHT (lb)	=	31312
Actual Total		
Anti-Seep Collars (lb)	=	7725
Carrier Pipe (lb)	=	18065
Carrier Pipe Encasement (lb)	=	2867
Weight of Saturated Soil (lb)	=	10579
TOTAL (lb)	=	39,235
(Actual) c.f. > (Required) c.f.	=	OK

2.7 Outlet Protection

OUTLET PROTECTION CALCULATIONS

Site: Rock 'N Bar D
 Name: GWP
 Date: 11/15/2024

STORMWATER DRAINAGE PIPES

Pipe No.	Q ₂₅ (ft ³ /sec)	D _o (in)	L _a (ft)	d ₅₀ (ft)	W ₁ (ft)	W ₂ (ft)	Riprap (S.Y.)	d _{50,design} (in)
100	12.65	24	13	0.4	6.0	15.2	16	6

Where:

Q₂₅ = 25-year storm flow rate existing downdrain

D_o = Pipe diameter

L_a = Length of apron from chart

d₅₀ = Size of Riprap from chart

W₁ = Length of Riprap at the pipe outlet

W₂ = Length of Riprap at the full length of apron

Riprap = Area of Riprap required

d_{50,design} = Riprap sizing in inches and rounded to nominal Riprap size

Formulas:

$$W_1 = 3 \times D_o$$

$$W_2 = D_o + L_a$$

$$\text{Riprap} = ((W_1 + W_2) \times L_a) / 18$$

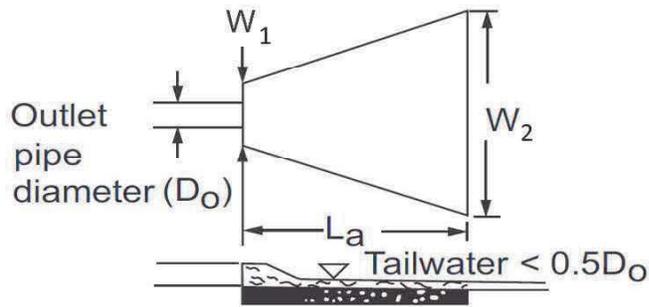
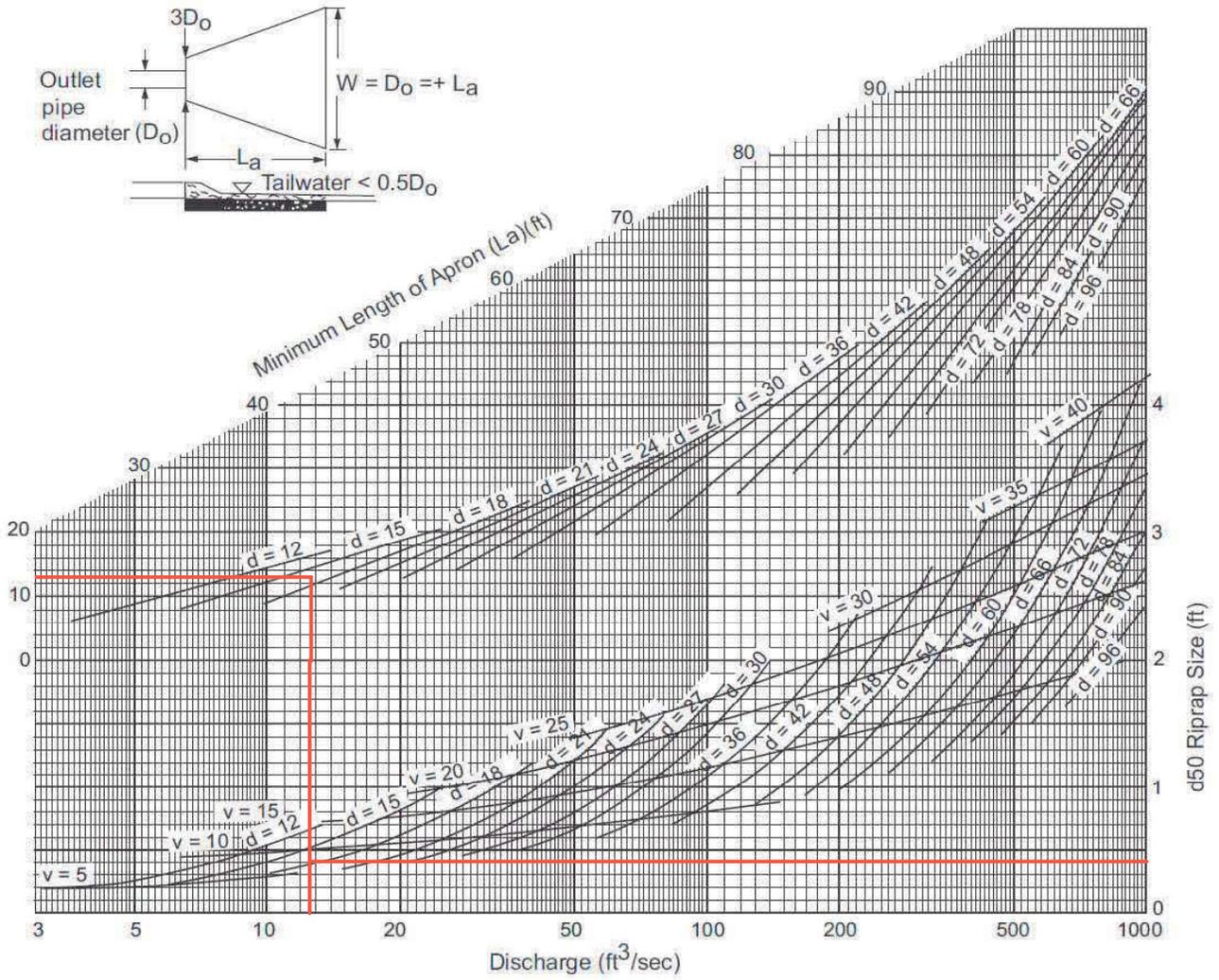


