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January 21, 2021

Edward Nam
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Ms. Elizabeth Browne
Michigan Environment, Great Lakes and Energy,
Material Management Division
525 W Allegan Street 4th Floor, South
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RE: Wayne Disposal Inc. (WDI) - MID048090633
MC VI-F and MC VI-G4 through G7 Liner Design Upgrade Major Modification;
MC VI-F Liner Grade and Leachate Collection Sump and Leak Detection Sump Modification (R 299.9519(9))

Dear Ms. Browne,

With this letter Wayne Disposal Inc. (WDI) is submitting a major modification request in order to upgrade the design of Master Cell VI Subcell F1 through F4 (MC VI-F) and MC VI Subcell G4 through G7 (MC VI-G) to incorporate Geosynthetic Clay Liner (GCL) into the baseliner system. Attached is a demonstration completed by CTI and Associates showing the proposed design is equivalent to the existing approved compacted clay liner system. It should be noted the upgraded GCL design for MC VI-F and MC VI-G4 though G7 is identical to the MC VI Subcell G2 and G3 baseliner system upgrade submitted in May 2018 and approved by Michigan Environment, Great Lakes and Energy and the United States Environmental Protection Agency.

In response to feedback provided by Michigan Environment, Great Lakes, and Energy's, Material Management Division, which requested an evaluation of the feasibility of additional extraction sumps, WDI is also requesting a minor modification pursuant to R 299.9519(9), for the modification of Attachment 7 Engineering Plans of its Part 111 Operating License to modify the liner grade of MC VI-F in order to construct two additional leachate collection and leak detection sumps in MC VI-F, further improving the designs of the system. WDI is not requesting an expansion or enlargement of MC VI’s approved capacity or requesting to alter the disposal method previously authorized. The proposed changes will not alter the license conditions or reduce WDI’s capacity to protect human health or the environment.

If you have any questions or need further information, please let me know.

Sincerely,

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CC: Al Taylor, MMD (electronic)
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January 21, 2021

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Subject: Wayne Disposal Inc. (WDI) - MID048090633
MC VI-F and MC VI-G4 through G7 Liner Design Upgrade Major Modification;
MC VI-F Liner Grade and Leachate Collection Sump and Leak Detection Sump Modification (R 299.9519(9))

Dear Mr. Nam and Ms. Browne:

On behalf of Wayne Disposal, Inc. (WDI), CTI and Associates, Inc. (CTI) is submitting this Permit Modification Letter Report for your review and approval of proposed upgrades to the design of Master Cell VI-F1 through Master Cell VI-F4 (MC VI-F) and Master Cell VI-G4 through Master Cell VI-G7 (MC VI-G) base liner. The purpose of this upgrade is to incorporate the numerous advantages of Geosynthetic Clay Liner (GCL) into the baseliner system of these areas. A similar upgrade for Master Cells VI-G2 and VI-G3 was approved by the Michigan Department of Environmental Quality's, Waste Management and Radiological Protection Division on October 20, 2018. In addition, a minor modification is also proposed with this submittal to add additional sumps in MC VI-F1 and F4 to improve the leachate management operations and provide additional leak detection capabilities.

With this letter CTI is providing a summary of the methodology used to evaluate the upgrades, results of the analysis, and the recommendations along with supporting documentation which includes calculations and the revised permit engineering drawings.

Introduction

This letter report presents the basis for the proposed base liner revisions for MC VI-F and MC VI-G at WDI. The proposed upgrades include a change from the currently approved compacted clay liner (CCL) based design to a GCL-based liner design providing the following benefits:

- GCL is man-made with superior consistency and reliability

- GCL has superior resistance to freeze-thaw damage and is preferred considering Michigan's climate
- GCL has superior resistance to settlement–induced tensioning
- GCL reduces the need for compaction and is more consistent in achieving the approved grades
- GCL has substantially lower hydraulic conductivity

Figure 1 outlines the proposed area of the base liner system upgrade from CCL to GCL in MC VI-F and MC VI-G, as well as associated changes to the baseliner grades and layout of MC VI-F.

Figure 1. Proposed Master Cells VI-F and VI-G Layout

In accordance with Rule 299.9620 (4) of the Michigan Part 111 Administrative Rules, an alternate design may be approved if the owner or operator can demonstrate the design will prevent the migration of any hazardous constituent into the groundwater or surface water at least as effectively as the design requirements specified in the subrule. The following sections discuss how the proposed design satisfies this requirement.

Proposed Liner System Configuration

This modification proposes the incorporation of GCL, in lieu of the currently approved design of CCL only, as part of the soil component of the base liner system for the future construction of MC VI-F and MC VI-G. In May of 2018, this same upgrade was submitted by CTI and approved by your offices for Master Cells

VI-G2 and VI-G3. Information on GCL products and the equivalency demonstration approved in 2018 is presented again in this proposed permit modification for clarity.

GCL products are factory-manufactured hydraulic barriers consisting of a layer of sodium bentonite supported by geotextiles (woven and/or non-woven) and, in some cases, an additional film of flexible membrane liner (FML) for enhanced barrier performance. These components (sodium bentonite, geotextiles, and FML) are mechanically held together by either needle punching or by chemical adhesive.

Sodium bentonite, the interlayer of GCL, is an effective barrier primarily because it can absorb moisture (i.e., hydrate and swell) producing a dense, uniform layer with extremely low hydraulic conductivity on the order of 10^{-9} centimeters per second (cm/sec). Sodium bentonite's exceptional hydraulic properties make GCL superior to CCL with respect to a steady state of water even though the thickness of GCL is less than CCL.

WDI is proposing to install two layers of GCL, as described in Attachment A and as approved in 2018, immediately beneath the primary high-density polyethylene (HDPE) geomembrane base liner of MC VI-F and MC VI-G. Figure 2 below shows the proposed base liner construction details. Note that the captions of some of the other liner components (e.g., 80-mil HDPE geomembranes, double-sided geocomposite, geogrid, etc.) are omitted in Figure 2 for clarity and because those components of the liner system are not changing. Please refer to Attachment C, 2020 Permit Engineering Drawings, for complete liner construction details.

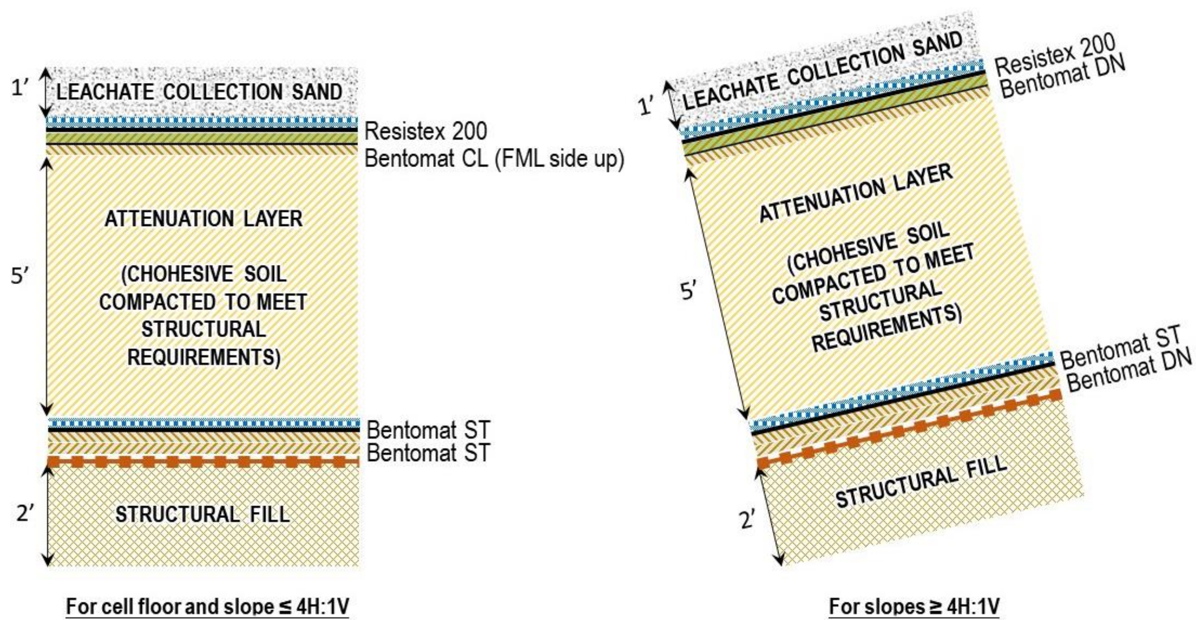

Figure 2. Proposed Liner System in MC VI-F and MC VI-G
(The geogrid and structure fill are only required on top of the existing waste within MC I and IV boundary)

As shown in Figure 2, the proposed base liner system consists of multiple layers of geosynthetic and soil materials to optimize the performance of the liner system. These layers, along with their respective functions, are tabulated in Table 1 for a direct comparison between the proposed and the permitted base liner systems (in the order from top to bottom).

Table 1. Comparison Between Permitted and Proposed Liner Systems (cell floor from top to bottom)

Component	Permitted System	Proposed System
Primary leachate collection	1-foot of drainage sand	
	Double-sided drainage geocomposite	
Primary geomembrane liner	80-mil textured HDPE geomembrane	
Primary clay liner	5-feet CCL (K ≤ 1.0 x 10^{-7} cm/s)	Resistex® 200, manufactured by CETCO
		Bentomat® CL, manufactured by CETCO
		5-feet cohesive soil attenuation layer
Secondary leachate collection	Double-sided drainage geocomposite	
Secondary geomembrane liner	80-mil textured HDPE geomembrane	
Secondary clay liner	3-feet CCL (K ≤ 1.0 x 10^{-7} cm/s)	Bentomat® ST, manufactured by CETCO
		Bentomat® ST, manufactured by CETCO
Base reinforcement (on top of existing waste in MC I and IV)	Bi-axial geogrid	
Liner subbase	2-feet structural fill on top of existing waste in MCI and IV or native soil	

As indicated in Table 1, the main difference between the permitted and the proposed liner systems are the use of GCL in lieu of CCL. Other liner components will remain unchanged. Additionally, on the sideslopes (slope ≥ 4(H):1(V)), the lower GCL layer in the primary liner system (Bentomat® CL, which includes an FML laminated to one side) will be replaced with a standard CETCO GCL product (Bentomat® DN, without the laminated FML) to maximize slope stability. Similarly, the bottom GCL layer in the secondary liner system (Bentomat® ST) will also be replaced on the sideslopes with a standard CETCO GCL product (Bentomat® DN) to maximize slope stability. Details of the GCL products proposed to be used in the construction of MC VI-F and MC VI-G can be found in Attachment D of this report.

Equivalency Demonstration

Federal and Michigan regulations allow alternative liner designs provided “equivalence” can be demonstrated. For this report, the equivalence assessment was conducted in the same manner as the approved 2018 demonstration by the following steps allowing for a technically-sound, effective, and project-focused equivalency demonstration.

1. Identify various technical criterion that are relevant to the proposed MC VI-F and MC VI-G base liners.
2. Divide the identified criteria into distinct categories to facilitate a direct technical comparison between GCL (the proposed alternative) and CCL (the approved design).
3. Identify criteria where technical equivalency between GCL and CCL has already been well-studied, demonstrated and documented by the lining industry (e.g., landfills, surface impoundments, mining, water-proofing of hydraulic structures, etc.) and, based on past tests and project experiences, found to be superior or equivalent to CCL. No additional demonstration effort is needed for these items.
4. Identify criteria which are mainly site-, project-, or product-specific items, and demonstrate equivalency.

Following the steps above and as shown in Table 2 below, the following five items are identified and subjected to detailed comparison.

Hydraulic Properties

- Steady state solute flux
- Chemical adsorptive capacity / Solute breakthrough time

Physical/Mechanical Properties

- Stability of slopes
- Bearing capacity

Construction Properties

- Puncture resistance/subgrade condition

Table 2. Generalized Technical Equivalency Assessment for Landfill Base Liners

Category	Criterion for Evaluation	Equivalency of GCL to CCL			
		GCL is superior	GCL is equivalent	Equivalency is product-, design-, or site-specific	Category irrelevant to this project
Hydraulic	Steady state water flux	X			Evaluation will focus on site-specific leachate
	Breakthrough time - water	X			Evaluation will focus on site-specific leachate
	Horizontal flow in seams or lifts		X		-
	Horizontal flow beneath geomembranes	X			-
	Steady state solute flux			X	-
	Chemical adsorptive capacity / Solute breakthrough time			X	-
	Permeability to gases	-	-	-	A non-issue when GCL is installed under FML
	Generation of consolidation water	X			-
Physical/ Mechanical	Freeze-thaw behavior	X			-
	Wet-dry behavior	X			-
	Vulnerability to erosion	-	-	-	Erosion is irrelevant in the proposed liner
	Total settlement		X		-
	Differential settlement	X			-
	Stability on slopes			X	-
	Bearing capacity			X	-
Construction	Puncture resistance			X	-
	Ease of placement	X			-
	Speed of construction	X			-
	Availability of material	X			-
	Requirements of water	X			-
	Air pollution concerns	X			-
	Quality assurance considerations		X		-

Category of which GCL is superior than CCL	Category of which equivalency is product-, design-, or site-specific
Category of which GCL is equivalent to CCL	Category is irrelevant to this project

WDI successfully demonstrates that the proposed GCL liner system is technically equivalent to the permitted CCL liner system in these criteria as shown in Attachment A. Therefore, the proposed GCL liner system will minimize the risk of migration of hazardous constituents into the groundwater or surface water at least as effectively as the CCL design requirements specified in State and Federal rules.

Design Calculations

In order to add sumps, the base liner grades in MC VI-F were revised and cell layouts were updated. Design calculations to support the liner grade changes and updates to leachate collection and control are included in Attachments A and B. Calculations contained in Attachment B include:

- Geotechnical slope stability calculations (Attachment B-1)
- Geotechnical settlement calculations (Attachment B-2)
- Pipe strength and deflection calculations (Attachment B-3)
- Leachate collection system flow capacity analysis (Attachment B-4)
- Head-on-liner calculation (Attachment B-5)

Permit Drawings

The proposed upgrades to the MC VI-F and MC VI-G base liner systems will result in some revisions to the permit drawing sheets listed in Table 3. A complete set of permit drawings, including both revised and unrevised sheets, is included in Attachment C for ease of review and reference.

Table 3. List of Revised Permit Drawings

Sheet	Title
01	Title sheet
02	General Site Plan
03	Construction Phasing
04	Top of Subgrade Grading Plan
05	Top of Secondary Liner Grading Plan
06	Top of Primary Liner Grading Plan
07	Leachate Management Plan
08	Final Cover Grading Plan (1 of 2)
09	Final Cover Grading Plan (2 of 2)
10	Stormwater Management and Sedimentation Plan (1 of 2)
11	Stormwater Management and Sedimentation Plan (2 of 2)
12	Cross Sections (1 of 3)
13	Cross Sections (2 of 3)
14	Cross Sections (3 of 3)
15	Liner System Details (1 of 3)
16	Liner System Details (2 of 3)
17	Liner System Details (3 of 3)
18	Leachate Collection System Details (1 of 2)
19	Leachate Collection System Details (2 of 2)
20	Final Cover Details
21	Stormwater Management System Details
22	Conceptual Gas Venting System

GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines

The proposed base liner in MC VI-F and MC VI-G includes manufacturer and product specific GCL components as shown in Figure 2 above. These GCL components were selected based on the approved 2018 permit modification and the equivalency demonstration provided in Attachment A. Manufacturer specifications for the GCL products selected for use in the MC VI-F and MC VI-G base liner systems are included in Attachment D.

In order to maximize the safety, efficiency, and physical integrity of the selected GCL, the manufacturer's Construction Quality Assurance (CQA) Manual and Installation Guidelines (Attachment D) will supersede the GCL section of the existing WDI CQA Plan for the base liner of MC VI-F and MC VI-G. Installation guidelines and the GCL CQA Manual (Attachment D) will be followed for all GCL products at WDI. The following additional installation guidelines will also apply to GCL installation:

- Overlapping seams of adjacent GCL panels will be offset between the two layers of GCL to ensure that each overlap seam in the upper GCL does not vertically coincide with the overlap seam in the lower GCL (see Figure 3 below).
- All required interface- and internal-shear resistance testing associated with various GCL products, including standard methods, procedures and minimum requirements, will be included on the construction drawings of each subcell as part of the CQA program.
- Prior to installation of GCL, the soil subsurface will be inspected. All protrusions (stone, etc.) greater than 1-inch in size, or more angular than "sub-rounded" in shape, will be removed and the remaining cavity will be backfilled with clay. In addition, all soil subsurface will be proof-rolled prior to GCL installation.
- As indicated on the attached manufacturer's installation guidelines, no heavy equipment should come in direct contact with the GCL. Permission to drive equipment on the GCL will only be granted in writing by the manufacturer on a case by case basis as outlined in the installation guidelines. Additionally, a minimum thickness of 1 foot of cover soil is always required between equipment tires/tracks and the GCL during installation.

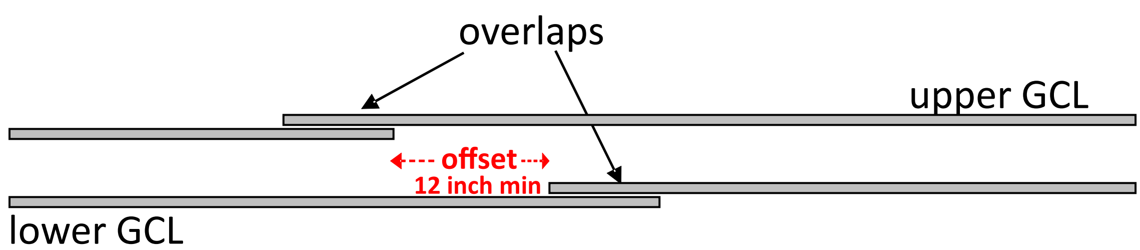

Figure 3. Vertical Offset for Upper and Lower GCL Installation

Attenuation Layer CQA Requirements

Soil properties such as Atterberg limits (ASTM D4318) and grain size distribution (ASTM D422) will be tested for materials proposed for use in the attenuation layer. These tests will be used to confirm that the proposed materials meet classification requirements of SC, CH, CL, CL/ML or ML per the Unified Soil Classification System (ASTM D2487). Modified proctor moisture-density correlation (ASTM D1557) will also be tested to determine the maximum dry density of the soil. Soil properties will be tested at a rate of 5,000 cubic yards placed or if a visual change in borrow soil character is noted. Field density testing will be performed to verify the in-place density of the attenuation soil meets the minimum 90% requirement at a rate of one test per 1,000 cubic yards placed and a minimum rate of 1 test per lift and one test per day. Attenuation layer material will be placed in lifts with a maximum thickness of 6 inches after compaction, except for the first lift of material over GCL. A minimum thickness of 1 foot of cover soil is always required between equipment tires/tracks and GCL materials. Permeability testing is not applicable to the attenuation layer and will not be performed on the material.

If you have any questions regarding this submittal, please feel free to contact the undersigned at (248) 486-5100 or xzhao@cticompanies.com.

Sincerely,

CTI and Associates, Inc.

Xianda Zhao, Ph.D., P.E.
Sr. Project Manager

Cc: Kerry Durnen, US Ecology
Sylwia Scott, US Ecology
Al Taylor, EGLE
Lisa Graczyk, EPA

List of Attachments

Attachment A: Technical Equivalency Demonstration

- Attachment A-1: Chemical Compatibility Evaluation Report Provided by CETCO

Attachment B: Design Calculations

- Attachment B-1: Slope Stability Analysis
- Attachment B-2: Settlement Calculations
- Attachment B-3: Pipe Strength and Deflection Calculations
- Attachment B-4: Leachate Collection System Flow Capacity Analysis
- Attachment B-5: Head-on-Liner Calculations and Minimum Geocomposite Transmissivity

Attachment C: 2020 Permit Engineering Drawings

Attachment D: GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines

Attachment E: Responses to MDEQ / US EPA Region 5 Questions on 2018 WDI Permit Modification

Attachment A

Technical Equivalency Information

Proposed Liner System for MC VI-F and MC VI-G

WDI is proposing to install a polymer-treated geosynthetic clay liner (GCL) (Resistex® 200, manufactured by CETCO) immediately beneath the primary 80-mil HDPE geomembrane liner of Master Cell VI-F1 through Master Cell VI-F4 (MC VI-F) and Master Cell VI-G4 through Master Cell VI-G7 (MC VI-G) to maximize the barrier performance of the liner system. This proposed GCL liner system was approved by the agency in 2018 for MC VI-G2 and MC VI-G3, using the same information presented below. **Figure A-1** shows the proposed liner construction details. Note that the captions of other liner components (e.g., 80-mil HDPE geomembranes, double-sided geocomposite, geogrid, etc.) are omitted in **Figure A-1** for clarity. Please refer to **Attachment C**, 2020 Permit Engineering Drawings for more liner construction details.

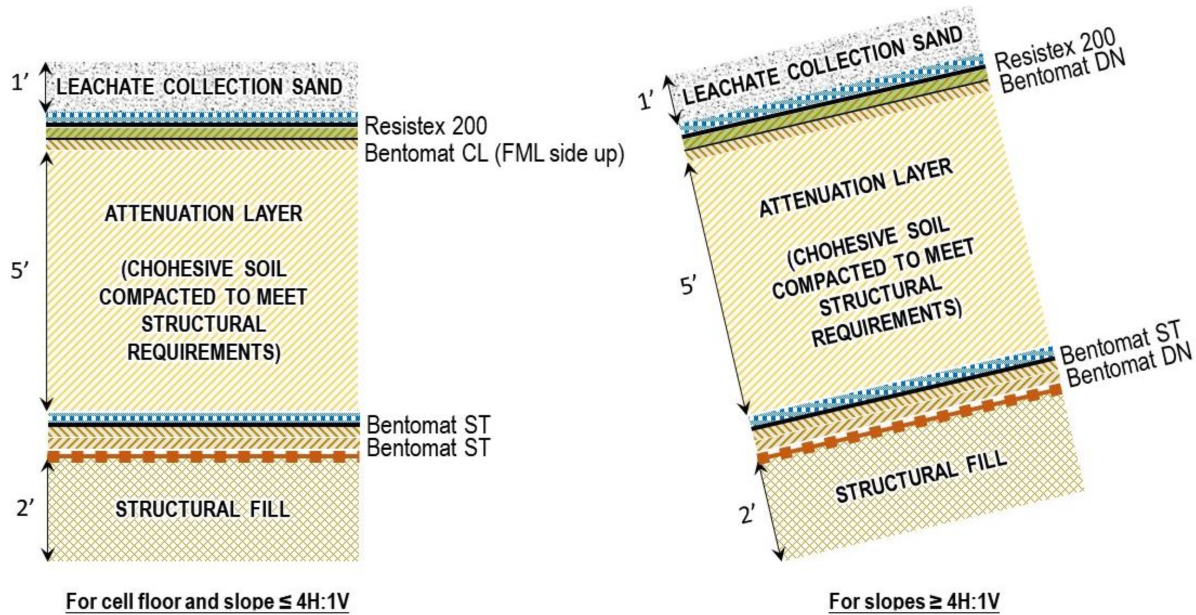

Figure A-1. Proposed MC VI-F and MC VI-G Base Liner Construction Detail.
(The geogrid and structure fill are only required on top of the existing waste within MC I and IV boundary)

To quantify the equivalency of the proposed liner system including GCL to the permitted liner system including CCL, WDI provided the GCL manufacturer (CETCO) with site-specific leachate test data for a conservative evaluation of GCL chemical compatibility. CETCO conducted a series of tests in their R&D laboratory on the supplied sample of leachate from WDI.

After 243 hours of permeation, CETCO measured an average permeability of 1.5 x 10^{-9} cm/sec with 0.7 pore volumes of leachate passing through the specimen. This means that the bentonite / polymer blend in the Resistex® 200 hydrated and cut off flow as designed. For the equivalency demonstration calculations (specifically, the steady-state solute flux), a conservative permeability of 1 x 10^{-8} cm/sec was used. In other words, an extra adjustment or safety factor of 6.7 was applied for additional conservatism. See **Attachment A-1** for CETCO's chemical evaluation report.

In addition to installing the polymer-treated GCL (Resistex® 200) immediately beneath the primary 80-mil HDPE geomembrane liner on the cell floor, WDI is also proposing to use another specialty GCL, Bentomat® CL, for enhanced protection. Bentomat® CL has an additional FML laminated on one side of the GCL to offer the highest level of hydraulic barrier performance. By installing this product with the FML side "facing up" towards the cell as indicated in **Figure A-1**, Bentomat® CL provides another impervious layer to isolate its own bentonite layer from contacting moisture, if any, that may migrate through the primary HDPE geomembrane liner and the overlying GCL (Resistex® 200).

For sideslopes that are steeper than 4(H):1(V), WDI proposes to replace the FML-laminated GCL (Bentomat® CL) with a standard GCL product (Bentomat® DN) for slope stability purposes. Bentomat® DN consists of two layers of needle-punched, non-woven geotextiles on both sides of the bentonite interlayer. This configuration provides superior sideslope shear resistance. The FML-laminated GCL (Bentomat® DN) to be installed on the cell floor will be extended 5-ft vertically above the toe of the sideslopes for optimized performance.

Technical Equivalency

An equivalency assessment was conducted by the following steps allowing for a technically-sound, effective and project-focused equivalency demonstration.

1. Identify various technical criterion that are relevant to the proposed MC VI-F and G cell liners.
2. Divide the identified criterion into distinct categories to facilitate a direct technical comparison between GCLs (the proposed alternative) and CCLs (the approved design).
3. Identify criterion where technical equivalency between GCLs and CCLs has already been well-studied, demonstrated and documented by the lining industry (e.g., landfills, surface impoundments, mining, water-proofing of hydraulic structures, etc.), based on past tests and project experiences. No additional demonstration effort is needed for these items.
4. Identify criteria which are mainly site-, project-, or product-specific items, and demonstrate equivalency.

The results of Steps 1, 2 and 3 are summarized in **Table A-1** below. Both the format and content shown in the table is largely adapted from the well-referenced papers by Koerner and Daniel (1993), Bonaparte et. al. (2002), as well as from general liner engineering practice over the past two decades, with some site-specific modifications that are considered appropriate for the construction of the MC VI-F and MC VI-G liner.

Table A-1. Generalized Technical Equivalency Assessment for Liners Beneath Landfills

Category	Criterion for Evaluation	Equivalency of GCL to CCL			
		GCL is superior	GCL is equivalent	Equivalency is product-, design-, or site-specific	Category irrelevant to this project
Hydraulic	Steady state water flux	X			Evaluation will focus on site-specific leachate
	Breakthrough time - water	X			Evaluation will focus on site-specific leachate
	Horizontal flow in seams or lifts		X		-
	Horizontal flow beneath geomembranes	X			-
	Steady state solute flux			X	-
	Chemical adsorptive capacity / Solute breakthrough time			X	-
	Permeability to gases	-	-	-	A non-issue when GCL is installed under FML
	Generation of consolidation water	X			-
Physical/ Mechanical	Freeze-thaw behavior	X			-
	Wet-dry behavior	X			-
	Vulnerability to erosion	-	-	-	Erosion is irrelevant in the proposed liner
	Total settlement		X		-
	Differential settlement	X			-
	Stability on slopes			X	-
	Bearing capacity			X	-
Construction	Puncture resistance			X	-
	Ease of placement	X			-
	Speed of construction	X			-
	Availability of material	X			-
	Requirements of water	X			-
	Air pollution concerns	X			-
	Quality assurance considerations		X		-

Category of which GCL is superior than CCL	Category of which equivalency is product-, design-, or site-specific
Category of which GCL is equivalent to CCL	Category is irrelevant to this project

As shown in **Table A-1**, the following five items (criterion) are identified for Step 4 discussed above:

Hydraulic Properties
- Steady state solute flux
- Chemical adsorptive capacity / Solute breakthrough time

Physical/Mechanical Properties
- Stability of slopes
- Bearing capacity

Construction Properties
- Puncture resistance/subgrade condition

These items were subjected to detailed comparison between GCLs and CCLs as presented in the following sections.

Hydraulic Properties

<u>Steady state solute flux</u>

Past testing and experience have shown that sodium bentonite (the interlayer of GCL) is chemically compatible with many common waste streams, including leachate, some petroleum hydrocarbons, deicing fluids, livestock wastes, and dilute sodium cyanide mine waste.

In certain chemical environments, the sodium ions in bentonite can be replaced with cations dissolved in the water that comes in contact with the GCL, a process referred to as cation exchange. This type of exchange reaction can reduce the amount of water that can be held in the interlayer, resulting in decreased swell.

With the design and installation configuration shown in **Figure A-1** in mind the steady state solute flux equivalency demonstration was prepared and presented in **Tables A-2a** and **A-2b**. Please note that the following assumptions were made in the demonstration for additional conservatism:

1. Comparisons were made as if the 80-mil HDPE primary geomembrane liner does not exist. In other words, GCL's superior swelling capability, which is capable of enhancing the performance in the overlying HDPE liner, is completely ignored.

2. Considering the evaluation performed by the GCL manufacturer of GCL chemical compatibility with site specific leachate data, the hydraulic conductivity of the upper GCL (Resistex® 200) is assumed at 1×10^{-8} cm/sec despite the tested results suggesting a permeability of 1.5×10^{-9} cm/sec. As discussed previously, this adjustment serves to conservatively address the concern of chemical compatibility associated with site-specific leachate. This adjustment is extremely conservative since this GCL layer will be completely covered by a layer of 80-mil HDPE geomembrane liner and hydration of GCL by leachate can only take place if it is exposed through liner imperfections. The chance of this assumed scenario does not practically exist.

3. Values of head-on-liner used in the evaluation were selected as 12.0 inches (30.5 cm) for the cell floor (per regulation) and 6.0 inches (15.2 cm) for sideslopes steeper than 4(H):1(V). Please note that the head-on-liner over both the floor and the sideslope is calculated as not to exceed 6 inches as shown in the "Maximum head-on-liner calculation" included in **Attachment B-5**. Moreover, while only the standard GCL product (Bentomat® DN) is used in the flux calculation, the calculated maximum head-on-liner will theoretically occur near the toe of the sideslope where the specialty GCL (Bentomat® CL) will be installed. This presents an additional conservative factor of safety.

4. Technically, an "apples-to-apples" comparison of steady state solute flux should be made by comparing flux that comes from the bottom of the 5-ft attenuation layer (in the proposed design case) and from the bottom of the 5-ft CCL layer (in the permitted design case). However, the equivalency evaluation was conservatively conducted by determining the flux that flows through the two layers of GCLs and comes out the bottom of the lower GCL layer (Bentomat® CL). In other words, any flow retardation capacity that could be provided by the underlying 5-ft thick cohesive attenuation layer is completely ignored in this evaluation.

5. Consequent to assumptions 3 and 4 discussed above, the hydraulic gradient (the driving force that causes flow to take place) selected for the proposed liner case is 14 times and 8 times greater than that selected for the permitted liner case for floor and sideslope liners, respectively. This represents another very conservative assumption.

The evaluation of the steady state solute flux criteria is made by dividing the calculated steady state solute flux of the proposed liner (GCL) by the number associated with the permitted liner (CCL). The resulting "ratio", if it is less than or equal to 100%, would indicate that the performance of the proposed liner system is acceptable, and therefore technical equivalency is demonstrated.

Input parameters, assumptions, and results of the steady state solute flux evaluation are presented in **Tables A-2a** and **A-2b** for cell floor and slopes that are steeper than 4(H):1(V), respectively.

Table A-2a. Steady State Solute Flux Equivalency Demonstration
Liner over Cell Floor and Slopes ≤ 4(H):1(V)

Layer	Thickness (cm)	K (cm/sec) (water)	K (cm/sec) (WDI leachate)	Additional adjustment	Adjusted K (cm/sec)	Thickness/ Perm
Resistex 200	0.95	3E-09	1.5E-09	6.7	1.0E-08	47,625,000
Bentomat CL	0.95	5E-10	5E-10	1.0	5E-10	1,905,000,000

Saturated thickness of GCL = 0.375" (or 0.95 cm)

K equivalent	
1E-09	cm/sec

$$k_v = \frac{H}{\left(\frac{H_1}{k_1}\right) + \left(\frac{H_2}{k_2}\right) + \left(\frac{H_3}{k_3}\right) + \ldots\ldots\ldots + \left(\frac{H_n}{k_n}\right)}$$

Demonstration is made by comparing the steady-state flux (Q's) using Darcy's Law Q = kiA (assuming no geomembrane)

Clay Liner	K_{eq} (cm/sec)	head (cm)	thickness (cm)	gradient i	Flux, Q (gal/acre-day)
5-ft of CCL	1E-07	30.48	152.4	1.20	111
Resistex 200 / Bentomat CL	1E-09	30.48	1.91	17.0	15
Conversion: 1.0 $cm^3/sec/cm^2$ =	*9.237E+08*	*gal/acre/day*		**Q_{GCL}/Q_{CCL} =**	**14%**

Table A-2b. Steady State Solute Flux Equivalency Demonstration
Liner on Slopes ≥ 4(H):1(V)

Layer	Thickness (cm)	K (cm/sec) (water)	K (cm/sec) (WDI leachate)	Adjustment factor	Adjusted K (cm/sec)	Thickness/ Perm
Resistex 200	0.95	3E-09	5E-09	2.0	1E-08	158,750,000
Bentomat DN	0.95	5E-09	5E-09	1.0	5E-09	190,500,000

Saturated thickness of GCL = 0.375" (or 0.95 cm)

K equivalent	
5.5E-09	cm/sec

$$k_v = \frac{H}{\left(\frac{H_1}{k_1}\right) + \left(\frac{H_2}{k_2}\right) + \left(\frac{H_3}{k_3}\right) + \ldots\ldots\ldots + \left(\frac{H_n}{k_n}\right)}$$

Demonstration is made by comparing the steady-state flux (Q's) using Darcy's Law Q = kiA (assuming no geomembrane)

Clay Liner	K_{eq} (cm/sec)	head (cm)	thickness (cm)	gradient i	Flux, Q (gal/acre-day)
5-ft of CCL	1E-07	15.2	152.4	1.10	102
Resistex 200 / Bentomat DN	5E-09	15.2	1.91	9.0	45
Conversion: 1.0 $cm^3/sec/cm^2$ =	*9.237E+08*	*gal/acre/day*		**Q_{GCL}/Q_{CCL} =**	**45%**

As shown in **Tables A-2a** and **A-2b**, the steady state solute flux "ratios" are 14% and 45% for the cell floor and sideslope, respectively. Both numbers are significantly less than 100% indicating the performance of the proposed liner system is superior. Therefore, technical equivalency is demonstrated and the proposed liner system is acceptable.

Chemical adsorptive capacity / Solute breakthrough time

Federal and State regulations focus on preventing contamination of groundwater (CFR 40 Part 264.301(b) and Michigan Part 111 R299.9620(4)(a)). Therefore, selecting a point in the subsoil that has the same hydrogeological characteristics and distance to groundwater and using that point as a reference for both liner systems would be an appropriate approach in demonstrating equivalency.

As shown in **Figure A-2**, two models were established according to the concept described above: (a) permitted and constructed MC VI-G Phase 1 liner and (b) proposed MC VI-F and MC VI-G liner. As shown in **Figure A-2**, the thickness of in-situ clayey subsoils under the existing waste where the proposed MC VI-F and MC VI-G cells will be constructed, is approximately the same as the combined thickness of the existing MC VI-G Phase 1 CCL liner and its in-situ clayey soil.

This is an important finding since numerical equivalency, in terms of chemical adsorptive capacity and solute breakthrough time, can already be achieved by the 10-ft in-situ clay present in the MC VI-F and MC VI-G subsoils since all clayey soils (e.g., CCL or in-situ clay) exhibit a similar diffusion coefficient (Lake and Rowe (2005)).

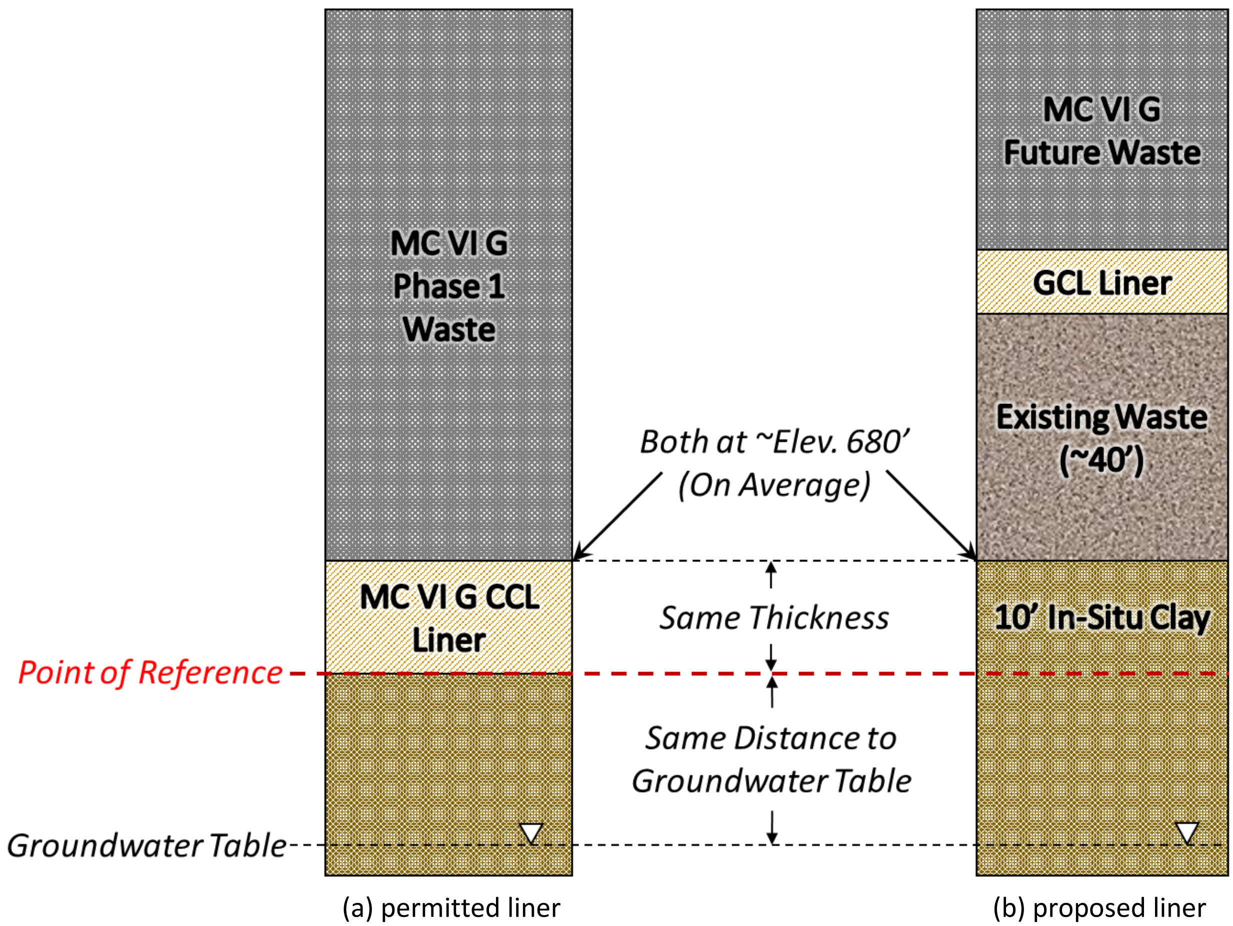

Figure A-2. Conceptual Model for Chemical Adsorptive Capacity and Breakthrough Time Comparison

In addition, as shown in **Figure A-1**, the proposed MC VI-F and MC VI-G liner system contains 7-ft of cohesive soil layers (5-ft attenuation layer and 2-ft structural fill). Since the distance between the contaminant source (leachate above the primary liner) and the point of reference is significantly thicker for the proposed MC VI-F and MC VI-G phases compared to the existing MC VI-G Phase 1, the breakthrough time will be significantly increased in the proposed system.

Another factor impacting the breakthrough time is the steady state flux passing through the liner system (higher flux would lead to shorter breakthrough time). Since it has already been demonstrated (see **Tables**

A-2a and **A-2b**) that the proposed GCL liner system will significantly reduce the steady state flux, the GCL liner system should also significantly increase the advective breakthrough time.

Additionally, as shown in **Figure A-2b**, approximately 40-ft of existing waste in the existing closed landfills further separates the new waste in MC VI-F and MC VI-G from the in-situ clay subsoil and groundwater. This existing waste layer provides additional chemical adsorptive capacity due to the following properties:

- Its anaerobic natural and high sulfide condition could bond heavy metals (Bhattacharyya et. al. (2006) and Robinson and Sum (1980))
- Non-degradable organic and other material provide additional adsorption and/or absorption capabilities for organic contaminants (De Gisi et. al. (2016) and Erses et. al. (2005))
- Additional biological activity reduces the half-life of organic pollutants and reduces potential breakthrough (Christensen et. al. (1994) and Guan et. al. (2014))
- Increases the mass transport distance and further reduces the concentration gradient (Shackelford (2013) and Xie (2015)
- Reduces the “concentration gradient” with the contaminants in the existing waste

Based on the above discussions, the performance of the proposed MC VI-F and MC VI-G liner system is superior in the criterion of chemical adsorptive capacity / solute breakthrough time than the reference case (MC VI-G Phase 1 liner system). Therefore, technical equivalency is demonstrated, and the proposed liner system is acceptable.

Conclusions

US Ecology Wayne Disposal, Inc. is proposing the use of GCL in the construction of MC VI-F and MC VI-G. The use of GCL was approved by the agencies in 2018 for the construction of MC VI-G2 and MC VI-G3 using the same equivalency demonstration presented above. WDI has presented this information again demonstrating that the proposed liner system is equivalent or superior to the currently permitted liner system and is capable of preventing the migration of hazardous constituents into the groundwater or surface water at least as effectively as the approved liner system.

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List of Supplemental Attachments

Attachment A-1: Chemical Compatibility Evaluation Report Provided by CETCO

Attachment A-1

Chemical Compatibility Evaluation Report Provided by CETCO

CETCO 2870 Forbs Avenue Hoffman Estates, IL 60192
847.851.1800 800.527.9948 Fax 847.851.1339 www.cetco.com

May 1, 2018

Te-Yang Soong, Ph.D., P.E.
CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
Novi, MI 48377

RE: US Ecology's Wayne Disposal, Inc., Master Cell VI Sub-Cell G Phase 2
Geosynthetic Clay Liner – Tier I Report

Dear Mr. Soong:

The purpose of this letter is to present the results of compatibility testing of the CETCO® CG-50® bentonite used to make our Bentomat® products and the Resistex® geosynthetic clay liner (GCL) for the above mentioned project. This report is being made at the completion of the permeability testing for Resistex® 200 FLW9 GCL. All testing was performed by CETCO®'s in-house GAI-LAP accredited laboratory located in Hoffman Estates, Illinois.

Per your request, CETCO® initiated a geosynthetic clay liner (GCL) chemical compatibility evaluation as outlined in our Technical Reference (TR-345, attached) in April 2018 after receiving a representative sample of leachate. Completion of Tier I and II evaluations (see TR-345) indicated that a standard GCL (Bentomat®) in the presence of the leachate would likely not provide suitable performance as defined by permeability. CETCO®'s Resistex® 200 FLW9 GCL was also evaluated for its Tier II performance and is CETCO®'s recommended product for Tier III testing.

Permeability testing was completed in general accordance with ASTM D6766, Scenario II. For this testing, a cell pressure of 80 pounds per square inch (psi), 77 psi headwater pressure, and 75 psi tailwater pressure were utilized and represent test conditions that CETCO® utilizes in evaluating our GCL products. Permeability testing of the Resistex® 200 FLW9 product was terminated upon your request after 243.0 hours and 0.7 pore volumes of flow through the sample. The final average permeability for the Resistex® 200 FLW9 product was 1.5 x 10^{-9} cm/sec.

In addition to our Tier I & II results please find enclosed a copy of our Technical Data Sheet and Technical Reference. We appreciate your interest in CETCO® products. Please contact Tom Hauck, CETCO® Technical Sales Manager, at (248) 652-9274 if you have any further questions.