Figure 1. Riprap Area Diagram

Pipe No. 100





PROPOSED DRAINAGE STRUCTURES

PIPE NO.	SIZE	LENGTH	SLOPE	MATERIAL
100	24"	79'	1.89%	RCP

HEADWALL NO.	INVERT
100	438.00

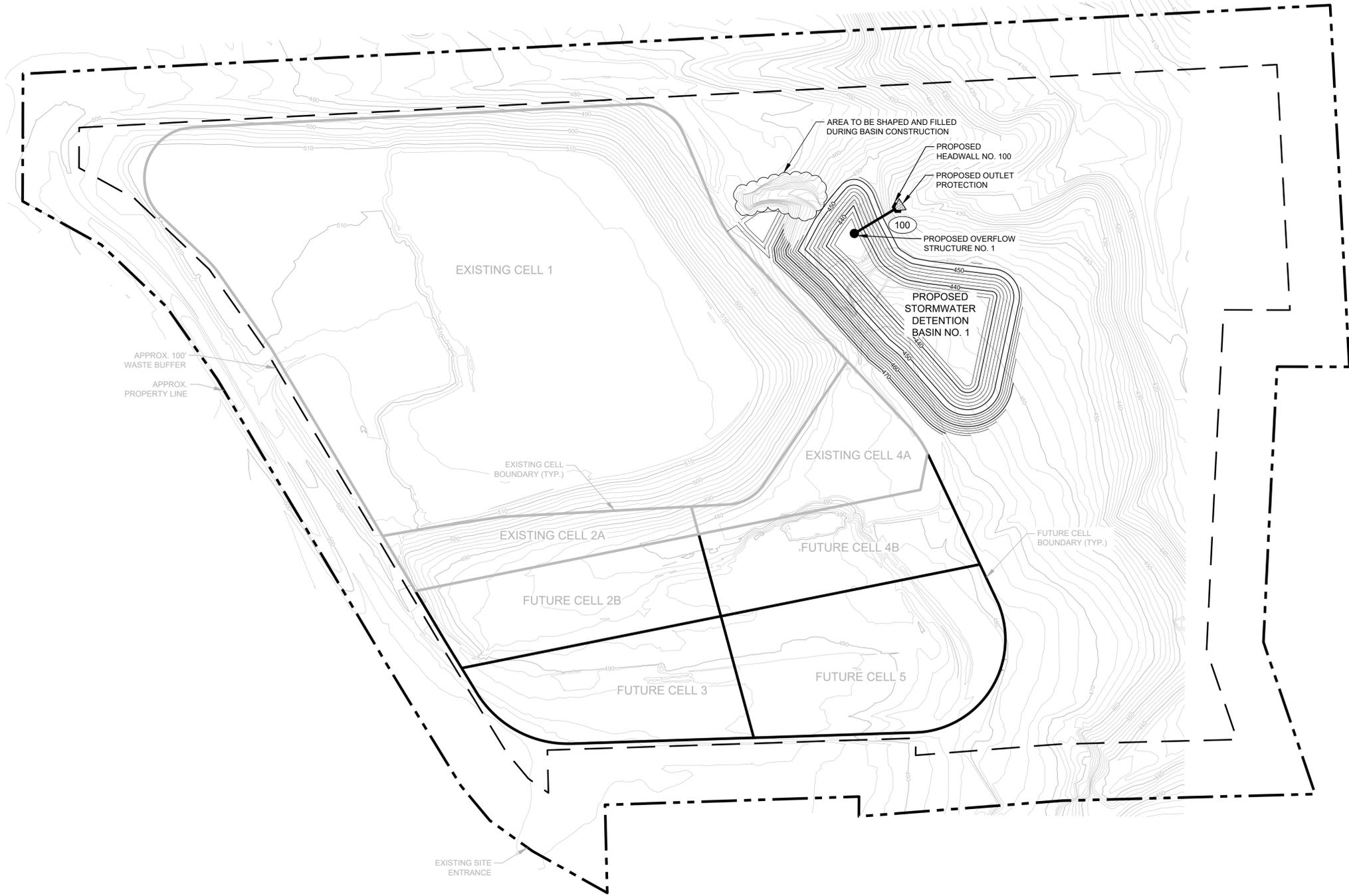
W2	W1	PIPE NO.	RIP-RAP SIZE	LENGTH	W1	W2
6"	15.2'	100	6"	13'	6"	15.2'