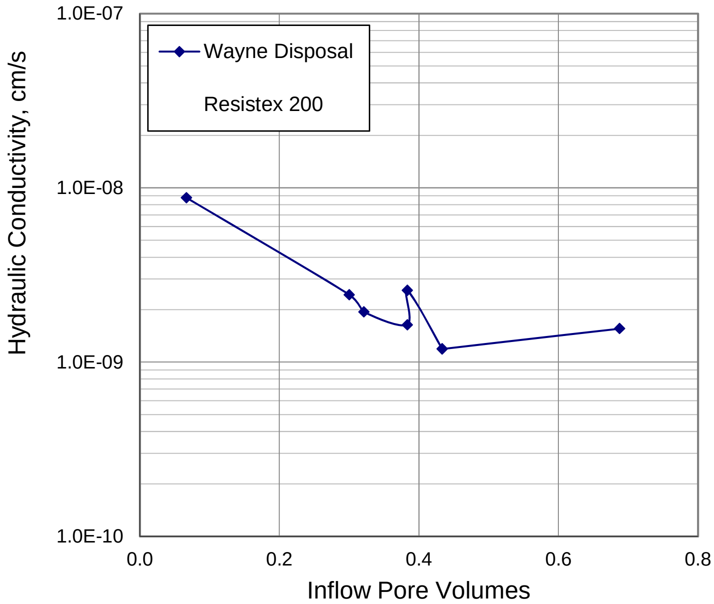
Table 1. Summary of final three measurements for the Resistex® 200 fLW9 product

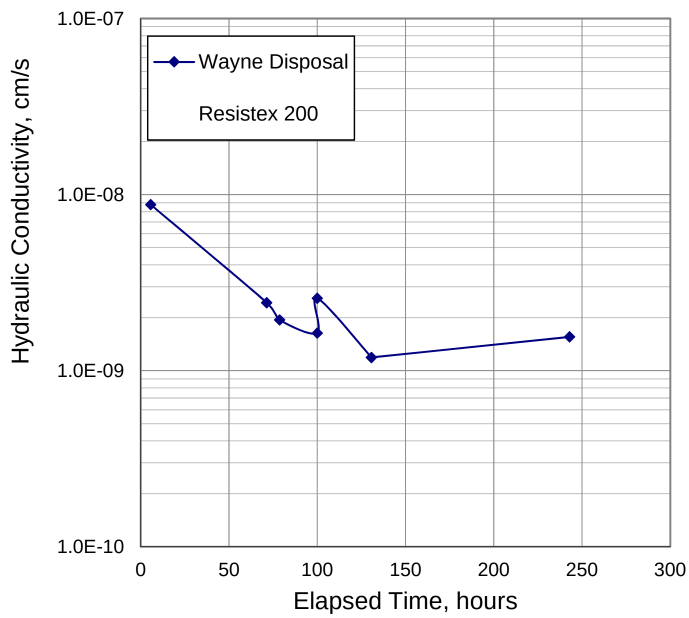
Elapsed Time (hr)	Pore Volumes	Inflow/ Outflow	Permeability (cm/sec)
100.0	0.383	0.96	1.6 x 10^{-9}
130.7	0.433	0.96	1.2 x 10^{-9}
243.0	0.688	0.96	1.6 x 10^{-9}

Very truly yours,

John M. Allen, P.E.
Technical Services Manager
CETCO® Environmental Products

Attachments (3)





Permeability with pore volumes and time for the Resistex® 200 FLW9 GCL using site specific leachate per ASTM D6766, Scenario II, for the US Ecology's Wayne Disposal, Inc., Master Cell VI Sub-Cell G Phase 2

Analytical Results for the provided leachate for US Ecology's Wayne Disposal, Inc., Master Cell VI Sub-Cell G Phase 2 Project

Leachate Code Number	LT 18-1
Leachate Description	leachate
Leachate Type	leachate
Actual pH	9.250
Actual EC (uS/cm)	48,600
Calculations	**LT 18-1**
ICP Estimated EC (uS/cm) (Snoeyink Jenkins)	43281.45
Ionic Strength Estimated by ICP (mol/L)	0.693
RMD Estimated by ICP (M^0.5)	5.370
Ratio of SO4/Cl	0.190

Cl^-	16400.000
Ag+	0.169
Al^{3+}	
As3+	2.816
B4O5(OH)4	51.462
Ba2+	1.778
Ca^{2+}	47.013
Cd2+	0.189
Cr^{3+}	0.211
Cu2+	0.123
Fe^{+2}	3.859
Hg2+	3.527
K+	2231.718
Mg^{2+}	102.739
Mn^{2+}	1.216
Mo2+	11.253
Na^+	9056.907
Ni^{3+}	1.473
P of PO4-3	10.700
Pb2+	1.359
S	2811.831
Sb+2	0.968
Se2+	0.754
Ti4+	0.124
Zn^{2+}	0.532
Zr4+	0.219
H+(Calculated)	0.000
OH- (Calculated)	0.302

EVALUATING GCL CHEMICAL COMPATIBILITY

Sodium bentonite is an effective barrier primarily because it can absorb water (i.e., hydrate and swell), producing a dense, uniform layer with extremely low hydraulic conductivity, on the order of 10^{-9} cm/sec. Water absorption occurs because of the unique physical structure of bentonite and the complementary presence of sodium ions in the interlayer region between the bentonite platelets. Sodium bentonite's exceptional hydraulic properties allow GCLs to be used in place of much thicker soil layers in composite liner systems.

Sodium bentonite which is hydrated and permeated with relatively "clean" water will perform as an effective barrier indefinitely. In addition, past testing and experience have shown that sodium bentonite is chemically compatible with many common waste streams, including Subtitle D municipal solid waste landfill leachate (TR-101 and TR-254), some petroleum hydrocarbons (TR-103), deicing fluids (TR-109), livestock waste (TR-107), and dilute sodium cyanide mine wastes (TR-105).

In certain chemical environments, the interlayer sodium ions in bentonite can be replaced with cations dissolved in the water that comes in contact with the GCL, a process referred to as ion exchange. This type of exchange reaction can reduce the amount of water that can be held in the interlayer, resulting in decreased swell. The loss of swell usually causes increased porosity and increased GCL hydraulic conductivity. Experience and research have shown that calcium and magnesium are the most common source of compatibility problems for GCLs (Jo et al, 2001, Shackelford et al, 2000, Meer and Benson, 2004, Kolstad et al, 2004/2006). Examples of liquids with potentially high calcium and magnesium concentrations include: leachates from lime-stabilized sludge, soil, or fly ash; extremely hard water; unusually harsh landfill leachates; and acidic drainage from calcareous soil or stone. Other cations (ammonium, potassium, and sodium) may contribute to compatibility problems, but they are generally not as prevalent or as concentrated as calcium (Alther et al, 1985), with the exception of brines and seawater. Even though these highly concentrated solutions do not necessarily contain high levels of calcium, their high ionic strength can reduce the amount of bentonite swelling, resulting in increased GCL hydraulic conductivity.

This reference discusses the tools that can be used by a design engineer to evaluate GCL chemical compatibility with a site-specific leachate or other liquid.

HOW IS GCL CHEMICAL COMPATIBILITY EVALUATED?

Ideally, concentration-based guidelines would be available for determining GCL compatibility with a site-specific waste. Unfortunately, considering the variety and chemical complexity of the liquids that may be evaluated, as well as the many variables that influence chemical compatibility (e.g., prehydration with subgrade moisture [TR-222], confining stress [TR-321], and repeated wet-dry cycling [TR-341]), it is not possible to establish such guidelines. Instead, a three-tiered approach to evaluating GCL chemical compatibility is recommended, as outlined below.

Tier I

The first tier is a simple review of existing analytical data. The topic of GCL chemical compatibility has been the subject of much study in recent years, with several important references available in the literature. One of these references, Kolstad et al (2004/2006), reported the results of several long-term hydraulic conductivity tests involving GCLs in contact with various multivalent (i.e., containing both sodium and calcium) salt solutions. Based on the results of these tests, the researchers found that a GCL's long-term hydraulic conductivity (as determined by ASTM D6766) can be estimated if the ionic strength (I) and the ratio of monovalent to divalent ions (RMD) in the permeant solution are both known, using the following empirical expression:

$$\frac{\log K_c}{\log K_{DI}} = 0.965 - 0.976 \times I + 0.0797 \times RMD + 0.251 \times I^2 \times RMD$$

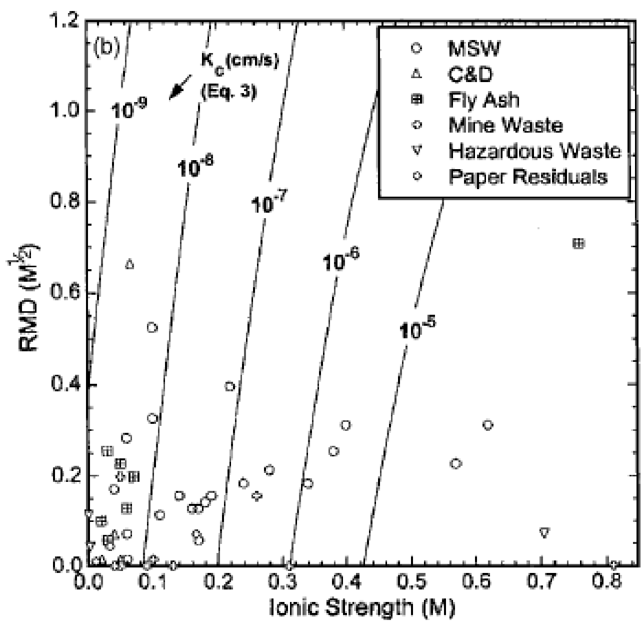
where:

I = ionic strength (M) of the site-specific leachate.

RMD = ratio of monovalent cation concentration to the square root of the divalent cation concentration ($M^{1/2}$) in the site-specific leachate.

K_c = GCL hydraulic conductivity when hydrated and permeated with site-specific leachate (cm/sec).

K_{DI} = GCL hydraulic conductivity with deionized water (cm/sec).



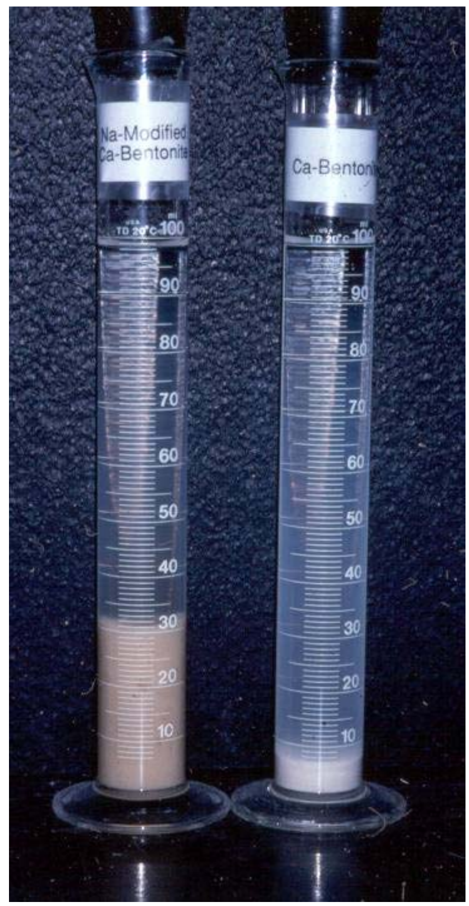
Using this tool, a Tier I compatibility evaluation can be performed if the major ion concentrations (typically, calcium, magnesium, sodium, and potassium) and ionic strength (estimated from either the total dissolved solids [TDS], or electrical conductivity [EC]) of the site leachate are known. For example, using the relationship above and MSW leachate data available in the literature, Kolstad et al. were able to conclude that high hydraulic conductivities (i.e., >10^{-7} cm/sec) are unlikely for GCLs in base liners in many solid waste containment facilities.

In many cases, the Tier I evaluation is sufficient to show that a site-specific leachate should not pose compatibility problems. However, if the analytical data indicate a potential impact to GCL hydraulic performance, or if there is no analytical data available, then it is necessary to proceed to the second tier, involving bentonite "screening" tests, which are described below.

Tier II

The next tier of compatibility testing involves bentonite screening tests, performed in accordance with ASTM Method D6141. These tests are fairly straightforward, and can be performed at one of CETCO's R&D laboratories or at most commercial geosynthetics testing laboratories.

Liquid samples should be obtained very early in the project, such as during the site hydrogeological investigation. It is important that the sample collected is representative of actual site conditions. Synthetic leachate samples may also be considered for use in the compatibility tests. The objective is to create a liquid representative of that which will come in contact with the GCL. At least 1-gallon (4-Liter) of each sample should be submitted for testing. Samples should be accompanied by a chain-of-custody or information form. When a sample is received at the CETCO laboratory, the following screening tests are performed to assess compatibility:



- Fluid Loss (ASTM D5890) – A mixture of sodium bentonite and the site water/leachate is tested for fluid loss, an indicator of the bentonite's sealing ability.
- Swell Index (ASTM D5891) – Two grams of sodium bentonite are added to the site water/leachate and tested for swell index, the volumetric swelling of the bentonite.
- Water quality – The pH and EC of the site water/leachate are measured using bench-top water quality probes. pH will indicate if any strong acids (pH < 2) or bases (pH > 12) are present which might damage the bentonite clay. EC indicates the strength of dissolved salts in the water, which can hamper the swelling and sealing properties of bentonite if present at high concentrations.
- Chemistry – The site water/leachate is analyzed for major dissolved cations using ICP. The analytical results can then be used to perform a Tier I assessment, if one has not already been done.

As part of this testing, fluid loss and free swell tests are also performed on clean, deionized, or "DI" water for comparison to the results obtained with the site water/leachate sample. Sodium bentonite tested with DI water is expected to have a free swell of at least 24 mL/2g and a fluid loss less than 18 mL. Changes in bentonite swell and fluid loss indicate that the constituents dissolved in the site water may have an impact on GCL hydraulic conductivity. However, since it is only a screening tool, there are no specific values for the fluid loss and swell index tests that the clay must meet in order to be considered chemically compatible with the test liquid in question. Differences between the results of the baseline tests and those conducted with the site leachate may warrant further hydraulic testing.

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A major drawback of the D6141 tests is the potential for a false “negative” result, meaning that the bentonite swell index or fluid loss might predict no impact to hydraulic performance, where in reality, there may be a long-term adverse effect. This is primarily a concern with dilute calcium or magnesium solutions, which may slowly affect GCL hydraulic performance over months or years. Short-term (2-day) bentonite screening tests would not be able to capture this type of long-term effect. This is not expected to be a concern with strong calcium or magnesium or high ionic strength solutions, which have been shown to impact GCL hydraulic conductivity almost immediately, and whose effects would therefore be captured by the short-term bentonite screening tests. Another limitation of the bentonite screening tests is their inability to simulate site conditions, such as clean water prehydration, increased confining pressure, and wet/dry cycling. These limitations can be in part addressed by moving to the third tier, a long-term GCL hydraulic conductivity test, discussed below.

Tier III

The third-tier compatibility evaluation consists of an extended GCL hydraulic conductivity test performed in accordance with ASTM D6766. This test method is essentially a hydraulic conductivity test, but instead of permeating the GCL sample with DI water, the site-specific leachate is used. Since leachates can often be hazardous, corrosive, or volatile, the testing laboratory must have permeant interface devices, such as bladder accumulators, to contain the test liquid in a closed chamber, and prevent contamination of the flow measurement and pressure systems, or release of chemicals to the ambient air.

Method D6766 provides some flexibility in specifying the testing conditions so that certain site conditions can be simulated. For example, in situations where the GCL will be deployed on a subgrade soil that is compacted wet of optimum, the GCL will very likely hydrate from the relatively clean moisture in the subgrade (TR-222), long before it comes in contact with the potentially aggressive site leachate. Lee and Shackelford (2005) showed that a GCL which is pre-hydrated with clean water before being exposed to a harsh solution is expected to exhibit a lower hydraulic conductivity than one hydrated directly with the solution. Depending on the expected site conditions, the D6766 test can be specified to pre-hydrate the GCL with either water (Scenario 1) or the site liquid (Scenario 2).

Another site-specific consideration is confining pressure. Certain applications, such as landfill bottom liners and mine heap leach pads, involve up to several hundred feet of waste, resulting in high compressive loads on the liner systems. Although the standard confining pressure for the ASTM D6766 test is 5 psi (representing less than 10 feet of waste), the test method is flexible enough to allow greater confining pressures, thus mimicking conditions in a landfill bottom liner or heap leach pad. Petrov et al (1997) showed that higher confining pressures will decrease bentonite porosity, and tend to decrease GCL permeability. TR-321 shows that higher confining pressures will improve hydraulic conductivity even when the GCL is permeated with aggressive calcium solutions.

ASTM D6766 has two sets of termination criteria: hydraulic and chemical. To meet the hydraulic termination criterion, the ratio of inflow rate to outflow rate from the last three readings must be between 0.75 and 1.25. It normally takes between one week and one month to reach the hydraulic termination criterion. To meet the chemical termination criterion, the test must continue until at least two pore volumes of flow have passed through the sample and chemical equilibrium is established between the effluent and influent. The test method defines chemical equilibrium as effluent electrical conductivity within ±10% of the influent electrical conductivity. This requirement was put in place to ensure that a large enough volume of site liquid passes through the sample to allow slow ion exchange reactions to occur. Two pore volumes can take approximately a month to permeate through the GCL sample. However, reaching chemical equilibrium (effluent EC within 10% of influent EC), may take more than a year of testing, depending on the leachate characteristics.

ASTM D6766 is a very useful tool which provides a fairly conclusive assessment of GCL chemical compatibility with a site-specific leachate. However, the major drawback of the D6766 test is the potentially long period of time required to reach chemical equilibrium. This limitation reinforces the need for upfront compatibility testing early in the project. Clearly, requiring the contractor to perform this testing during the construction phase is not recommended.

WHAT DO THE ASTM D6766 COMPATIBILITY TEST RESULTS MEAN?

ASTM D6766 is currently the state-of-the-practice in the geosynthetics industry for evaluating long-term chemical compatibility of a GCL with a particular site waste stream. An ASTM D6766 test that is properly run until both the hydraulic (inflow and outflow within ±25% over three consecutive readings) and chemical (effluent EC within ±10% of influent EC) termination criteria are achieved, provides a good approximation of the GCL's long-term hydraulic conductivity when exposed to the site leachate. Jo et al (2005) conducted several GCL compatibility tests with weak calcium and magnesium solutions, with some tests running longer than 2.5 years, representing several hundred pore volumes of flow. The intent of this study was to run the tests until complete ion exchange had occurred, which required even stricter chemical equilibrium termination criteria than the D6766 test. The study found that the final GCL hydraulic conductivity values measured after complete ion exchange were fairly close to (within 2 to 13 times) the hydraulic conductivity values determined by ASTM D6766 tests, which took much less time to complete.

The laboratory that performs the chemical compatibility test, whether it is the CETCO R&D laboratory or an independent third-party laboratory, is only reporting the test results under the specified testing conditions, and is not making any guarantees about actual field performance or the suitability of a GCL for a particular project. It is the design engineer's responsibility to incorporate the D6766 results into their design to determine whether the GCL will meet the overall project objectives. Neither the testing laboratory nor the GCL manufacturer can make this determination.

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Also, it is important to note that the results of D6766 testing for a particular project are only applicable for that site, for the specific waste stream that is tested, and only for the specific conditions replicated by the test. For instance, D6766 testing performed at high normal loads representative of a landfill bottom liner should not be applied to a situation where the GCL will only be placed under a modest normal load, such as a landfill cover or pond. Similarly, the results of a D6766 test where the GCL was pre-hydrated with clean water should not be applied to sites located in extremely arid climates where little subgrade moisture is expected, unless water will be applied manually to the subgrade prior to deployment. And finally, since D6766 tests are normally performed on continuously hydrated GCL samples, the test results should not be applied to situations where repeated cycles of wetting and drying of the GCL are likely to occur, such as in some GCL-only landfill covers, as desiccation can worsen compatibility effects.

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5. CETCO TR-103, "Compatibility Testing of Bentomat (Gasoline, Diesel and Jet Fuel)".
6. CETCO TR-105, "Bentomat Compatibility Testing with Dilute Sodium Cyanide".
7. CETCO TR-107, "GCL Compatibility with Livestock Waste".
8. CETCO TR-109, "GCL Compatibility with Airport De-Icing Fluid".
9. CETCO TR-222, "Hydration of GCLs Adjacent to Soil Layers".
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18. Meer, S. and Benson, C., (2004) “In-Service Hydraulic Conductivity of GCLs Used in Landfill Covers – Laboratory and Field Studies”, Geo Engineering Report No. 04-17, University of Wisconsin at Madison.

19. Petrov, R., Rowe, R.K., and Quigley, R., (1997) “Selected Factors Influencing GCL Hydraulic Conductivity”, *Journal of Geotechnical and Geoenvironmental Engineering,* ASCE, Vol. 123, No. 8, pp. 683-695.

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Attachment B

Design Calculations

Physical/Mechanical Properties

Stability of slope

To demonstrate that the proposed liner system is technically equivalent to the permitted liner system with respect to slope stability, WDI examined the stability of the proposed liner system on the Master Cell VI-F1 through F4 (MC VI-F) and Master Cell VI-G4 through G7 (MC VI-G) waste and liner slopes. Specifically, WDI verified that the proposed liner system does not introduce any interface and/or internal shear plane that is more critical than what is in the currently permitted liner system.

To verify stability, WDI referred to the slope stability analyses that were conducted and documented in the Basis of Design Report in the current permit (approved by the MDEQ on May 4, 2012 and EPA on September 27, 2013), where the stability of the sideslope under excavation, stability of the liner system under construction, stability of the waste mass during filling, stability of the final cover, and stability of the long-term final closure were evaluated.

Two findings of the prior investigation that are relevant to this technical equivalency demonstration, both related to interface shear resistance, are identified and listed below:

- As long as the interim waste slope during filling does not exceed an inclination of 3.5(H) to 1(V), a friction angle of 12.7 degrees (or equivalent combination of friction and adhesion) or higher between any different geosynthetic-to-geosynthetic or geosynthetic-to-soil interfaces will result in satisfactory interim factor of safety (FS) values of 1.3 or greater during waste placement. The peak strength parameters of the interface strength tests may be used to confirm that the specific geosynthetics used in the construction of Master Cell VI-F meet the required shear strength.

Historical data and past experiences indicate that these requirements can be readily met by liner systems that utilize GCL products. Nevertheless, WDI will, as part of the CQA requirements, conduct direct shear tests (ASTM D6243) for relevant GCL-related interfaces (e.g., against 80-mil textured HDPE geomembranes, between different GCL products, against cohesive attenuation layer soils, etc.) as well as internal shear strength for different GCL products before approving the products to be used for construction of the MC VI-F and MC VI-G liner system. **Attachment B-1** includes the results of the performed stability analyses.

Bearing capacity

Studies and past experiences have demonstrated that an adequate thickness of cover soil (1 foot) will prevent a decrease in GCL thickness due to construction equipment loading thereby ensuring appropriate GCL bearing capacity. Performance equivalency can be achieved by properly specifying the installation procedure of the GCL and cover soil and a robust CQC/CQA program. A minimum thickness of 1 foot of cover soil is specified as a technical requirement and CQA site personnel will observe/verify/ document that such a requirement is maintained between the equipment tires/tracks and the GCL at all times during the installation process.

For the same reason, the initial (lowest) lift of the attenuation layer will be constructed with a 1-ft lift thickness to ensure GCL in the secondary liner system does not encounter loading from the construction equipment without adequate soil protection.

Attachment D of the Permit Modification Letter Report includes the CQA manual and Installation Guidelines for the GCL.

Settlement

As required in Michigan Part 111 R299.9620 (4), the proposed MC VI-F liner grades were designed at a minimum slope of 2% in directions perpendicular to the leachate collection pipes. The leachate collection pipes were designed at a minimum slope of 1%.

The ability of the proposed liner grades to maintain positive drainage post-settlement was evaluated. The settlement of the underlying foundational soils and existing MC IV waste due to the expected loading was first examined. For each of the cells, the post-settlement slope along the leachate collections pipe and a section of the cross-slope was calculated. The calculation showed that positive drainage will be maintained in all cells of MC VI-F. **Attachment B-2** includes the results of the performed settlement analyses.

Construction Properties

Puncture resistance

GCL performance against the risk of external and internal liner systems puncture was evaluated to determine how it compares to the existing approved liner.

External puncture resistance from overlying waste: The inclusion of GCLs arguably increases the resistance of the primary liner system to punctures from overlying debris by adding additional layers of geosynthetics. But ignoring that improvement as it is not the intended purpose of the GCLs, the primary composite liner is fundamentally unchanged in terms of puncture resistance. The GCL itself is protected from above by one foot of sand, geocomposite and 80 mil HDPE geomembrane.

Internal puncture resistance: The primary GCL will rest directly on the attenuation layer and the secondary GCL will rest directly on the structural fill. Stones potentially present in the attenuation layer and structural fill will be prevented from puncturing the GCL by a rigorously designed and enforced CQA program. Technical specifications for the GCL, included in **Attachment D** of the Permit Modification Letter Report, limit any stone particle in the upper most lift of the subgrade soils (i.e., the attenuation layer and structural fill) to be not larger than 1 inch (25 mm) in size. Proof-rolling of the prepared subgrade surface is also required to reduce stone particle protrusion.

External puncture resistance from underlying waste: The GCL will be protected from underlying debris by the structural fill layer. The structural fill layer will be prevented from contacting potentially damaging underlying debris (this first assumes underlying waste will be exposed which may not occur) by a rigorously designed and enforced CQA program that will include removal of debris that reasonably could penetrate the structural fill and proof-rolling of the surface on which the structural fill layer will be constructed to reduce the potential for protrusion.

Additional subgrade preparation requirements are listed in the CQA Manual and manufacturer's specifications included in **Attachment D** of the Permit Modification Letter Report. The Certifying Engineer's approval of the subgrade must also be obtained prior to GCL installation.

Leachate Collection System Design

Pipe Strength

Leachate collection pipes and leachate sideslope risers were analyzed for structural stability under the expected loads in MC VI-F. The pipes were analyzed for both deflection and factor of safety against wall buckling. Both SDR 11 and SDR 9 pipes achieved acceptable factors of safety for wall buckling and deflections. Refer to **Attachment B-3** for additional calculation information.

Leachate collection system

The leachate collection system consists of the leachate collection geocomposite, overlying sand leachate collection layer, and leachate collection pipes. The perforated 8-inch diameter leachate collection pipes are designed to be recessed in trenches on the cell floors. The capacity of the leachate collection pipes and the capacity of the perforations in the leachate collection pipes were analyzed and found to surpass the maximum open condition leachate generation flow to the most critical pipes. Therefore the 8-inch pipes along with the proposed perforation pattern meet the required flow capacity for MC VI-F cells. For additional details see **Attachment B-4**.

The leachate collection system geocomposite drainage layer was designed using McEnroe's equation for maximum head on liner. The leachate collection system geocomposite and sand layers were designed by determining the minimum geocomposite transmissivity required to achieve 1 foot of head on the liner or less through a process of iteration. The resultant minimum geocomposite transmissivity for MCVI F subcells was determined to be within the range of standard industry materials and will be set as the requirement for the construction of each subcell. For additional details see **Attachment B-5**.

Conclusions

The calculations and information provided above and contained in the attachments demonstrate that the proposed modifications of MC VI-F, including settlement, slope stability, pipe strength, and leachate collection system flow, comply with the currently effective hazardous waste regulatory requirements.

List of Supplemental Attachments

Attachment B-1: Slope Stability Analysis

Attachment B-2: Settlement Calculations

Attachment B-3: Pipe Strength and Deflection Calculations

Attachment B-4: Leachate Collection System Flow Capacity Analysis

Attachment B-5: Head-on-Liner Calculations and Minimum Geocomposite Transmissivity

Attachment B-1

Slope Stability Analysis

Project Name:	WDI MC6F Permit Modification	Client:	Wayne Disposal, Inc.
Project Number:	1208070039.004	Project Manager:	Chris Backus
Project Location:	Belleville, Michigan	QA Manager:	

Calculation Sheet Information

Calculation Medium: ☒ Electronic
☐ Hard copy Number of pages (including cover sheet): 53

Title of Calculation:	Slope Stability Analyses
Calculation Originator:	Andra Malburg, Mohammad Kabalan
Calculation Contributors:	Mohammad Kabalan
Calculation Checker:	Kevin Foye

Calculation Objective

This calculation evaluates the stability of the proposed MC6F at Wayne Disposal, Inc. (WDI) Landfill. The analyses include consideration of global slope stability for failures through the waste mass, along the liner system, and/or through the foundation soils at interim and final conditions. The analyses also determined the minimum required interface friction angle to attain a satisfactory factor of safety against failure at the liner system interface. Cross sections that are the most critical for analysis and design include cross sections with the steepest slopes and highest embankment (waste or soil) heights. The following critical cross sections were examined:

1. Cross Section B-B’ oriented East-West and going through Cell F1.
2. Cross Section E-E’ oriented North-South and going through Cell F4.

Assumptions and Open Items

1. Representative total stress shear strength parameters were used for all layers in the profile. Material properties were retrieved from existing site data (NTH 2012) and are presented in Table 1. Strength properties for the lower clay were modeled as a relationship of shear stress to normal stress (total vertical stress), whereas all other layers used the Mohr-Coulomb model with either an undrained shear strength or friction angle as input. A shear strength to total vertical stress ratio of 0.22 was applied for the lower clay in accordance with existing analyses (NTH 2012) to account for increases in shear strength resulting from increased overburden pressure within the lower clay layer.

Table 1: Material Properties

Material	Name	Color in Profile	Unit Wt(s) (pcf)	Strength ϕ or δ (deg.)	Strength C or Ca (psf)
1	Final Cover	Orange	130	0	1500
2	Existing Waste	Teal	86	34	0
3	New Waste	Light Green	103[A]	26[B]	300[B]
4	Upper Clay	Brown	131	0	2150
5	Middle Clay	Yellow	136	0	3300
6	Lower Clay	Maroon	133	$0.22\sigma_v$	
7	Silt	Blue	125	28	0
8	Sand	Red	115	32	0

Notes:
[A] unit weight of waste determined from site survey data reported in 2020.
[B] representative value of waste strength as reported by Qian et al. (2002)
All other properties obtained from NTH (2012)

2. For liner system stability cases, the domain of the slip surfaces are defined so that a portion of the failure surface conforms to the liner system.
3. Applicable data used in the analysis that was provided by third parties is assumed to be accurate.

Design Criteria/Design Basis (with Reference to Source of Data)

1. The minimum allowable factor-of-safety (FS) against slope stability failures is 1.50 for final conditions and 1.30 for interim conditions.
2. The analyses were conducted using the computer program SLOPE/W within the software package GeoStudio 2021 by GEOSLOPE International Ltd. This program performs an automatic search to identify a critical failure surface that has the lowest FS value.
3. The analyses were conducted using the Morgenstern-Price method, which considers both moment and force equilibrium.
4. The geometry of the cross sections was derived from the engineering drawing set submitted as part of the permit mod package.
5. The required/assumed interface friction angles shall be met by considering peak strength values for the cell floor and large-displacement strength values for the cell sideslopes.
6. The required minimum interface friction angle for the liner system components is determined under the final conditions (after final cover is installed).
7. Due to the complex natural of the waste fill phasing during operation, the liner stability shall be evaluated based on the actual measurements of the interface friction angle for the liner system components and the design waste filling geometry for each phase. An example one such calculation was prepared to illustrate how to evaluate required minimum interface friction angle for the liner system components. This example analysis was performed on cross section B-B’ assuming an interim waste slope of 3.5H:1V.

Results/Conclusions

1. Global slope stability analyses of the waste and foundation for each cross section determined that filling to proposed final grades yields acceptable factors of safety.
    a. Cross Section B-B': Factor of Safety = 1.84
    b. Cross Section E-E': Factor of Safety = 2.23
2. Under the final conditions (after installation of final cover, the liner system analyses determined the minimum required interface friction angle for geosynthetics in the floor and slideslope liner systems to yield a factor of safety = 1.50. These values are **10.7 degrees for the floor (peak) and 7 degrees for the sideslope (large-displacement) with zero adhesion** .
    a. Cross Section B-B': Factor of Safety = 1.50 (used to evaluate minimum friction angle)
    b. Cross Section E-E': Factor of Safety = 1.77
3. The above values are minimum acceptable secant friction angles. Any combination of adhesion and friction angle resulting in comparable shear strength under representative normal stresses to final site conditions are also acceptable. Stability analysis using lab interface shear strength tests results from previous products used on site show that a combination of **$C_{\alpha,peak}$=164 psf / ϕ_{peak}=11.1° and $C_{\alpha,large\ displacement}$=110 psf / $\phi_{large\ displacement}$=7.3°** achieves an acceptable factor of safety. **Conformance testing of the selected geosynthetics shall be performed to confirm that the interface shear strength of the actual liner system components is sufficient to ensure the stability of the liner system.**
    a. Cross Section B-B': Factor of Safety = 1.64
    b. Cross Section E-E': Factor of Safety = 1.93
4. An example calculation of liner stability for an interim waste filling conditions is presented in Attachment 7. The required interface friction angle for the floor liner system was determined to be 12.7 degrees (peak). Actual interim phasing plan slopes and tested liner system interface properties shall be evaluated for each phase of fill per this example.

Source Documents and References

NTH (2012). WDI Operating License Application Master Cells VI F & G Volume III – Basis of Design Report

Qian, X., Gray, D.H., and Koerner, R.M. (2002) *Geotechnical Aspects of Landfill Design and Construction.*

Attachments
1. B-B’ Foundation Stability 2. E-E’ Foundation Stability 3. B-B’ Liner Stability under Final Conditions with zero adhesion 4. E-E’ Liner Stability under Final Conditions with zero adhesion 5. B-B’ Liner Stability under Final Conditions with non-zero adhesion (previously tested values) 6. E-E’ Liner Stability under Final Conditions with non-zero adhesion (previously tested values) 7. B-B’ Liner Stability under Interim Conditions (example interim stability calculation)

Attachment B-1.1

B-B’ Foundation Stability

SLOPE STABILITY ANALYSIS REPORT FORM

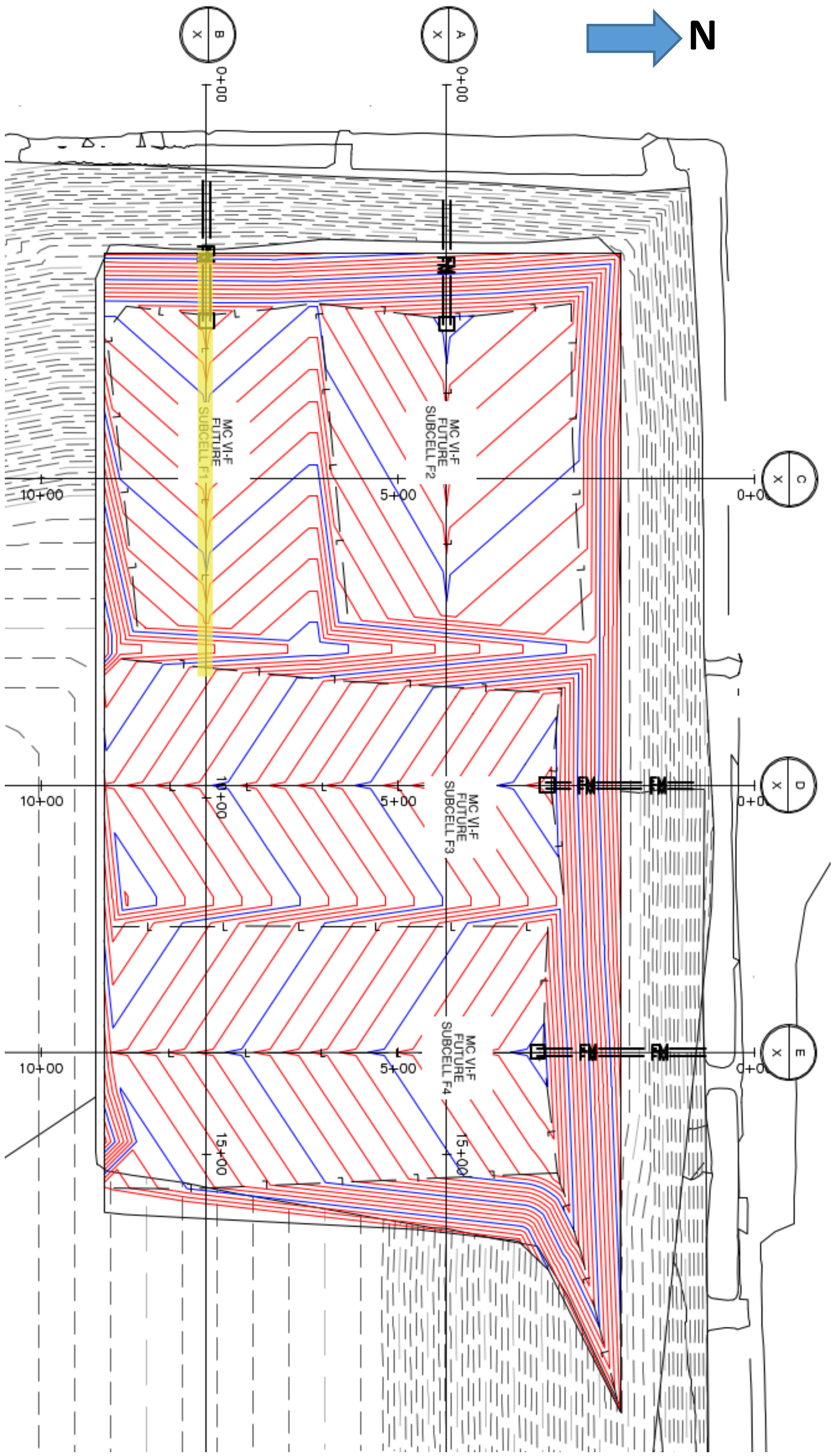
Project Name:	WDI MC6F Permit Modification						
Project Number:	1208070039.004			**Client:**	Wayne Disposal, Inc.		
Analysis Short Name:	B-B' Foundation Stability				**File name:**	WDI Cross Section B Full_20201123_RevD_MK.gsz	
Revision:	1	**Originated:**	MK	**Checked:**	KF	**Approved:**	
Date:	11/23/20	**Date:**	11/23/20	**Date:**	11/23/20	**Date:**	

Purpose of Analysis:	To determine the factor of safety of the proposed final waste grades using cross-section B-B'. This case considers a west-facing slope, with fill to the final permitted grade elevations.		
☐ Effective Stress ☒ Total Stress	☒ Static ☐ Seismic	☐ Pore Pressure	☒ Optimized Surface
Additional Details:	The friction angle of the liner system was set equal to the required minimum interface friction angle determined from the liner stability analysis performed on Cross Section B.		

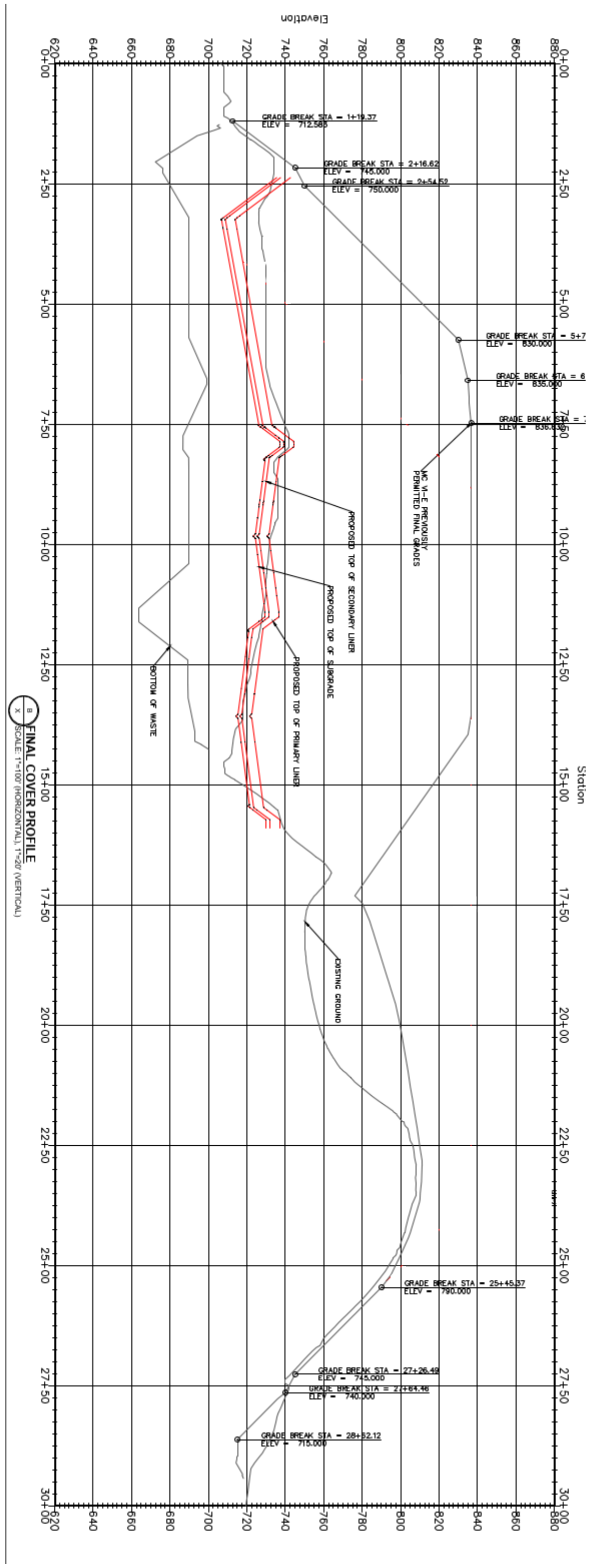
Material	**Name**	**Color in Profile**	**Unit Wt(s) (pcf)**	**Strength ϕ or δ (deg.)**	**Strength C or Ca (psf)**
1	Final Cover	Orange	130	0	1500
2	Existing Waste	Teal	86	34	0
3	New Waste	Light Green	103	26	300
4	Upper Clay	Brown	131	0	2150
5	Middle Clay	Yellow	136	0	3300
6	Lower Clay	Maroon	133	$0.22\sigma_v$	
7	Silt	Blue	125	28	0
8	Sand	Red	115	32	0
9	Liner	Magenta	120	10.7	0

Source of Geometry:	Engineering Drawing Set
Source of Subsurface Profile:	Basis of Design Report - NTH (2012)
☐ Preconstruction ☐ Construction ☐ Interim ☒ Final ☐ Existing ☐ Back-Analysis	
Construction Phase Represented:	Final Build out
Other Geometry Notes:	Cross Section B

Final Grades Cross-Section (plan):

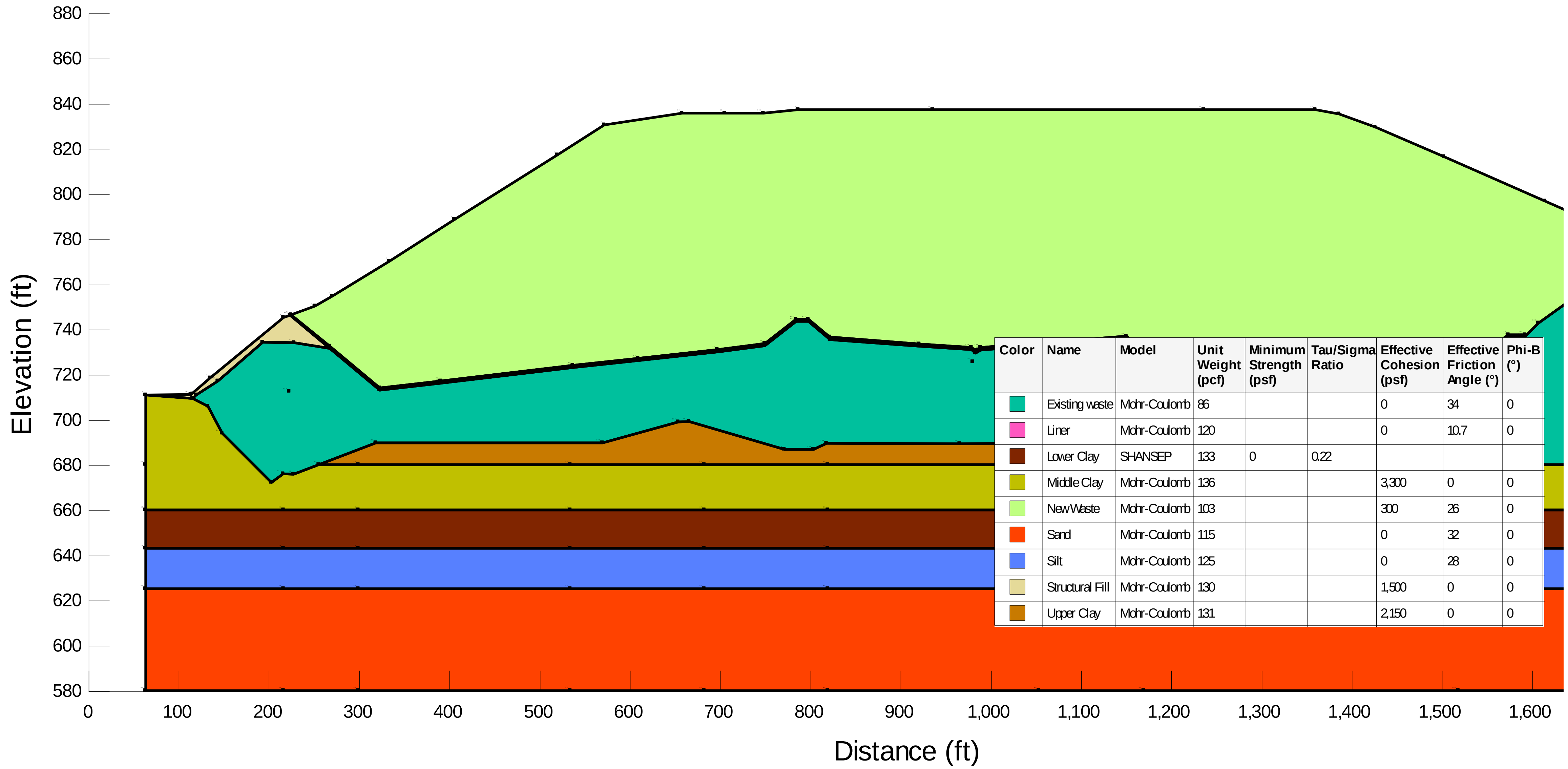


Final Grades Cross-Section (profile):

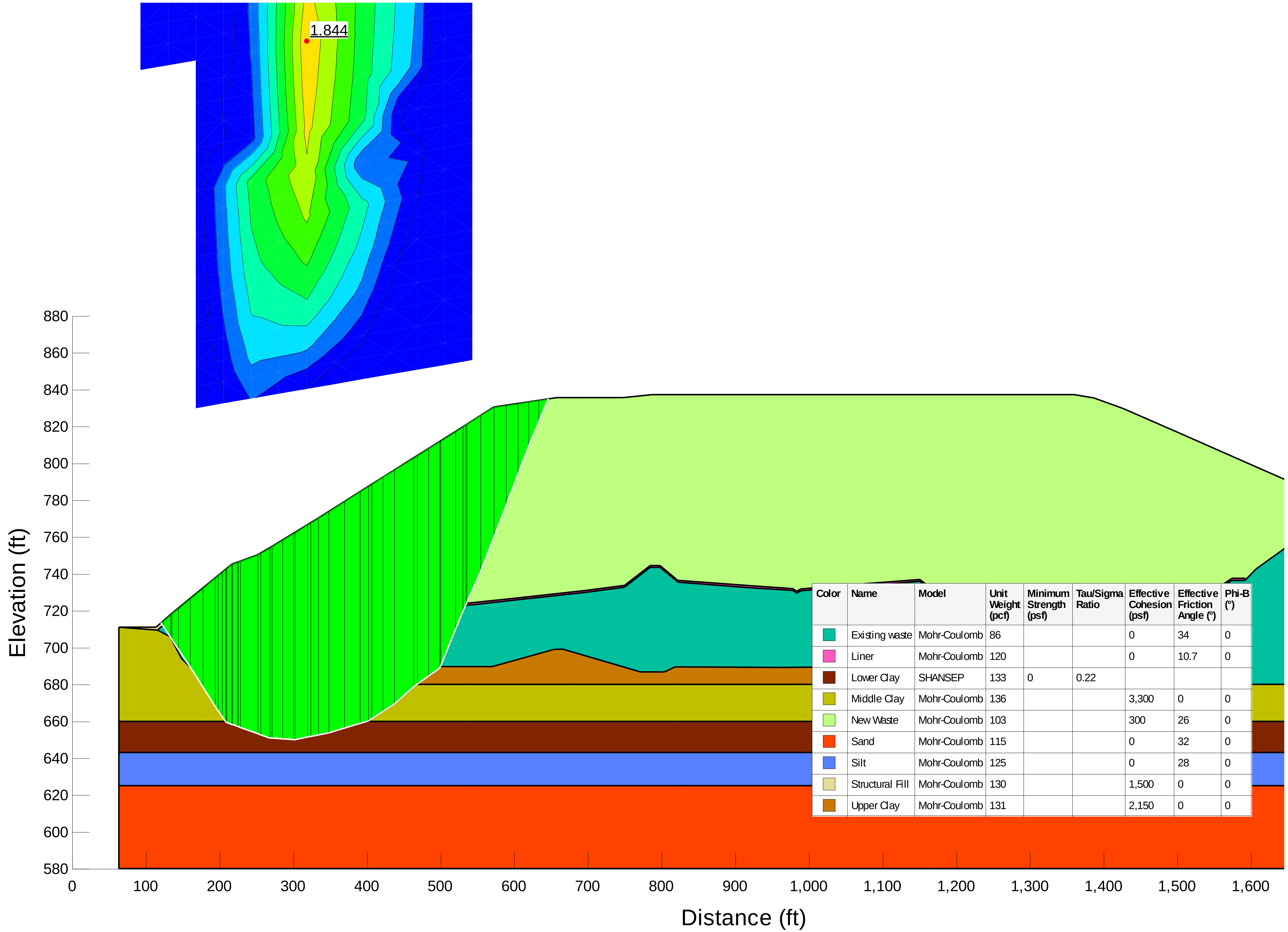


SLOPE STABILITY ANALYSIS REPORT FORM

Factor of Safety:	1.84	☒ Acceptable ☐ Not Acceptable ☐ Follow-up ☐ Superseded
Comments:		
Attachments:	Slope/W Cross Section and Results	