LEGEND

PERMITTED PROPERTY LINE	
100' WASTE BUFFER	
EXISTING CELL BOUNDARY	
FUTURE CELL BOUNDARY	
EXISTING 2' CONTOUR	
EXISTING 10' CONTOUR	
PROPOSED 2' CONTOUR	
PROPOSED 10' CONTOUR	
DRAINAGE PIPE	
HEADWALL	
OVERFLOW STRUCTURE	

NOTES:

1. TOPOGRAPHIC SURVEY PREPARED BY COOPER AERIAL SURVEYS CO., DATE OF PHOTOGRAPHY: JANUARY 17, 2024.
2. CELL BOUNDARIES AND PROPERTY LINE PROVIDED BY CDG ENGINEERS & ASSOCIATES, INC.
3. BASIN DESIGN BASED ON FINAL GRADING PLAN PROVIDED ON SHEET C-302 PREPARED BY CDG ENGINEERS & ASSOCIATES, INC.
4. SEDIMENT AND EROSION CONTROL DEVICES ARE TO BE INSTALLED PRIOR TO BEGINNING LAND DISTURBING ACTIVITIES.
5. SEDIMENT AND EROSION CONTROL DEVICES ARE TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE 'ALABAMA HANDBOOK FOR EROSION CONTROL, SEDIMENT CONTROL AND STORM WATER MANAGEMENT ON CONSTRUCTION SITES AND URBAN AREAS' LATEST EDITION.