Color	Name	Model	Unit Weight (pcf)	Minimum Strength (psf)	Tau/Sigma Ratio	Effective Cohesion (psf)	Effective Friction Angle (°)	Phi-B (°)
	Existing waste	Mohr-Coulomb	86			0	34	0
	Liner	Mohr-Coulomb	120			0	10.7	0
	Lower Clay	SHANSEP	133	0	0.22			
	Middle Clay	Mohr-Coulomb	136			3,300	0	0
	New Waste	Mohr-Coulomb	103			300	26	0
	Sand	Mohr-Coulomb	115			0	32	0
	Silt	Mohr-Coulomb	125			0	28	0
	Structural Fill	Mohr-Coulomb	130			1,500	0	0
	Upper Clay	Mohr-Coulomb	131			2,150	0	0



Color	Name	Model	Unit Weight (pcf)	Minimum Strength (psf)	Tau/Sigma Ratio	Effective Cohesion (psf)	Effective Friction Angle (°)	Phi-B (°)
	Existing waste	Mohr-Coulomb	86			0	34	0
	Liner	Mohr-Coulomb	120			0	10.7	0
	Lower Clay	SHANSEP	133	0	0.22			
	Middle Clay	Mohr-Coulomb	136			3,300	0	0
	New Waste	Mohr-Coulomb	103			300	26	0
	Sand	Mohr-Coulomb	115			0	32	0
	Silt	Mohr-Coulomb	125			0	28	0
	Structural Fill	Mohr-Coulomb	130			1,500	0	0
	Upper Clay	Mohr-Coulomb	131			2,150	0	0

Attachment B-1.2

E-E’ Foundation Stability

SLOPE STABILITY ANALYSIS REPORT FORM

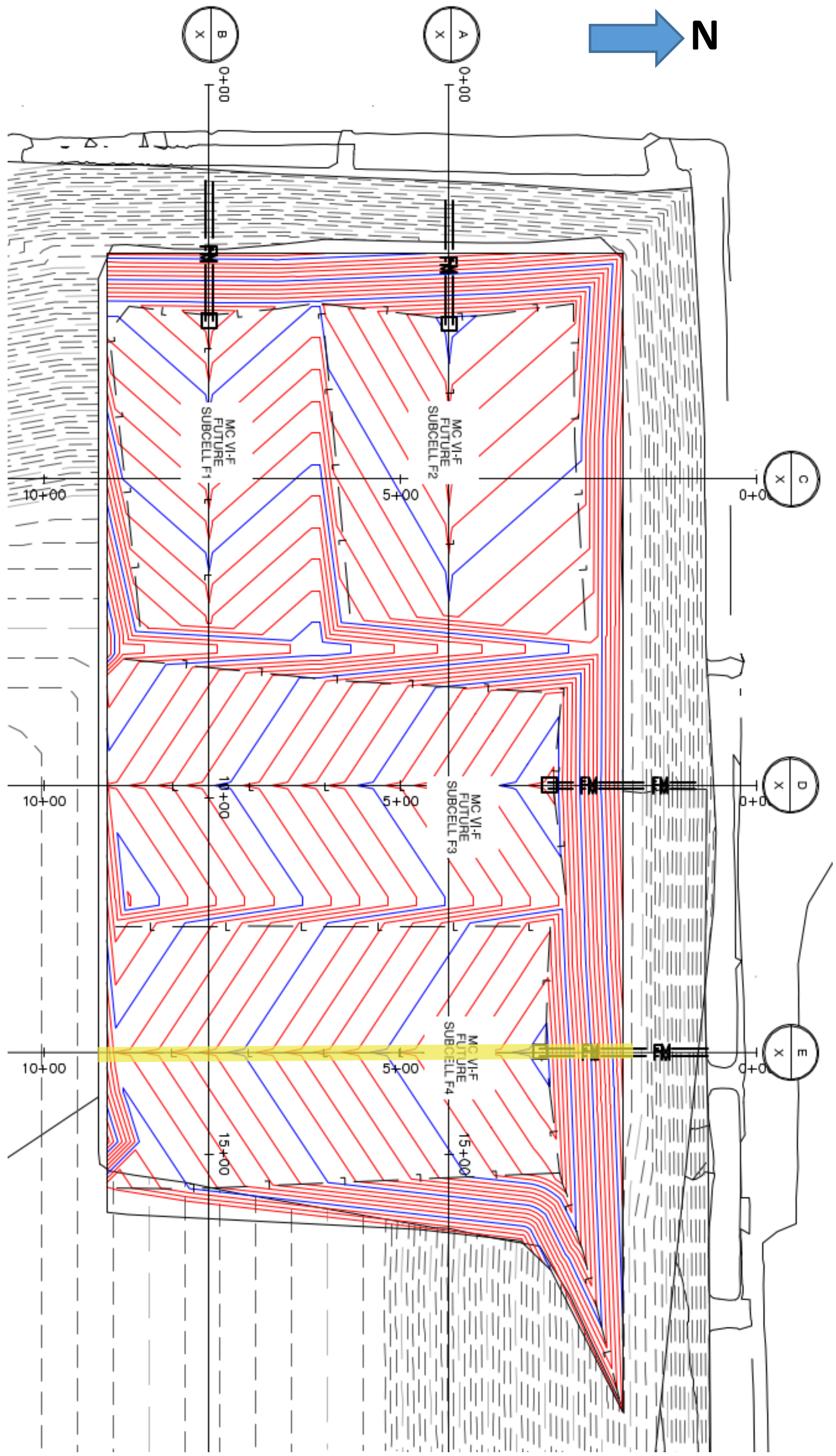
Project Name:	WDI MC6F Permit Modification						
Project Number:	1208070039.004			**Client:**	Wayne Disposal, Inc.		
Analysis Short Name:	E-E' Foundation Stability				**File name:**	WDI Cross Section E Full_20201123_RevD_MK.gsz	
Revision:	1	**Originated:**	MK	**Checked:**	KF	**Approved:**	
Date:	11/23/20	**Date:**	11/23/20	**Date:**	11/23/20	**Date:**	

Purpose of Analysis:	To determine the factor of safety of the proposed final waste grades using cross-section E. This case considers a north-facing slope, with fill to the final grade elevations.		
☐ Effective Stress ☒ Total Stress	☒ Static ☐ Seismic	☐ Pore Pressure	☒ Optimized Surface
Additional Details:	The friction angle of the liner system was set equal to the required minimum interface friction angle determined from the liner stability analysis performed on Cross Section B		

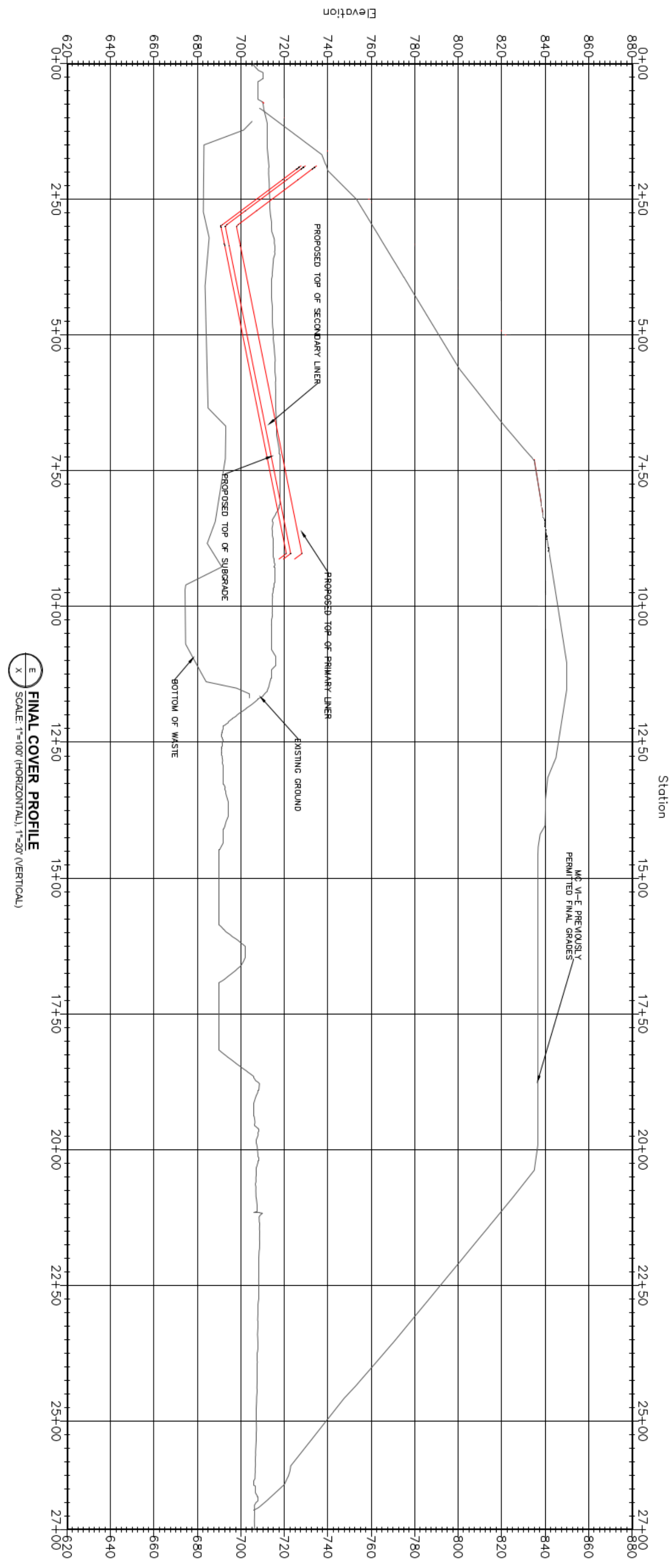
Material	Name	Color in Profile	Unit Wt(s) (pcf)	Strength ϕ or δ (deg.)	Strength C or Ca (psf)
1	Final Cover	Orange	130	0	1500
2	Existing Waste	Teal	86	34	0
3	New Waste	Light Green	103	26	300
4	Upper Clay	Brown	131	0	2150
5	Middle Clay	Yellow	136	0	3300
6	Lower Clay	Maroon	133	$0.22\sigma_v$	
7	Silt	Blue	125	28	0
8	Sand	Red	115	32	0
8	Liner System	Magenta	120	10.7	0

Source of Geometry:	Engineering Drawing Set
Source of Subsurface Profile:	Basis of Design Report - NTH (2012)
☐ Preconstruction ☐ Construction ☐ Interim ☒ Final ☐ Existing ☐ Back-Analysis	
Construction Phase Represented:	Final build out
Other Geometry Notes:	Cross Section E-E'

Final Grades Cross-Section (plan):

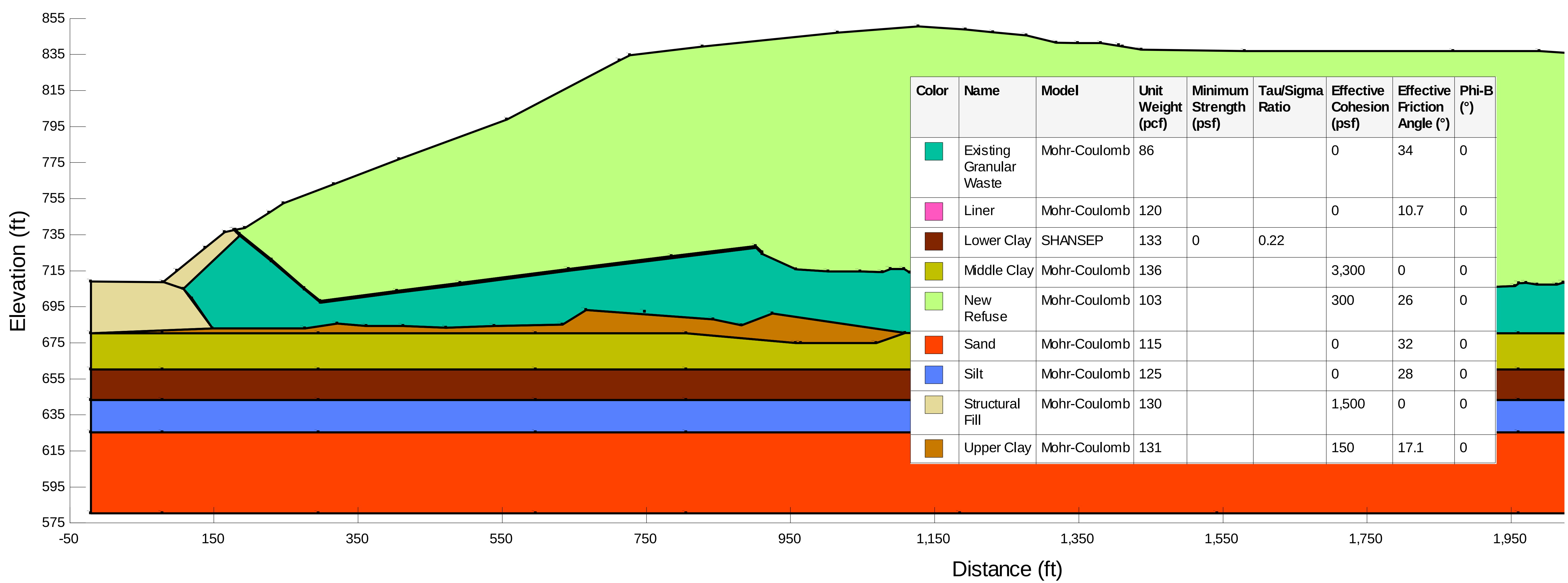


Final Grades Cross-Section (profile):

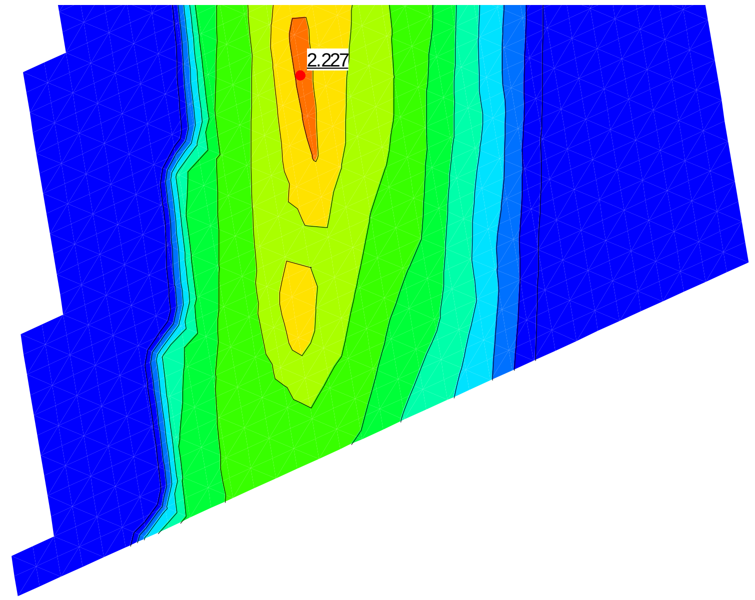


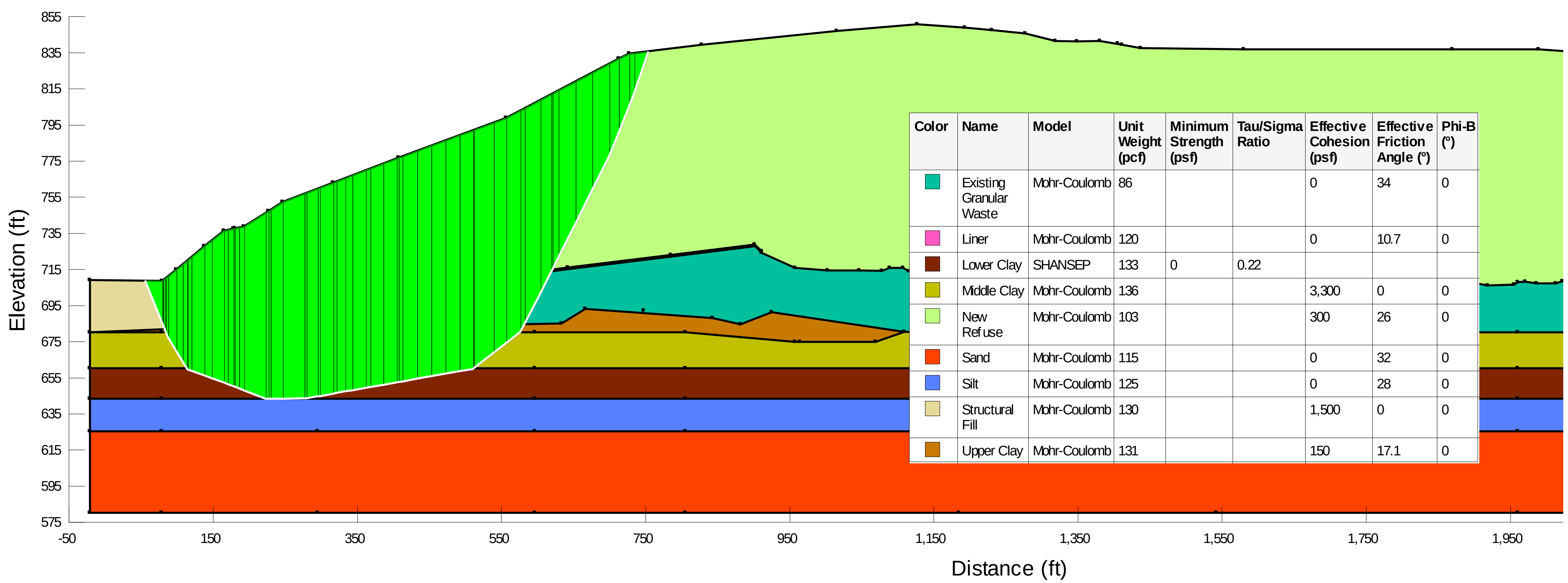
SLOPE STABILITY ANALYSIS REPORT FORM

Factor of Safety:	2.23	☒ Acceptable ☐ Not Acceptable ☐ Follow-up ☐ Superseded
Comments:		
Attachments:	Slope/W Cross Section and Results	



Color	Name	Model	Unit Weight (pcf)	Minimum Strength (psf)	Tau/Sigma Ratio	Effective Cohesion (psf)	Effective Friction Angle (°)	Phi-B (°)
	Existing Granular Waste	Mohr-Coulomb	86			0	34	0
	Liner	Mohr-Coulomb	120			0	10.7	0
	Lower Clay	SHANSEP	133	0	0.22			
	Middle Clay	Mohr-Coulomb	136			3,300	0	0
	New Refuse	Mohr-Coulomb	103			300	26	0
	Sand	Mohr-Coulomb	115			0	32	0
	Silt	Mohr-Coulomb	125			0	28	0
	Structural Fill	Mohr-Coulomb	130			1,500	0	0
	Upper Clay	Mohr-Coulomb	131			150	17.1	0





Color	Name	Model	Unit Weight (pcf)	Minimum Strength (psf)	Tau/Sigma Ratio	Effective Cohesion (psf)	Effective Friction Angle (°)	Phi-B (°)
	Existing Granular Waste	Mohr-Coulomb	86			0	34	0
	Liner	Mohr-Coulomb	120			0	10.7	0
	Lower Clay	SHANSEP	133	0	0.22			
	Middle Clay	Mohr-Coulomb	136			3,300	0	0
	New Refuse	Mohr-Coulomb	103			300	26	0
	Sand	Mohr-Coulomb	115			0	32	0
	Silt	Mohr-Coulomb	125			0	28	0
	Structural Fill	Mohr-Coulomb	130			1,500	0	0
	Upper Clay	Mohr-Coulomb	131			150	17.1	0

Attachment B-1.3

B-B’ Liner Stability under Final Conditions with zero adhesion

SLOPE STABILITY ANALYSIS REPORT FORM

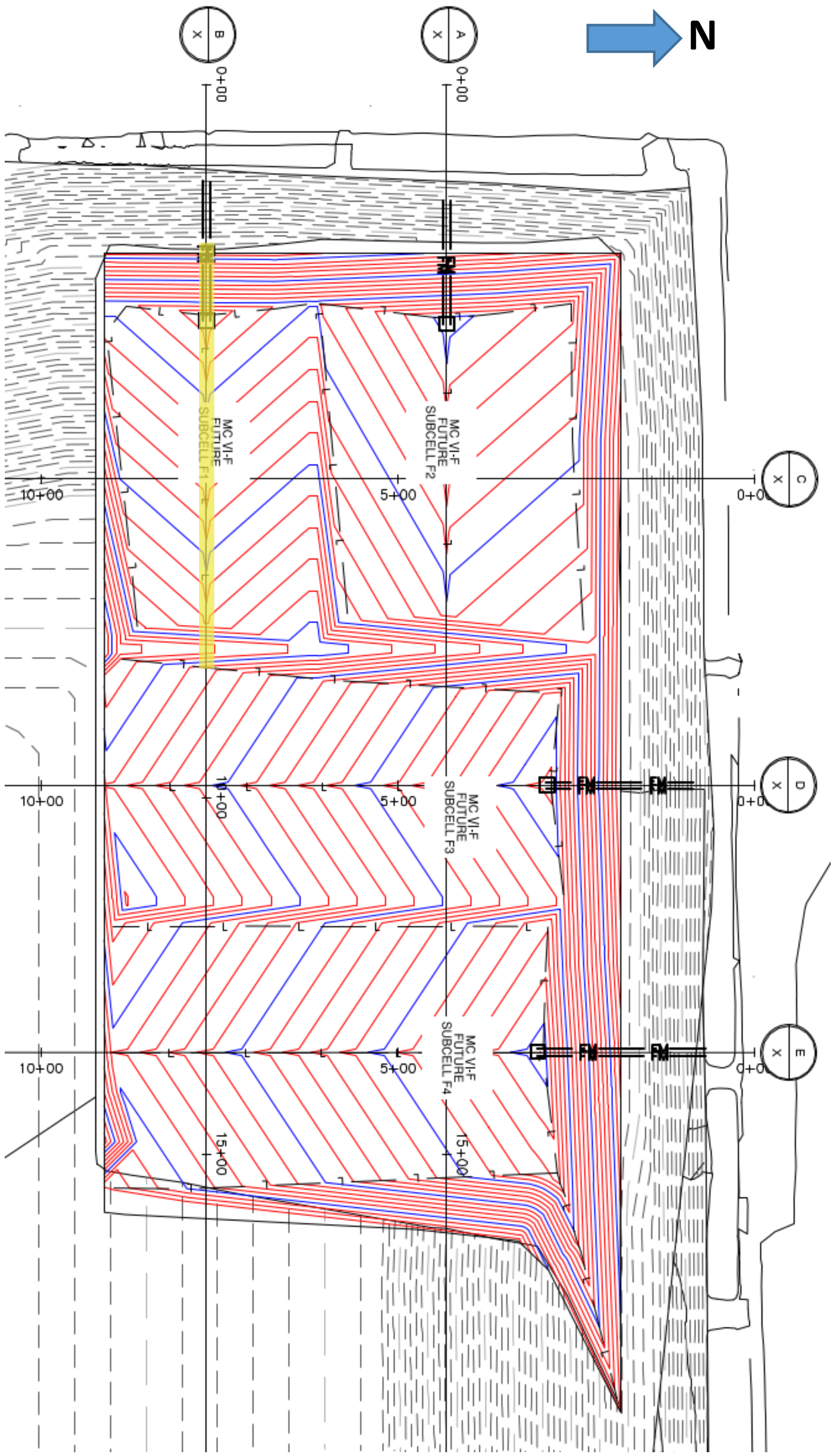
Project Name:	WDI MC6F Permit Modification						
Project Number:	1208070039.004			**Client:**	Wayne Disposal, Inc.		
Analysis Short Name:	B-B' Liner Stability				**File name:**	WDI Cross Section B Liner_20201123_RevD_MK.gsz	
Revision:	1	**Originated:**	MK	**Checked:**	KF	**Approved:**	
Date:	11/23/20	**Date:**	11/23/20	**Date:**	11/23/20	**Date:**	

Purpose of Analysis:	To determine the required liner system interface strength to achieve an acceptable factor of safety of the proposed final waste grades using cross-section B. This case considers a west-facing slope, with fill to the final permitted grade elevations. The failure surface is defined such that failure occurs in the underlying liner in order to consider the stability of the liner.			
☐ Effective Stress ☒ Total Stress	☒ Static ☐ Seismic	☐ Pore Pressure	☒ Optimized Surface	
Additional Details:	The liner system was modeled in 2 sections (floor and sideslope) to allow use of Peak and Large-Displacement strength parameters appropriately. The friction angle of the sideslope was set at 7° corresponding to commonly achievable large-displacement interface secant friction angle. The friction angle of the floor liner system was varied to determine the required peak interface secant friction angle to achieve the required factor of safety of 1.5.			

Material	Name	Color in Profile	Unit Wt(s) (pcf)	Strength ϕ or δ (deg.)	Strength C or Ca (psf)
1	Final Cover	Orange	130	0	1500
2	Existing Waste	Teal	86	34	0
3	New Waste	Light Green	103	26	300
4	Upper Clay	Brown	131	0	2150
5	Middle Clay	Yellow	136	0	3300
6	Lower Clay	Maroon	133	$0.22\sigma_v$	
7	Silt	Blue	125	28	0
8	Sand	Red	115	32	0
9	Liner (Floor)	Magenta	120	TBD	0
10	Liner (Sideslope)	Purple	120	7	0

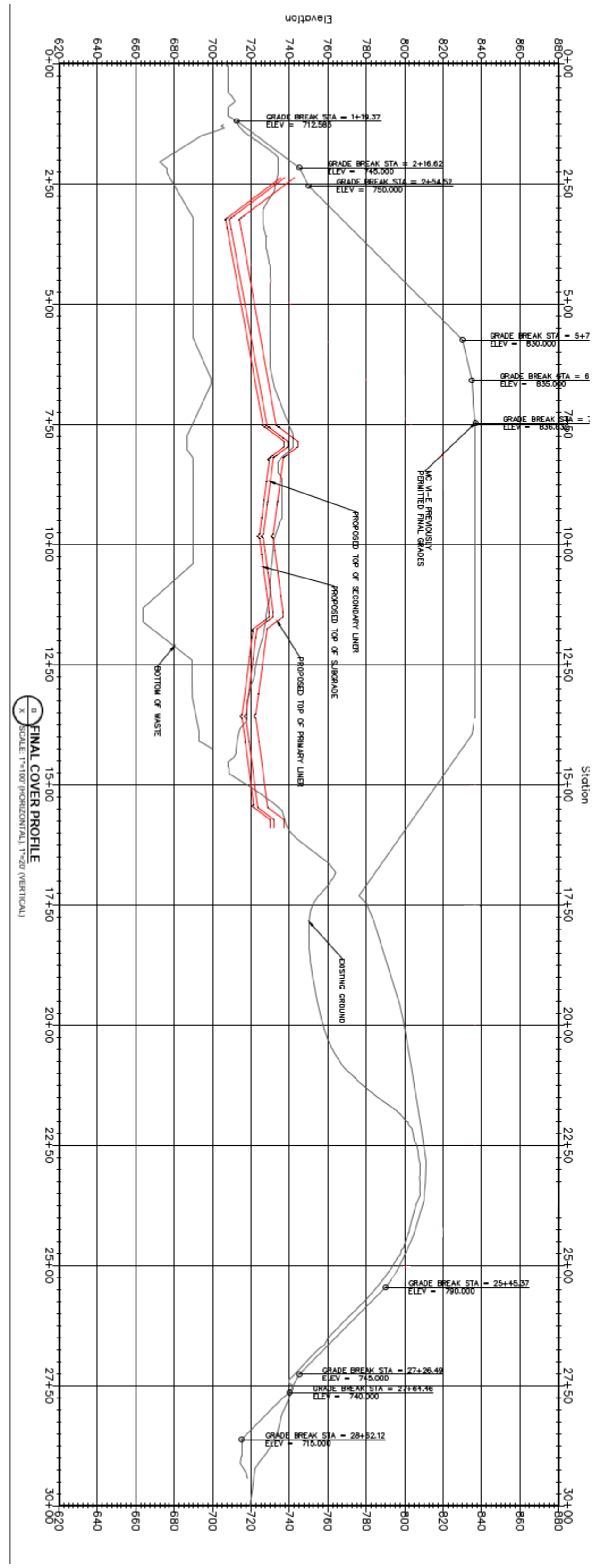
Source of Geometry:	Engineering Drawing Set
Source of Subsurface Profile:	Basis of Design Report - NTH (2012)
☐ Preconstruction ☐ Construction ☐ Interim ☒ Final ☐ Existing ☐ Back-Analysis	
Construction Phase Represented:	Final build out
Other Geometry Notes:	Cross Section B

Final Grades Cross-Section (plan):



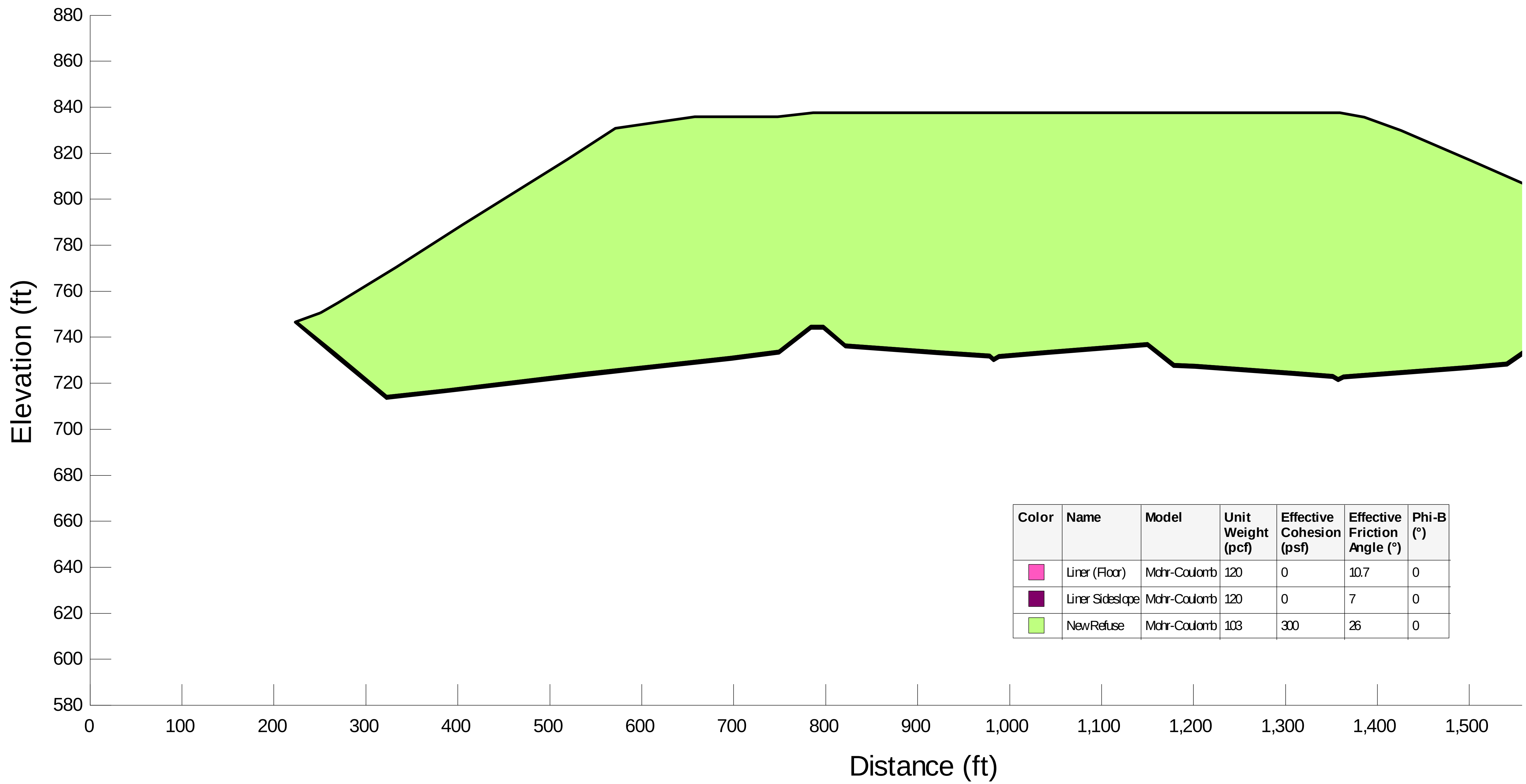
SLOPE STABILITY ANALYSIS REPORT FORM

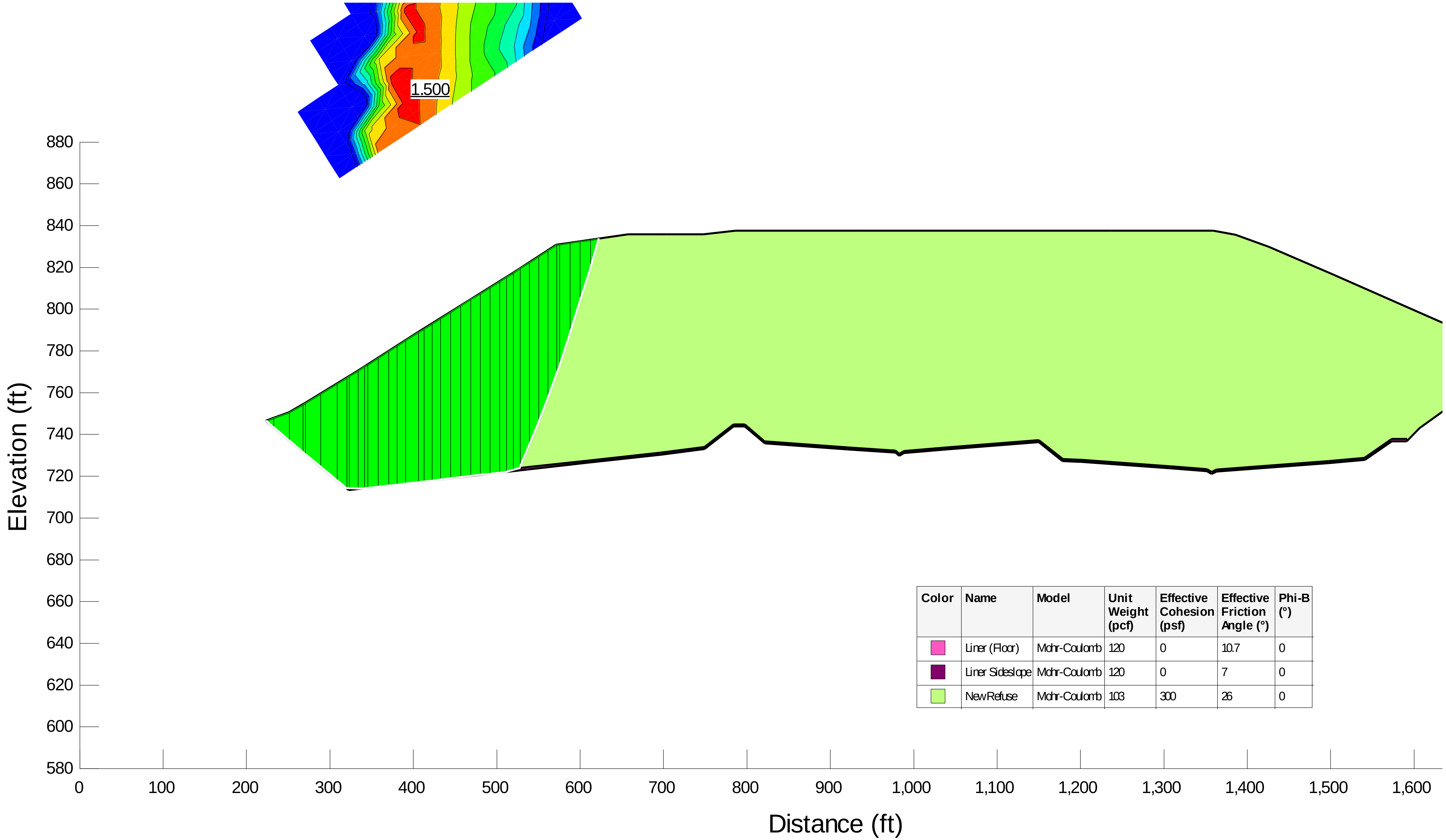
Final Grades Cross-Section (profile):



SLOPE STABILITY ANALYSIS REPORT FORM

Factor of Safety:	1.50	☒ Acceptable ☐ Not Acceptable ☐ Follow-up ☐ Superseded
Comments:	The required peak interface friction for the floor liner system was determined to be 10.7°.	
Attachments:	Slope/W Cross Section and Results	


Elevation (ft)
880
860
840
820
800
780
760
740
720
700
680
660
640
620
600
580
0
100
200
300
400
500
600
700
800
900
1,000
1,100
1,200
1,300
1,400
1,500
Distance (ft)
Color | Name | Model | Unit Weight (pcf) | Effective Cohesion (psf) | Effective Friction Angle (°) | Phi-B (°)
Liner (Floor) | Mohr-Coulomb | 120 | 0 | 10.7 | 0
Liner Sideslope | Mohr-Coulomb | 120 | 0 | 7 | 0
New Refuse | Mohr-Coulomb | 103 | 300 | 26 | 0


1.500
Elevation (ft)
880
860
840
820
800
780
760
740
720
700
680
660
640
620
600
580
Distance (ft)
0
100
200
300
400
500
600
700
800
900
1,000
1,100
1,200
1,300
1,400
1,500
1,600
Color | Name | Model | Unit Weight (pcf) | Effective Cohesion (psf) | Effective Friction Angle (°) | Phi-B (°)
Liner (Floor) | Mohr-Coulomb | 120 | 0 | 10.7 | 0
Liner Sideslope | Mohr-Coulomb | 120 | 0 | 7 | 0
New Refuse | Mohr-Coulomb | 103 | 300 | 26 | 0

Attachment B-1.4

E-E’ Liner Stability under Final Conditions with zero adhesion

SLOPE STABILITY ANALYSIS REPORT FORM

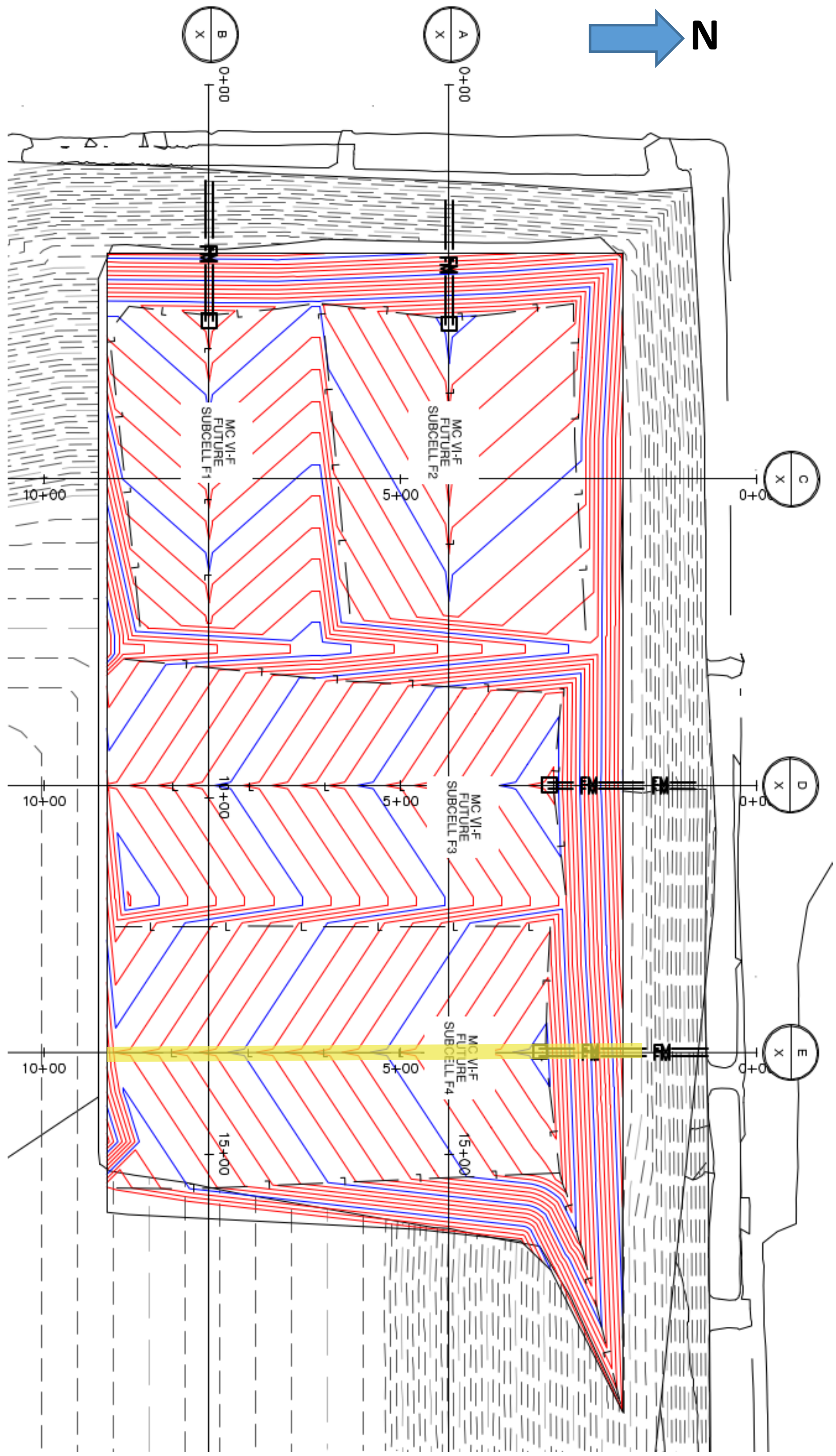
Project Name:	WDI MC6F Permit Modification						
Project Number:	1208070039.004			**Client:**	Wayne Disposal, Inc.		
Analysis Short Name:	E-E' Liner Stability				**File name:**	WDI Cross Section E Liner_20201123_RevC_MK.gsz	
Revision:	1	**Originated:**	MK	**Checked:**	KF	**Approved:**	
Date:	11/23/20	**Date:**	11/23/20	**Date:**	11/23/20	**Date:**	

Purpose of Analysis:	To determine the factor of safety of the proposed final waste grades using cross-section E. This case considers a north-facing slope, with fill to the final grade elevations. The failure surface is defined such that failure occurs in the underlying liner in order to consider the stability of the liner.		
☐ Effective Stress ☒ Total Stress	☒ Static ☐ Seismic	☐ Pore Pressure	☒ Optimized Surface
Additional Details:	The friction angle of the liner system was set equal to the required minimum interface friction angle determined from the liner stability analysis performed on Cross Section B. The liner system was modeled in 2 sections (floor and sideslope) to allow use of Peak and Large-Displacement strength parameters appropriately.		