1. THE DESIGN / ENGINEERING WORK SHOWN ON THIS SHEET IS EXCLUSIVELY BASED ON THE TOPOGRAPHY, EXISTING CONDITIONS, OR DESIGNS BY OTHERS AS REFERENCED. SHOULD ANY OF THE EXISTING CONDITIONS OR TOPOGRAPHY BE FOUND TO BE DIFFERENT OR CHANGED, THE DESIGN ENGINEER THAT PREPARED THIS PLAN SHOULD BE CONTACTED PRIOR TO CONSTRUCTING / IMPLEMENTING THIS DESIGN, AND TO DETERMINE IF DESIGN REVISIONS ARE REQUIRED.
2. THE ENGINEER THAT PREPARED THIS DRAWING HAS ASSUMED THAT THE CONSTRUCTION WILL BE PERFORMED IN ACCORDANCE WITH THE ENGINEERING INTENT AND COMPLETE CONSTRUCTION SPECIFICATIONS WILL BE PREPARED TO ACCOMPANY THE DRAWINGS. THE ENGINEER EXPECTS THAT HE WILL BE INVOLVED WITH, PROVIDED AN OPPORTUNITY TO REVIEW, AND INSPECT PRODUCTS AND CONSTRUCTION OF THE IMPROVEMENTS SHOWN ON THIS PLAN SHEET IN ORDER TO CONFIRM THAT THE CONSTRUCTION OF THE IMPROVEMENTS ARE INSTALLED IN ACCORDANCE WITH DESIGN CONCEPTS. SHOULD THE DESIGN ENGINEER NOT BE INVOLVED WITH CONSTRUCTION, HE WILL NOT BE LIABLE FOR CHANGES IN CONDITIONS OR FIELD CONDITIONS THAT MAY AFFECT THE DESIGN.