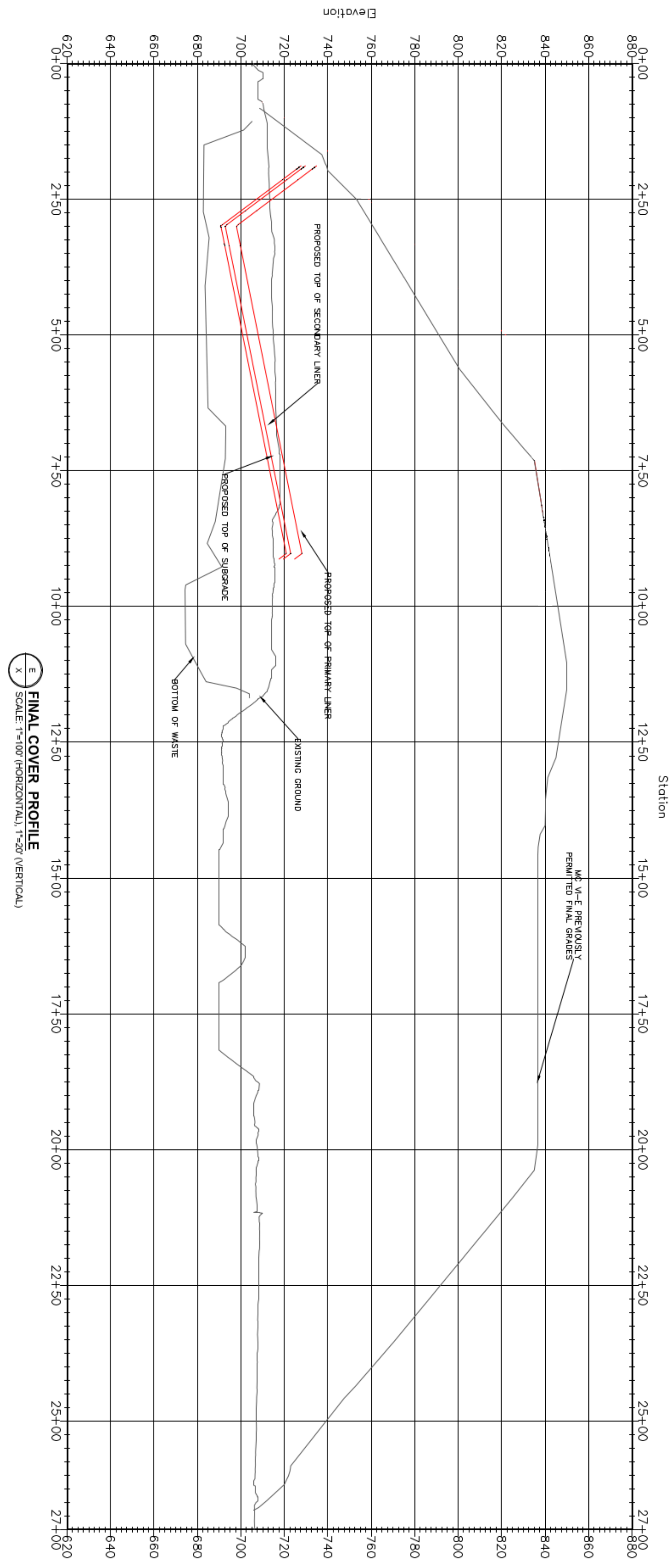
Material	Name	Color in Profile	Unit Wt(s) (pcf)	Strength ϕ or δ (deg.)	Strength C or Ca (psf)
1	Final Cover	Orange	130	0	1500
2	Existing Waste	Teal	86	34	0
3	New Waste	Light Green	103	26	300
4	Upper Clay	Brown	131	0	2150
5	Middle Clay	Yellow	136	0	3300
6	Lower Clay	Maroon	133	$0.22\sigma_v$	
7	Silt	Blue	125	28	0
8	Sand	Red	115	32	0
9	Liner (Floor)	Magenta	120	10.7	0
10	Liner (Sideslope)	Purple	120	7	0

Source of Geometry:	Engineering Drawing Set
Source of Subsurface Profile:	Basis of Design Report - NTH (2012)
☐ Preconstruction ☐ Construction ☐ Interim ☒ Final ☐ Existing ☐ Back-Analysis	
Construction Phase Represented:	Final build out
Other Geometry Notes:	Cross Section E

Final Grades Cross-Section (plan):

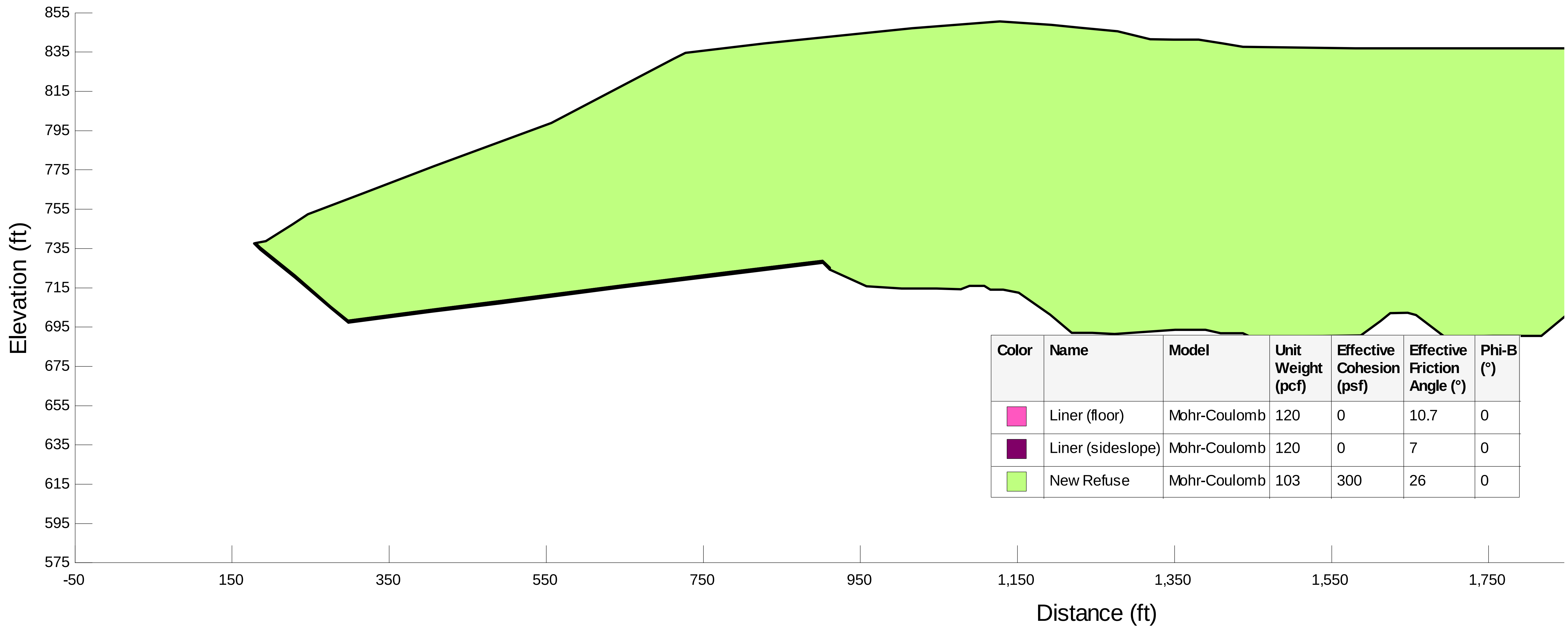


Final Grades Cross-Section (profile):

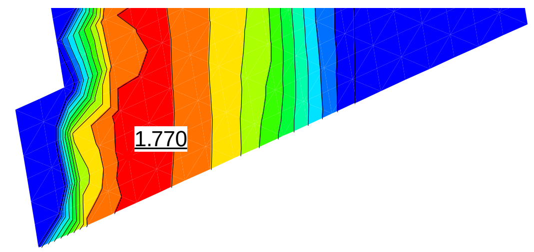


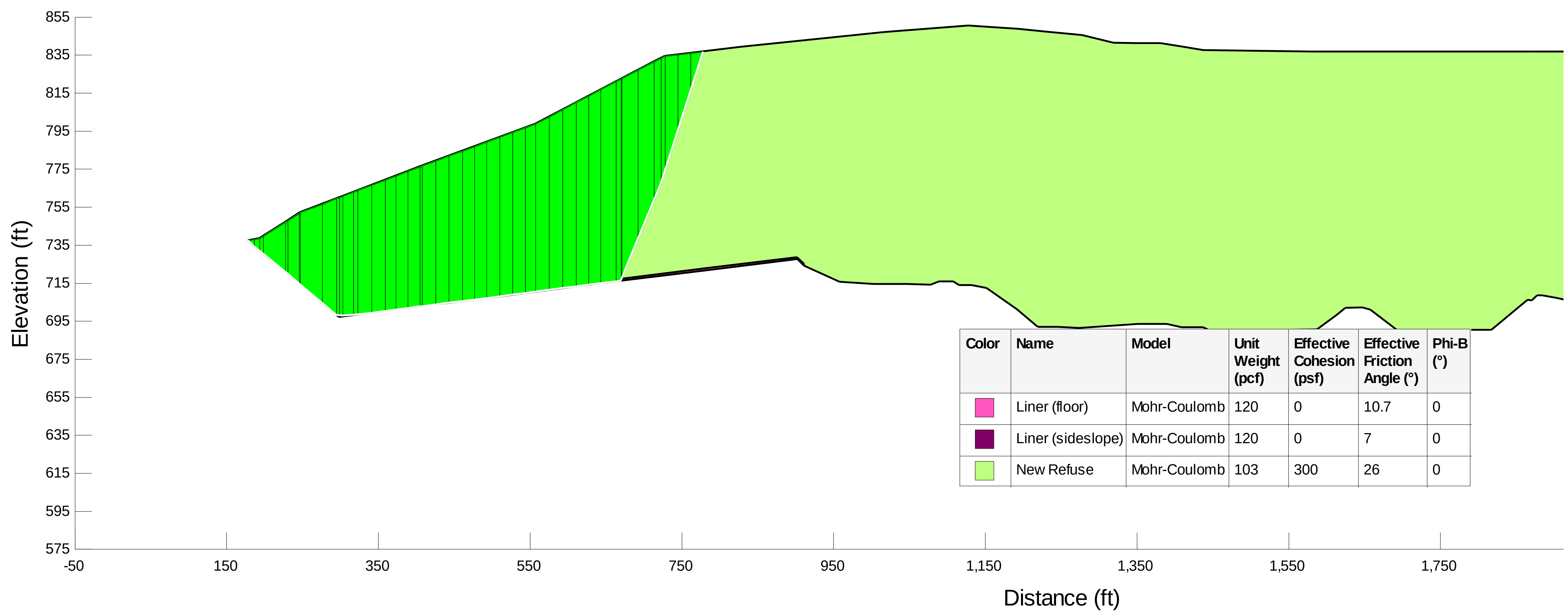
SLOPE STABILITY ANALYSIS REPORT FORM

Factor of Safety:	1.77	☒ Acceptable ☐ Not Acceptable ☐ Follow-up ☐ Superseded
Comments:		
Attachments:	Slope/W Cross Section and Results	



Color	Name	Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Phi-B (°)
	Liner (floor)	Mohr-Coulomb	120	0	10.7	0
	Liner (sideslope)	Mohr-Coulomb	120	0	7	0
	New Refuse	Mohr-Coulomb	103	300	26	0





Color	Name	Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Phi-B (°)
	Liner (floor)	Mohr-Coulomb	120	0	10.7	0
	Liner (sideslope)	Mohr-Coulomb	120	0	7	0
	New Refuse	Mohr-Coulomb	103	300	26	0

Attachment B-1.5

B-B’ Liner Stability under Final Conditions with non-zero adhesion (previously tested values)

SLOPE STABILITY ANALYSIS REPORT FORM

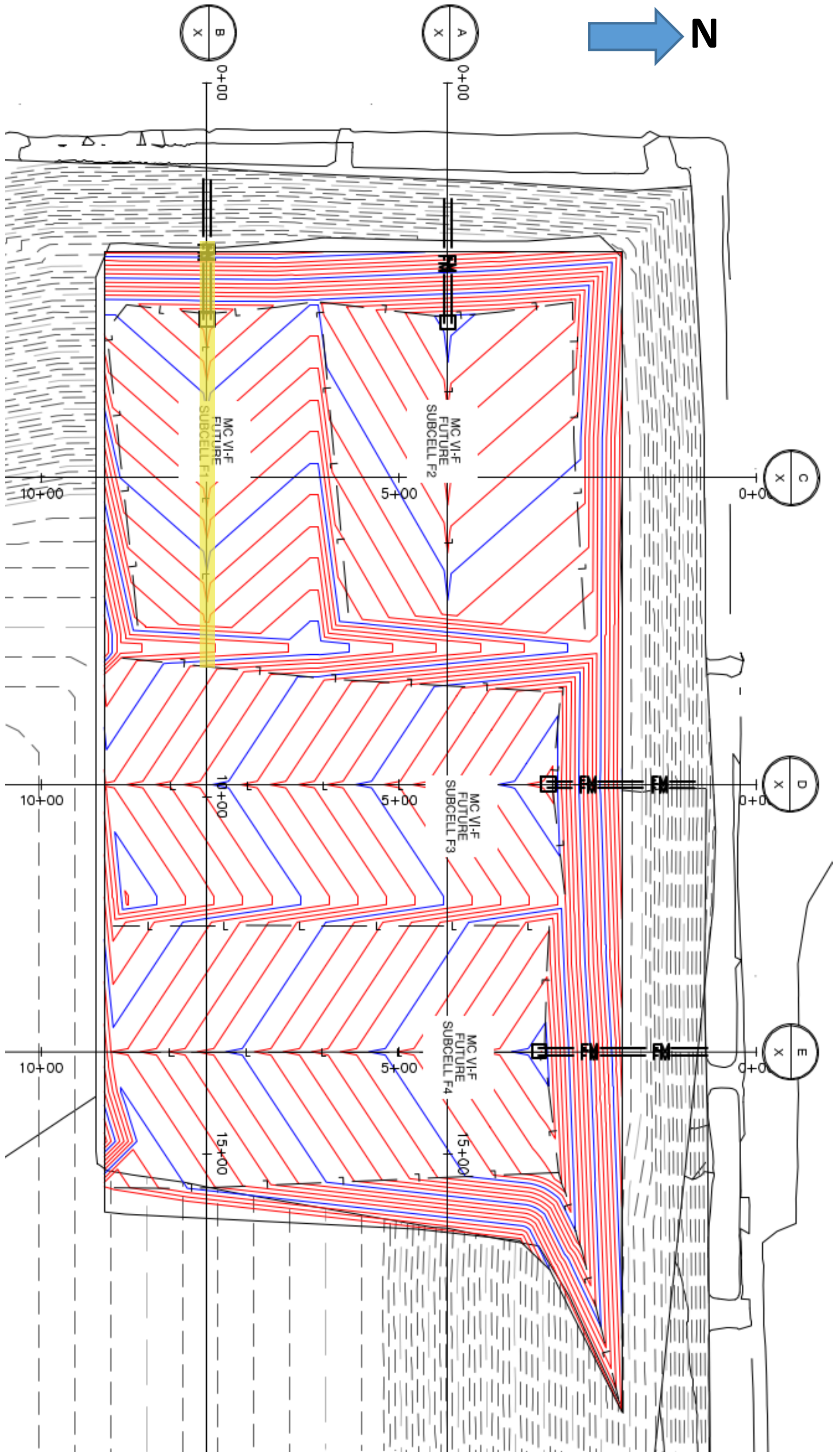
Project Name:	WDI MC6F Permit Modification						
Project Number:	1208070039.004			**Client:**	Wayne Disposal, Inc.		
Analysis Short Name:	B-B' Liner Stability with tested interface strength parameters				**File name:**	WDI Cross Section B Liner_20201123_RevC_ MK_c_phi_combo	
Revision:	1	**Originated:**	MK	**Checked:**	KF	**Approved:**	
Date:	11/23/20	**Date:**	11/23/20	**Date:**	11/23/20	**Date:**	

Purpose of Analysis:	To determine the factor of safety of the proposed final waste grades using cross-section B. This case considers a west-facing slope, with fill to the final permitted grade elevations. The failure surface is defined such that failure occurs in the underlying liner in order to consider the stability of the liner. The liner interface strength properties are based on interface strength test results of a similar liner system installed on site.		
☐ Effective Stress ☒ Total Stress	☒ Static ☐ Seismic	☐ Pore Pressure	☒ Optimized Surface
Additional Details:	The liner system was modeled in 2 sections (floor and sideslope) to allow use of Peak and Large-Displacement strength parameters appropriately. The required factor of safety is 1.5.		

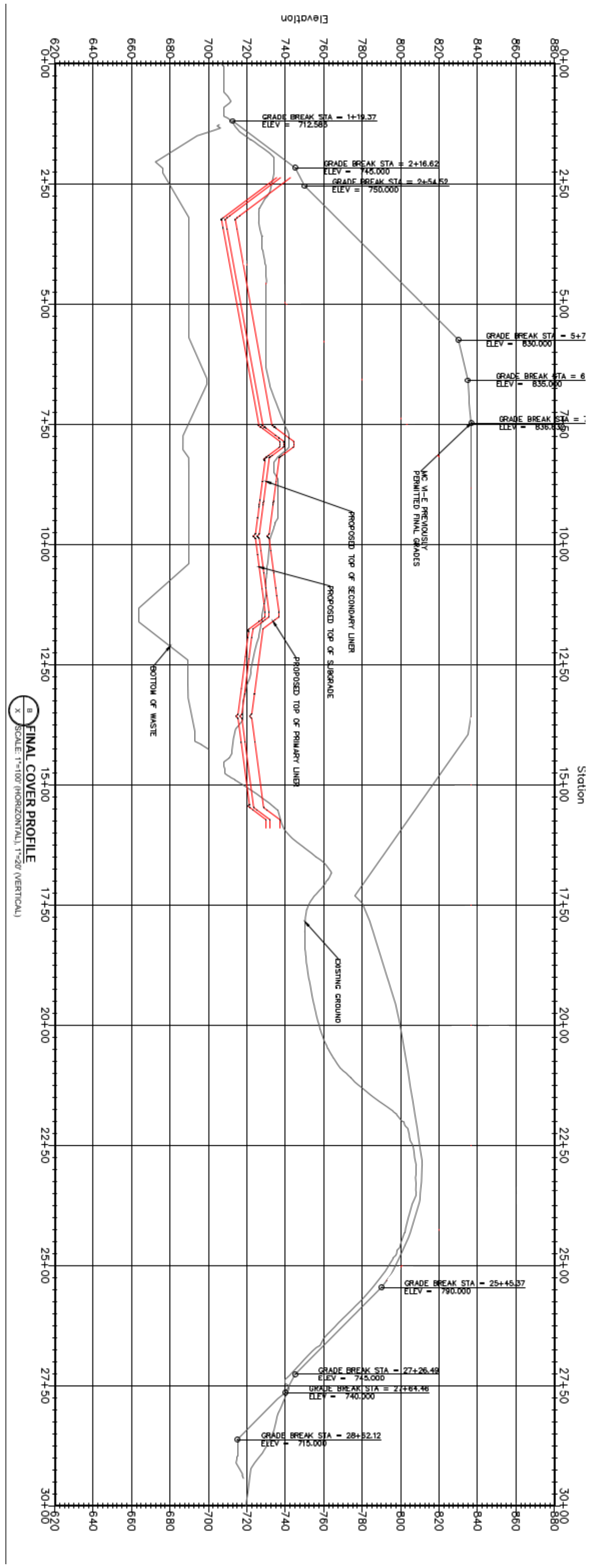
Material	Name	Color in Profile	Unit Wt(s) (pcf)	Strength ϕ or δ (deg.)	Strength C or Ca (psf)
1	Final Cover	Orange	130	0	1500
2	Existing Waste	Teal	86	34	0
3	New Waste	Light Green	103	26	300
4	Upper Clay	Brown	131	0	2150
5	Middle Clay	Yellow	136	0	3300
6	Lower Clay	Maroon	133	$0.22\sigma_v$	
7	Silt	Blue	125	28	0
8	Sand	Red	115	32	0
9	Liner (Floor)	Magenta	120	11.1	164
10	Liner (Sideslope)	Purple	120	7.3	110

Source of Geometry:	Engineering Drawing Set
Source of Subsurface Profile:	Basis of Design Report - NTH (2012)
☐ Preconstruction ☐ Construction ☐ Interim ☒ Final ☐ Existing ☐ Back-Analysis	
Construction Phase Represented:	Final build out
Other Geometry Notes:	Cross Section B

Final Grades Cross-Section (plan):

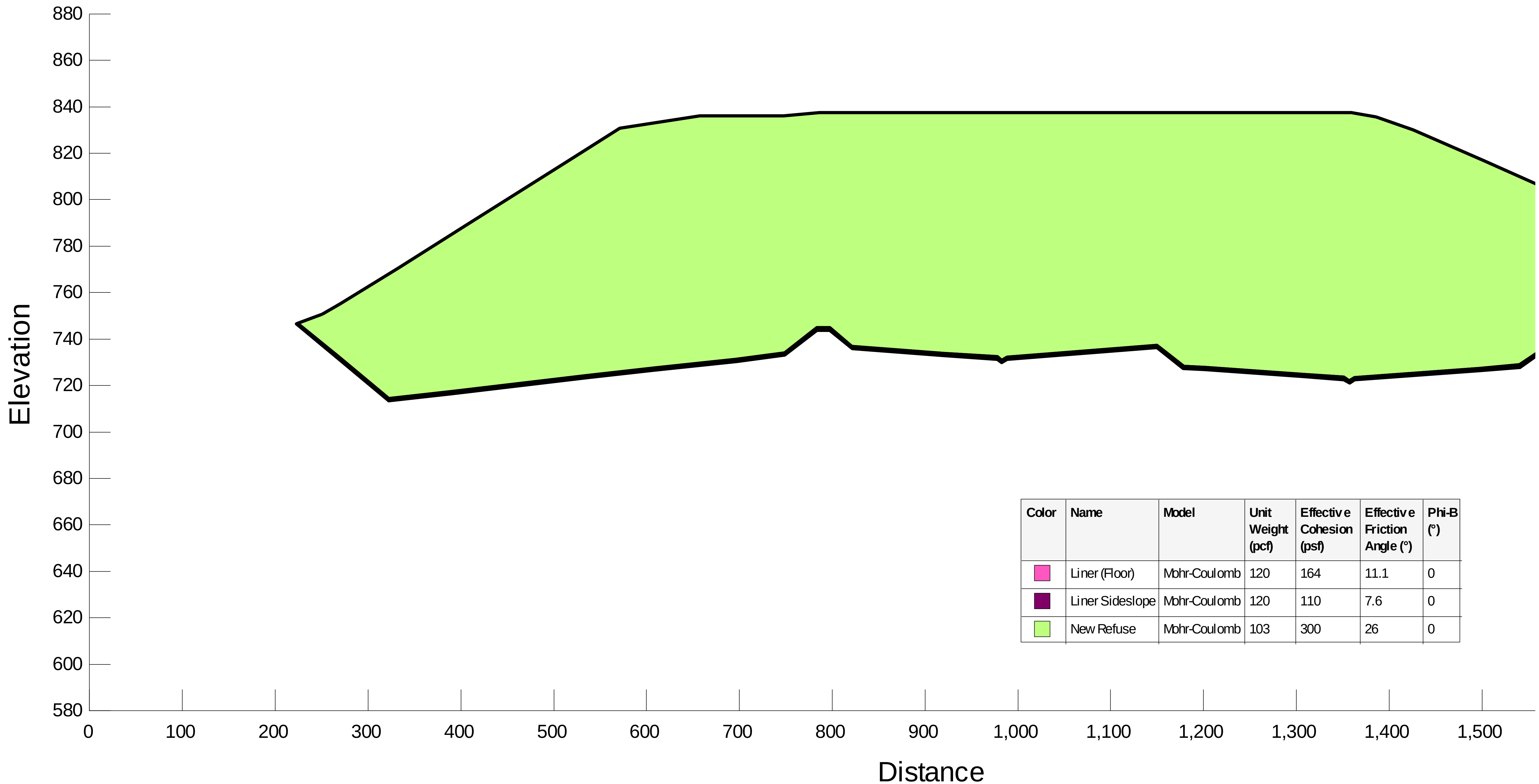


Final Grades Cross-Section (profile):

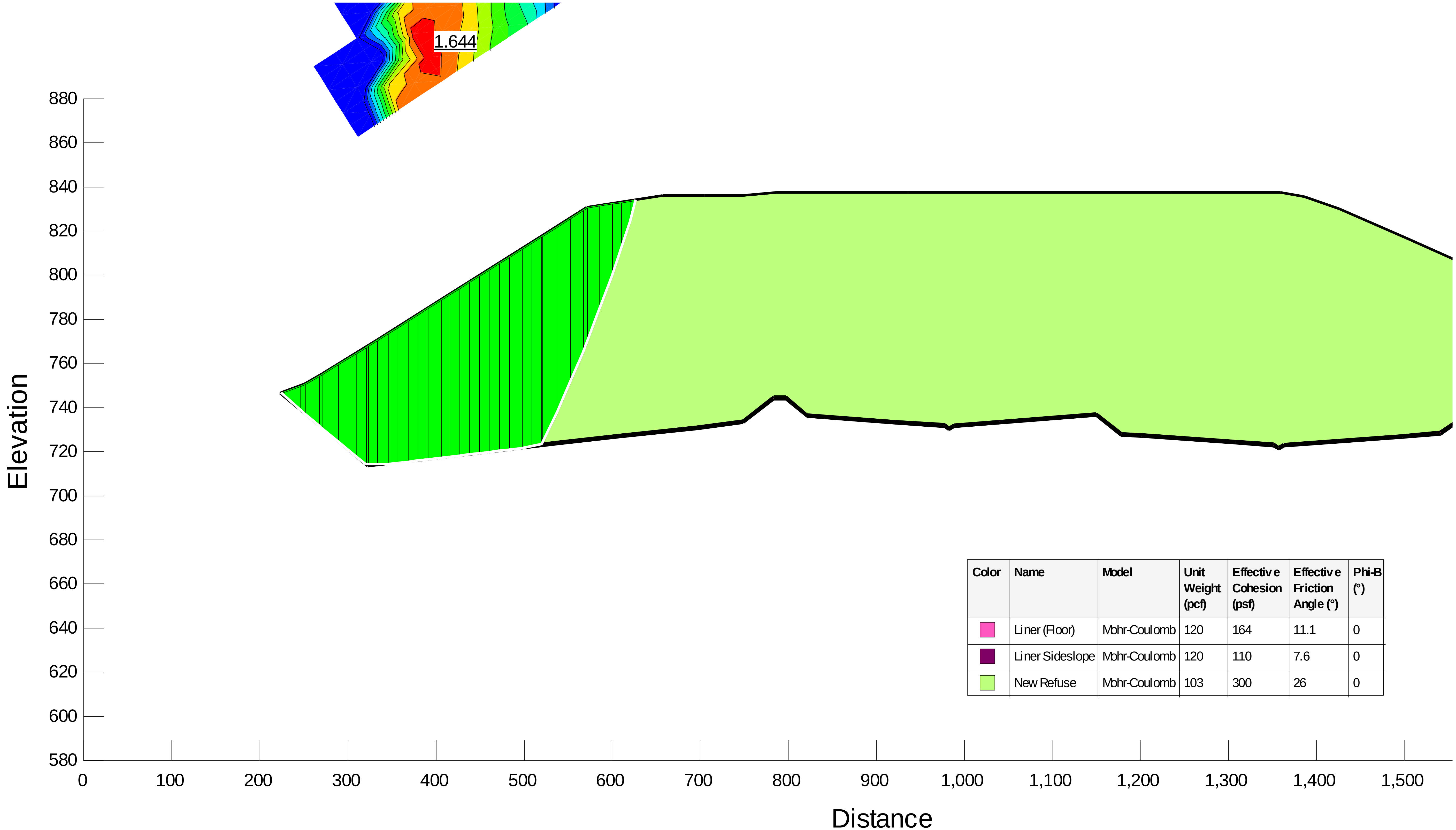


SLOPE STABILITY ANALYSIS REPORT FORM

Factor of Safety:	1.64	☒ Acceptable ☐ Not Acceptable ☐ Follow-up ☐ Superseded
Comments:		
Attachments:	Slope/W Cross Section and Results	



Color	Name	Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Phi-B (°)
	Liner (Floor)	Mohr-Coulomb	120	164	11.1	0
	Liner Sideslope	Mohr-Coulomb	120	110	7.6	0
	New Refuse	Mohr-Coulomb	103	300	26	0


1.644
Elevation
880
860
840
820
800
780
760
740
720
700
680
660
640
620
600
580
0
100
200
300
400
500
600
700
800
900
1,000
1,100
1,200
1,300
1,400
1,500
Distance
Color | Name | Model | Unit Weight (pcf) | Effective Cohesion (psf) | Effective Friction Angle (°) | Phi-B (°)
Liner (Floor) | Mohr-Coulomb | 120 | 164 | 11.1 | 0
Liner Sideslope | Mohr-Coulomb | 120 | 110 | 7.6 | 0
New Refuse | Mohr-Coulomb | 103 | 300 | 26 | 0

Attachment B-1.6

E-E' Liner Stability under Final Conditions with non-zero adhesion (previously tested values)

SLOPE STABILITY ANALYSIS REPORT FORM

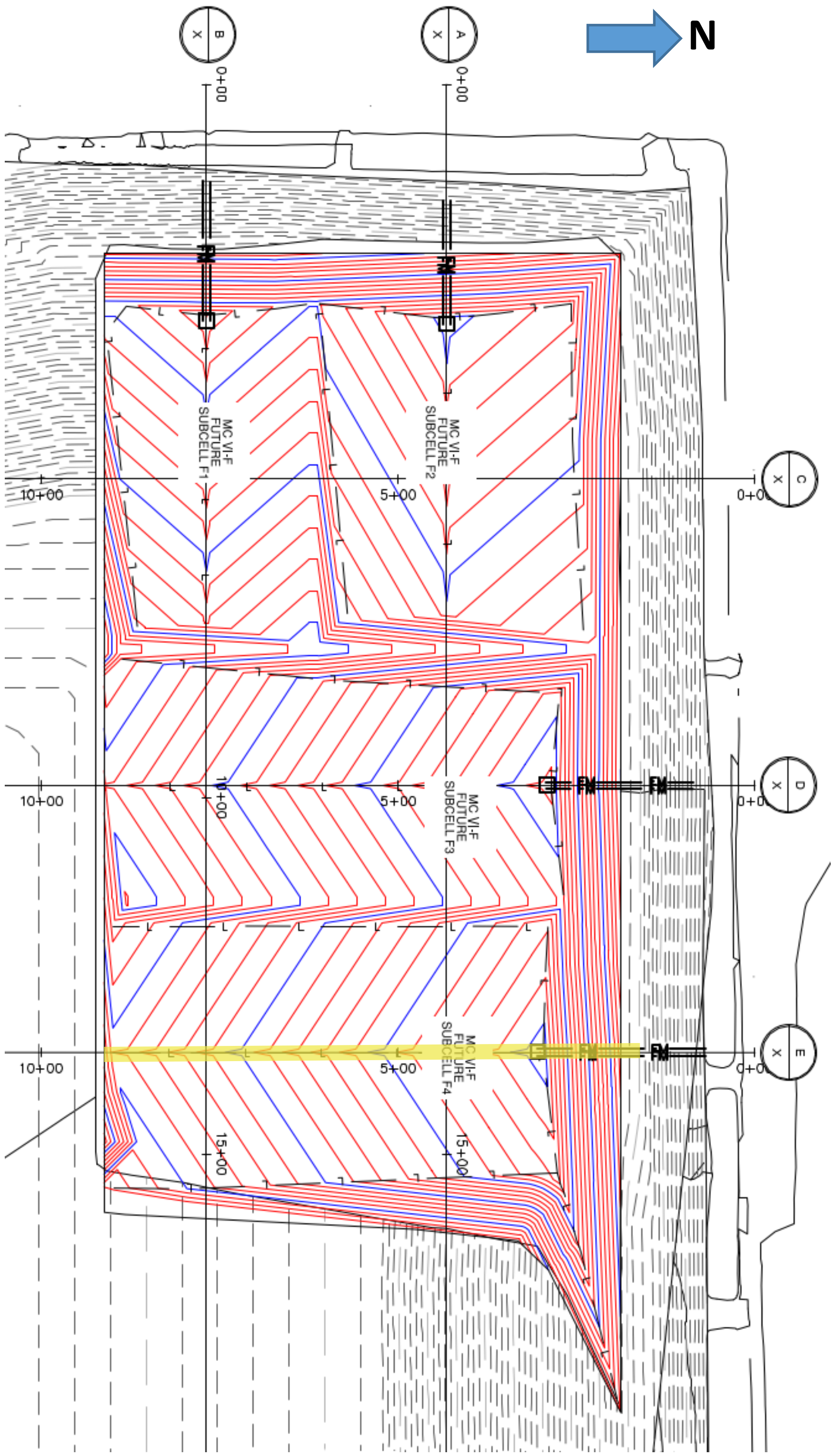
Project Name:	WDI MC6F Permit Modification						
Project Number:	1208070039.004			**Client:**	Wayne Disposal, Inc.		
Analysis Short Name:	E-E' Liner Stability				**File name:**	WDI Cross Section E Liner_20201123_RevC_MK_c_phi_combo.gsz	
Revision:	1	**Originated:**	MK	**Checked:**	KF	**Approved:**	
Date:	11/23/20	**Date:**	11/23/20	**Date:**	11/23/20	**Date:**	

Purpose of Analysis:	To determine the factor of safety of the proposed final waste grades using cross-section E. This case considers a north-facing slope, with fill to the final grade elevations. The failure surface is defined such that failure occurs in the underlying liner in order to consider the stability of the liner. The liner interface strength properties are based on interface strength test results of a similar liner system installed on site.			
☐ Effective Stress ☒ Total Stress	☒ Static ☐ Seismic	☐ Pore Pressure	☒ Optimized Surface	
Additional Details:	The liner system was modeled in 2 sections (floor and sideslope) to allow use of Peak and Large-Displacement strength parameters appropriately. The required factor of safety is 1.5.			

Material	Name	Color in Profile	Unit Wt(s) (pcf)	Strength ϕ or δ (deg.)	Strength C or Ca (psf)
1	Final Cover	Orange	130	0	1500
2	Existing Waste	Teal	86	34	0
3	New Waste	Light Green	103	26	300
4	Upper Clay	Brown	131	0	2150
5	Middle Clay	Yellow	136	0	3300
6	Lower Clay	Maroon	133	$0.22\sigma_v$	
7	Silt	Blue	125	28	0
8	Sand	Red	115	32	0
9	Liner (Floor)	Magenta	120	11.1	164
10	Liner (Sideslope)	Purple	120	7.3	110

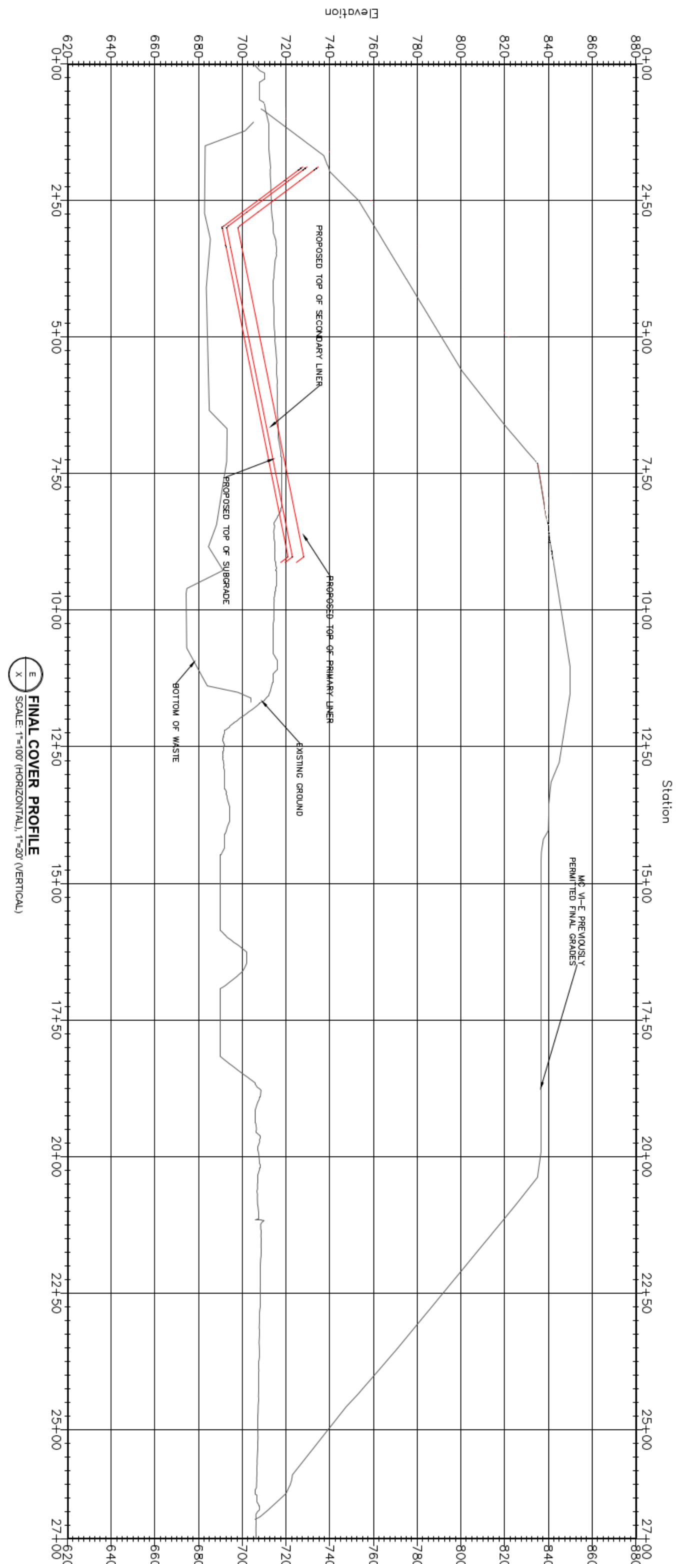
Source of Geometry:	Engineering Drawing Set
Source of Subsurface Profile:	Basis of Design Report - NTH (2012)
☐ Preconstruction ☐ Construction ☐ Interim ☒ Final ☐ Existing ☐ Back-Analysis	
Construction Phase Represented:	Final build out
Other Geometry Notes:	Cross Section E

Final Grades Cross-Section (plan):

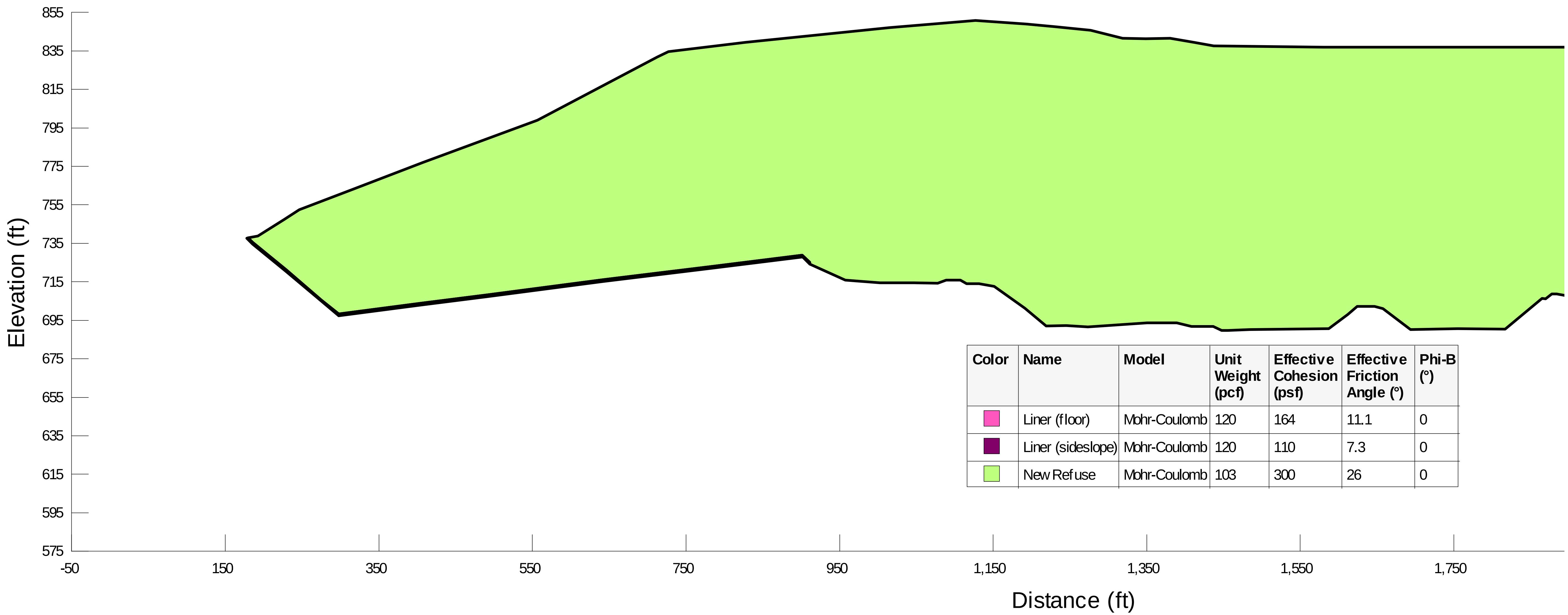


SLOPE STABILITY ANALYSIS REPORT FORM

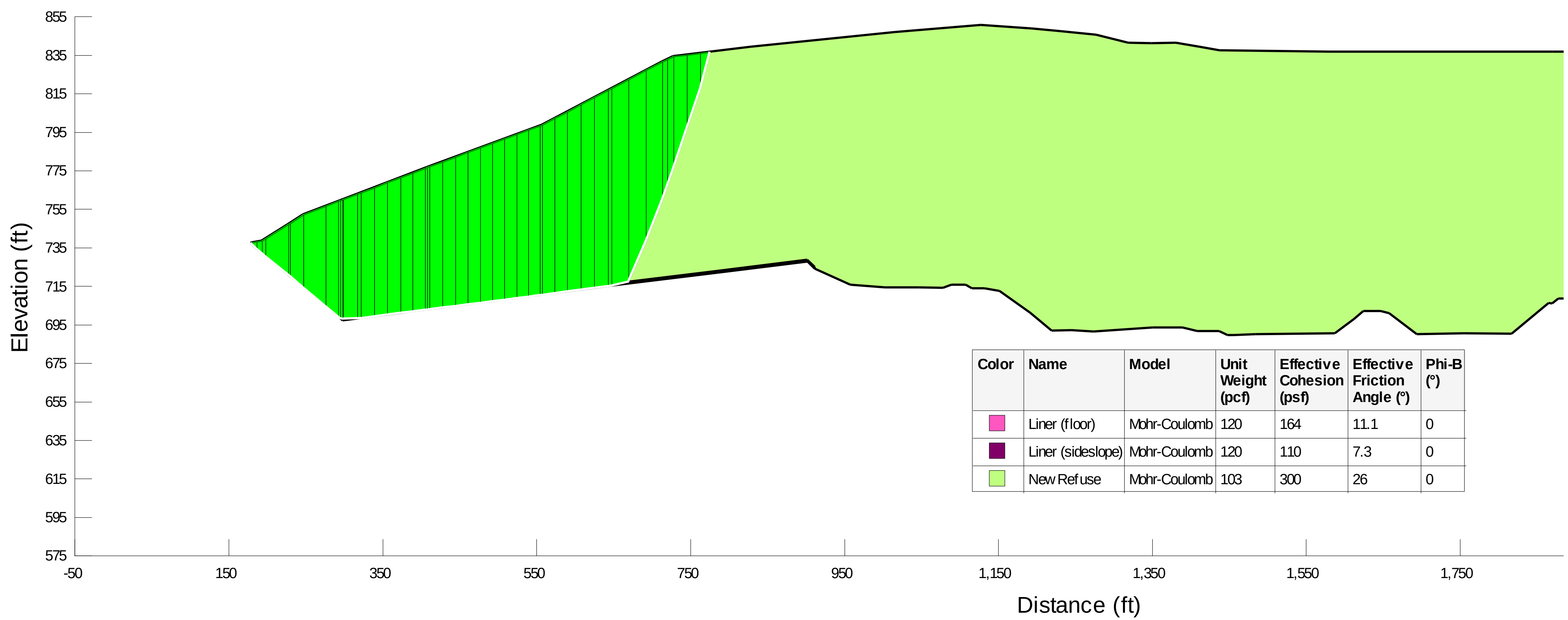
Final Grades Cross-Section (profile):



Factor of Safety:	1.93	☒ Acceptable ☐ Not Acceptable ☐ Follow-up ☐ Superseded
Comments:		
Attachments:	Slope/W Cross Section and Results	



Color	Name	Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Phi-B (°)
	Liner (floor)	Mohr-Coulomb	120	164	11.1	0
	Liner (sideslope)	Mohr-Coulomb	120	110	7.3	0
	New Refuse	Mohr-Coulomb	103	300	26	0



Color	Name	Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Phi-B (°)
	Liner (floor)	Mohr-Coulomb	120	164	11.1	0
	Liner (sideslope)	Mohr-Coulomb	120	110	7.3	0
	New Refuse	Mohr-Coulomb	103	300	26	0

Attachment B-1.7

B-B' Liner Stability under Interim Conditions (example interim stability calculation)

SLOPE STABILITY ANALYSIS REPORT FORM

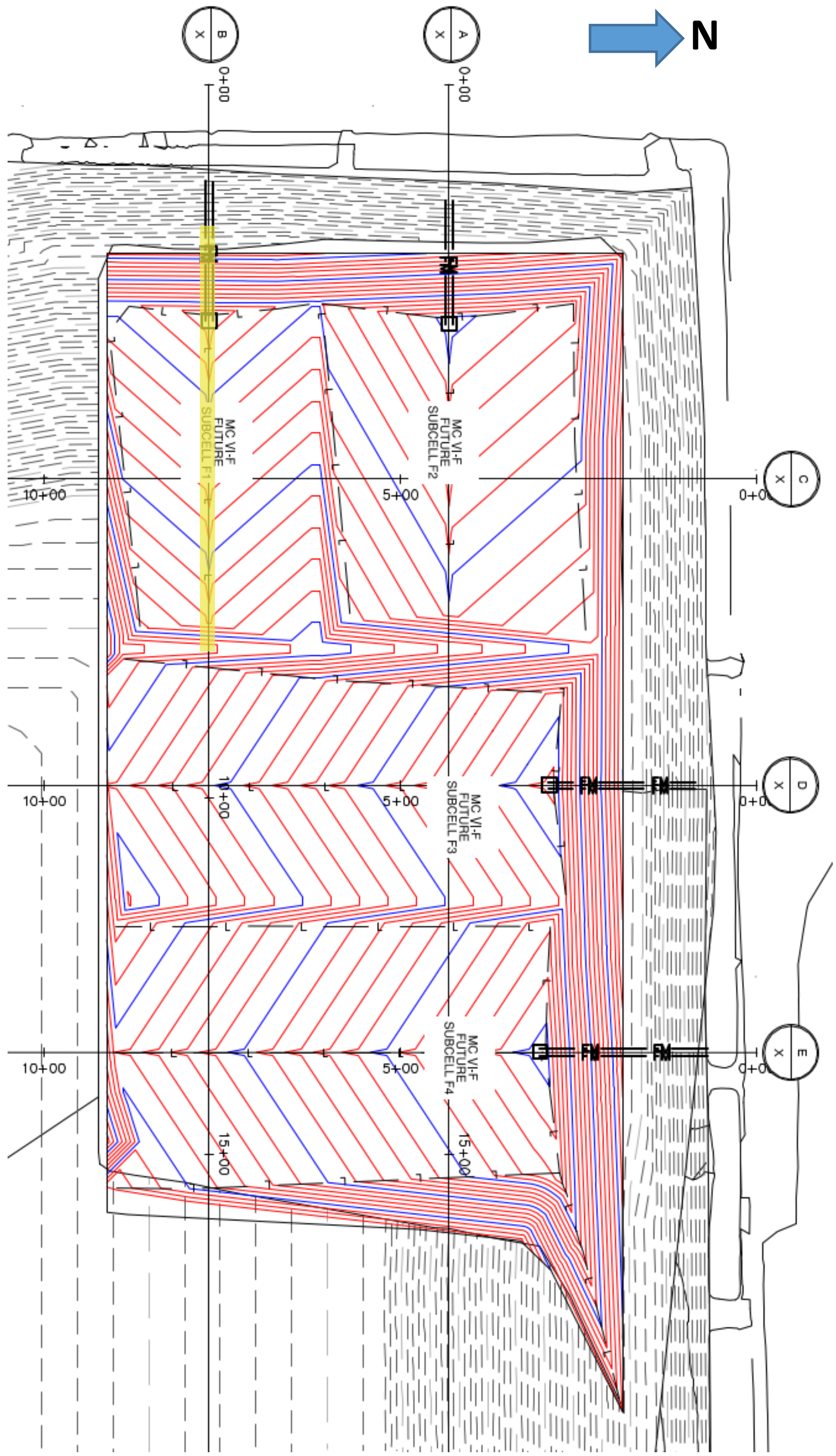
Project Name:	WDI MC6F Permit Modification						
Project Number:	1208070039.004			**Client:**	Wayne Disposal, Inc.		
Analysis Short Name:	B-B' Interim Liner Stability				**File name:**	WDI Cross Section B Interim_20201119_RevA _MK_3.5H1V.gsz	
Revision:	1	**Originated:**	MK	**Checked:**	KF	**Approved:**	
Date:	11/23/20	**Date:**	11/23/20	**Date:**	11/23/20	**Date:**	

Purpose of Analysis:	To determine the required interface friction angle of the liner system to achieve an acceptable interim factor of safety of 1.3 using cross-section B. This case considers a west-facing slope and models an example interim fill case with waste fill up to the final permitted grade elevations at an interim slope of 3.5H:1V. The failure surface is defined such that failure occurs in the underlying liner in order to consider the stability of the liner.		
☐ Effective Stress ☒ Total Stress	☒ Static ☐ Seismic	☐ Pore Pressure	☒ Optimized Surface
Additional Details:			

Material	**Name**	**Color in Profile**	**Unit Wt(s) (pcf)**	**Strength ϕ or δ (deg.)**	**Strength C or Ca (psf)**
1	Final Cover	Orange	130	0	1500
2	Existing Waste	Teal	86	34	0
3	New Waste	Light Green	103	26	300
4	Upper Clay	Brown	131	0	2150
5	Middle Clay	Yellow	136	0	3300
6	Lower Clay	Maroon	133	$0.22\sigma_v$	
7	Silt	Blue	125	28	0
8	Sand	Red	115	32	0

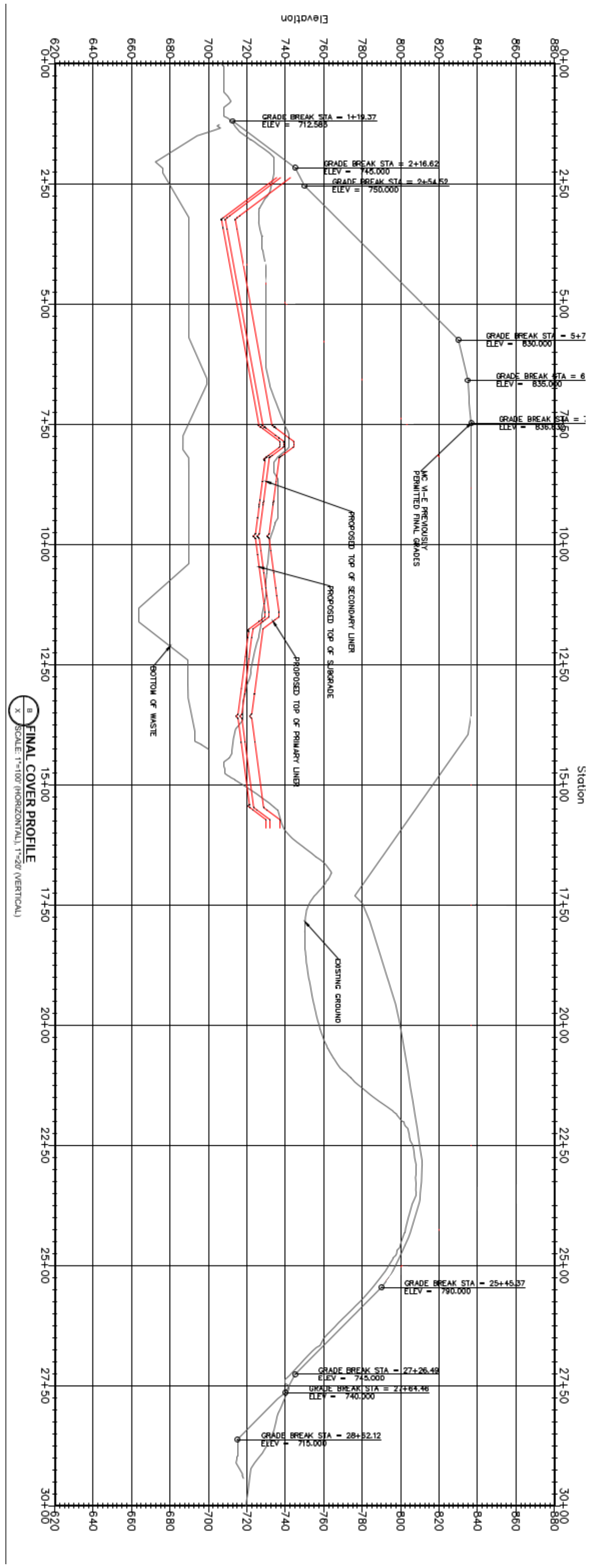
Source of Geometry:	Engineering Drawing Set
Source of Subsurface Profile:	Basis of Design Report - NTH (2012)
☐ Preconstruction ☐ Construction ☒ Interim ☐ Final ☐ Existing ☐ Back-Analysis	
Construction Phase Represented:	Interim waste filling
Other Geometry Notes:	Cross Section B

Final Grades Cross-Section (plan):



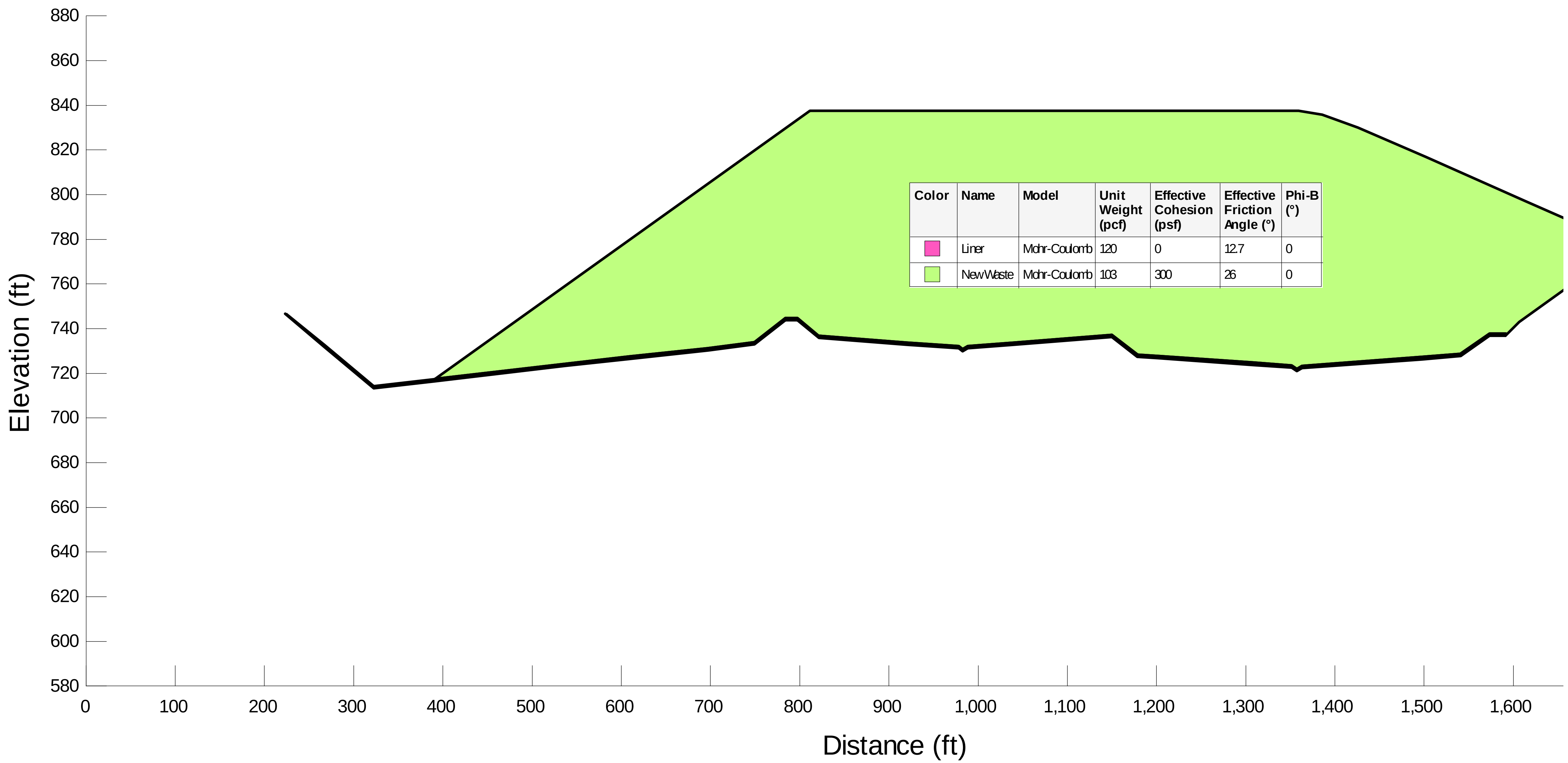
SLOPE STABILITY ANALYSIS REPORT FORM

Final Grades Cross-Section (profile):

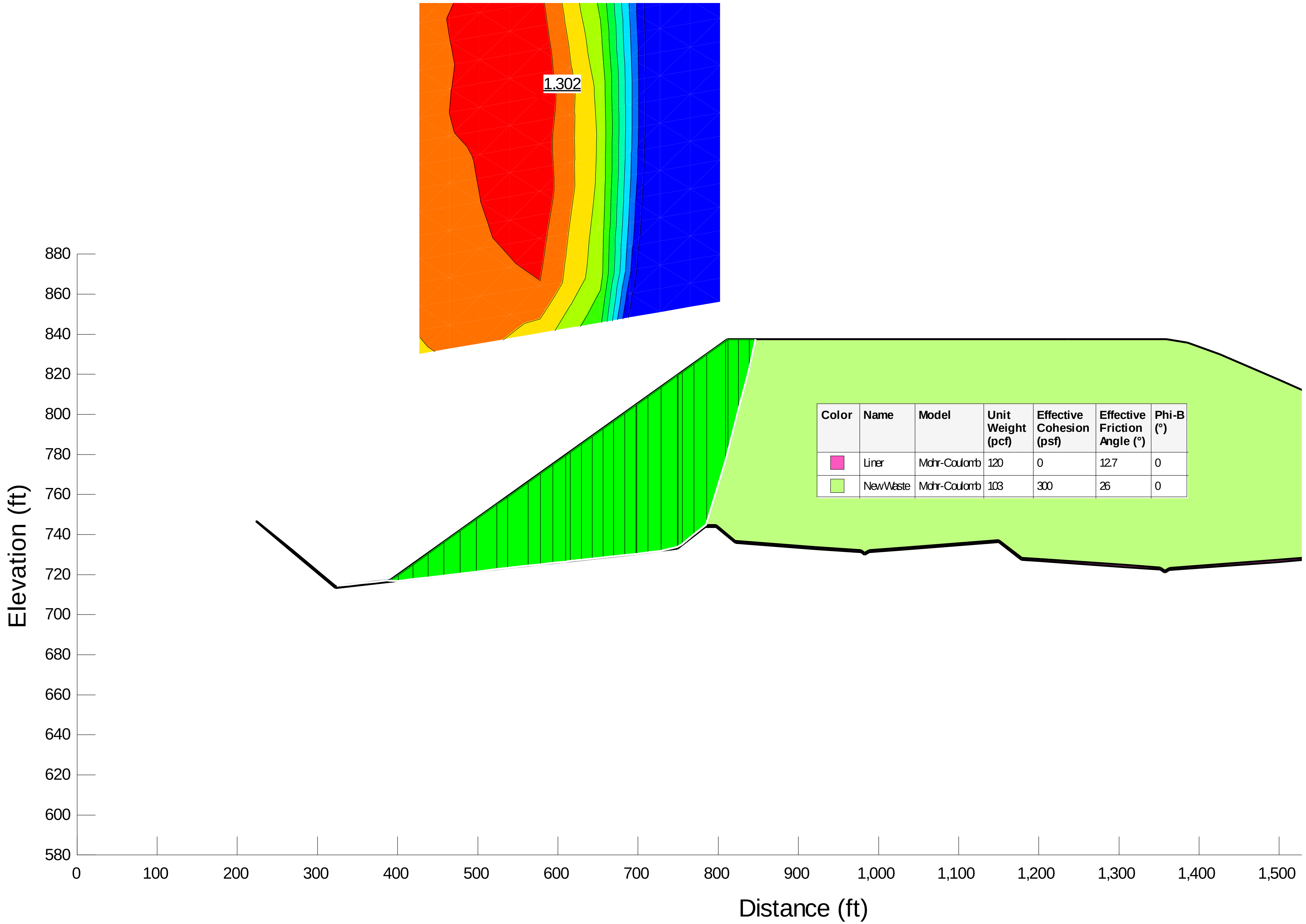


SLOPE STABILITY ANALYSIS REPORT FORM

Factor of Safety:	1.30	☒ Acceptable ☐ Not Acceptable ☐ Follow-up ☐ Superseded
Comments:	Required friction angle of 12.7 degrees (peak). Any combination of adhesion and friction angle that yields a comparable shear strength under modeled site conditions is acceptable.	
Attachments:	Slope/W Cross Section and Results	



Color	Name	Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Phi-B (°)
	Liner	Mohr-Coulomb	120	0	12.7	0
	New Waste	Mohr-Coulomb	103	300	26	0



Color	Name	Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Phi-B (°)
	Liner	Mohr-Coulomb	120	0	12.7	0
	New Waste	Mohr-Coulomb	103	300	26	0

Attachment B-2

Settlement Calculations

CALCULATION SHEET

Client: Wayne Disposal, Inc.	Project No.:	1208070039.004			
Project: WDI MC6 F Permit Modification	Calculated By:	KM	Date:	11/16/2020	
Calculation: Leachate Collection Pipe Settlement Analysis MC6F	Checked By:	MK	Date:	11/18/2020	
	Approved By:	KF	Date:	11/19/2020	

LEACHATE COLLECTION PIPE SETTLEMENT ANALYSIS

OBJECTIVE

This calculation evaluates the post-settlement slopes of the leachate collection pipes and cell floor cross slope for proposed Master Cell-VI (MC6) F1, F2, F3, and F4, at Wayne Disposal, Inc. (WDI). This evaluation is based on the estimated settlement of the existing waste and soil underlying the proposed cells due to additional overburden stresses induced by waste placement and the impact of such settlement on the post settlement cell floor slopes.

DESIGN CRITERIA AND ASSUMPTIONS

- The post-settlement slope of each proposed leachate collection pipe should be at least 1% and each cell floor cross slope should be at least 2% per Rule 299.9620 (4) (EGLE 2020).
- Pipe flowline analysis points were selected along the proposed leachate collection pipe flowlines within MC6-F (Attach. B-2.1). The specific locations of these points were selected to correspond to the cell floor high point, low point, changes in final cover slope and at regular intervals in between. Total settlement is estimated for each point, allowing an assessment of the post-settlement slope(s) along the flowline.
- Cross slope analysis points (Attach. B-2.1) were selected at the location of maximum fill height within each cell in order to evaluate post-settlement slopes under maximum load.
- Maximum settlement is expected to occur at the completion of the cap construction when the foundation is subjected to the maximum overburden pressure. Under the worst-case scenario, maximum load is applied (in full) to the foundation instantaneously during settlement analysis for a conservative (i.e., greater than anticipated) estimate of total settlement. In reality, loads would be applied incrementally as waste is placed gradually during the active life of the landfill. Additionally, the resulting settlement is assumed to occur immediately, conservatively accounting for the maximum settlement at the end of foundation soil consolidation.
- Table 1 Material properties used for the settlement analysis are listed in
- Table 2.summarizes the compressibility parameters used in the settlement analysis. The compacted clay liner is only very slightly compressible relative to the in-situ clay layer. Considering the insignificant magnitude of the settlement of the compacted clay liner, it was not included in the analysis.

CALCULATION SHEET

Client: Wayne Disposal, Inc.
Project: WDI MC6 F Permit Modification
Calculation: Leachate Collection Pipe Settlement Analysis MC6F

Project No.: 1208070039.004
Calculated By: KM Date: 11/16/2020
Checked By: MK Date: 11/18/2020
Approved By: KF Date: 11/19/2020

Table 1. Soil Properties for Settlement Analysis

Soil Type	Thickness [ft]	Moist Unit Weight [pcf]
Final cover soil	4	135
New waste	Varies	103*
Existing cover soil	Varies	135
Existing waste	Varies	82
Attenuation Layer	5	135
Structural Fill	2	135
Venting Layer	1	135
Leachate Collection Sand	1	135
In-situ middle clay	Varies	136
In-situ lower clay (moist)	5	128
In-situ lower clay (saturated)	12	128
In-situ silt (saturated)	18	125
In-situ sand (saturated)	45	115

** New waste unit weight obtained from email correspondence with WDI dated 11/18/2020*

Table 2. Compressibility Parameters of Waste and Soils

Soil Type	Primary Compression Ratio $C_c/(1+e_0)$	Secondary Compression Ratio $C_\alpha/(1+e_0)$	Recompression Ratio $C_r/(1+e_0)$
Existing cover	0.102[B]	0.005[B]	0.017[A]
Existing waste	0.147	0	0.0245[A]
In-situ middle clay	0.102	0.005	0.017[A]
In-situ lower clay	0.171	0.009	0.0285[A]
In-situ silt	0.15[B]	0[B]	0[B]
In-situ sand	0.1[B]	0[B]	0[B]

[A] Estimated from $C_r = C_c/6$.

[B] Assumed values.

The information for subsurface soils is based on MCIV General Profiles (South), Appendix A Subsurface Soil/Waste Profiles & Corresponding Physical Properties, Volume III – WDI Operating License Application Master Cells VI F & G by NTH Consultants (2011a). Specifically, subsurface investigation boring logs, cross sectional profiles, and laboratory test results were used to assess the subgrade soil profile and its properties. Note that some uncertainty may exist in the interpretation of hydrogeological data due to natural soil's inherent variability, conservative assumptions have been applied to ensure a conservative estimate of settlement in this analysis.

METHODOLOGY

Total settlement is estimated using the 1-D consolidation equations (Coduto 1999), with primary consolidation being the critical component. Total settlement is calculated as:

$$S = S_c + S_s \qquad (1)$$

Where:

S = total settlement [ft]
S_c = primary consolidation settlement due to load application [ft]
S_s = secondary compression settlement due to creep effects [ft]

Settlement caused by primary consolidation for a given layer of soil with uniform properties is calculated as:

$$S_c = \frac{h_0}{1+e_0}\left(C_r \log\frac{\sigma_c}{\sigma_0} + C_c \log\frac{\sigma_i}{\sigma_c}\right) \qquad (2)$$

Where:

C_c = primary compression index
C_r = recompression index
h_0 = initial compressible layer thickness [ft]
e_0 = initial void ratio of the clay subgrade
σ_0 = initial overburden pressure acting on the compressible layer [psf]
σ_i = final overburden pressure acting on the compressible layer [psf]
σ_c = preconsolidation stress [psf]
= OCR × σ_0
OCR = overconsolidation ratio

CALCULATION SHEET

Client: Wayne Disposal, Inc.	Project No.:	1208070039.004			
	Calculated By:	KM	Date:	11/16/2020	
Project: WDI MC6 F Permit Modification	Checked By:	MK	Date:	11/18/2020	
Calculation: Leachate Collection Pipe Settlement Analysis MC6F	Approved By:	KF	Date:	11/19/2020	

Settlement due to secondary compression is calculated using Equation 3 below:

$$S_s = h_0 \frac{C_\alpha}{1 + e_0} log\left(\frac{t_2}{t_1}\right) \quad (3)$$

Where:

C_α = secondary compression index
H = layer thickness [ft]
t_2 = time after application of load (assumed 70 years)
t_1 = time required to complete primary consolidation (assumed 40 years)

- The elevations in this report are referenced to Mean Sea Level (MSL).
- The initial ground elevation (prior to initial development) was assumed to be approximately 705 ft. This value was inferred from the cross-sectional profile from Engineering Drawings, Wayne Disposal, Inc. Site No.2 MC VI-F&G by NTH Consultants (2011b).
- The preconsolidation pressure of the middle clay and lower clay, the major contributing compressible layers below the existing waste, was set equal to the initial effective overburden pressure acting on them prior to development. This value is used in Equation 2 to estimate settlement resulting from an initial load less than the preconsolidation pressure. Note that both layers have exhibited a higher overburden pressure since initial development of the site and placement of the now existing waste.
- Calculation of settlement following MC6-F construction accounts for changes in overburden pressure resulting from the excavation of existing materials, the placement of new liner system components, the placement of new MC6-F waste, and the placement of new MC6-F final cover.
- At each point selected along the leachate collection pipe system, the elevations for the existing ground, proposed overfill liner, final cover, and the foundation soils are determined and used to compute the initial and final overburden pressures for each layer within the analysis.
- Soil layers are identified using subsurface soil profiles provided in MCIV General Profiles (South), Appendix A Subsurface Soil/Waste Profiles & Corresponding Physical Properties, Volume III – WDI Operating License Application Master Cells VI F & G by NTH Consultants (2011a). These layers include in-situ clay with varying degrees of compressibility (see Table 2).
- Attachment B-2.1 presents plan locations of the settlement analysis points within MC6-F with respect to proposed cell floor grades and final grades. Leachate collection pipe cross section profiles are also presented in Attachment B-2.1.

CALCULATION SHEET

Client: Wayne Disposal, Inc.
Project: WDI MC6 F Permit Modification
Calculation: Leachate Collection Pipe Settlement Analysis MC6F

Project No.: 1208070039.004
Calculated By: KM Date: 11/16/2020
Checked By: MK Date: 11/18/2020
Approved By: KF Date: 11/19/2020

CALCULATIONS

Equations 1 through 3 were incorporated into a spreadsheet to conduct the settlement calculations. The settlement calculation output and resulting post-settlement slope(s) for each leachate collection pipe within MC6-F are presented in Table 3 through Table 6. The settlement calculation output and resulting post-settlement slope(s) for each analyzed cross slope within MC6-F are presented in Table 7 through Table 10.

Table 3. MC6-F1 Leachate Pipe Flowline Settlement Calculation Summary

			Elevation			Liner Grade	Side Slope		
Point	North	East	Flowline Elevation	Settlement	**Length**	Post-Settlement	Pre-Settlement	Post-Settlement	**Min. Slope**
	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[%]	[%]	[%]
1	0.00	0.00	716.00	6.71	120	709.29	4.0%	2.4%	1%
2	120.00	0.00	720.80	8.66		712.14			
2	120.00	0.00	720.80	8.66	100	712.14	4.0%	3.0%	1%
3	220.00	0.00	724.80	9.70		715.10			
3	220.00	0.00	724.80	9.70	88	715.10	4.0%	3.4%	1%
4	308.00	0.00	728.32	10.20		718.12			
4	308.00	0.00	728.32	10.20	85	718.12	4.0%	3.9%	1%
5	393.00	0.00	731.72	10.29		721.43			

Table 4. MC6-F2 Leachate Pipe Flowline Settlement Calculation Summary

			Elevation			Liner Grade	Side Slope		
Point	North	East	Flowline Elevation	Settlement	**Length**	Post-Settlement	Pre-Settlement	Post-Settlement	**Min. Slope**
	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[%]	[%]	[%]
1	0.00	0.00	710.00	6.21	72	703.79	3.0%	1.3%	1%
2	71.80	0.00	712.15	7.46		704.69			
2	71.80	0.00	712.15	7.46	65	704.69	3.0%	2.1%	1%
3	136.70	0.00	714.10	8.02		706.08			
3	136.70	0.00	714.10	8.02	131	706.08	3.0%	2.9%	1%
4	267.60	0.00	718.03	8.10		709.93			
4	267.60	0.00	718.03	8.10	124	709.93	3.0%	2.9%	1%
5	392.00	0.00	721.76	8.19		713.57			

CALCULATION SHEET

Client: Wayne Disposal, Inc.
Project: WDI MC6 F Permit Modification
Calculation: Leachate Collection Pipe Settlement Analysis MC6F

Project No.: 1208070039.004
Calculated By: KM Date: 11/16/2020
Checked By: MK Date: 11/18/2020
Approved By: KF Date: 11/19/2020

Table 5. MC6-F3 Leachate Pipe Flowline Settlement Calculation Summary

			Elevation			Liner Grade	Side Slope		
Point	North	East	Flowline Elevation	Settlement	**Length**	Post-Settlement	Pre-Settlement	Post-Settlement	**Min. Slope**
	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[%]	[%]	[%]
1	0.00	0.00	708.00	5.87	116	702.13	4.0%	2.2%	1%
2	116.00	0.00	712.64	7.99		704.65			
2	116.00	0.00	712.64	7.99	121	704.65	4.0%	2.7%	1%
3	237.00	0.00	717.48	9.58		707.90			
3	237.00	0.00	717.48	9.58	196	707.90	4.0%	4.3%	1%
4	433.00	0.00	725.32	8.93		716.39			
4	433.00	0.00	725.32	8.93	162	716.39	4.0%	3.6%	1%
5	595.00	0.00	731.80	9.52		722.28			

Table 6. MC6-F4 Leachate Pipe Flowline Settlement Calculation Summary

			Elevation			Liner Grade	Side Slope		
Point	North	East	Flowline Elevation	Settlement	**Length**	Post-Settlement	Pre-Settlement	Post-Settlement	**Min. Slope**
	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[%]	[%]	[%]
1	0.00	0.00	700.00	5.48	102	694.52	4.0%	3.0%	1%
2	102.00	0.00	704.08	6.51		697.57			
2	102.00	0.00	704.08	6.51	103	697.57	4.0%	3.1%	1%
3	205.00	0.00	708.20	7.42		700.78			
3	205.00	0.00	708.20	7.42	201	700.78	4.0%	3.0%	1%
4	406.00	0.00	716.24	9.52		706.72			
4	406.00	0.00	716.24	9.52	158	706.72	4.0%	3.4%	1%
5	564.00	0.00	722.56	10.53		712.03			

Table 7. MC6-F1 Cross Slope Settlement Calculation Summary

			Elevation			Liner Grade	Side Slope		
Point	North	East	Floor Elevation	Settlement	**Length**	Post-Settlement	Pre-Settlement	Post-Settlement	**Min. Slope**
	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[%]	[%]	[%]
5	0.00	0.00	734.00	10.16	142	723.84	4.5%	5.2%	2%
6	142.00	0.00	740.35	9.12		731.23			
5	0.00	0.00	734.00	10.16	101	723.84	4.5%	4.9%	2%
7	101.00	0.00	738.51	9.76		728.75			

Table 8. MC6-F2 Cross Slope Settlement Calculation Summary

			Elevation			Liner Grade	Side Slope		
Point	North	East	Floor Elevation	Settlement	**Length**	Post-Settlement	Pre-Settlement	Post-Settlement	**Min. Slope**
	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[%]	[%]	[%]
5	0.00	0.00	722.00	7.76	206	714.24	2.3%	4.2%	2%
6	206.00	0.00	726.64	3.78		722.86			
5	0.00	0.00	722.00	7.76	150	714.24	5.7%	5.0%	2%
7	150.00	0.00	730.48	8.67		721.81			

Table 9. MC6-F3 Cross Slope Settlement Calculation Summary

			Elevation			Liner Grade	Side Slope		
Point	North	East	Floor Elevation	Settlement	**Length**	Post-Settlement	Pre-Settlement	Post-Settlement	**Min. Slope**
	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[%]	[%]	[%]
5	0.00	0.00	738.00	9.02	105	728.98	4.5%	4.8%	2%
6	105.00	0.00	742.69	8.68		734.02			
5	0.00	0.00	738.00	9.02	163	728.98	4.5%	4.8%	2%
7	163.00	0.00	745.29	8.49		736.79			

CALCULATION SHEET

Client: Wayne Disposal, Inc.
Project: WDI MC6 F Permit Modification
Calculation: Leachate Collection Pipe Settlement Analysis MC6F

Project No.: 1208070039.004
Calculated By: KM Date: 11/16/2020
Checked By: MK Date: 11/18/2020
Approved By: KF Date: 11/19/2020

Table 10. MC6-F4 Cross Slope Settlement Calculation Summary

			Elevation			Liner Grade	Side Slope		
Point	North	East	Floor Elevation	Settlement	**Length**	Post-Settlement	Pre-Settlement	Post-Settlement	**Min. Slope**
	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[%]	[%]	[%]
5	0.00	0.00	728.00	10.09	187	717.91	4.5%	5.5%	2%
6	187.00	0.00	736.36	8.24		728.12			
5	0.00	0.00	728.00	10.09	180	717.91	4.5%	5.1%	2%
7	180.00	0.00	736.05	8.98		727.06			

CONCLUSIONS

The post-settlement slope of each proposed leachate collection pipe should be at least 1% and each cell floor cross slope should be at least 2% per Rule 299.9620 (4) (EGLE 2020). This calculation estimated the settlement at points along the leachate collection pipe and cross slopes within each subcell. The settlement of each of these points was used to calculate the post-settlement slopes of the MC6-F floor. This settlement analysis determined that all leachate collection pipes and cross slopes within MC6-F meet the required minimum post-settlement slopes.

REFERENCES

Coduto, D.P. (1999) *Geotechnical Engineering: Principles and Practices*, Prentice-Hall Inc., New Jersey

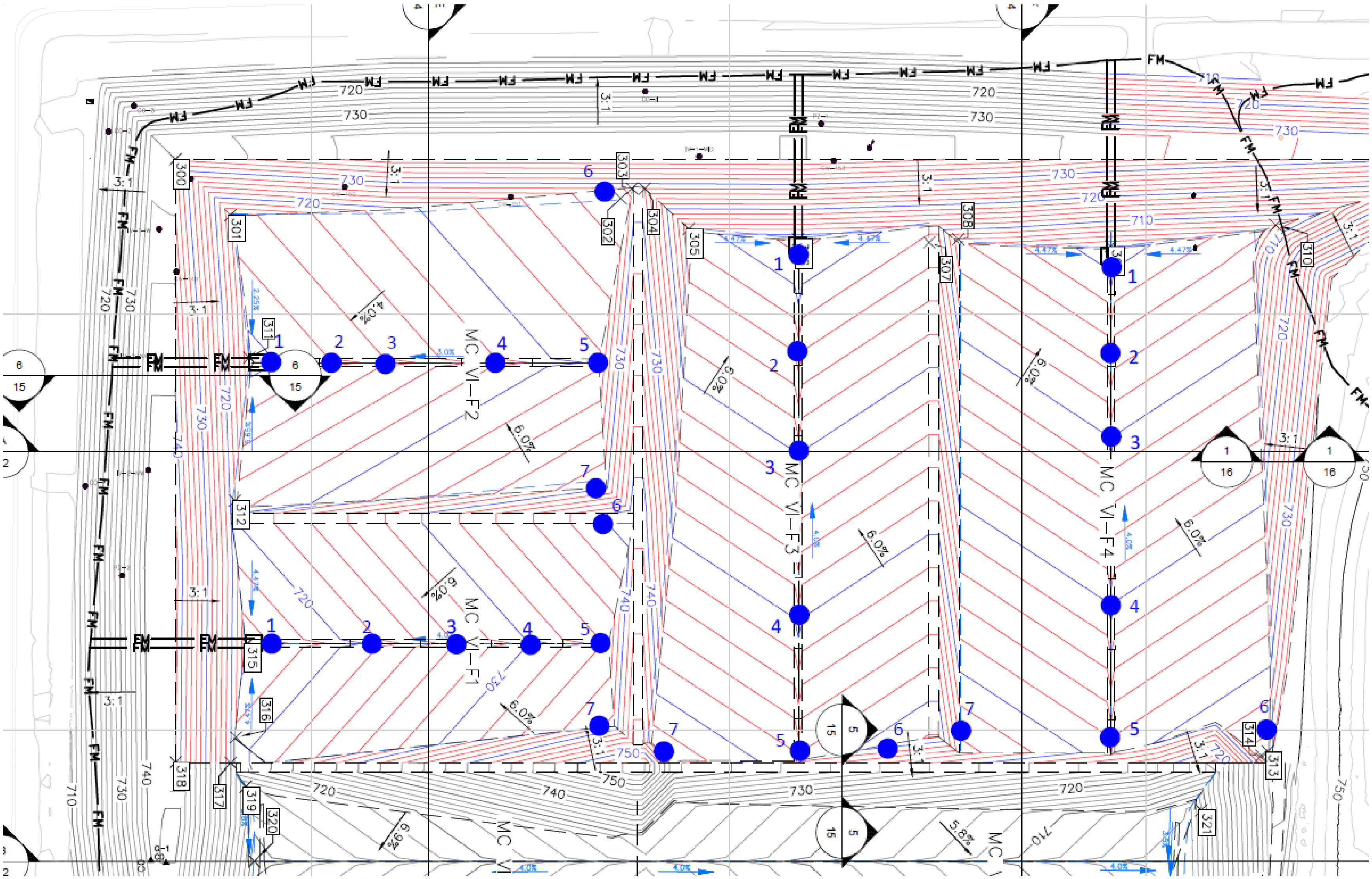
EGLE (2020) *Part 111 Administrative Rules,* Department of Environment, Great Lakes, and Energy *Hazardous Waste Management*, Materials Management Division.

NTH Consultants, Ltd. (2011a) *Volume III – WDI Operating License Application Master Cells VI F & G.*

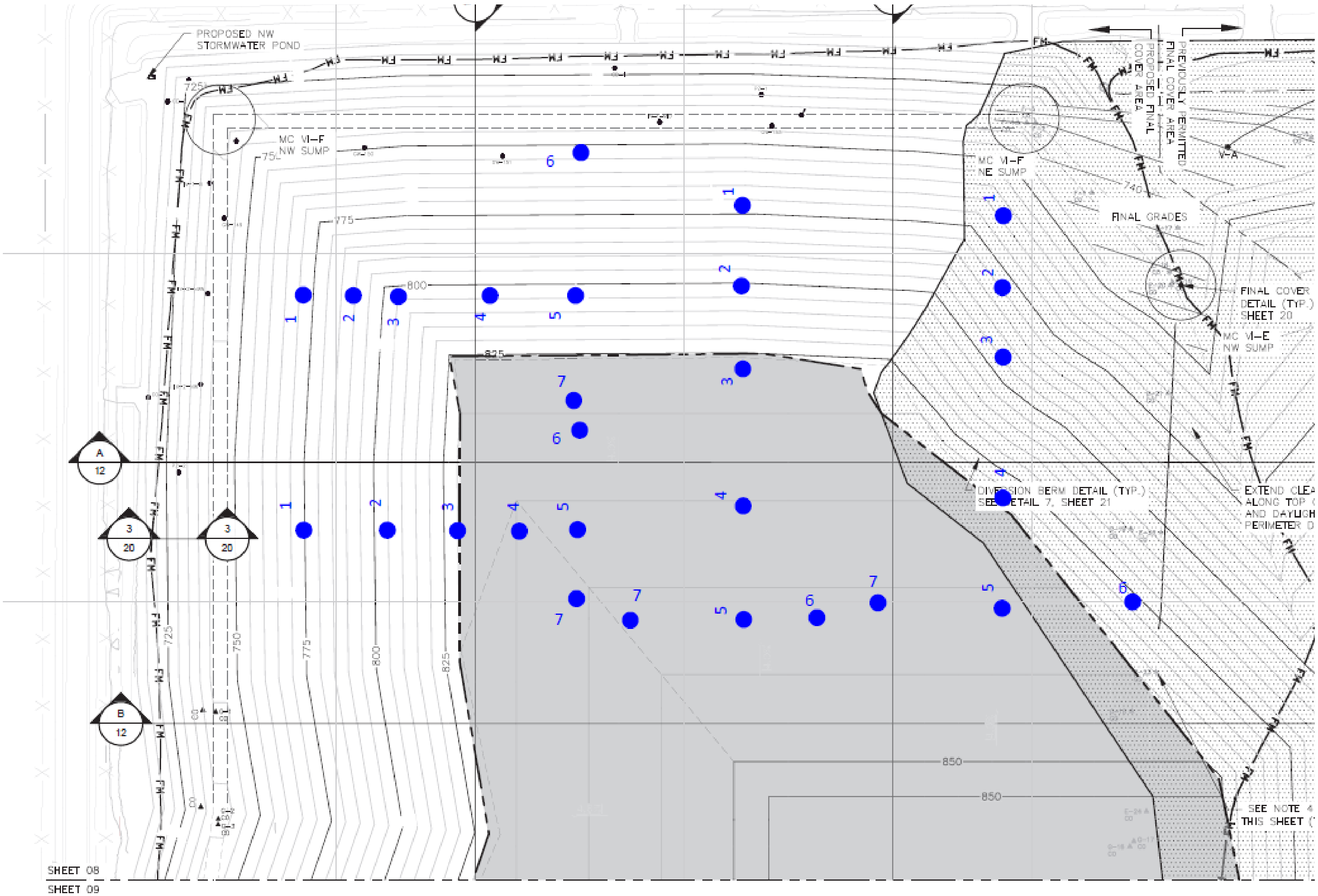
NTH Consultants, Ltd. (2011b) Engineering Drawings. *Wayne Disposal, Inc. Site No. 2 Master Cell VI-F&G.*

Attachment B-2.1

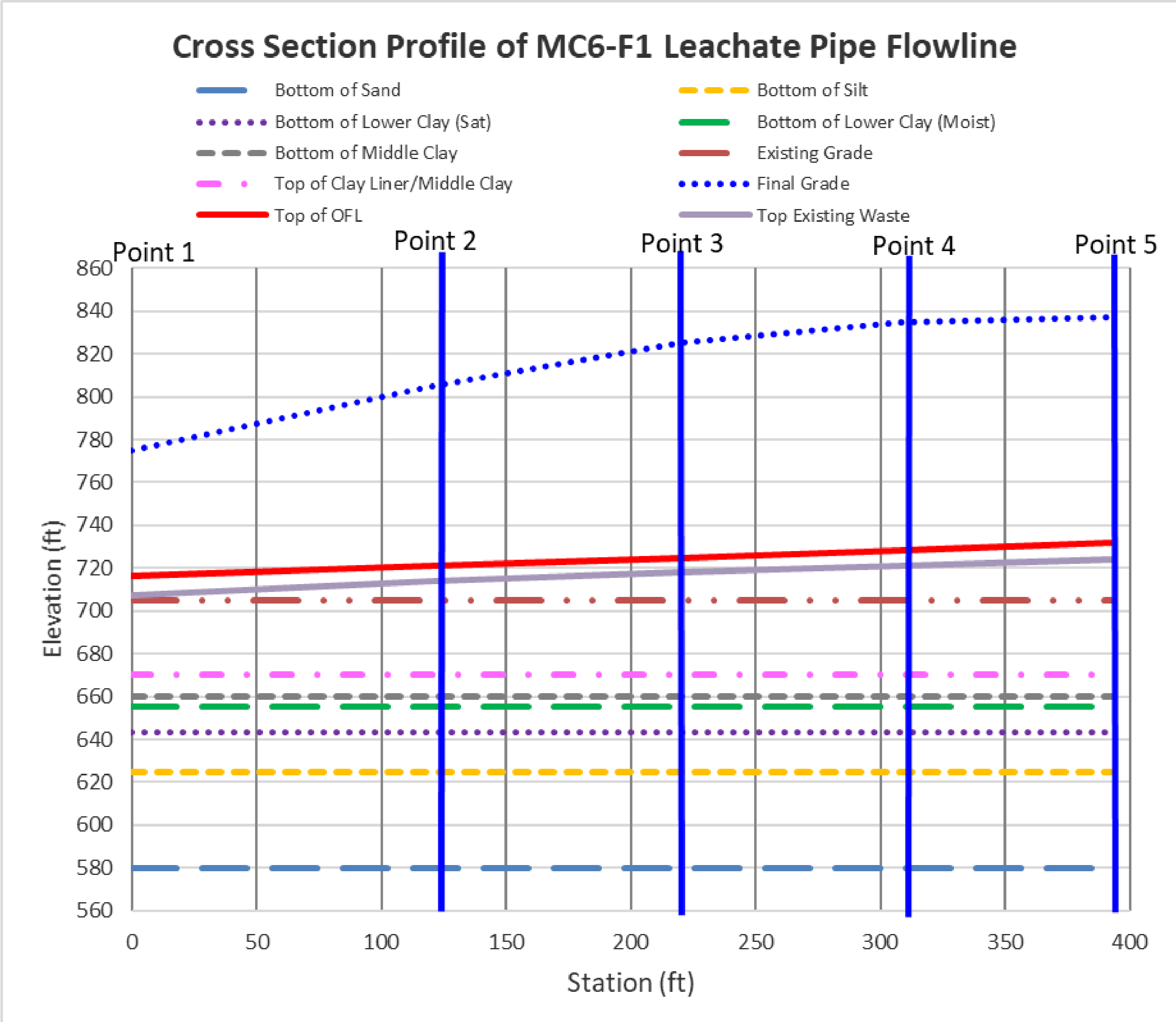
Plan View and Cross Sections of Leachate Flowlines