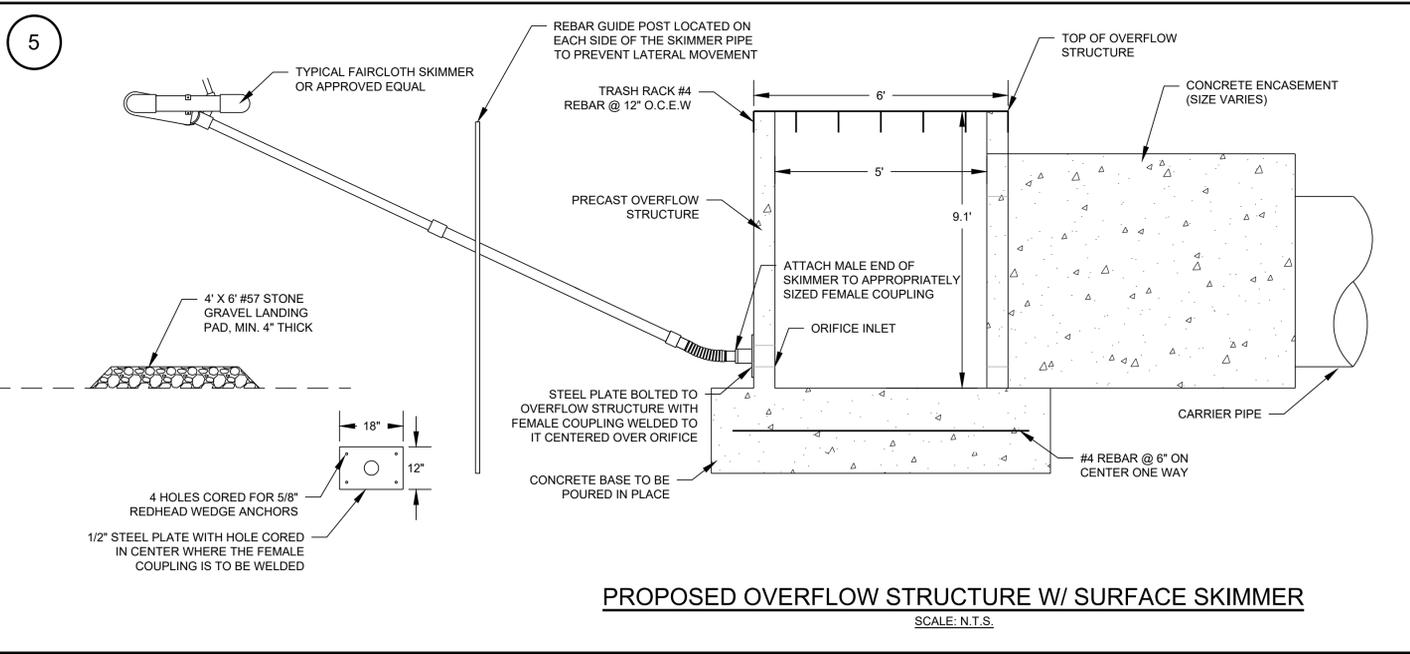
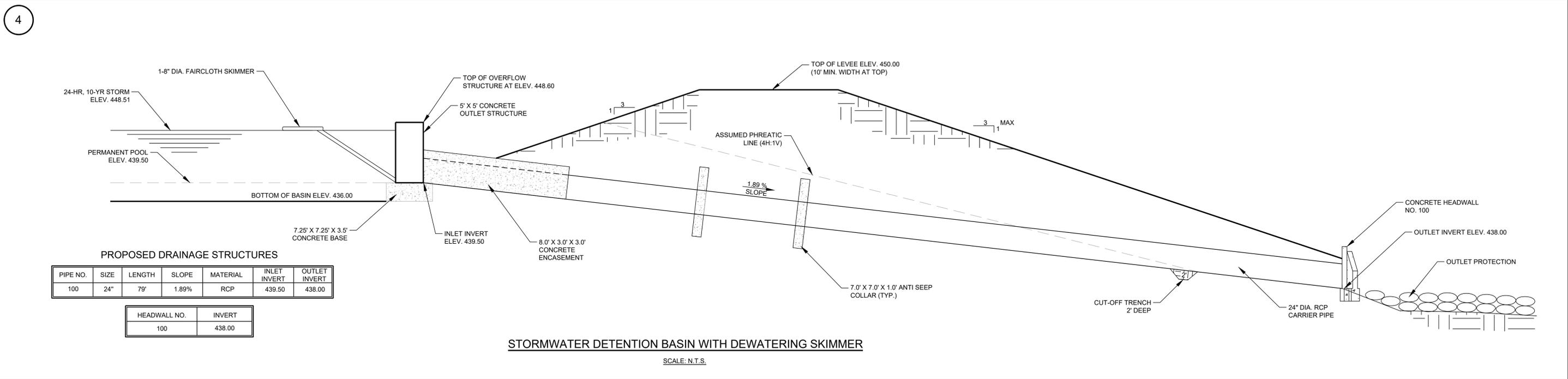
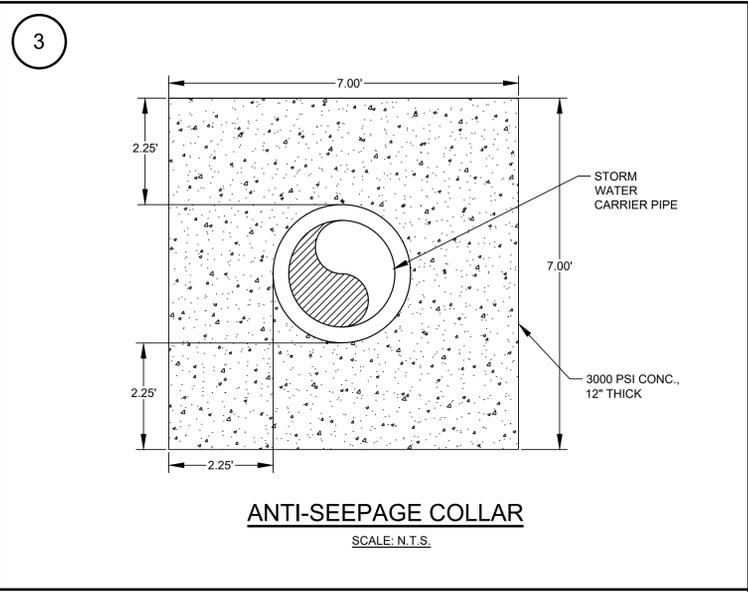
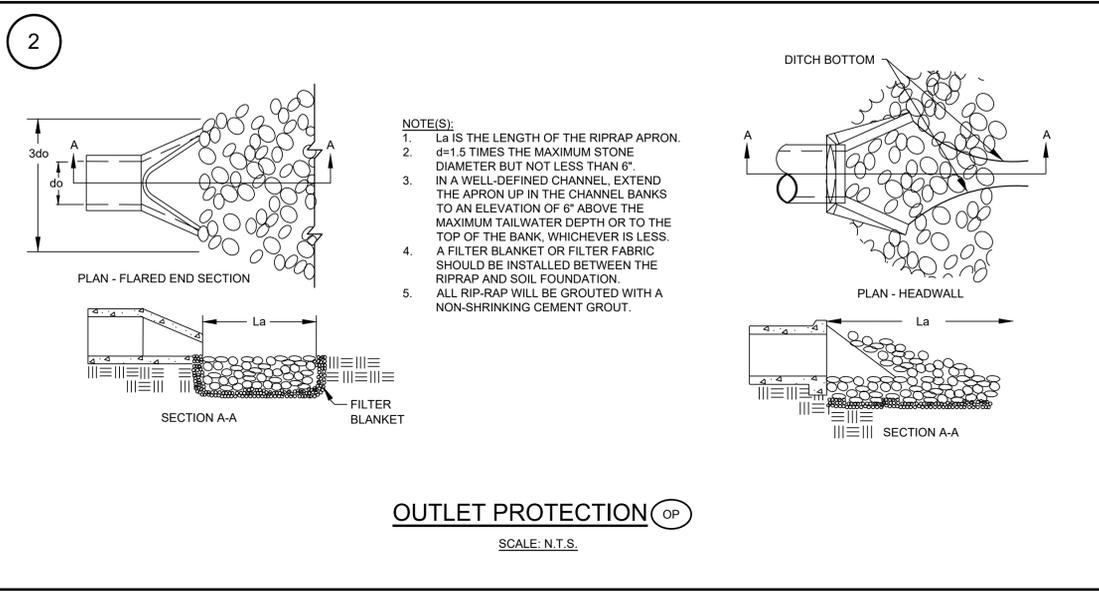