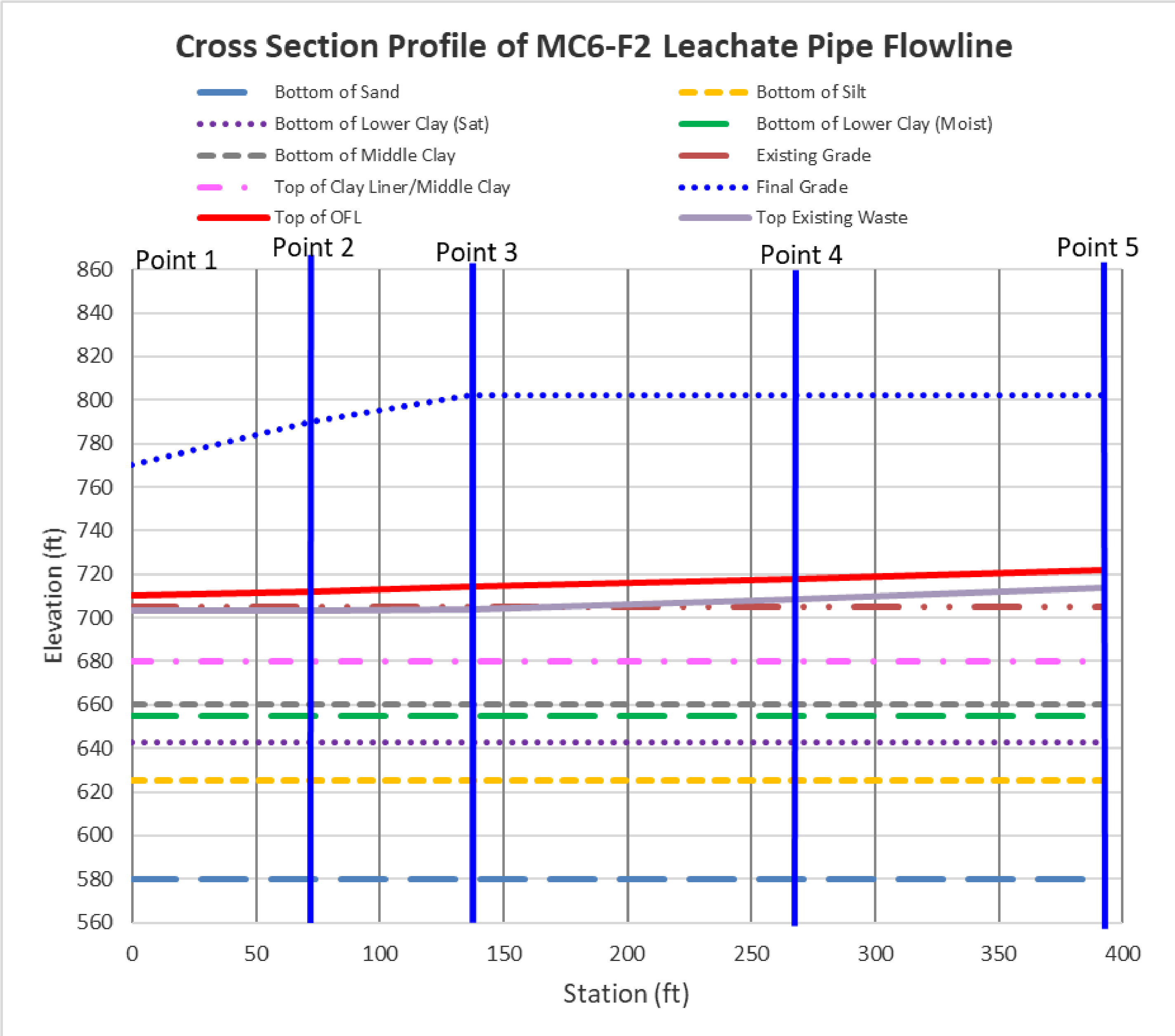


Plan View of Settlement Analysis Points Showing Top of Liner Grades

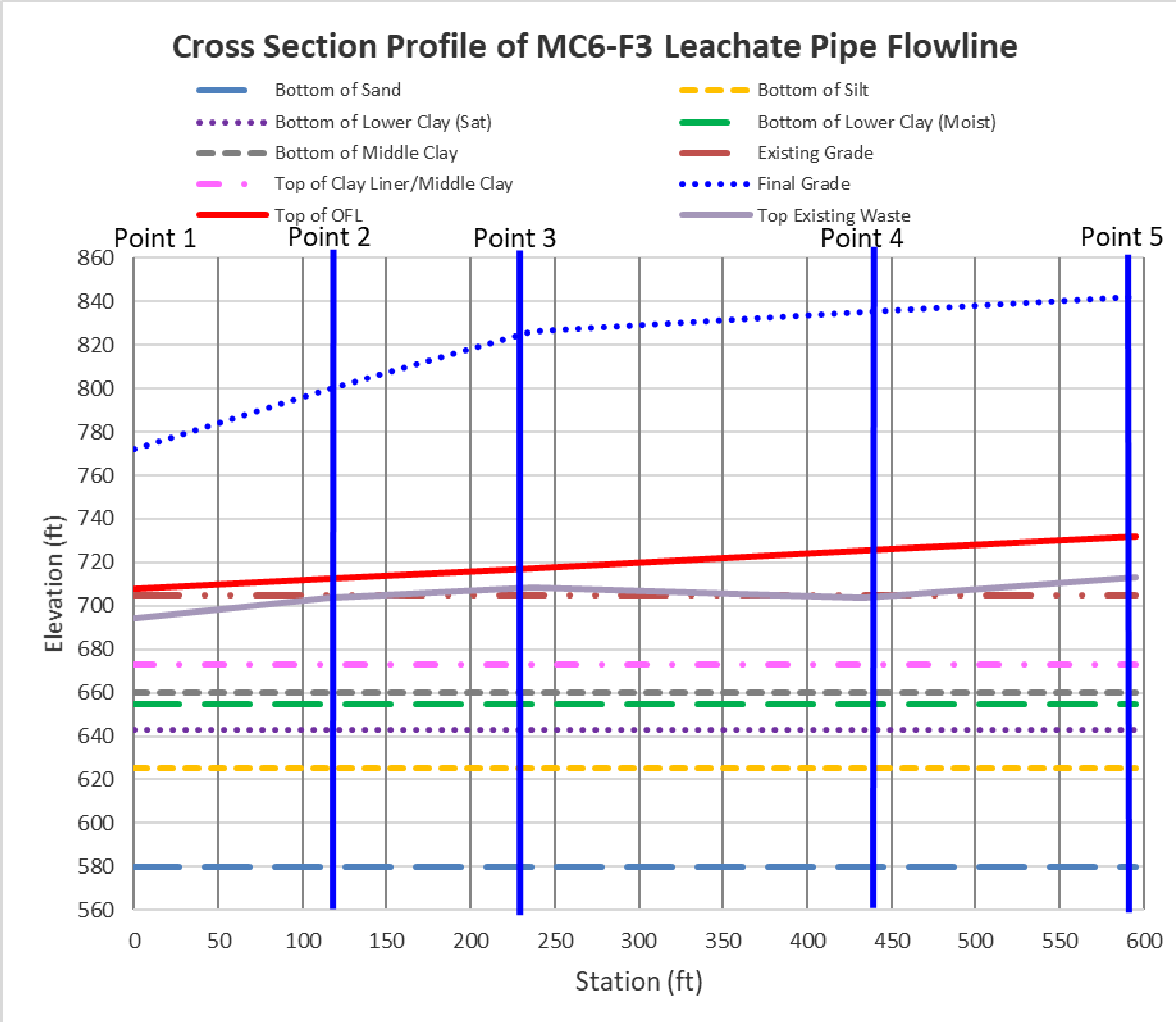


Plan View of Settlement Analysis Points Showing Final Grades

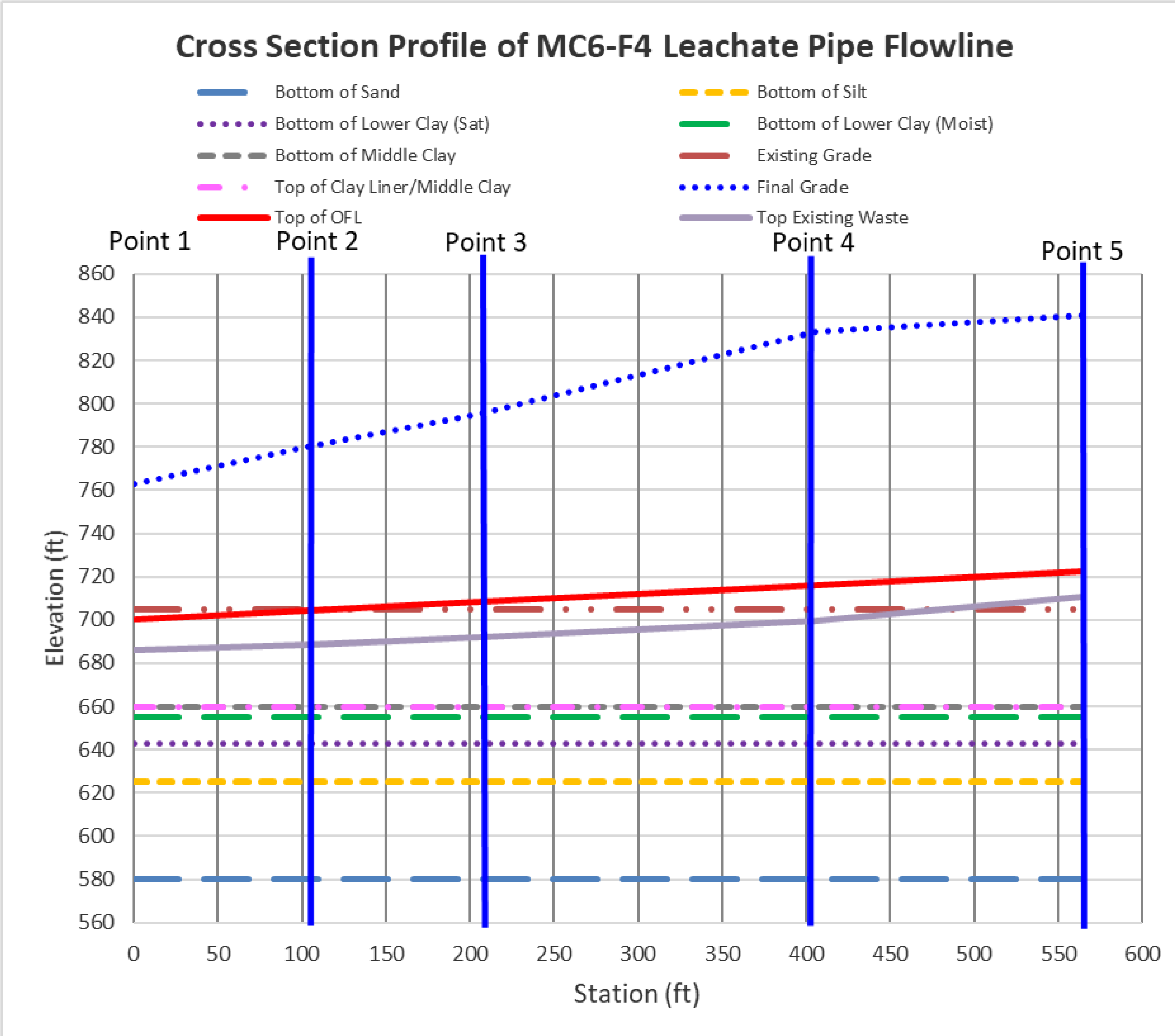

Cross Section Profile of MC6-F1 Leachate Pipe Flowline
Bottom of Sand
Bottom of Silt
Bottom of Lower Clay (Sat)
Bottom of Lower Clay (Moist)
Bottom of Middle Clay
Existing Grade
Top of Clay Liner/Middle Clay
Final Grade
Top of OFL
Top Existing Waste
Point 1
Point 2
Point 3
Point 4
Point 5
860
840
820
800
780
760
740
720
700
680
660
640
620
600
580
560
Elevation (ft)
0
50
100
150
200
250
300
350
400
Station (ft)



Cross Section Profile of MC6-F2 Leachate Pipe Flowline
Bottom of Sand
Bottom of Silt
Bottom of Lower Clay (Sat)
Bottom of Lower Clay (Moist)
Bottom of Middle Clay
Existing Grade
Top of Clay Liner/Middle Clay
Final Grade
Top of OFL
Top Existing Waste
Point 1
Point 2
Point 3
Point 4
Point 5
Elevation (ft)
860
840
820
800
780
760
740
720
700
680
660
640
620
600
580
560
0
50
100
150
200
250
300
350
400
Station (ft)



Cross Section Profile of MC6-F3 Leachate Pipe Flowline
Bottom of Sand
Bottom of Silt
Bottom of Lower Clay (Sat)
Bottom of Lower Clay (Moist)
Bottom of Middle Clay
Existing Grade
Top of Clay Liner/Middle Clay
Final Grade
Top of OFL
Top Existing Waste
Point 1
Point 2
Point 3
Point 4
Point 5
Elevation (ft)
860
840
820
800
780
760
740
720
700
680
660
640
620
600
580
560
0
50
100
150
200
250
300
350
400
450
500
550
600
Station (ft)


Cross Section Profile of MC6-F4 Leachate Pipe Flowline
Bottom of Sand
Bottom of Silt
Bottom of Lower Clay (Sat)
Bottom of Lower Clay (Moist)
Bottom of Middle Clay
Existing Grade
Top of Clay Liner/Middle Clay
Final Grade
Top of OFL
Top Existing Waste
Point 1
Point 2
Point 3
Point 4
Point 5
Elevation (ft)
860
840
820
800
780
760
740
720
700
680
660
640
620
600
580
560
0
50
100
150
200
250
300
350
400
450
500
550
600
Station (ft)

Attachment B-3

Pipe Strength and Deflection Calculations

Attachment B-3.1
Pipe Strength in Sumps

CALCULATION SHEET
Client: Wayne Disposal
Project: 2021 Cell 6F SSR Evaluation
Calculation: SSR Pipe Strength and Deflection Rev0

Project No.: 1208070039
Calculated By: BA Date: 9/14/2020
Checked By: NSG Date: 9/20/2020
Approved By: XZ Date:

Leachate Collection Sump Pipe Strength and Deflection

OBJECTIVE

Evaluate the strength and deflection of the leachate collection sump riser pipes for Master Cell VI-F (MC6F).

DESIGN CRITERIA, ASSUMPTIONS AND METHODOLOGY

The leachate collection pipes selected for this analysis are:

- Sump riser pipes: 24-inch diameter – either HDPE SDR-11 or SDR-17 perforated pipe
- Sump riser pipe will operate at "non-pressurized" condition.
- The Sump Riser is perforated with a pattern of 8 perforations around the circumference (45 degree spacing), at 6 inches between sets of holes (See Figure 1).

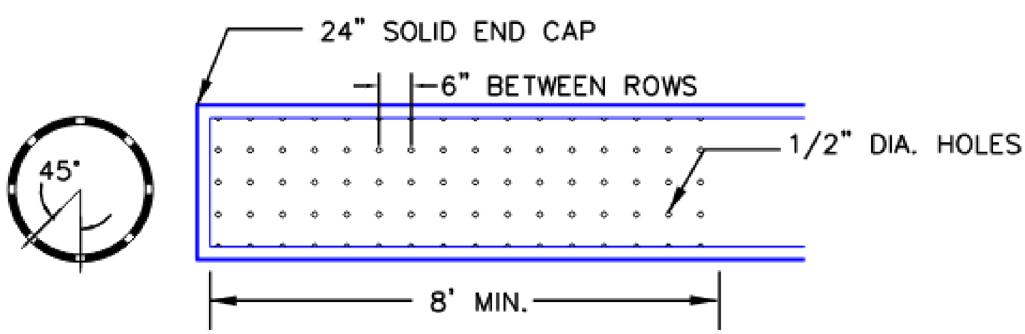


Figure 1 - Pipe Perforation Detail

Leachate sump pipes will be subjected to static loadings from the deposited waste vehicular traffic during the early stages of waste disposal. Previous analyses demonstrated that the live loading due to equipment loading was insignificant in comparison with the static loading at full height of the landfill so long as the initial cover over the riser pipes was at least 5 feet. The modification does not change this.

Static Loading

Pipe static loads were calculated using the Prism Load Method. The overburden load on the leachate collection pipe, (from top to bottom) includes the protective cover layer, waste layer, and the drainage layer. Because all of the layer thicknesses are constant except the waste layer, the most critical case (maximum static load) occurs where the waste thickness is greatest.

A comparison between the final cover grade plan and leachate collection system plan shows that the maximum waste thickness is in the MC6F Cell F4 Sump. Waste thickness is 57 feet with 4 feet of cover soil in the cap system and 4 feet of drainage gravel in the sump. Figure 2 illustrates the thicknesses and unit weights of the various soil materials above the sump riser.

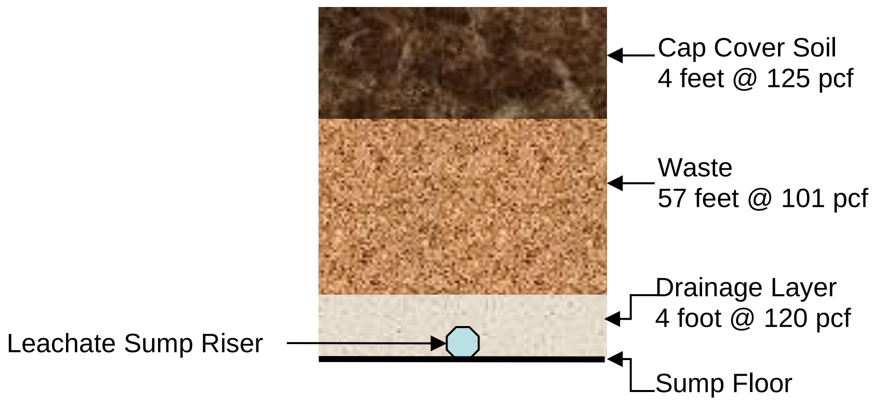


Figure 2. Cross Section of Typical Profile of Leachate Pipe for Static Loading Analysis
Figure Not To Scale

The Prism Load Method is most conservative as it does not make use of any reduction factors (Moser 1990). Equation 1 shows how the pressure on the pipe is calculated.

$$\sigma_s = \gamma_{c.s}\ h_{c.s.} + \gamma_{waste}\ h_{waste} + \gamma_{l.s}\ h_{l.s} \qquad (1)$$

Where:

σ_s = static load on the leachate pipes, pounds per square foot [psf]
$\gamma_{c.s}$ = unit weight of final cover soil, pounds per cubic foot [pcf]
$h_{c.s}$ = thickness of final cover soil [ft]
γ_{waste} = unit weight of waste [pcf]
h_{waste} = depth of waste above the pipe [ft]
$\gamma_{l.s}$ = unit weight of sumpfloor aggregate above the pipe [pcf]
$h_{l.s}$ = thickness of sump floor aggregate above the pipe [ft]

Pipe and Soil Properties Sources

The maximum allowable deflection ratios of HDPE pipes is 7.5% (ASTM F1962-11). As stated in the Handbook of PE Pipe, "for non-pressure applications, a 7.5 percent defection limit provides a large safety factor against instability and strain and is considered a safe design defection. Some engineers will design profile wall pipe and other non-pressure pipe applications to a 5% defection limit, but allow spot defections up to 7.5% during field inspection." (Plastic Pipe Institute, 2020)

The elastic modulus for HDPE pipe material (E_p) was reduced to 21,170 pounds per square inch (psi) to account for potential creep effects assuming a temperature of 100° F for 50 years (Plastic Pipe Institute, 2020).

The soil reaction modulus (E') depends on the soil elastic modulus (E_s) which is in turn based on soil stress. (Qian et al 2001).

$$E' = 2 \times E_s \tag{5}$$

Where:

E' = soil reaction modulus, psi
E_s = soil elastic modulus, psi

The soil elastic modulus was conservatively selected as 4,299 psi (*See Attachment 2 – Determination of Soil Elasticity Modulus*).

Parameter Sources

Table 2 summarizes the sources used to gather the various parameters made in these calculations.

Table 2. Sources of Pipe and Soil Parameters

	Parameter	Source
HDPE Pipe	Dimensions (OD, ID, t_p)	ISCO Product Catalog
	Perforation	CTI 2020
	Elastic Modulus (E_p)	Plastic Pipe Institute, 2020
	Acceptable Deflection	ASTM F1962-11
Soil	Unit Weights (γ_c, γ_d, γ_{waste})	Soil – typical values Waste – based on historical site-specific waste density
	Elastic Modulus (E_s)	Attachment 1
Misc.	Modified Iowa Method Parameters	Moser 1990

CALCULATIONS AND RESULTS

Vertical Deflection – Modified Iowa State Method

An engineering approach to estimate the deflection of buried pipes was developed by a group of research faculty and students at Iowa State University. Equation 6 is a summary of the effort of the Iowa State Group's to model buried, flexible pipe deflection (Moser 1990).

$$y \approx \frac{D_L K_b W_P}{\left(E_P I / r^3\right) + \left(0.061E'\right)} \tag{6}$$

Where:

y = vertical pipe deflection [in]

D_L = deflection lag factor

K_b = bedding constant

W_P = vertical load per unit length (in the pipe length direction) [lb/in]

= $W \times \left(\dfrac{12}{12 - (D \times N)}\right)$

W = unadjusted (for perforation) vertical load per unit length [lb/ft]

= $\sum \gamma_i H_i$

- γ_i = unit weight of material i on the pipe
- H_i = thickness of material i

OD = outside diameter of pipe [in]

D = diameter of perforations [in]

N = number of perforation per row per linear foot of pipe

E_P = modulus of elasticity of pipe material [psi]

I = moment of inertia of the pipe wall per unit length [in^3]

r = mean radius of pipe [in]

= $\dfrac{OD - t_P}{2}$

E' = soil reaction modulus [psi]

Since the conservative Prism Load Method is being applied, no adjustment for lag is required. Therefore the deflection lag factor is set to 1.0. It is typical in designs to assume a bedding constant of 0.1, as this is also a conservative value (Moser 1990).

Once the vertical pipe deflection is determined, the corresponding percent pipe wall strain/deflection ratio can be calculated as follows.

$$\varepsilon = \frac{y}{2r} \times 100\% \tag{7}$$

Where:

ε = pipe wall strain/deflection ratio

y = vertical pipe deflection [in]

r = mean radius of pipe [in]

Wall Buckling

Local wall buckling is a longitudinal wrinkling of the pipe wall. Although wall buckling is seldom the limiting factor in the design of a pipe-soil system, a check can be made according to Equation 8 (Moser 1990).

$$FS = \frac{P_{cb}}{\sigma_z} = \frac{0.8\sqrt{\frac{2E'E_P}{SDR^3}}}{\sigma_z} \tag{8}$$

Where:

P_{cb} = critical buckling pressure at top of pipe [psi]

σ_z = actual vertical pressure on the pipe [psi]

E' = modulus of soil reaction [psi]

E_p = modulus of elasticity of pipe material [psi]

SDR = standard dimension ratio = OD/t_p

OD = outside diameter of pipe [in]

T_p = pipe wall thickness [in]

A calculation spreadsheet, based on equations presented in the previous section, was developed to analyze pipe strength. See Table 3 for calculation details of HDPE pipes in the proposed modification area.

CALCULATION SHEET

Client: Wayne Disposal
Project: 2021 Cell 6F SSR Evaluation
Calculation: SSR Pipe Strength and Deflection Rev0

Project No.: 1208070039
Calculated By: BA Date: 9/14/2020
Checked By: NSG Date: 9/20/2020
Approved By: XZ Date:

Table 3. Pipe Deflection and Buckling Strength Worksheet for MC6F Sump

Item	Notation	Units	1	2
			18" HDPE SDR 17 Perforated	18" HDPE SDR 11 Perforated
Vertical load				
Design vertical stress on pipe	H_{refuse}	ft	57.0	57.0
	σ_z	psf	6,737	6,737
		psi	46.8	46.8
Outside diameter of pipe	*OD*	in	24.000	24.000
Inside Diameter of pipe	*ID*	in	21.007	19.375
Pipe Wall Thickness *OD/SDR*	t_p	in	1.412	2.182
Unadjusted vertical load per unit length $W = \gamma * H * OD$	*W*	lbs/in	1123	1123
Dia. of perforations	*D*	in	0.50	0.50
No. of Perforation Rows per foot	*N*		**2**	**2**
Modified Vertical stress $W_p = W*(12/(12-(D*N)))$	W_p	lbs/in	1225	1225
Vertical Deflection (Modified Iowa Method)				
Deflection Lag factor	D_L		1.00	1.00
Mean Pipe radius $r = (OD-t_p)/2$	*r*	in	11.29	10.91
Bedding Constant	K_b		0.10	0.10
Soil Modulus of Elasticity	E_s	psi	4299	4299
Modulus Soil Reaction $E' = 2E_s$	*E'*	psi	8,597	8,597
Pipe Modulus of elasticity	E_p	psi	21,170	21,170
Moment of Inertia $I = (t_p^3/12)$	*I*	in^3	0.2345	0.8655
Vertical Deflection $y = [(D_L K_b W_p)/((E_p I/r^3)+(0.061E_s)]$	*y*	in	0.2320	0.2274
Percentage Deflection *y/(2r) for both PVC and HDPE*	ε	%	**1.0%**	**1.0%**
Limiting Strain for HDPE pipe		%	2.7%	2.2%
Buckling Analysis (for HDPE pipes only)				
Critical Buckling Pressure $P_{bc} = 0.8*(2E_s E_P/SDR^3)^{0.5}$	P_{bc}	psi	217.76	418.37
Required Factor of Safety	*FS*		*1.0*	*1.0*
Provided F.S against wall buckling $FS = P_{bc}/[\sigma z/(1-nd/12)]$	*FS*		**4.3**	**8.2**

CONCLUSIONS

The vertical deflection and factors of safety against buckling and collapse were examined for the leachate sump risers in the proposed modification. The strength and deflection analyses are shown in Table 3.

Based on the results in Table 3 for the MC6F Sump risers, it is concluded that the calculations indicate acceptable levels of deflection will occur and an adequate factor of safety is provided against buckling for both SDR-11 and SDR-17.

REFERENCES

ASTM F1962-11 (2011) "*Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings*"

ISCO Product Catalog, Section B: ASTM HDPE Materials, 4710 HDPE Pipe Sizes. https://isco-pipe.com/wp-content/uploads/2019/03/Q3_2018_Entire-Catalog_Final_web.pdf (accessed Sept 9, 2020)

Moser, A.P. (1990) *Buried Pipe Design*, McGraw-Hill, New York.

Plastic Pipe Institute, Second Edition Handbook of PE Pipe. https://plasticpipe.org/publications/pe-handbook.html (accessed Sept 9, 2020)

Xuede Qian, Robert M. Koerner and Donald H. Gray (2001) "*Geotechnical Aspects of Landfill Design and Construction*" Prentice Hall, New Jersey.

ATTACHMENTS

Attachment B-3.1.1
Pipe Properties Charts

TABLE B.1.1

Apparent Elastic Modulus for 73°F (23°C)

Duration of Sustained Loading	Design Values For 73°F (23°C) [1,2,3]					
	PE 2XXX		PE3XXX		PE4XXX	
	psi	MPa	psi	MPa	psi	MPa
0.5hr	62,000	428	78,000	538	82,000	565
1hr	59,000	407	74,000	510	78,000	538
2hr	57,000	393	71,000	490	74,000	510
10hr	50,000	345	62,000	428	65,000	448
12hr	48,000	331	60,000	414	63,000	434
24hr	46,000	317	57,000	393	60,000	414
100hr	42,000	290	52,000	359	55,000	379
1,000hr	35,000	241	44,000	303	46,000	317
1 year	30,000	207	38,000	262	40,000	276
10 years	26,000	179	32,000	221	34,000	234
50 years	22,000	152	28,000	193	29,000	200
100 years	21,000	145	27,000	186	28,000	193

(1) Although there are various factors that determine the exact apparent modulus response of a PE, a major factor is its ratio of crystalline to amorphous content – a parameter that is reflected by a PE's density. Hence, the major headings PE2XXX, PE3XXX and, PE4XXX, which are based on PE's Standard Designation Code. The first numeral of this code denotes the PE's density category in accordance with ASTM D3350 (An explanation of this code is presented in Chapter 5).

(2) The values in this table are applicable to both the condition of sustained and constant loading (under which the resultant strain increases with increased duration of loading) and that of constant strain (under which an initially generated stress gradually relaxes with increased time).

(3) The design values in this table are based on results obtained under uni-axial loading, such as occurs in a test bar that is being subjected to a pulling load. When a PE is subjected to multi-axial stressing its strain response is inhibited, which results in a somewhat higher apparent modulus. For example, the apparent modulus of a PE pipe that is subjected to internal hydrostatic pressure – a condition that induces bi-axial stressing – is about 25% greater than that reported by this table. Thus, the Uni-axial condition represents a conservative estimate of the value that is achieved in most applications.

It should also be kept in mind that these values are for the condition of continually sustained loading. If there is an interruption or a decrease in the loading this, effectively, results in a somewhat larger modulus.

In addition, the values in this table apply to a stress intensity ranging up to about 400psi, a value that is seldom exceeded under normal service conditions.

(Plastic Pipe Institute, 2020, Ch. 3)

TABLE B.1.2

Temperature Compensating Multipliers for Determination of the Apparent Modulus of Elasticity at Temperatures Other than at 73°F (23°C)

Equally Applicable to All Stress-Rated PE's
(e.g., All PE2xxx's, All PE3xxx's and All PE4xxx's)

Maximum Sustained Temperature of the Pipe °F (°C)	Compensating Multiplier
-20 (-29)	2.54
-10 (-23)	2.36
0 (-18)	2.18
10 (-12)	2.00
20 (-7)	1.81
30 (-1)	1.65
40 (4)	1.49
50 (10)	1.32
60 (16)	1.18
73.4 (23)	1.00
80 (27)	0.93
90 (32)	0.82
100 (38)	0.73
110 (43)	0.64
120 (49)	0.58
130 (54)	0.50
140 (60)	0.43

(Plastic Pipe Institute, 2020, Ch. 3)

CALCULATION SHEET

Client: Wayne Disposal
Project: 2021 Cell 6F SSR Evaluation
Calculation: SSR Pipe Strength and Deflection Rev0

Project No.: 1208070039
Calculated By: BA Date: 9/14/2020
Checked By: NSG Date: 9/20/2020
Approved By: XZ Date:

DR		11		
PE4710 Pressure Rating Resistencia a la Presión		200 psi		
Nom. OD DE Nominal (in)	Actual OD DE Actual (in)	Min Wall Espesor Mínimo de Pared (in)	Avg ID DI Promedio (in)	Weight Peso (lb/ft)
¾"	1.05	0.095	0.848	0.13
1"	1.315	0.12	1.062	0.2
1¼"	1.66	0.151	1.34	0.314
1½"	1.9	0.173	1.534	0.411
2"	2.375	0.216	1.917	0.642
3"	3.5	0.318	2.825	1.395
4"	4.5	0.409	3.633	2.31
5"	5.375	0.489	4.339	3.29
5"	5.563	0.506	4.491	3.523
6"	6.625	0.602	5.348	5
7"	7.125	0.648	5.752	5.78
8"	8.625	0.784	6.963	8.47
10"	10.75	0.977	8.678	13.16
12"	12.75	1.159	10.293	18.51
14"	14	1.273	11.302	22.32
16"	16	1.455	12.916	29.15
18"	18	1.636	14.531	36.89
20"	20	1.818	16.145	45.541
22"	22	2	17.76	55.105
24"	24	2.182	19.375	65.58

DR		17		
PE4710 Pressure Rating Resistencia a la Presión		125 psi		
Nom. OD DE Nominal (in)	Actual OD DE Actual (in)	Min Wall Espesor Mínimo de Pared (in)	Avg ID DI Promedio (in)	Weight Peso (lb/ft)
¾"	1.05	---	---	---
1"	1.315	---	---	---
1¼"	1.66	---	---	---
1½"	1.9	---	---	---
2"	2.375	0.14	2.079	0.431
3"	3.5	0.206	3.064	0.94
4"	4.5	0.265	3.939	1.55
5"	5.375	0.316	4.705	2.2
5"	5.563	0.327	4.869	2.36
6"	6.625	0.39	5.799	3.36
7"	7.125	0.419	6.236	3.86
8"	8.625	0.507	7.549	5.69
10"	10.75	0.632	9.409	8.834
12"	12.75	0.75	11.16	12.43
14"	14	0.824	12.254	14.983
16"	16	0.941	14.005	19.57
18"	18	1.059	15.755	24.77
20"	20	1.176	17.506	30.58
22"	22	1.294	19.256	37
24"	24	1.412	21.007	44.031

(*ISCO Product Catalog*)

CALCULATION SHEET

Client: Wayne Disposal

Project: 2021 Cell 6F SSR Evaluation

Calculation: SSR Pipe Strength and Deflection Rev0

Project No.: 1208070039

Calculated By: BA Date: 9/14/2020

Checked By: NSG Date: 9/20/2020

Approved By: XZ Date:

Designation: F1962 – 11

Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings[1]

This standard is issued under the fixed designation F1962; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

X2.6 *Deflection Limits*—The limiting deflection (in percent) is determined by the geometric stability of the deflected pipe, hydraulic capacity, and the strain occurring in the pipe wall. It has been observed that for PE, pressure-rated pipe, subjected to soil pressure only, no upper limit from a practical design point of view seems to exist for the bending strain (**15**). Therefore, for non-pressure pipes or conduits the safe long-term deflection is 7.5 % of the diameter. When subjected to internal pressure in addition to soil pressure, the localized bending strain resulting from deflection combines with the hoop tensile strain caused by internal pressure to produce a higher, localized tensile fiber-stress. However, as the internal pressure is increased the pipe re-rounds and the bending strain is reduced. At high pressures, the bending strain is reduced and the ring tensile stress approaches that due to internal pressure alone. For calculation method, see Ref. (**16**). This fact coupled with the ductility of PE permits the designer to ignore the combined effect of pressure and deflection. In lieu of an exact calculation based on allowable strain, the designer can use the safe long-term design deflection values for pressure pipe shown to Table X2.1.

TABLE X2.1 Safe Long-Term Design Deflection values for Buried Pressurized Polyethylene Pipe

DR or SDR	Deflection Limits as % of Diameter
21	7.5
17	6.0
15.5	6.0
13.5	6.0
11	5.0
9	4.0
7.3	3.0

(**15**) Janson, L.E.," Long-Term Studies of PVC and PE Pipes Subjected to Forced Constant Deflection", Report No. 3, KP-Council, Stockholm, Sweden, 1991.

(**16**) Janson, L.E., *Plastics Pipes for Water Supply and Sewage Disposal*, Borealis, Stockholm, Sweden, 1995.

Attachment B-3.1.2
Determination of Soil Elasticity Modulus

CALCULATION SHEET
Client: Wayne Disposal
Project: 2021 Cell 6F SSR Evaluation
Calculation: Attachment 2 – Soil Modulus Determination

Project No.: 1208070039
Calculated By: BA Date: 9/14/2020
Checked By: NSG Date: 9/20/2020
Approved By: XZ Date:

DETERMINATION OF SOIL MODULUS OF ELASTICITY

OBJECTIVE

Determine an appropriately conservative soil modulus of elasticity (E_s) for use in calculating the strength of the Master Cell VI-F (MC6F) leachate collection sump riser.

ASSUMPTIONS AND METHODOLOGY

Calculation of E_s

The following assumptions were made to ensure the accuracy of the final calculated value while preserving conservatism.

- The pipe under strength analysis is to be backfilled with stone (gravel).
- Maximum estimated stress on leachate collection MC6F riser = 46.8 psi
- Soil modulus of elasticity can be conservatively calculated as follows (from Table 1).

$$E_s = 2 \cdot q_c \quad \text{[psi]} \tag{1}$$

Where:
q_c = Cone Penetration Test (CPT) value [psi]

The CPT value of the stone is not available through direct test data, but it can be estimated using the friction angle and relative density. The following values were conservatively estimated based on likely properties that the gravel backfill would possess:

- Friction angle (ϕ) = 32º
- Relative Density (D_R) = 70%

Table 1. Equations for computing E_s by making use of SPT and CPT values [kpa] (Murthy 2003)

Soil	SPT	CPT
Sand (normally consolidated)	$500\ (N_{cor} + 15)$	$\boxed{2 \text{ to } 4\ q_c}$
	$(35000 \text{ to } 50000) \log N_{cor}$	$(1 + D_r^2)\ q_c$
	(U.S.S.R Practice)	
Sand (saturated)	$250\ (N_{cor} + 15)$	
Sand (overconsolidated)	–	$6 \text{ to } 30\ q_c$
Gravelly sand and gravel	$1200\ (N_{cor} + 6)$	
Clayey sand	$320\ (N_{cor} + 15)$	$3 \text{ to } 6\ q_c$
Silty sand	$300\ (N_{cor} + 6)$	$1 \text{ to } 2\ q_c$
Soft clay	–	$3 \text{ to } 8\ q_c$

Figure 1 shows an accepted correlation between these two properties and the CPT value, as well as stress state (in terms of horizontal stress, calculated in Equation 2)

$$\sigma_h = k_0 \cdot \sigma_v \quad \text{[psi]} \tag{2}$$

Where:

σ_h = Horizontal stress due to overburden pressure [psi]
k_0 = Lateral earth pressure coefficient
= 0.36 (conservative assumption, Table 2)
σ_v = Stress due to overburden soils
= 46.8 psi for the MC6F riser

Table 2. Coefficients of Earth Pressure for "at-rest" condition (Murthy 2003)

Type of soil	I_p	K_0
Loose sand, saturated	–	0.46
Dense sand, saturated	–	0.36
Dense sand, dry ($e = 0.6$)	–	0.49
Loose sand, dry ($e = 0.8$)	–	0.64
Compacted clay	9	0.42
Compacted clay	31	0.60
Organic silty clay, undisturbed ($w_l = 74\%$)	45	0.57

Thus, once certain properties are known / calculated, the CPT value can be inferred and ultimately the soil modulus determined.

CALCULATION SHEET
Client: Wayne Disposal
Project: 2021 Cell 6F SSR Evaluation
Calculation: Attachment 2 – Soil Modulus Determination

Project No.: 1208070039
Calculated By: BA Date: 9/14/2020
Checked By: NSG Date: 9/20/2020
Approved By: XZ Date:

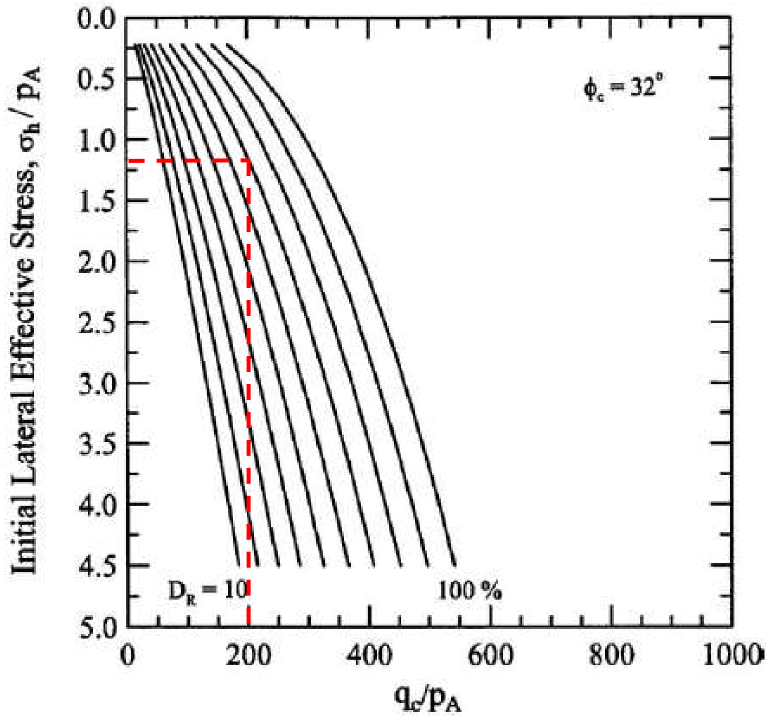


Figure 1. Correlation between Stress, Relative Density and CPT value for ϕ = 32º (Salgado and Prezzi 2007)

Extrapolation of E_s

In addition to the aforementioned calculation approach (known to be conservative), the previously approved correlation between stress and soil modulus developed by Selig (1990) and referenced by Qian et al (2001) will be extrapolated for comparison with the calculated value.

CALCULATIONS AND RESULTS

- The horizontal stress (σ_h in Equation 2) was calculated as 16.8 pounds per square inch (psi).
- The σ_h / p_A ratio is therefore 1.2 (p_A = standard reference stress = 1 tsf = 13.88 psi) correlating to a q_c / p_A ratio of approximately 200. This yields a CPT value of 2,800 psi.
- Finally, the soil modulus (E_s in equation 1) is calculated to be **5,600 psi**.

Another method of analysis uses Table 3 as the basis of determining the soil modulus E_s.

CALCULATION SHEET
Client: Wayne Disposal
Project: 2021 Cell 6F SSR Evaluation
Calculation: Attachment 2 – Soil Modulus Determination

Project No.: 1208070039
Calculated By: BA Date: 9/14/2020
Checked By: NSG Date: 9/20/2020
Approved By: XZ Date:

Table 3. Elasticity of Soil Under Stress (Selig 1990 c/o *Qian et al 2001*)

Soil Type	Stress Level		85% Standard Density			95% Standard Density		
			E_s			E_s		
	psi	kPa	psi	MPa	ν_s	psi	MPa	ν_s
SW, SP, GW, GP	1	7	1,300	9	0.26	1,600	11	0.40
	5	35	2,100	14	0.21	4,100	28	0.29
	10	70	2,600	18	0.19	6,000	41	0.24
	20	140	3,300	23	0.19	8,600	59	0.23
	40	280	4,100	28	0.23	13,000	90	0.25
	60	420	4,700	32	0.28	16,000	110	0.29
GM, SM, ML, and GC, SC with < 20% fines	1	7	600	4	0.25	1,800	12	0.34
	5	35	700	5	0.24	2,500	17	0.29
	10	70	800	6	0.23	2,900	20	0.27
	20	140	850	6	0.30	3,200	22	0.29
	40	280	900	6	0.38	3,700	25	0.32
	60	420	1,000	7	0.41	4,100	28	0.35
CL, MH, GC, SC	1	7	100	1	0.33	400	3	0.42
	5	35	250	2	0.29	800	6	0.35
	10	70	400	3	0.28	1,100	8	0.32
	20	140	600	4	0.25	1,300	9	0.30
	40	280	700	5	0.35	1,400	10	0.35
	60	420	800	6	0.40	1,500	10	0.38

- This approved correlation is plotted in Figure 2, showing a coefficient of determination (i.e. accuracy of trend line).

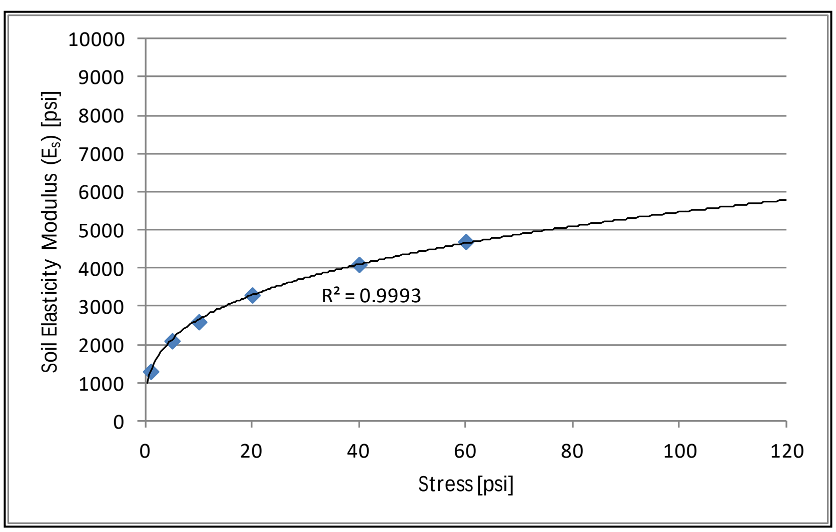


Figure 2. Correlation between overburden stress and soil elasticity modulus (from Table 3)

- The equation of the trend line shown is given below. Equation 3 was used to estimate E_s under the specified overburden pressure for both the horizontal and vertical expansion cases.

$$E_s = 1281.6\sigma_v{}^{0.3147} \quad (3)$$

- This correlation indicates that at 46.8 psi (estimated overburden scenario) the soil modulus of elasticity will be approximately **4,299 psi**.

- To preserve a conservative calculation, the smaller values of elastic modulus – 4,299 psi for horizontal expansion cells will be used in the pipe strength and deflection analysis.

REFERENCES

Murthy, V.N.S. (2003) *Geotechnical Engineering: Principles and Practices of Soils Mechanics and Foundation Engineering* Marcel Dekker, Inc., New York, NY.

Salgado, R. and Prezzi, M. (2007). "Computation of Cavity Expansion Pressure and Penetration Resistance in Sands." International Journal of Geomechanics. American Society of Civil Engineers.

Xuede Qian, Robert M. Koerner and Donald H. Gray (2001). "Geotechnical Aspects of Landfill Design and Construction" Prentice Hall, New Jersey.

Attachment B-3.2
Pipe Strength on Floor

Leachate Collection Pipe Strength and Deflection

OBJECTIVE

Evaluate the strength and deflection of the leachate collection pipes for Master Cell VI-F (MC6F).

DESIGN CRITERIA, ASSUMPTIONS AND METHODOLOGY

The leachate collection pipes selected for this analysis are:

- Leachate collection pipes: 8-inch diameter – either HDPE SDR-11 or SDR-9 perforated pipe
- Leachate collection pipes will operate at "non-pressurized" condition.
- The leachate collection pipe is perforated with a pattern of 4 perforations around the circumference (90 degree spacing), at 6 inches between sets of holes (See Figure 1).

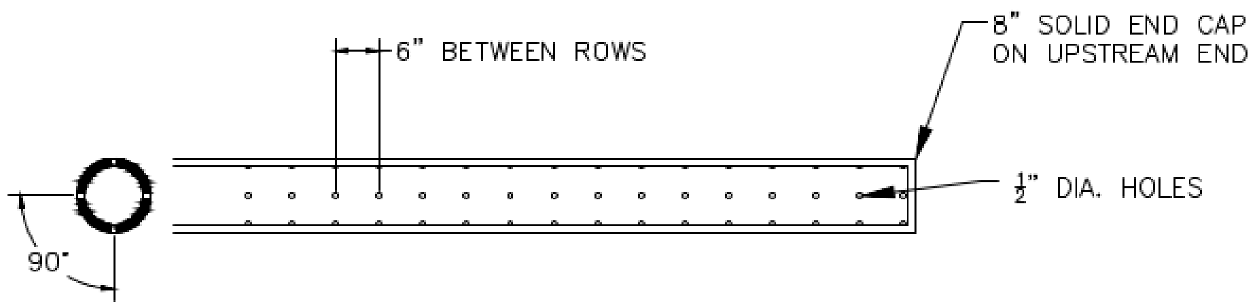


Figure 1 - Pipe Perforation Detail

Leachate collection pipes will be subjected to static loadings from the deposited waste vehicular traffic during the early stages of waste disposal. Previous analyses demonstrated that the live loading due to equipment loading was insignificant in comparison with the static loading at full height of the landfill so long as the initial cover over the riser pipes was at least 5 feet. The modification does not change this.

Static Loading

Pipe static loads were calculated using the Prism Load Method. The overburden load on the leachate collection pipe, (from top to bottom) includes the protective cover layer, waste layer, and the drainage layer. Because all of the layer thicknesses are constant except the waste layer, the most critical case (maximum static load) occurs where the waste thickness is greatest.

A comparison between the final cover grading plan and leachate collection system plan shows that the maximum waste thickness in MC6F is 106 feet with 4 feet of cover soil in the cap system and a 1-foot drainage layer below the waste. Figure 2 illustrates the thicknesses and unit weights of the various soil material layers above the sump riser.

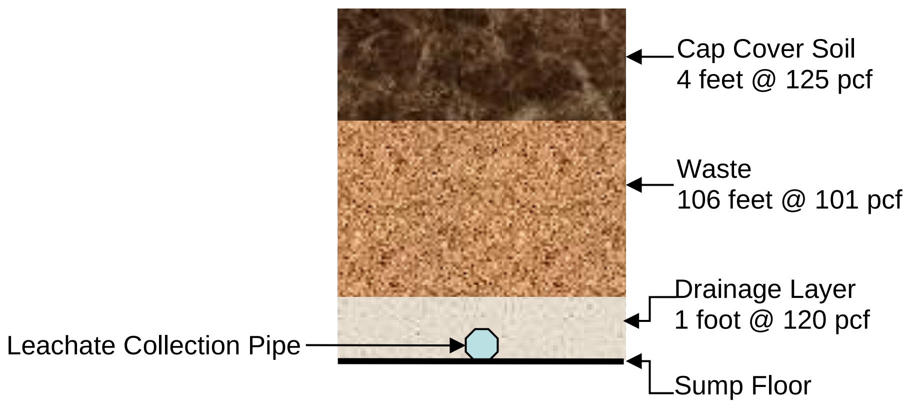


Figure 2. Cross Section of Typical Profile of Leachate Pipe for Static Loading Analysis
Figure Not To Scale

The Prism Load Method is most conservative as it does not make use of any reduction factors (Moser 1990). Equation 1 shows how the pressure on the pipe is calculated.

$$\sigma_s = \gamma_{c.s}\ h_{c.s.} + \gamma_{waste}\ h_{waste} + \gamma_{l.s}\ h_{l.s} \tag{1}$$

Where:

σ_s = static load on the leachate pipes, pounds per square foot [psf]
$\gamma_{c.s}$ = unit weight of final cover soil, pounds per cubic foot [pcf]
$h_{c.s}$ = thickness of final cover soil [ft]
γ_{waste} = unit weight of waste [pcf]
h_{waste} = depth of waste above the pipe [ft]
$\gamma_{l.s}$ = unit weight of sumpfloor aggregate above the pipe [pcf]
$h_{l.s}$ = thickness of sump floor aggregate above the pipe [ft]

Pipe and Soil Properties Sources

The maximum allowable deflection ratios of HDPE pipes is 7.5% (ASTM F1962-11). As stated in the Handbook of PE Pipe, “for non-pressure applications, a 7.5 percent defection limit provides a large safety factor against instability and strain and is considered a safe design defection. Some engineers will design profile wall pipe and other non-pressure pipe applications to a 5% defection limit, but allow spot defections up to 7.5% during field inspection.” (Plastic Pipe Institute, 2019)

The elastic modulus for HDPE pipe material (E_p) was reduced to 21,170 pounds per square inch (psi) to account for potential creep effects assuming a temperature of 100° F for 50 years (Plastic Pipe Institute, 2020).

The soil reaction modulus (E') depends on the soil elastic modulus (E_s) which is in turn based on soil stress. (Qian et al 2001).

$$E' = 2 \times E_s \tag{5}$$

Where:

E' = soil reaction modulus, psi
E_s = soil elastic modulus, psi

The soil elastic modulus was conservatively selected as 5,062 psi (*See Attachment 2 – Determination of Soil Elasticity Modulus*).

Parameter Sources

Table 2 summarizes the sources used to gather the various parameters made in these calculations.

Table 2. Sources of Pipe and Soil Parameters

	Parameter	Source
HDPE Pipe	Dimensions (*OD*, *ID*, t_p)	ISCO Pipe Catalog
	Perforation	CTI 2020
	Elastic Modulus (E_p)	Plastic Pipe Institute, 2020
	Acceptable Deflection	ASTM F1962-11
Soil	Unit Weights (γ_c, γ_d, γ_{waste})	Soil – typical values Waste – based on historical site-specific waste density
	Elastic Modulus (E_s)	Attachment 1
Misc.	Modified Iowa Method Parameters	Moser 1990

CALCULATIONS AND RESULTS

Vertical Deflection – Modified Iowa State Method

An engineering approach to estimate the deflection of buried pipes was developed by a group of research faculty and students at Iowa State University. Equation 6 is a summary of the effort of the Iowa State Group's to model buried, flexible pipe deflection (Moser 1990).

$$y \approx \frac{D_L K_b W_P}{\left(E_P I / r^3\right) + \left(0.061E'\right)} \tag{6}$$

Where:

y = vertical pipe deflection [in]

D_L = deflection lag factor

K_b = bedding constant

W_P = vertical load per unit length (in the pipe length direction) [lb/in]

$= W \times \left(\frac{12}{12-(D \times N)} \right)$

W = unadjusted (for perforation) vertical load per unit length [lb/ft]

$= \sum \gamma_i H_i$

γ_i = unit weight of material i on the pipe

H_i = thickness of material i

OD = outside diameter of pipe [in]

D = diameter of perforations [in]

N = number of perforation per row per linear foot of pipe

E_P = modulus of elasticity of pipe material [psi]

I = moment of inertia of the pipe wall per unit length [in^3]

r = mean radius of pipe [in]

$= \frac{OD - t_P}{2}$

E' = soil reaction modulus [psi]

Since the conservative Prism Load Method is being applied, no adjustment for lag is required. Therefore the deflection lag factor is set to 1.0. It is typical in designs to assume a bedding constant of 0.1, as this is also a conservative value (Moser 1990).

Once the vertical pipe deflection is determined, the corresponding percent pipe wall strain/deflection ratio can be calculated as follows.

$$\varepsilon = \frac{y}{2r} \times 100\% \quad (7)$$

Where:

ε = pipe wall strain/deflection ratio

y = vertical pipe deflection [in]

r = mean radius of pipe [in]

Wall Buckling

CALCULATION SHEET

Client: Wayne Disposal	Project No.: 1208070039		
Project: 2021 Cell 6F SSR Evaluation	Calculated By: BA	Date: 9/14/2020
Calculation: SSR Pipe Strength and Deflection Rev0	Checked By: NSG	Date: 9/20/2020
	Approved By: XZ	Date:

Local wall buckling is a longitudinal wrinkling of the pipe wall. Although wall buckling is seldom the limiting factor in the design of a pipe-soil system, a check can be made according to Equation 8 (Moser 1990).

$$FS = \frac{P_{cb}}{\sigma_z} = \frac{0.8\sqrt{\dfrac{2E'E_P}{SDR^3}}}{\sigma_z} \qquad (8)$$

Where:

P_{cb} = critical buckling pressure at top of pipe [psi]
σ_z = actual vertical pressure on the pipe [psi]
E' = modulus of soil reaction [psi]
E_p = modulus of elasticity of pipe material [psi]
SDR = standard dimension ratio = OD/t_p
OD = outside diameter of pipe [in]
T_p = pipe wall thickness [in]

A calculation spreadsheet, based on equations presented in the previous section, was developed to analyze pipe strength. See Table 3 for calculation details of HDPE pipes in the proposed modification area.

CALCULATION SHEET

Client: Wayne Disposal
Project: 2021 Cell 6F SSR Evaluation
Calculation: SSR Pipe Strength and Deflection Rev0

Project No.: 1208070039
Calculated By: BA Date: 9/14/2020
Checked By: NSG Date: 9/20/2020
Approved By: XZ Date:

Table 3. Pipe Deflection and Buckling Strength Worksheet for MC6F Leachate Collection pipes

Item	Notation	Units	1	2
			8" HDPE SDR 11	8" HDPE SDR 9
			Perforated	Perforated
Vertical load				
Design vertical stress on pipe	H_{refuse}	ft	106.0	106.0
	σ_z	psf	11,326	11,326
		psi	78.7	78.7
Outside diameter of pipe	*OD*	in	8.625	8.625
Inside Diameter of pipe	*ID*	in	6.963	6.593
Pipe Wall Thickness *OD/SDR*	t_p	in	0.784	0.958
Unadjusted vertical load per unit length $W = \gamma * H * OD$	*W*	lbs/in	678	678
Dia. of perforations	*D*	in	0.50	0.50
No. of Perforation Rows per foot	*N*		**2**	**2**
Modified Vertical stress $W_p = W*(12/(12-(D*N)))$	W_p	lbs/in	740	740
Vertical Deflection (Modified Iowa Method)				
Deflection Lag factor	D_L		1.00	1.00
Mean Pipe radius $r = (OD-t_p)/2$	*r*	in	3.92	3.83
Bedding Constant	K_b		0.10	0.10
Soil Modulus of Elasticity	E_s	psi	5062.1	5062.1
Modulus Soil Reaction $E' = 2E_s$	*E'*	psi	10,124	10,124
Pipe Modulus of elasticity	E_p	psi	21,170	21,170
Moment of Inertia $I = (t_p^3/12)$	*I*	in^3	0.0402	0.0733
Vertical Deflection $y = [(D_L K_b W_p)/((E_p I/r^3)+(0.061E_s)]$	*y*	in	0.1172	0.1147
Percentage Deflection *y/(2r) for both PVC and HDPE*	ε	%	**1.5%**	**1.5%**
Limiting Strain for HDPE pipe		%	2.7%	2.2%
Buckling Analysis (for HDPE pipes only)				
Critical Buckling Pressure $P_{bc} = 0.8*(2E_s E_p/SDR^3)^{0.5}$	P_{bc}	psi	454.00	613.46
Required Factor of Safety	*FS*		*1.0*	*1.0*
Provided F.S against wall buckling $FS = P_{bc}/[\sigma z/(1-nd/12)]$	*FS*		**5.3**	**7.1**

CONCLUSIONS

The vertical deflection and factors of safety against buckling and collapse were examined for the leachate collection pipes in the proposed modification. The strength and deflection analyses are shown in Table 3.

Based on the results in Table 3 for the MC6F leachate collection pipes, it is concluded that the calculations indicate acceptable levels of deflection will occur and an adequate factor of safety is provided against buckling for both SDR-11 and SDR-9.

REFERENCES

ASTM F1962-11 (2011) "*Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings*"

ISCO Product Catalog, Section B: ASTM HDPE Materials, 4710 HDPE Pipe Sizes. https://isco-pipe.com/wp-content/uploads/2019/03/Q3_2018_Entire-Catalog_Final_web.pdf (accessed Sept 9, 2020)

Moser, A.P. (1990) *Buried Pipe Design*, McGraw-Hill, New York.

Plastic Pipe Institute, Second Edition Handbook of PE Pipe. https://plasticpipe.org/publications/pe-handbook.html (accessed Sept 9, 2020)

Xuede Qian, Robert M. Koerner and Donald H. Gray (2001) "*Geotechnical Aspects of Landfill Design and Construction*" Prentice Hall, New Jersey.

Attachment B-3.2.1
Pipe Properties Charts

CALCULATION SHEET

Client: Wayne Disposal
Project: 2021 Cell 6F SSR Evaluation
Calculation: SSR Pipe Strength and Deflection Rev0

Project No.: 1208070039
Calculated By: BA Date: 9/14/2020
Checked By: NSG Date: 9/20/2020
Approved By: XZ Date:

TABLE B.1.1
Apparent Elastic Modulus for 73°F (23°C)

Duration of Sustained Loading	Design Values For 73°F (23°C) (1,2,3)					
	PE 2XXX		PE3XXX		PE4XXX	
	psi	MPa	psi	MPa	psi	MPa
0.5hr	62,000	428	78,000	538	82,000	565
1hr	59,000	407	74,000	510	78,000	538
2hr	57,000	393	71,000	490	74,000	510
10hr	50,000	345	62,000	428	65,000	448
12hr	48,000	331	60,000	414	63,000	434
24hr	46,000	317	57,000	393	60,000	414
100hr	42,000	290	52,000	359	55,000	379
1,000hr	35,000	241	44,000	303	46,000	317
1 year	30,000	207	38,000	262	40,000	276
10 years	26,000	179	32,000	221	34,000	234
50 years	22,000	152	28,000	193	29,000	200
100 years	21,000	145	27,000	186	28,000	193

(1) Although there are various factors that determine the exact apparent modulus response of a PE, a major factor is its ratio of crystalline to amorphous content – a parameter that is reflected by a PE's density. Hence, the major headings PE2XXX, PE3XXX and, PE4XXX, which are based on PE's Standard Designation Code. The first numeral of this code denotes the PE's density category in accordance with ASTM D3350 (An explanation of this code is presented in Chapter 5).

(2) The values in this table are applicable to both the condition of sustained and constant loading (under which the resultant strain increases with increased duration of loading) and that of constant strain (under which an initially generated stress gradually relaxes with increased time).

(3) The design values in this table are based on results obtained under uni-axial loading, such as occurs in a test bar that is being subjected to a pulling load. When a PE is subjected to multi-axial stressing its strain response is inhibited, which results in a somewhat higher apparent modulus. For example, the apparent modulus of a PE pipe that is subjected to internal hydrostatic pressure – a condition that induces bi-axial stressing – is about 25% greater than that reported by this table. Thus, the Uni-axial condition represents a conservative estimate of the value that is achieved in most applications.

It should also be kept in mind that these values are for the condition of continually sustained loading. If there is an interruption or a decrease in the loading this, effectively, results in a somewhat larger modulus.

In addition, the values in this table apply to a stress intensity ranging up to about 400psi, a value that is seldom exceeded under normal service conditions.

(Plastic Pipe Institute, 2020, Ch. 3)

TABLE B.1.2

Temperature Compensating Multipliers for Determination of the Apparent Modulus of Elasticity at Temperatures Other than at 73°F (23°C)

Equally Applicable to All Stress-Rated PE's
(e.g., All PE2xxx's, All PE3xxx's and All PE4xxx's)

Maximum Sustained Temperature of the Pipe °F (°C)	Compensating Multiplier
-20 (-29)	2.54
-10 (-23)	2.36
0 (-18)	2.18
10 (-12)	2.00
20 (-7)	1.81
30 (-1)	1.65
40 (4)	1.49
50 (10)	1.32
60 (16)	1.18
73.4 (23)	1.00
80 (27)	0.93
90 (32)	0.82
100 (38)	0.73
110 (43)	0.64
120 (49)	0.58
130 (54)	0.50
140 (60)	0.43

(Plastic Pipe Institute, 2020, Ch. 3)

CALCULATION SHEET

Client: Wayne Disposal
Project: 2021 Cell 6F SSR Evaluation
Calculation: SSR Pipe Strength and Deflection Rev0

Project No.: 1208070039
Calculated By: BA Date: 9/14/2020
Checked By: NSG Date: 9/20/2020
Approved By: XZ Date:

DR		7			7.3			9		
PE4710 Pressure Rating Resistencia a la Presión		333 psi			317 psi			250 psi		
Nom. OD DE Nominal	Actual OD DE Actual (in)	Min Wall Espesor Mínimo de Pared (in)	Avg ID DI Promedio (in)	Weight Peso (lb/ft)	Min Wall Espesor Mínimo de Pared (in)	Avg ID DI Promedio (in)	Weight Peso (lb/ft)	Min Wall Espesor Mínimo de Pared (in)	Avg ID DI Promedio (in)	Weight Peso (lb/ft)
¾"	1.05	0.15	0.732	0.19	0.144	0.745	0.18	0.117	0.803	0.15
1"	1.315	0.188	0.917	0.291	0.18	0.933	0.281	0.146	1.005	0.235
1¼"	1.66	0.237	1.157	0.463	0.227	1.178	0.45	0.184	1.269	0.374
1½"	1.9	0.271	1.325	0.607	0.26	1.348	0.59	0.211	1.452	0.49
2"	2.375	0.339	1.656	0.95	0.325	1.685	0.92	0.264	1.816	0.77
3"	3.5	0.5	2.44	2.06	0.479	2.484	1.99	0.389	2.676	1.664
4"	4.5	0.643	3.137	3.402	0.616	3.193	3.29	0.5	3.44	2.751
5"	5.375	0.768	3.747	4.85	0.736	3.814	4.68	0.597	4.109	3.92
5"	5.563	0.795	3.878	5.2	0.762	3.947	5.022	0.618	4.253	4.204
6"	6.625	0.946	4.619	7.374	0.908	4.701	7.13	0.736	5.064	5.963
7"	7.125	1.018	4.967	8.49	0.976	5.056	8.23	0.792	5.447	6.89
8"	8.625	1.232	6.013	12.498	1.182	6.12	12.07	0.958	6.593	10.11

DR		11		
PE4710 Pressure Rating Resistencia a la Presión		200 psi		
Nom. OD DE Nominal (in)	Actual OD DE Actual (in)	Min Wall Espesor Mínimo de Pared (in)	Avg ID DI Promedio (in)	Weight Peso (lb/ft)
¾"	1.05	0.095	0.848	0.13
1"	1.315	0.12	1.062	0.2
1¼"	1.66	0.151	1.34	0.314
1½"	1.9	0.173	1.534	0.411
2"	2.375	0.216	1.917	0.642
3"	3.5	0.318	2.825	1.395
4"	4.5	0.409	3.633	2.31
5"	5.375	0.489	4.339	3.29
5"	5.563	0.506	4.491	3.523
6"	6.625	0.602	5.348	5
7"	7.125	0.648	5.752	5.78
8"	8.625	0.784	6.963	8.47

(*ISCO Product Catalog*)

CALCULATION SHEET

Client: Wayne Disposal | Project No.: 1208070039
Project: 2021 Cell 6F SSR Evaluation | Calculated By: BA | Date: 9/14/2020
Calculation: SSR Pipe Strength and Deflection Rev0 | Checked By: NSG | Date: 9/20/2020
Approved By: XZ | Date:

Designation: F1962 – 11

INTERNATIONAL

Standard Guide for
Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings[1]

This standard is issued under the fixed designation F1962; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

X2.6 *Deflection Limits*—The limiting deflection (in percent) is determined by the geometric stability of the deflected pipe, hydraulic capacity, and the strain occurring in the pipe wall. It has been observed that for PE, pressure-rated pipe, subjected to soil pressure only, no upper limit from a practical design point of view seems to exist for the bending strain (**15**). Therefore, for non-pressure pipes or conduits the safe long-term deflection is 7.5 % of the diameter. When subjected to internal pressure in addition to soil pressure, the localized bending strain resulting from deflection combines with the hoop tensile strain caused by internal pressure to produce a higher, localized tensile fiber-stress. However, as the internal pressure is increased the pipe re-rounds and the bending strain is reduced. At high pressures, the bending strain is reduced and the ring tensile stress approaches that due to internal pressure alone. For calculation method, see Ref. (**16**). This fact coupled with the ductility of PE permits the designer to ignore the combined effect of pressure and deflection. In lieu of an exact calculation based on allowable strain, the designer can use the safe long-term design deflection values for pressure pipe shown to Table X2.1.

TABLE X2.1 Safe Long-Term Design Deflection values for Buried Pressurized Polyethylene Pipe

DR or SDR	Deflection Limits as % of Diameter
21	7.5
17	6.0
15.5	6.0
13.5	6.0
11	5.0
9	4.0
7.3	3.0

(15) Janson, L.E.," Long-Term Studies of PVC and PE Pipes Subjected to Forced Constant Deflection", Report No. 3, KP-Council, Stockholm, Sweden, 1991.

(16) Janson, L.E., *Plastics Pipes for Water Supply and Sewage Disposal*, Borealis, Stockholm, Sweden, 1995.

Attachment B-3.2.2
Determination of Soil Elasticity Modulus

DETERMINATION OF SOIL MODULUS OF ELASTICITY

OBJECTIVE

Determine an appropriately conservative soil modulus of elasticity (E_s) for use in calculating the strength of the Master Cell VI-F (MC6F) leachate collection pipes.

ASSUMPTIONS AND METHODOLOGY

Calculation of E_s

The following assumptions were made to ensure the accuracy of the final calculated value while preserving conservatism.

- The pipe under strength analysis is to be backfilled with stone (gravel).
- Maximum estimated stress on leachate collection MC6F leachate collection pipes = 78.7 psi
- Soil modulus of elasticity can be conservatively calculated as follows (from Table 1).

$$E_s = 2 \cdot q_c \quad \text{[psi]} \qquad (1)$$

Where:
q_c = Cone Penetration Test (CPT) value [psi]

The CPT value of the stone is not available through direct test data, but it can be estimated using the friction angle and relative density. The following values were conservatively estimated based on likely properties that the gravel backfill would possess:

- Friction angle (ϕ) = 32º
- Relative Density (D_R) = 70%

CALCULATION SHEET

Client: Wayne Disposal	Project No.: 1208070039		
Project: 2021 Cell 6F Leachate Collection Pipe Evaluation	Calculated By: BA	Date: 9/14/2020	
Calculation: Attachment 2 – Soil Modulus Determination	Checked By: NSG	Date: 9/20/2020	
	Approved By: XZ	Date:	

Table 1. Equations for computing E_s by making use of SPT and CPT values [kpa] (Murthy 2003)

Soil	SPT	CPT
Sand (normally consolidated)	$500\ (N_{cor} + 15)$	$\boxed{2 \text{ to } 4\ q_c}$
	$(35000 \text{ to } 50000) \log N_{cor}$	$(1+ D_r^2)\ q_c$
	(U.S.S.R Practice)	
Sand (saturated)	$250\ (N_{cor} + 15)$	
Sand (overconsolidated)	–	$6 \text{ to } 30\ q_c$
Gravelly sand and gravel	$1200\ (N_{cor} + 6)$	
Clayey sand	$320\ (N_{cor} + 15)$	$3 \text{ to } 6\ q_c$
Silty sand	$300\ (N_{cor} + 6)$	$1 \text{ to } 2\ q_c$
Soft clay	–	$3 \text{ to } 8\ q_c$

Figure 1 shows an accepted correlation between these two properties and the CPT value, as well as stress state (in terms of horizontal stress, calculated in Equation 2)

$$\sigma_h = k_0 \cdot \sigma_v \quad \text{[psi]} \tag{2}$$

Where:

σ_h = Horizontal stress due to overburden pressure [psi]

k_0 = Lateral earth pressure coefficient

= 0.36 (conservative assumption, Table 2)

σ_v = Stress due to overburden soils

= 78.7 psi for the MC6F leachate collection pipes

Table 2. Coefficients of Earth Pressure for "at-rest" condition (Murthy 2003)

Type of soil	I_p	K_0
Loose sand, saturated	–	0.46
Dense sand, saturated	–	0.36
Dense sand, dry ($e = 0.6$)	–	0.49
Loose sand, dry ($e = 0.8$)	–	0.64
Compacted clay	9	0.42
Compacted clay	31	0.60
Organic silty clay, undisturbed ($w_l = 74\%$)	45	0.57

Thus, once certain properties are known / calculated, the CPT value can be inferred and ultimately the soil modulus determined.

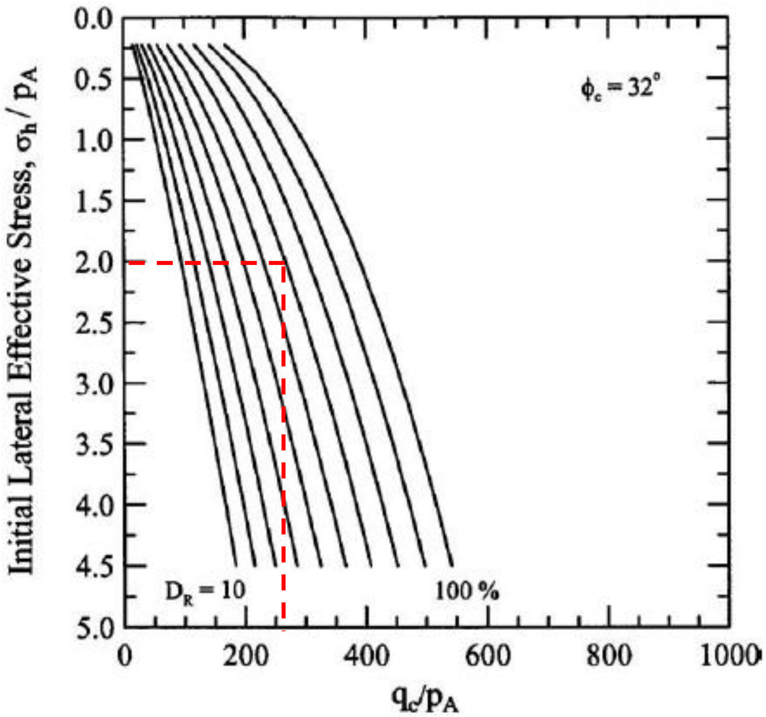


Figure 1. Correlation between Stress, Relative Density and CPT value for $\phi = 32^o$ (Salgado and Prezzi 2007)

Extrapolation of E_s

In addition to the aforementioned calculation approach (known to be conservative), the previously approved correlation between stress and soil modulus developed by Selig (1990) and referenced by Qian et al (2001) will be extrapolated for comparison with the calculated value.

CALCULATIONS AND RESULTS

- The horizontal stress (σ_h in Equation 2) was calculated as 28.3 pounds per square inch (psi).
- The σ_h / p_A ratio is therefore 2.0 (p_A = standard reference stress = 1 tsf = 13.88 psi) correlating to a q_c / p_A ratio of approximately 260. This yields a CPT value of 3,600 psi.
- Finally, the soil modulus (E_s in equation 1) is calculated to be **7,200 psi**.

Another method of analysis uses Table 3 as the basis of determining the soil modulus E_s.

Table 3. Elasticity of Soil Under Stress (Selig 1990 c/o *Qian et al 2001*)

Soil Type	Stress Level		85% Standard Density			95% Standard Density		
			E_s			E_s		
	psi	kPa	psi	MPa	ν_s	psi	MPa	ν_s
SW, SP, GW, GP	1	7	1,300	9	0.26	1,600	11	0.40
	5	35	2,100	14	0.21	4,100	28	0.29
	10	70	2,600	18	0.19	6,000	41	0.24
	20	140	3,300	23	0.19	8,600	59	0.23
	40	280	4,100	28	0.23	13,000	90	0.25
	60	420	4,700	32	0.28	16,000	110	0.29
GM, SM, ML, and GC, SC with < 20% fines	1	7	600	4	0.25	1,800	12	0.34
	5	35	700	5	0.24	2,500	17	0.29
	10	70	800	6	0.23	2,900	20	0.27
	20	140	850	6	0.30	3,200	22	0.29
	40	280	900	6	0.38	3,700	25	0.32
	60	420	1,000	7	0.41	4,100	28	0.35
CL, MH, GC, SC	1	7	100	1	0.33	400	3	0.42
	5	35	250	2	0.29	800	6	0.35
	10	70	400	3	0.28	1,100	8	0.32
	20	140	600	4	0.25	1,300	9	0.30
	40	280	700	5	0.35	1,400	10	0.35
	60	420	800	6	0.40	1,500	10	0.38

- This approved correlation is plotted in Figure 2, showing a coefficient of determination (i.e. accuracy of trend line).

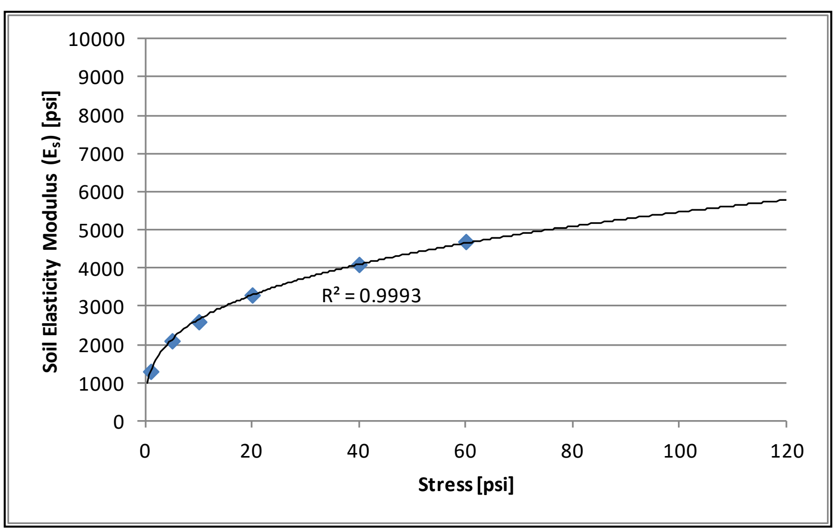


Figure 2. Correlation between overburden stress and soil elasticity modulus (from Table 3)

- The equation of the trend line shown is given below. Equation 3 was used to estimate E_s under the specified overburden pressure for both the horizontal and vertical expansion cases.

$$E_s = 1281.6\sigma_v{}^{0.3147} \quad (3)$$

- This correlation indicates that at 78.7 psi (estimated overburden scenario) the soil modulus of elasticity will be approximately **5,062 psi**.

- To preserve a conservative calculation, the smaller values of elastic modulus – 5,062 psi for horizontal expansion cells will be used in the pipe strength and deflection analysis.

REFERENCES

Murthy, V.N.S. (2003) *Geotechnical Engineering: Principles and Practices of Soils Mechanics and Foundation Engineering* Marcel Dekker, Inc., New York, NY.

Salgado, R. and Prezzi, M. (2007). "Computation of Cavity Expansion Pressure and Penetration Resistance in Sands." International Journal of Geomechanics. American Society of Civil Engineers.

Xuede Qian, Robert M. Koerner and Donald H. Gray (2001). "Geotechnical Aspects of Landfill Design and Construction" Prentice Hall, New Jersey.

Attachment B-4

Leachate Collection System Flow Capacity Analysis

Leachate Collection System Flow Capacity Analysis

Objective

To evaluate the flow capacity of the leachate collection system as a part of the proposed MC VI-F operation in Cell F1, F2, F3 and F4 at Wayne Disposal Inc. (WDI).

Design Criteria, Assumptions, and Methodology

1. The leachate collection system of the proposed design MC VI F1, F2, F3 and F4 are described below:

    a. The constructed system in MC VI F1, F2, F3 and F4 all consist of one layer of geocomposite, a 8-inch HDPE SDR-9 or 11 perforation pipe, and a 12-inch thick drainage sand layer.

2. Use Manning's equation to calculate the allowable leachate collection pipe flow:

$$Q_{pipe} = \frac{1.49}{n} A R_h^{2/3} S^{1/2} \quad (1)$$

where;
- Q_{pipe} = allowable flow rate, cubic feet per second (ft^3/sec),
- n = Manning's roughness coefficient ≈ 0.011 for HDPE or PVC pipe,
- A = cross-sectional area of the pipe, square feet (ft^2)
- R_h = hydraulic radius, feet = ID/4 for full flow,
- S = slope of pipe, minimum 1% after settlement.

For a partial flow pipe:

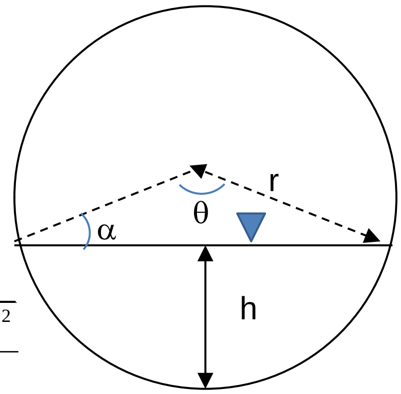
$$\alpha = \sin^{-1}\frac{r-h}{r} \quad \text{in radians}$$

$$\theta = \pi\text{-}2\alpha$$

$$\text{Wet Area}: \; A = r^2\frac{\theta}{2} - (r-h)\left(\sqrt{2rh-h^2}\right)$$

$$\text{Wet Perimeter}: \; P = r\theta$$

$$\text{Hydraulic Radius}: \; R_h = \frac{A}{P} = \frac{r}{2} - \frac{(r-h)\sqrt{2rh-h^2}}{r\theta}$$



Where:

r = pipe radius (ft)

h = liquid depth in the pipe (ft)

3. Leachate collection pipes used (or to be used) in Cell F1, F2, F3 and F4 are 8-inch diameter SDR 9 or 11 HDPE pipes with an average inside diameter (ID) of 6.593 inches (SDR 9 ID used for conservatism).

4. Flow rate for each orifice (pipe perforation) is calculated as follows [1]:

$$Q_{orifice} = CAV_{ent} \tag{2}$$

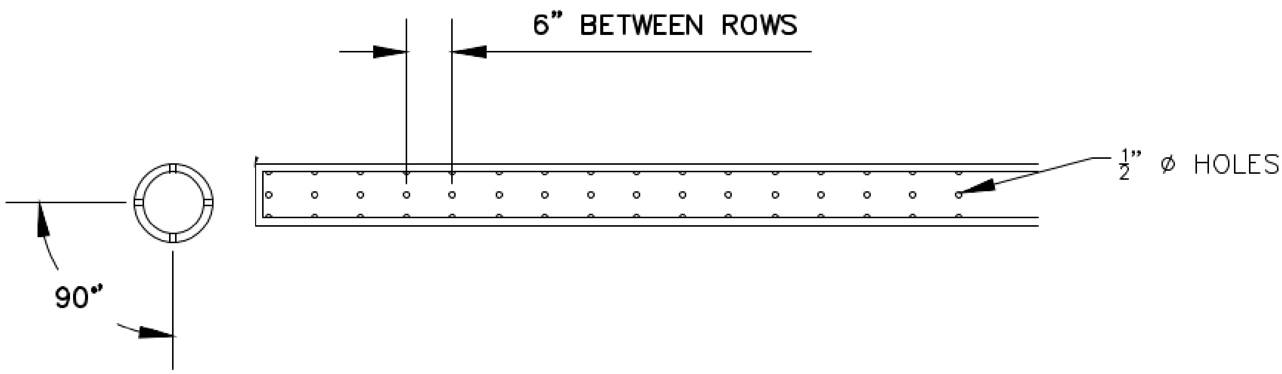
Where $Q_{orifice}$ = flow rate, cubic feet per second (ft^3/sec)

C = discharge coefficient = 0.62 [1]

A = area of orifice, square feet (ft^2)

V_{ent} = limit leachate entrance velocity, 0.1 feet per square second (ft/sec)

5. Perforations of leachate collection pipes used in MC VI F1, F2, F3 and F4 are ½ inches in diameter. Four rows of perforations along the bottom portion of the pipe were drilled with 6-inch spacing between perforations. To be conservative, it is assumed that only the bottom two rows of perforations are submerged under leachate.



6. The 8-inch leachate collection pipes in MV VI F1, F2, F3 and F4 are assumed to flow ½ full (See Appendix B-1 for detail).

7. Leachate generation was modeled using the HELP Model. The estimated leachate generation rate for the floor area and the sideslope areas is 6,373 gallons/acre/day (gpad) and 6,899 gpad, respectively. For the analysis area, the higher value of 6,373 gpad for the sideslopes was used for all pipes for conservatism.

CALCULATION SHEET

Client: US Ecology - Wayne Disposal
Project: 2021 WDI Permit Modification Application
Calculation: Leachate Collection System Flow Capacity Analysis

Project No.: 1208070039
Calculated By: BME Date: 11/06/2020
Checked By: NSG Date: 11/06/2020
Approved By: XZ Date: 11/20/2020

Calculation

Leachate Collection System - Pipe Flow Capacity

MC VI F1, F3 & F4:

Assuming the pipe is flowing full.

$$Q_{allow} = \frac{1.49}{n} A R_h^{\frac{2}{3}} S^{\frac{1}{2}} = \frac{1.49}{0.011}\left(\frac{\pi}{4}\left(\frac{6.593}{12}\right)^2\right)\left(\frac{6.593}{4\times 12}\right)^{\frac{2}{3}}(0.05)^{\frac{1}{2}} = 857.9\frac{ft^3}{s} = 1{,}235{,}422 gpd$$

Assuming the pipe is flowing ½ full (r=h, θ=π).

$$Q_{allow} = \frac{1.49}{n} A R_h^{2/3} S^{1/2} = (1.49/0.011)(0.119)(0.137)^{2/3}(0.05)^{1/2}$$

$$= 1.11\ ft^3/s = 428\ gpm = 617{,}711\ gpd$$

Where:

$$A = r^2\frac{\theta}{2} = \left(\frac{3.2965}{12}\right)^2 \times \frac{3.14}{2} = 0.119\ ft^2$$

$$R_h = \frac{A}{P} = \frac{r}{2} = \left(\frac{3.2965}{12}\right) \times \frac{1}{2} = 0.137 ft$$

S = 5%

MC VI F2:

Assuming the pipe is flowing full.

$$Q_{allow} = \frac{1.49}{n} A R_h^{\frac{2}{3}} S^{\frac{1}{2}} = \frac{1.49}{0.011}\left(\frac{\pi}{4}\left(\frac{6.593}{12}\right)^2\right)\left(\frac{6.593}{4\times 12}\right)^{\frac{2}{3}}(0.02)^{\frac{1}{2}} = 1.20\frac{ft^3}{s} = 781{,}350 gpd$$

Assuming the pipe is flowing ½ full.

$$Q_{allow} = \frac{1.49}{n} A R_h^{2/3} S^{1/2} = (1.49/0.011)(0.119)(0.137)^{2/3}(0.02)^{1/2}$$

$$= .604\ ft^3/s = 271.3\ gpm = 390{,}674\ gpd$$

Where:

$A = 0.119\ ft^2$
$R_h = 0.137$ ft
S = 2%

CALCULATION SHEET
Client: US Ecology - Wayne Disposal
Project: 2021 WDI Permit Modification Application
Calculation: Leachate Collection System Flow Capacity Analysis

Project No.: 1208070039
Calculated By: BME Date: 11/06/2020
Checked By: NSG Date: 11/06/2020
Approved By: XZ Date: 11/20/2020

Leachate Collection System – Perforation Flow Capacity

MC VI F1, F2, F3 & F4 :

$$Q_{orifice} = CVA = 0.62 \times 0.1 \times \frac{\pi d^2}{4}$$

$$= 0.062 \times \frac{\pi (0.5/12)^2}{4}$$

$$= 8.45 \times 10^{-5} \text{ ft}^3/\text{sec}$$

$$= 54.64 \text{ gallon/day}$$

The total flow capacity for the perforations can be determined using the following equation and the results are presented in Table 1:

$$Q_{perforation} = n \times L \times Q_{orifice}$$

Where
$Q_{perforation}$ = total flow capacity through the perforations (gpd)
n = number perforation per foot (4 holes per foot)
L = perforated pipe length (ft)

Table 1. Flow Capacity for the Pipe Perforations

	Cell F1	Cell F2	Cell F3	Cell F4
Leachate collection pipe length (ft)	430	405	625	600
Maximum flow capacity of perforation (gpd)	93,973	88,509	136,589	131,125
Estimated leachate generation based upon HELP Model (gpd)	25,211	38,264	40,564	55,228

Conclusion

Based on the above calculations, flow capacities of leachate collection pipes and perforations are shown in Table 2. Note that the geocomposite layer and stone pack around the pipe can provide additional flow capacity for leachate collection system. Therefore, the presented value is conservative.

Table 2. Flow Capacity for the Leachate Collection Systems

	MC VI F1	MC VI F2	MC VI F3	MC VI F4
Flow Capacity of Collection pipe (gpd)	**1,235,422**	**781,350**	**1,235,422**	**1,235,422**
Maximum flow capacity of perforation (gpd)	**93,973**	**88,509**	**136,589**	**131,125**
Cell Acreage (acres)	**3.65**	**5.55**	**5.88**	**8.01**
Estimated leachate generation based upon HELP Model (gpd)	**25,211**	**38,264**	**40,564**	**55,228**

Reference

1. Qian, Xuede; Koerner, Robert; and Gray, Donald "Geotechnical Aspects of Landfill Design and Construction" Prentice Hall, 2001.

ATTACHMENT B-4.1

PIPE SIZES

HDPE Pipe

Source: www.hdpepipeco.com

PE 3608/3408 IPS HDPE PIPE SIZES

Pressure Rating		DR 7 (267psi)			DR 7.3 (254psi)			DR 9 (200psi)			DR 11 (160psi)			DR 13.5 (128psi)			DR 15.5 (110psi)		
Nominal Size	Actual O.D.	Min. wall	Average I.D.	Weight lb/lf	Min. wall	Average I.D.	Weight lb/lf	Min. wall	Average I.D.	Weight lb/lf	Min. wall	Average I.D.	Weight lb/lf	Min. wall	Average I.D.	Weight lb/lf	Min. wall	Average I.D.	Weight lb/lf
3/4"	1.05"	0.150"	0.732"	0.184	0.144"	0.745"	0.178	0.117"	0.803"	0.150	0.095"	0.848"	0.125	---	---	---	---	---	---
1"	1.315"	0.188"	0.917"	0.289	0.180"	0.933"	0.279	0.146"	1.005"	0.234	0.120"	1.062"	0.197	---	---	---	---	---	---
1 1/4"	1.66"	0.237"	1.157"	0.460	0.227"	1.178"	0.444	0.184"	1.269"	0.372	0.151"	1.340"	0.312	---	---	---	---	---	---
1 1/2"	1.90"	0.271"	1.325"	0.603	0.260"	1.348"	0.582	0.211"	1.452"	0.488	0.173"	1.534"	0.409	---	---	---	---	---	---
2"	2.375"	0.339"	1.656"	0.943	0.325"	1.685"	0.762	0.264"	1.816"	0.762	0.216"	1.917"	0.639	0.176"	2.002"	0.531	0.153"	2.050"	0.467
3"	3.500"	0.500"	2.440"	2.047	0.479"	2.484"	1.656	0.389"	2.676"	1.656	0.318"	2.825"	1.387	0.259"	2.950"	1.153	0.226"	3.021"	1.015
4"	4.500"	0.643"	3.137"	3.384	0.616"	3.193"	2.737	0.500"	3.440"	2.737	0.409"	3.633"	2.294	0.333"	3.793"	1.906	0.290"	3.885"	1.678
5"	5.375"	0.768"	3.747"	4.830	0.736"	3.814"	4.663	0.597"	4.109"	3.903	0.489"	4.339"	3.272	0.398"	4.531"	2.718	0.347"	4.640"	2.396
5"	5.563"	0.795"	3.878"	5.172	0.762"	3.947"	4.182	0.618"	4.253"	4.182	0.506"	4.491"	3.505	0.412"	4.689"	2.912	0.359"	4.802"	2.564
6"	6.625"	0.946"	4.619"	7.336	0.908"	4.701"	5.932	0.736"	5.064"	5.932	0.602"	5.348"	4.971	0.491"	5.585"	4.130	0.427"	5.719"	3.637
7"	7.125"	1.018"	4.967"	8.195	0.976"	5.056"	8.200	0.792"	5.447"	6.863	0.648"	5.752"	5.750	0.528"	6.006"	4.779	0.460"	6.150"	3.985
8"	8.625"	1.232"	6.013"	12.433	1.182"	6.120"	10.054	0.958"	6.593"	10.054	0.784"	6.963"	8.425	0.639"	7.271"	7.001	0.556"	7.445"	6.164
10"	10.750"	1.536"	7.494"	19.314	1.473"	7.628"	15.618	1.194"	8.218"	15.618	0.977"	8.678"	13.089	0.796"	9.062"	10.875	0.694"	9.280"	9.576
12"	12.750"	1.821"	8.889"	27.170	1.747"	9.047"	21.970	1.417"	9.747"	21.970	1.159"	10.293"	18.412	0.944"	10.748"	15.298	0.823"	11.006"	13.471
14"	14.000"	2.000"	9.760"	32.758	1.918"	9.934"	26.489	1.556"	10.702"	26.489	1.273"	11.302"	22.199	1.037"	11.801"	18.445	0.903"	12.085"	16.242
16"	16.00"	2.286"	11.154"	42.786	2.192"	11.353"	34.598	1.778"	12.231"	34.598	1.455"	12.916"	28.994	1.185"	13.487"	24.092	1.032"	13.812"	21.214
18"	18.00"	2.571"	12.549"	54.151	2.466"	12.773"	43.788	2.000"	13.760"	43.788	1.636"	14.531"	36.696	1.333"	15.173"	30.491	1.161"	15.538"	26.849
20"	20.00"	2.857"	13.943"	66.853	2.740"	14.192"	54.059	2.222"	15.289"	54.059	1.818"	16.145"	45.304	1.481"	16.859"	37.643	1.290"	17.265"	33.146
22"	22.00"	3.143"	15.337"	80.170	3.014"	15.611"	65.412	2.444"	16.818"	65.412	2.000"	17.760"	54.818	1.630"	18.545"	45.548	1.419"	18.991"	40.107
24"	24.00"	3.429"	16.731"	96.267	3.288"	17.030"	92.988	2.667"	18.347"	77.845	2.182"	19.375"	65.237	1.778"	20.231"	54.206	1.548"	20.717"	47.731
26"	26.00"	---	---	---	3.562"	18.449"	110.192	2.889"	19.876"	92.050	2.364"	20.989"	76.563	1.926"	21.917"	63.617	1.677"	22.444"	56.018
28"	28.00"	---	---	---	---	---	---	3.111"	21.404"	106.750	2.545"	22.604"	88.795	2.074"	23.603"	73.781	1.806"	24.170"	64.967
30"	30.00"	---	---	---	---	---	---	3.333"	22.933"	121.633	2.727"	24.218"	101.934	2.222"	25.289"	84.697	1.935"	25.897"	74.580
32"	32.00"	---	---	---	---	---	---	3.556"	24.462"	139.452	2.909"	25.833"	116.670	2.370"	26.975"	96.367	2.065"	27.623"	84.855
34"	34.00"	---	---	---	---	---	---	---	---	---	3.091"	27.447"	130.930	2.519"	28.661"	109.332	2.194"	29.350"	96.209
36"	36.00"	---	---	---	---	---	---	---	---	---	3.273"	29.062"	146.780	2.667"	30.347"	121.960	2.323"	31.076"	107.395
42"	42.00"	---	---	---	---	---	---	---	---	---	---	---	---	3.111"	35.404"	166.800	2.710"	36.255"	146.176
48"	48.00"	---	---	---	---	---	---	---	---	---	---	---	---	3.556"	40.462"	217.895	3.097"	41.435"	175.891
54"	54.00"	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3.484"	46.614"	242.649
63"	62.99"	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTE

Attachment B-5

Leachate Collection System Flow Capacity Analysis

Attachment B-5.1

Maximum Head-on-Liner Calculation

Leachate Head-on-Liner Analysis for Liner Sideslopes

Objective

To determine the required geocomposite drainage layer transmissivity to maintain less than 1 foot of head on the liner system for the sideslopes for Master Cell VI-F1 through Master Cell VI-F4 (MC VI-F) at Wayne Disposal Inc. (WDI).

Design Criteria, Assumptions, and Methodology

The analysis was conducted using the following procedures:

1. Estimate the anticipated leachate impingement rate using the leachate generation estimate from the Hydrologic Evaluation of Landfill Performance (HELP) Model. Two separate models were developed for the 3H:1V sideslope area and the floor area. The resultant impingement rate for the floor and sideslope areas are 6,373 and 6,899 gal/acre/day, respectively. See Attachment 2.2 for additional details.

2. MC VI-F1, MC VI-F3, and MC VI-F4 have a 6% floor slope. The northern portion of MC VI-F2 has a 4% floor slope. All MC VI-F subcells have cell sideslopes at 3H:1V. See Figure 1. Two critical sideslopes were analyzed for this analysis. The first was MC VI-F2 which the longest total slope length has a 55 foot long 3H:1V sideslope and 284 feet of 4% floor. The second critical slope was for MC VI-F4. The longest total slope length was a 3H:1V slope of 55 feet with a 320 foot long 6% floor.