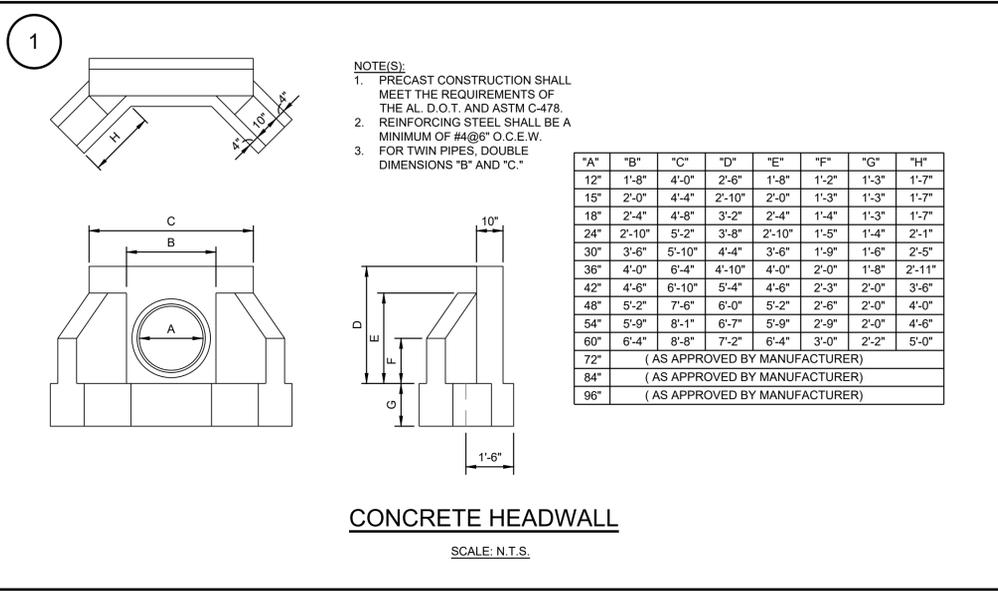
PROPOSED STORMWATER BASIN
STORMWATER DETENTION BASIN REDESIGN
ROCK 'N BAR D C&D LANDFILL
 FOR
GFL ENVIRONMENTAL
 PIKE COUNTY, ALABAMA

HHNT
 HODGES, HARBIN,
 NEWBERRY & TRIBBLE, INC.
 Consulting Engineers

(478) 743-7175
 (478) 743-1703 (FAX) 3920 ARK WRIGHT RD. SUITE 101
 MACON, GEORGIA 31210

PROJ. NO.	3032-054-01	DWG. RBD-BASIN-2024	EDIT: 12/9/2024
SCALE	1" = 100'		
DATE	DECEMBER 2024		

SHEET 1 OF 2



STORMWATER DETENTION BASIN DATA

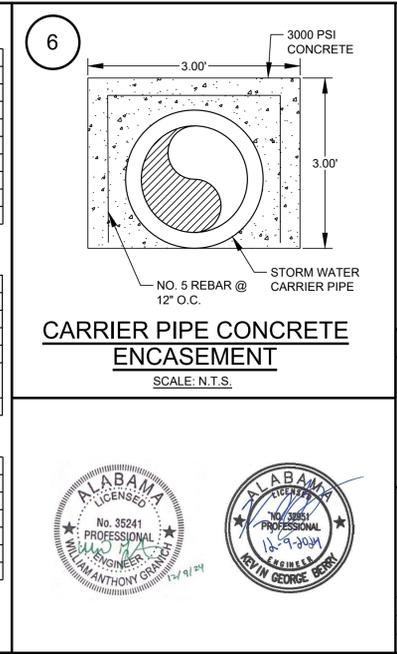
	BASIN 2
DRAINAGE AREA TO BASIN (AC)	33.5
SEDIMENT STORAGE VOLUME REQUIRED @ 1/2" PER AC (CF)	61,289
SEDIMENT STORAGE AVAILABLE (CF)	92,743
TOP OF SEDIMENT ELEVATION (FT)	438.43
BOTTOM OF BASIN ELEVATION (FT)	436.00
TOP OF DAM (FT)	450.00
PERMANENT POOL ELEVATION (FT)	439.50
WATER ELEVATION DURING 10 YEAR STORM (FT)	448.51
WATER ELEVATION DURING 25 YEAR STORM (FT)	448.91

OVERFLOW STRUCTURE

SIZE (FT)	5 x 5 I.D.
INVERT ELEVATION (BOTTOM OF STRUCTURE / TOP OF BASE) (FT)	439.50
HEIGHT (FT)	9.10
CONCRETE BASE DIMENSIONS L X W X H (FT)	7.25' x 7.25' x 3.5'
TOP OF OVERFLOW STRUCTURE ELEV.	448.60
DEWATERING WEIR	1-8" FAIRCLOTH SKIMMER
INVERT ELEVATION FOR DEWATERING ORIFICE(S)	439.50

RCP CARRIER PIPE

DIAMETER (IN)	24
LENGTH (FT)	79'
SLOPE (%)	1.89
INLET INVERT ELEVATION (FT)	439.50
OUTLET INVERT ELEVATION (FT)	438.00
NO. & SIZE OF ANTI-SEEP COLLARS (L' X W' X H')	2 - 7.0' x 7.0' x 1'
CONCRETE ENCASEMENT OF CARRIER PIPE (L' X W' X H')	8.0' x 3.0' x 3.0'



1. THE DESIGN / ENGINEERING WORK SHOWN ON THIS SHEET IS EXCLUSIVELY BASED ON THE TOPOGRAPHY, EXISTING CONDITIONS, OR DESIGNS BY OTHERS AS REFERENCED. SHOULD ANY OF THE EXISTING CONDITIONS OR TOPOGRAPHY BE FOUND TO BE DIFFERENT OR CHANGED, THE DESIGN ENGINEER THAT PREPARED THIS PLAN SHOULD BE CONTACTED PRIOR TO CONSTRUCTING / IMPLEMENTING THIS DESIGN, AND TO DETERMINE IF DESIGN REVISIONS ARE REQUIRED.

2. THE ENGINEER THAT PREPARED THIS DRAWING HAS ASSUMED THAT THE CONSTRUCTION WILL BE PERFORMED IN ACCORDANCE WITH THE ENGINEERING INTENT AND COMPLETE CONSTRUCTION SPECIFICATIONS WILL BE PREPARED TO ACCOMPANY THE DRAWINGS. THE ENGINEER EXPECTS THAT HE WILL BE INVOLVED WITH, PROVIDED AN OPPORTUNITY TO REVIEW, AND INSPECT PRODUCTS AND CONSTRUCTION OF THE IMPROVEMENTS SHOWN ON THIS PLAN SHEET IN ORDER TO CONFIRM THAT THE CONSTRUCTION OF THE IMPROVEMENTS ARE INSTALLED IN ACCORDANCE WITH DESIGN CONCEPTS. SHOULD THE DESIGN ENGINEER NOT BE INVOLVED WITH CONSTRUCTION, HE WILL NOT BE LIABLE FOR CHANGES IN CONDITIONS OR FIELD CONDITIONS THAT MAY AFFECT THE DESIGN.

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SHEET **2** OF **2**