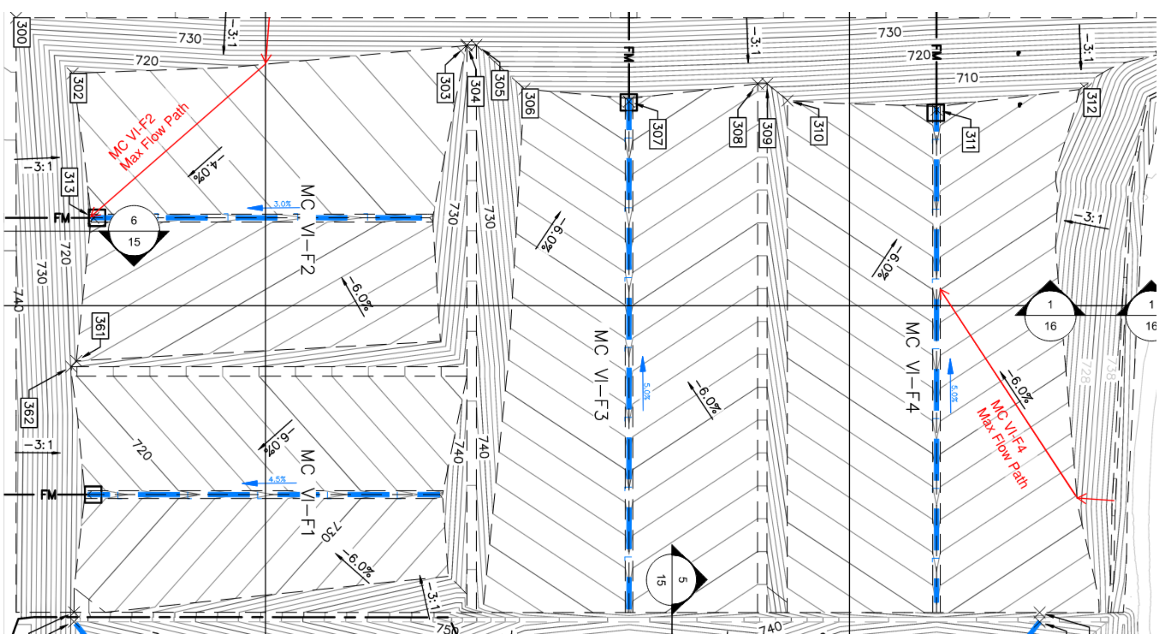


Figure 1 - Cell Layout

3. When the drainage geocomposite is used as part of the leachate collection system, the protection/drainage soil layer is constructed on top of the geocomposite layer. The combine (apparent) hydraulic conductivity of both layers can be calculated as [1]:

$$K_{combined} = K_{geonet} + \left(K_{sand} - K_{geonet}\right)\frac{t_{sand}{}^{2}}{\left(t_{sand} + t_{geonet}\right)^{2}} \qquad (1)$$

where,

$K_{combined}$ = combined hydraulic conductivity of the saturated drainage layer (cm/s)
K_{sand} = hydraulic conductivity of the protective/drainage soil (cm/s)
K_{geonet} = hydraulic conductivity of the geonet or geocomposite (cm/s)
t_{sand} = thickness of the saturated protective/drainage soil layer (in)
t_{geonet} = thickness of the geocomposite (in)

4. Vary the transmissivity of the geocomposite to estimate the minimum required drainage geocomposite transmissivity required. An additional cumulative reduction-factor of 5.28 is also applied to the transmissivity of the geocomposite drainage layer based on the following reduction factors based on GRI GC8:

   Reduction Factor for Intrusion – 1.0 – 100 hour test results to be used
   Reduction Factor for Creep – 1.2 – Typical value for high performance geocomposite under high loading
   Reduction factor for Chemical Clogging – 2.0 – highest value from GRI GC8
   Reduction Factor for Biological Clogging – 1.1 – not expected to be significant due to the nature of the waste
   Factor of Safety – 2.0

5. Head-on-Liner Calculation – Numerical Solution of McEnroe's Equation

   The design for MC VI-F1 through MC VI-F4 utilizes a leachate collection pipe that is laid on top of the base liner within a recessed trench.

   The McEnroe 93 Method is an analytical solution form the differential flow governing equation under a free draining condition. However, the differential flow governing equation can be integrated numerically to describe the saturated depth profile without preconditions such as the free draining requirement. This numerical solution of McEnroe's equation can be used to calculate the maximum head-on-liner calculation for all cells (See Attachment 2: Slope Combined Numerical Method).

   The differential flow governing equation is:

$$Ky\left(\frac{dy}{dx} - \tan\alpha\right)\cos^2\alpha + rx = 0 \qquad (2)$$

where,

K = hydraulic conductivity of the saturated drainage layer (cm/s)
y = saturated liquid depth over the liner (cm or inch)
x = horizontal coordinate (cm or inch)
r = leachate infiltration rate (cm/s)
α = slope angle

Equation 2 can be rearranged in a finite differential form:

$$y_{i+1} = y_i + \left(\tan\alpha - \frac{r x_i}{K y_i \cos^2\alpha} \right) dx \qquad (3)$$
$$dx = x_{i+1} - x_i$$

Equation 3 can be numerically integrated using a pre-selected saturated liquid depth (y_L) at the low end of the slope where "x" is equivalent to the maximum drainage length (Figure 1). The procedure will result in a full phreatic surface profile and from which, the maximum head-on-liner value can be determined.

Two cases were analyzed: (1) assuming the geocomposite drainage layer in the sand are both conveying leachate to the sump and (2) the case in which the leachate head is maintained within the thickness of the geonet and the sand layer serves only as a protective cover layer above the geocomposite and not as a lateral leachate drainage layer. For the first case, the calculated saturated depth of the sand was iterated until the predicted head on the liner and the saturated thickness converged at approximately 12 inches by varying the geocomposite transmissivity. For the second case, the transmissivity of the geocomposite was adjusted until the flow depth was equal to the thickness of the geonet component (0.20 inches).

CALCULATION SHEET

Client: US Ecology – Wayne Disposal
Project: 2021 WDI Permit Modification Application
Calculation: Leachate Head-on-Liner Analysis

Project No.: 1208070039
Calculated By: NG Date: 11/13/2020
Checked By: CAB Date: 11/13/2020
Approved By: XZ Date: 1/17/2021

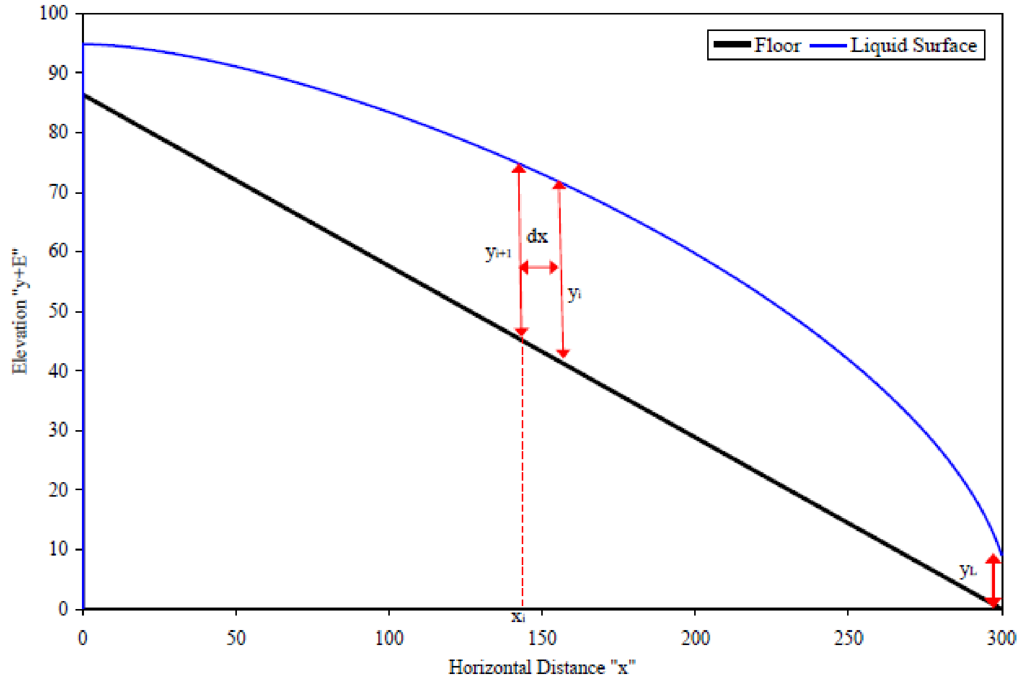


Figure 1. Example of Phreatic Leachate Surface

Calculation

For all cells, the starting leachate depth (y_L) is 0.1-inch since the leachate collection pipes were laid in recessed trenches. An interval of 0.5 inches was used as the incremental distance (dx) to generate a smooth surface. Geocomposite drainage layer transmissivity was adjusted until the predicted leachate thickness was less than 12 inches or less than 0.20 inches for the geocomposite/sand combination or geocomposite-alone analyses, respectively.

Results and Conclusion

The results are summarized in Table 1 for all cells. The minimum transmissivity for MC VI-F4 should be utilized for MC VI-F1 and MC VI-F3 to be conservative. The MC VI-F2 minimum transmissivity is to be utilized for only that cell because of its unique geometry. If the geocomposite transmissivity exceeds the minimum value for each cell neglecting the sand then the sand layer will serve only as a protective cover layer and not serve as a lateral leachate drainage layer.

The maximum leachate head on liner at the toe of the sideslope is below 1 inch in all cases.

CALCULATION SHEET
Client: US Ecology – Wayne Disposal
Project: 2021 WDI Permit Modification Application
Calculation: Leachate Head-on-Liner Analysis

Project No.: 1208070039
Calculated By: NG Date: 11/13/2020
Checked By: CAB Date: 11/13/2020
Approved By: XZ Date: 1/17/2021

Table 1 – Input Parameters and Minimum Required Geocomposite Transmissivity Results

Parameter	**MC VI-F2**	**MC VI-F2 - Neglecting Sand (2)**	**MC VI-F4**	**MC VI-F4 - Neglecting Sand (2)**
Estimated leachate generation rate - floor (gpad)	6,373	6,373	6,373	6,373
Floor slope used in calculation	4.0%	4.0%	6.0%	6.0%
Maximum drainage distance on floor (ft)	284	284	320	320
Length of 3H:1V sideslope	55	55	55	55
Estimated leachate generation rate - sideslopes (gpad)	6,899	6,899	6,899	6,899
Maximum allowable head-on-liner (in)	12	0.2	12	0.2
Maximum leachate depth at discharge point (in) (at leachate collection pipe)	0.1	0.1	0.1	0.1
Assumed sand permeability (cm/sec) (1)	1.0E-03	n/a	1.0E-03	n/a
Minimum required transmissivity for geocomposite on floor (m^2/sec)	**4.1E-04**	**9.3E-04**	**3.2E-04**	**7.0E-04**
Maximum Head-on-Liner at toe of the sideslope (inches)	**0.95**	**0.04**	**0.60**	**0.03**

NOTES

(1) Minimum requirement for protective sand layer in Part 115 Rules R299.4423(2)(ii) with geocomposite
(2) Minimum requirement of the geocomposite drainage layer to keep the flow within the thickness of the geonet.

Reference

1. Qian, Xuede; Gray, D.H.; Koerner, R.M. 2004, "Estimation of Maximum Liquid Head over Landfill Barriers", Journal of Geotechnical and Geoenvironmental Engineering, Vol. 130, No.5, Page 488-497.

2. McEnroe, B (1993) "Maximum Saturated Depth over Landfill Liner" Journal of Environmental Engineering, Val. 119, No.2, Page 262-270

CALCULATION SHEET

Client: US Ecology – Wayne Disposal
Project: 2021 WDI Permit Modification Application
Calculation: Leachate Head-on-Liner Analysis

Project No.: 1208070039
Calculated By: NG Date: 11/13/2020
Checked By: CAB Date: 11/13/2020
Approved By: XZ Date: 1/17/2021

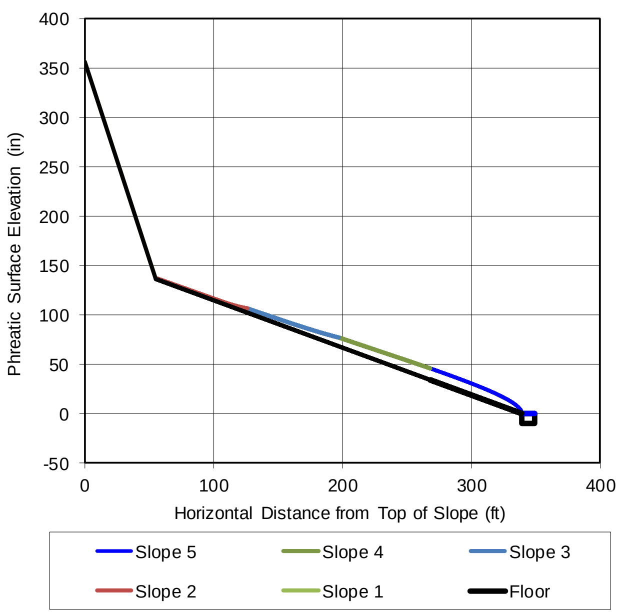
ATTACHMENT A-5.1.1

Head-on-Liner Calculation Spreadsheets

WDI MC VI-F2
R.01

Prepared by: NG 10/01/2020							
Reviewed by:			**SLOPE 5**	**SLOPE 4**	**SLOPE 3**	**SLOPE 2**	**SLOPE 1**
Approved by:	*minimum y (in)*	*0.010*	**Bottom**				**Top**
Slope in the direction of flow	S	ft./ft.	**4.00%**	**4.00%**	**4.00%**	**4.00%**	**33.33%**
Slope angle	α	radians	0.0400	0.0400	0.0400	0.0400	0.3218
Flow length in the direction of flow	L	ft.	**71**	**71**	**71**	**71**	**55**
Rate of vertical inflow per unit area	r	gal/acre/day	**6,373**	**6,373**	**6,373**	**6,373**	**6,899**
Saturated thickness of sand (or protective soil)	t_{sand}	in	**12.0**	**11.7**	**8.9**	**4.3**	**1.0**
		ft.	*1.000*	*0.975*	*0.738*	*0.358*	*0.079*
Permeability of sand (or protective soil)	K_{sand}	cm/sec	**1.00E-03**	**1.00E-03**	**1.00E-03**	**1.00E-03**	**1.00E-03**
Thickness of geonet	t_{geonet}	in.	**0.200**	**0.200**	**0.200**	**0.200**	**0.200**
		ft.	**0.017**	**0.017**	**0.017**	**0.017**	**0.017**
Geocomposite transmissivity	m2/s	m2/s	**4.10E-04**	**4.10E-04**	**4.10E-04**	**4.10E-04**	**4.10E-04**
Reduction Factor			**5.28**	**5.28**	**5.28**	**5.28**	**5.28**
Permeability of geocomposite	K_{geonet}	cm/sec	1.53E+00	1.53E+00	1.53E+00	1.53E+00	1.53E+00
Combined (apparent) permeability	K_{app}	**cm/sec**	**5.07E-02**	**5.19E-02**	**6.78E-02**	**1.34E-01**	**4.86E-01**
Leachate Head at Discharge Point	**h at L=0**	in	**0.10**	**11.70**	**8.85**	**4.30**	**0.95**
Step Size	dL	in	0.1	0.1	0.1	0.1	0.1
Unit Width	W	ft	1	1	1	1	1

Maximum head on liner (McEnroe numerical) in each slope	**in**	**11.94**	**11.70**	**8.85**	**4.30**	**0.95**
Maximum head on liner location (McEnroe numerical) in each slope	**ft**	**287.18**	**268.00**	**197.00**	**126.00**	**55.00**
		0.07	0.04	0.04	0.04	0.04
Maximum head on liner (McEnroe numerical) in all slope	**in**	**11.94**				



McEnroe 1993 "Maximum Saturated Depth over Landfill Liner"
Journal of Environmental Engineering

For Slope 1

$$y_{i+1} = y_i + \left(\tan \alpha_1 - \frac{r_1 x_i}{k_1 y_i \cos^2 \alpha_1} \right) (x_{i+1} - x_i)$$

Fore Slopes 2 - 5

$$y_{i+1} = y_i + \left(\tan \alpha_j - \frac{\sum_{f=1}^{j-1} r_f L_f + r_j \left(x_i - \sum_{f=1}^{j-1} L_f \right)}{k_j y_i \cos^2 \alpha_j} \right) (x_{i+1} - x_i)$$

CALCULATION SHEET

Client: US Ecology – Wayne Disposal
Project: 2021 WDI Permit Modification Application
Calculation: Leachate Head-on-Liner Analysis

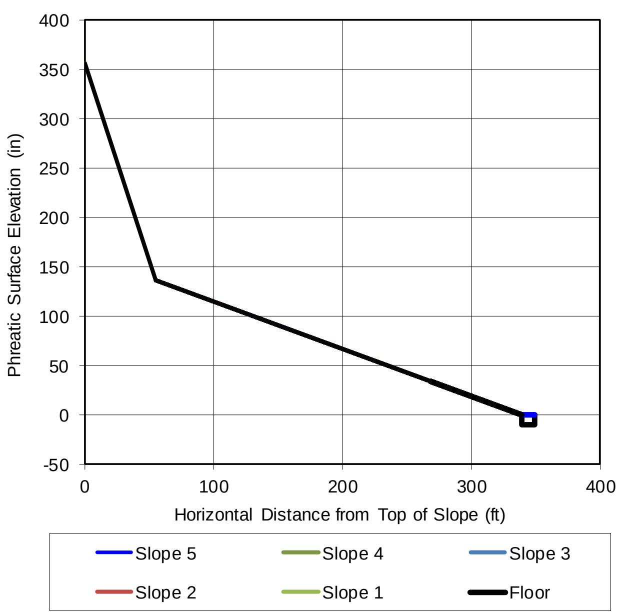
Project No.: 1208070039
Calculated By: NG Date: 11/13/2020
Checked By: CAB Date: 11/13/2020
Approved By: XZ Date: 1/17/2021

WDI MC VI-F2 - Neglecting Sand

R.01

Prepared by: NG 10/01/2020							
Reviewed by:			SLOPE 5	SLOPE 4	SLOPE 3	SLOPE 2	SLOPE 1
Approved by:	*minimum y (in)*	*0.010*	Bottom				Top
Slope in the direction of flow	S	ft./ft.	4.00%	4.00%	4.00%	4.00%	33.33%
Slope angle	α	radians	0.0400	0.0400	0.0400	0.0400	0.3218
Flow length in the direction of flow	L	ft.	71	71	71	71	55
Rate of vertical inflow per unit area	r	gal/acre/day	6,373	6,373	6,373	6,373	6,899
Saturated thickness of sand (or protective soil)	t_{sand}	in	0.0	0.0	0.0	0.0	0.0
		ft.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Permeability of sand (or protective soil)	K_{sand}	cm/sec	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Thickness of geonet	t_{geonet}	in.	0.200	0.200	0.200	0.200	0.200
		ft.	0.017	0.017	0.017	0.017	0.017
Geocomposite transmissivity	m2/s	m2/s	9.30E-04	9.30E-04	9.30E-04	9.30E-04	9.30E-04
Reduction Factor			5.28	5.28	5.28	5.28	5.28
Permeability of geocomposite	K_{geonet}	cm/sec	3.47E+00	3.47E+00	3.47E+00	3.47E+00	3.47E+00
Combined (apparent) permeability	K_{app}	**cm/sec**	**3.47E+00**	**3.47E+00**	**3.47E+00**	**3.47E+00**	**3.47E+00**
Leachate Head at Discharge Point	**h at L=0**	in	0.10	0.16	0.12	0.08	0.04
Step Size	dL	in	0.1	0.1	0.1	0.1	0.1
Unit Width	W	ft	1	1	1	1	1

Maximum head on liner (McEnroe numerical) in each slope	**in**	**0.20**	**0.16**	**0.12**	**0.08**	**0.04**
Maximum head on liner location (McEnroe numerical) in each slope	**ft**	**336.67**	**268.00**	**197.00**	**126.00**	**55.00**
		0.00	0.00	0.01	0.01	0.03
Maximum head on liner (McEnroe numerical) in all slope	**in**	**0.20**				



McEnroe 1993 "Maximum Saturated Depth over Landfill Liner"
Journal of Environmental Engineering

For Slope 1

$$y_{i+1} = y_i + \left(\tan\alpha_1 - \frac{r_1 x_i}{k_1 y_i \cos^2\alpha_1} \right)(x_{i+1} - x_i)$$

Fore Slopes 2 - 5

$$y_{i+1} = y_i + \left(\tan\alpha_j - \frac{\sum_{f=1}^{j-1} r_f L_f + r_j \left(x_i - \sum_{f=1}^{j-1} L_f \right)}{k_j y_i \cos^2\alpha_j} \right)(x_{i+1} - x_i)$$

CALCULATION SHEET

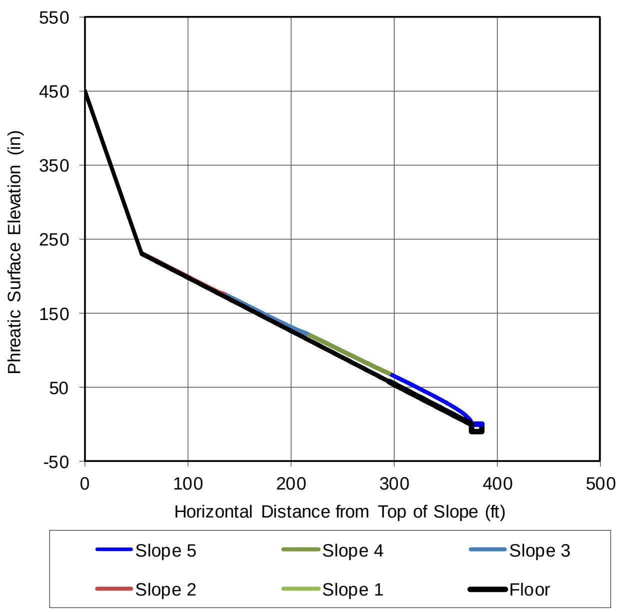
Client: US Ecology – Wayne Disposal
Project: 2021 WDI Permit Modification Application
Calculation: Leachate Head-on-Liner Analysis

Project No.: 1208070039
Calculated By: NG Date: 11/13/2020
Checked By: CAB Date: 11/13/2020
Approved By: XZ Date: 1/17/2021

WDI MC VI F4

Prepared by: NG 10/01/2020		*R.01*					
Reviewed by:			SLOPE 5	SLOPE 4	SLOPE 3	SLOPE 2	SLOPE 1
Approved by:	*minimum y (in)*	*0.010*	Bottom				Top
Slope in the direction of flow	S	ft./ft.	6.00%	6.00%	6.00%	6.00%	33.33%
Slope angle	α	radians	0.0599	0.0599	0.0599	0.0599	0.3218
Flow length in the direction of flow	L	ft.	80	80	80	80	55
Rate of vertical inflow per unit area	r	gal/acre/day	6,373	6,373	6,373	6,373	6,899
Saturated thickness of sand (or protective soil)	t_{sand}	in	12.0	10.9	7.3	3.2	0.6
		ft.	*1.000*	*0.911*	*0.612*	*0.263*	*0.050*
Permeability of sand (or protective soil)	K_{sand}	cm/sec	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Thickness of geonet	t_{geonet}	in.	0.200	0.200	0.200	0.200	0.200
		ft.	0.017	0.017	0.017	0.017	0.017
Geocomposite transmissivity	m2/s	m2/s	3.20E-04	3.20E-04	3.20E-04	3.20E-04	3.20E-04
Reduction Factor			5.28	5.28	5.28	5.28	5.28
Permeability of geocomposite	K_{geonet}	cm/sec	1.19E+00	1.19E+00	1.19E+00	1.19E+00	1.19E+00
Combined (apparent) permeability	K_{app}	**cm/sec**	**3.98E-02**	**4.35E-02**	**6.34E-02**	**1.39E-01**	**5.23E-01**
Leachate Head at Discharge Point	h at L=0	in	0.10	10.93	7.34	3.15	0.60
Step Size	dL	in	0.1	0.1	0.1	0.1	0.1
Unit Width	W	ft	1	1	1	1	1

Maximum head on liner (McEnroe numerical) in each slope	**in**	**11.80**	**10.93**	**7.34**	**3.15**	**0.60**
Maximum head on liner location (McEnroe numerical) in each slope	**ft**	**334.28**	**295.00**	**215.00**	**135.00**	**55.00**
		0.16	0.04	0.04	0.04	0.04
Maximum head on liner (McEnroe numerical) in all slope	**in**	**11.80**				



McEnroe 1993 "Maximum Saturated Depth over Landfill Liner"
Journal of Environmental Engineering

For Slope 1

$$y_{i+1} = y_i + \left(\tan\alpha_1 - \frac{r_1 x_i}{k_1 y_i \cos^2 \alpha_1} \right)(x_{i+1} - x_i)$$

Fore Slopes 2 - 5

$$y_{i+1} = y_i + \left(\tan\alpha_j - \frac{\sum_{f=1}^{j-1} r_f L_f + r_j \left(x_i - \sum_{f=1}^{j-1} L_f \right)}{k_j y_i \cos^2 \alpha_j} \right)(x_{i+1} - x_i)$$

CALCULATION SHEET

Client: US Ecology – Wayne Disposal
Project: 2021 WDI Permit Modification Application
Calculation: Leachate Head-on-Liner Analysis

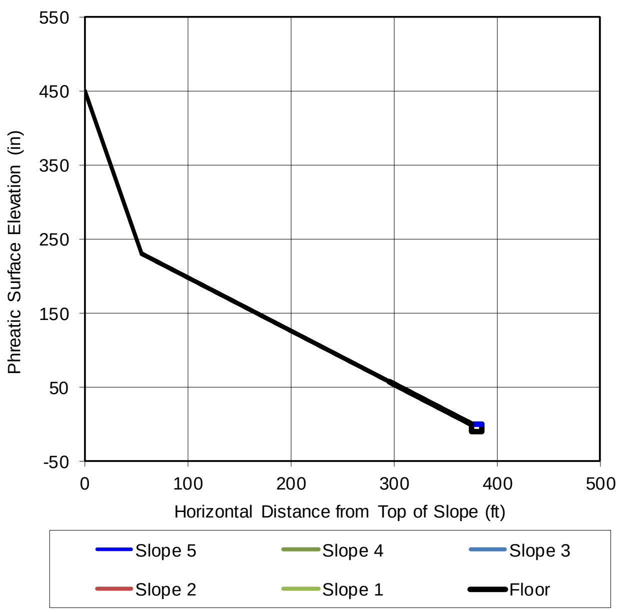
Project No.: 1208070039
Calculated By: NG   Date: 11/13/2020
Checked By: CAB   Date: 11/13/2020
Approved By: XZ   Date: 1/17/2021

WDI MC VI F4 Neglecting Sand

R.01

			SLOPE 5	SLOPE 4	SLOPE 3	SLOPE 2	SLOPE 1
Prepared by: NG 10/01/2020							
Reviewed by:							
Approved by:	*minimum y (in)*	*0.010*	**Bottom**				**Top**
Slope in the direction of flow	S	ft./ft.	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**33.33%**
Slope angle	α	radians	0.0599	0.0599	0.0599	0.0599	0.3218
Flow length in the direction of flow	L	ft.	**80**	**80**	**80**	**80**	**55**
Rate of vertical inflow per unit area	r	gal/acre/day	**6,373**	**6,373**	**6,373**	**6,373**	**6,899**
Saturated thickness of sand (or protective soil)	t_{sand}	in	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
		ft.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Permeability of sand (or protective soil)	K_{sand}	cm/sec	**1.00E-03**	**1.00E-03**	**1.00E-03**	**1.00E-03**	**1.00E-03**
Thickness of geonet	t_{geonet}	in.	**0.200**	**0.200**	**0.200**	**0.200**	**0.200**
		ft.	**0.017**	**0.017**	**0.017**	**0.017**	**0.017**
Geocomposite transmissivity	m2/s	m2/s	**7.00E-04**	**7.00E-04**	**7.00E-04**	**7.00E-04**	**7.00E-04**
Reduction Factor			**5.28**	**5.28**	**5.28**	**5.28**	**5.28**
Permeability of geocomposite	K_{geonet}	cm/sec	2.61E+00	2.61E+00	2.61E+00	2.61E+00	2.61E+00
Combined (apparent) permeability	K_{app}	**cm/sec**	**2.61E+00**	**2.61E+00**	**2.61E+00**	**2.61E+00**	**2.61E+00**
Leachate Head at Discharge Point	**h at L=0**	in	**0.10**	**0.16**	**0.12**	**0.07**	**0.03**
Step Size	dL	in	0.1	0.1	0.1	0.1	0.1
Unit Width	W	ft	1	1	1	1	1

Maximum head on liner (McEnroe numerical) in each slope	**in**	**0.20**	**0.16**	**0.12**	**0.07**	**0.03**
Maximum head on liner location (McEnroe numerical) in each slope	**ft**	**373.34**	**295.00**	**215.00**	**135.00**	**55.00**
		0.00	*0.00*	*0.01*	*0.02*	*0.03*
Maximum head on liner (McEnroe numerical) in all slope	**in**	**0.20**				



McEnroe 1993 "Maximum Saturated Depth over Landfill Liner"
Journal of Environmental Engineering

For Slope 1

$$y_{i+1} = y_i + \left(\tan \alpha_1 - \frac{r_1 x_i}{k_1 y_i \cos^2 \alpha_1} \right) (x_{i+1} - x_i)$$

Fore Slopes 2 - 5

$$y_{i+1} = y_i + \left(\tan \alpha_j - \frac{\sum_{f=1}^{j-1} r_f L_f + r_j \left(x_i - \sum_{f=1}^{j-1} L_f \right)}{k_j y_i \cos^2 \alpha_j} \right) (x_{i+1} - x_i)$$

ATTACHMENT 5.1.2

Slope Combined Numerical Method

HEAD-ON-LINER CALCULATION USING NUMERICAL APPROACH

OBJECTIVE

To determine the maximum saturated leachate depth within leachate drainage media above an impermeable liner using a numerical implementation of the McEnroe (1993) Equations .

DESIGN CRITERIA, ASSUMPTIONS AND METHODOLOGY

The head-on-liner calculation is conducted according to the following procedure:

1. Determine the average transmissivity value of drainage geocomposite using test results obtained under the design normal stress. This value is reduced through the application of several reduction factors as described in following equation (Koerner 2005):

$$\theta_{allow} = \frac{\theta_{test}}{RF_{IN} \times RF_{CR} \times RF_{CC} \times RF_{BC}} \tag{1}$$

Where,

RF_{IN} = reduction factor for intrusion (or elastic deformation)
RF_{CR} = reduction factor for creep deformation
RF_{CC} = reduction factor for chemical clogging
RF_{BC} = reduction factor for biological clogging
θ_{allow} = allowable transmissivity for the geocomposite, m^2/s
θ_{test} = tested transmissivity for the geocomposite, m^2/s

2. Determine the combined (apparent) hydraulic conductivity of the drainage layer (geocomposite overlain by a sand layer) using the equation by Qian et al. (2004):

$$k_{combined} = k_{geonet} + \left(k_{sand} - k_{geonet}\right)\frac{t_{sand}{}^2}{\left(t_{sand} + t_{geonet}\right)^2} \tag{2}$$

where,

$k_{combined}$ = combined hydraulic conductivity of the saturated drainage layer (cm/s)
k_{sand} = hydraulic conductivity of sand (cm/s)
k_{geonet} = hydraulic conductivity of geocomposite (cm/s)
t_{sand} = thickness of the saturated sand layer (in)
t_{geonet} = thickness of geocomposite (in)

3. Head-on-liner calculation – McEnroe (1993) Method (valid only for free draining condition)

A commonly used method for calculating the maximum head-on-liner was developed by McEnroe (1993). McEnroe (1993) developed a differential equation to describe the flow in the drainage layer using the extended Dupuit assumptions. McEnroe also derived an analytical solution from the governing differential equation to determine the maximum head (saturated depth) buildup under free draining conditions. McEnroe's 1993 method (under free draining conditions) is expressed as:

If R<1/4

$$y_{\max} = LS*\left(R - RS + R^2S^2\right)^{1/2} * \{[(1-A-2R)(1+A-2RS)]/[(1+A-2R)(1-A-2RS)]\}^{1/(2A)} \quad (3)$$

If R=1/4

$$y_{\max} = LSR*(1-2RS)/(1-2R)*\exp\{2R*(S-1)/[(1-2RS)(1-2R)]\} \quad (4)$$

If R>=1/4

$$y_{\max} = LS*\left(R - RS + R^2S^2\right)^{1/2} * \exp\{(1/B)*\tan^{-1}[(2RS-1)/B] - (1/B)*\tan^{-1}[(2R-1)/B]\} \quad (5)$$

The parameters "R", "A", and "B" used in the above equations are defined as:

$$R = q/\left(k\sin^2\alpha\right) \quad (6)$$

$$A = (1-4R)^{1/2} \quad (7)$$

$$B = (4R-1)^{1/2} \quad (8)$$

Where:
k = hydraulic conductivity of the saturated drainage layer
L = drainage length
q = leachate infiltration rate
α = slope angle

There are several limitations to the McEnroe (1993) method:

a. The analytical solution requires "free draining conditions".
b. Hydraulic conductivity, leachate infiltration rate, and slope angle must be consistent along the entire drainage length.

4. Head-on-liner calculation –numerical approach

The McEnroe (1993) method is an analytical solution of the differential equation governing flow under free draining conditions. However, this differential equation can be integrated numerically to describe the saturated depth profile based on the boundary conditions. In other words, the governing differential equation can be solved numerically without preconditions such as the free-draining requirement.

The differential equation governing flow along a single drainage length is McEnroe (1993):

$$ky\left(\frac{dy}{dx} - \tan\alpha\right)\cos^2\alpha + rx = 0 \quad (9)$$

where,

k = hydraulic conductivity of the combined saturated drainage layer (cm/s)
y = saturated liquid depth over the liner (cm or in)
x = horizontal coordinate (cm or in)
r = leachate infiltration rate (cm/s)
α = slope angle

Equation 9 can be rearranged into finite difference form:

$$y_{i+1} = y_i + \left(\tan\alpha - \frac{r x_i}{k y_i \cos^2\alpha} \right) dx \qquad (10)$$

$$dx = x_{i+1} - x_i$$

Equation 10 can be numerically integrated using a pre-selected saturated liquid depth (y_L) at the low point of the drainage path, where "x" is equivalent to the maximum drainage length (Figure 1). The procedure will result in a full phreatic surface profile. From this profile the maximum head-on-liner value can be determined.

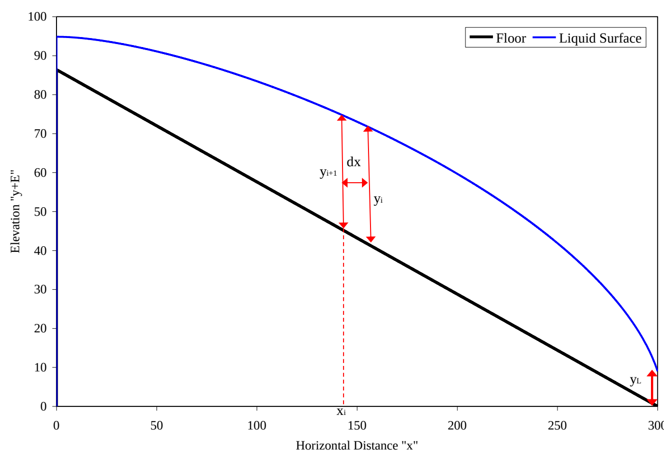


Figure 1. Example of Phreatic Leachate Surface

For a drainage system with multiple slopes (Figure 2), Equation 10 is arranged for each slope segment. Note that dimensions shown in Figure 2 are arbitrarily selected for illustrative purposes.

For slope segment 1: $0 \le x_i \le L_1$

$$y_{i+1} = y_i + \left(\tan\alpha_1 - \frac{r_1 x_i}{k_1 y_i \cos^2\alpha_1} \right)(x_{i+1} - x_i) \qquad \text{Eq. 11}$$

at $x = L_1$: y is equal to the value calculated from segment 2 at the same value of x.

For other slope segments (segment j where j >1): $\sum_{f=1}^{j-1} L_f \le x_i \le \sum_{f=1}^{j} L_f$:

$$y_{i+1} = y_i + \left(\tan\alpha_j - \frac{\sum_{f=1}^{j-1} r_f L_f + r_j \left(x_i - \sum_{f=1}^{j-1} L_f \right)}{k_j y_i \cos^2 \alpha_j} \right) (x_{i+1} - x_i) \qquad \text{Eq. 12}$$

at $x = \sum_{f=1}^{j-1} L_f$: y is equal to the value calculated from segment j-1 at the same value of x.

Where

k_1 and k_j = combined hydraulic conductivity of the saturated drainage layer in slope segments 1 and j, respectively

r_1 and r_j = leachate infiltration rate to slope segments 1 and j, respectively

α_1 and α_j = slope angle of slope segments 1 and j, respectively

L_1 and L_j = total drainage length of slope segments 1 and j, respectively

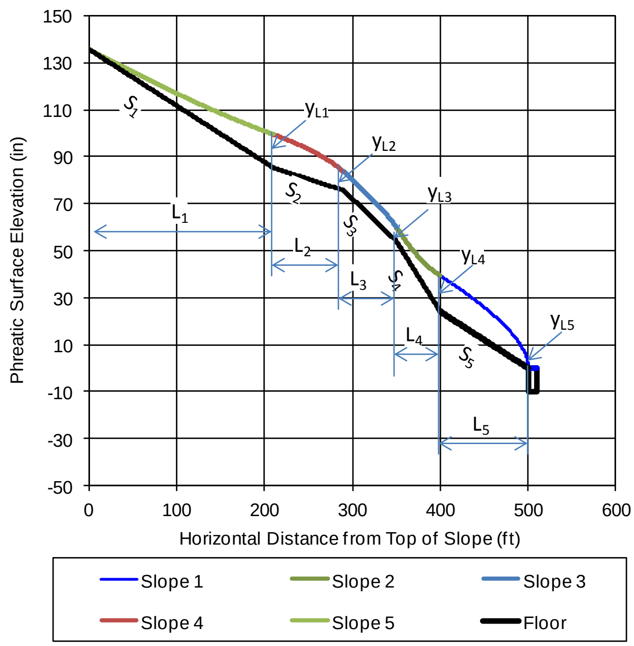


Figure 2. Example of Multiple Phreatic Leachate Surface

VERIFICATION OF THE NUMERICAL MODEL

A spreadsheet (in Microsoft Excel) was developed for the numerical integration of Equations 11 and 12. This spreadsheet included five slope segments. Multiple input parameters can be adjusted independently for each slope segment (Figure 3). To verify the accuracy of the numerical model results, the maximum values of leachate head on liner were calculated using a variety of input parameters and compared to the results estimated using the McEnroe (1993) method. Due to the limitations of the McEnroe (1993) method, constant values of leachate infiltration rate, slope angle, and permeability were applied to all slope segments in the numerical model and the free draining conditions were simulated using the numerical approach by applying a small leachate depth at the lowest point of the slope.

Test 1: Step distance for numerical integration

The maximum head-on-liner values were calculated using both the McEnroe (1993) Method and the numerical approach for six different permeability values (Table 1) and five leachate infiltration rates (Table 2). Four integration step distances (ranging from 0.2 to 3 inches) were used. In both tests, the results from the numerical approach are very close to the results calculated using McEnroe (1993) method. Therefore, the numerical approach was verified. Moreover, the incremental variation in numerical integration step distance (dx) did not significantly impact the results under the trial conditions. To minimize the file size and reduce computation time, an integration step distance of **0.5 inches** is recommended when using the numerical modeling approach.

Table 1. Sensitivity of Numerical Approach to Integration Step Distance for Various Permeability Values.

INPUT PARAMETERS					
		Infiltration Rate (gpad)	**Drainage Length (ft)**	**Slope**	**Liquid Depth at Lowest Point (in)**
Numerical Solution	Slope 1	3,000	140	2.00%	-
	Slope 2	3,000	235	2.00%	-
	Slope 3	3,000	200	2.00%	-
	Slope 4	3,000	75	2.00%	-
	Slope 5	3,000	350	2.00%	1.0
McEnroe 93 Method		3,000	1,000	2.00%	free drain

RESULTS					
Sand k (cm/s)	**Ymax (in)**				
	McEnroe 93	**Numerical**			
		dx=0.2 in	**dx=0.5 in**	**dx=1.0 in**	**dx=3.0 in**
0.01	112.35	102.98	112.35	112.38	112.56
0.05	30.64	30.61	30.65	30.65	30.67
0.10	16.63	16.63	16.64	16.64	16.65
0.50	3.70	3.70	3.70	3.70	3.70
1.00	1.89	1.89	1.89	1.89	1.89
5.00*	0.39	0.39	0.39	0.39	0.57

Table 2. Sensitivity of Numerical Approach to Integration Step Distance for Various Permeability Values and Leachate Infiltration Rates

INPUT PARAMETERS				
		Drainage Length (ft)	Slope	Liquid Depth at Lowest Point (in)
Numerical Solution	Slope 1	140	2.00%	-
	Slope 2	235	2.00%	-
	Slope 3	200	2.00%	-
	Slope 4	75	2.00%	-
	Slope 5	350	2.00%	1.0
McEnroe 93 Method		1,000	2.00%	free drain

RESULTS							
Infiltration Rate r (gpad)	Sand k (cm/s)	r/k*	Ymax (in)				
			McEnroe 93	Numerical			
				dx=0.2 in	dx=0.5 in	dx=1.0 in	dx=3.0 in
100	0.01	1.08E-05	6.02	6.02	6.02	6.02	6.03
500	0.01	5.41E-05	26.16	26.16	26.17	26.17	26.19
1,000	0.05	2.17E-05	11.50	11.50	11.50	11.50	11.51
3,000	0.05	6.50E-05	30.64	30.61	30.65	30.65	30.67
5,000	0.05	1.08E-04	47.18	47.18	47.18	47.19	47.23
5,000	0.10	5.41E-05	26.16	26.16	26.17	26.17	26.19
5,000	0.50	1.08E-05	6.02	6.02	6.02	6.02	6.03

Note:
* The ratio of infiltration rate and hydraulic conductivity of the drainage layer will control the maximum leachate depth on the liner (see Eq. 12).

Test 2: Starting leachate depth

In the numerical integration approach, a starting leachate depth at the lowest point (discharge point) of the slopes will be needed to initialize the integration. Four starting leachate depths were used in this test. The maximum head-on-liner values from both the McEnroe (1993) Method and the numerical solution were calculated for four different permeability values (Table 3). The results from the numerical approach are very close to the results calculated using the McEnroe (1993) method with one exception. Under the high permeability condition, the maximum head-on-linear was determined to be 3.70 inches using McEnroe 93 method. The results from numerical approach with a starting leachate depth of 1 inch or less were same as the value calculated from the McEnroe (1993) method. However, if the starting leachate depth was selected as 9 inches, the maximum leachate depth will occur at the starting point. This result indicates that the numerical integration approach can be used to determine the maximum head-on-liner when the "free draining" condition is not satisfied. In most cases, a starting leachate depth of **1.0 inch** can be used to represent the "free draining" condition. Note that under same conditions such as very high value of the ratio between infiltration rate and conductivity (high infiltration rate and low conductivity), the low starting leachate depth may result unstable solutions from the model. If it is occurred, user can adjust the staring value. A stable result can be verified by the trails and demonstrate that the the numerical solution is stable and not unduly affected by the starting leachate depth

Table 3. Sensitivity of Numerical Solution to the Starting Leachate Depth

INPUT PARAMETERS					
		Infiltration Rate (gpad)	**Drainage Length (ft)**	**Slope**	**Liquid Depth at Lowest Point (in)**
Numerical Solution	Slope 1	3,000	140	2.00%	-
	Slope 2	3,000	235	2.00%	-
	Slope 3	3,000	200	2.00%	-
	Slope 4	3,000	75	2.00%	-
	Slope 5	3,000	350	2.00%	-
McEnroe 93 Method		3,000	1,000	2.00%	free drain

RESULTS					
Sand k (cm/s)	**Ymax (in)**				
	McEnroe 93	**Numerical dx=0.5 in**			
		Yo=0.1 in	**Yo=0.5 in**	**Yo=1 in**	**Yo=9 in**
0.01	112.35	112.83	112.37	112.35	112.45
0.05	30.64	30.67	30.65	30.65	30.80
0.10	16.63	16.64	16.64	16.64	16.85
0.50	3.70	3.70	3.70	3.70	9.00

Test 3: Add geocomposite layer

To improve the drainage capacity of the drainage layer, a geocomposite layer can be added under the sand drainage layer. The combined hydraulic conductivity can be calculated using Equation 2. Two permeability values for sand with and without geocomposite layer were tested. The results from the numerical approach are very close to the values calculated using McEnroe 93 method (Table 4).

Table 4. Head-on-Liner Calculation with and without Geocomposite Layer

INPUT PARAMETERS					
		Infiltration Rate (gpad)	Drainage Length (ft)	Slope	Liquid Depth at Lowest Point (in)
Numerical Solution	Slope 1	3,000	70	2.00%	-
	Slope 2	3,000	117	2.00%	-
	Slope 3	3,000	100	2.00%	-
	Slope 4	3,000	38	2.00%	-
	Slope 5	3,000	175	2.00%	1.0
McEnroe 93 Method		3,000	500	2.00%	free drain
RESULTS					
				Ymax (in)	
Sand k (cm/s)	Geocomposite	Saturated Depth (inch)	Combined k (cm/s)	McEnroe 93	Numerical dx=0.5 in
0.0100	no	n/e	0.010	112.35	112.35
0.0100	yes	6.4	0.138	6.19	6.20
0.0010	no	n/e	0.001	267.21	266.93
0.0010	yes	7.8	0.108	7.78	7.79

n/e: no effect on the results.

DESIGN EXAMPLES USING THE NUMERICAL APPROACH

Six design examples are presented below to demonstrate the application of the numerical approach to the calculation of the maximum head-on-liner values. Descriptions and results for each example are summarized in Table 5. The detailed input parameters and phreatic surface plot for each example is presented in Figures 4 to 9, respectively. As demonstrated in Table 5, the numerical approach can accomodate multiple design conditions. In all design examples, the head-on-liner value cannot be estimated using the McEnroe (1993) method due to the complexity of the system.

Table 5. Summary of Design Examples

EXAMPLE	DESCRIPTION	Max Head-on-Liner (INCHES)
1	Single slope with different leachate infiltration rates for each slope segment	8.08
2	Five slopes with constant leachate infiltration rate for each slope segment	16.64
3	Five slopes with different leachate infiltration rates for each slope segment	8.08
4	Single slope with constant leachate infiltration rate; Increased flow capacity in bottom two slope segments by installing geocomposite layer	11.73
5	Five slopes with different leachate infiltration rates for each slope segment; High infiltration rate at top of the slope (representing open conditions); Increased flow capacity in bottom two slope segments by installing geocomposite layer	10.48
6	Single slope with constant leachate infiltration rate; Increased flow capacity by installing geocomposite layer in all slope segments; Applied different leachate depths for each slope segment; no trench at lowest point of the slope (no "free drain") and the leachate depth is 9 inches at lowest point (discharge point).	10.74

CONCLUSION

A numerical approach was developed to solve the differential equation governing flow in permeable media above an impermeable barrier presented by McEnroe (1993). This new approach was verified by analyzing multiple different boundary conditions and comparing the results to those calculated using analytical solutions developed by McEnroe (1993). Several design examples were provided to demonstrate the capability of this approach.

REFERENCES

Koerner, R. M. (2005). *Designing with Geosynthetics*, 5th ed. Upper Saddle River, NJ: Prentice Hall.

McEnroe, B. (1993) "Maximum Saturated Depth over Landfill Liner" Journal of Environmental Engineering, Val. 119, No.2, Page 262-270

Qian, X.D., Gray, D.H., and Koerner, R.M. (2004), "Estimation of Maximum Liquid Head over Landfill Barriers," Journal of Geotechnical and Geoenvironmental Engineering, ASCE, 130:5, 488-497

CALCULATION SHEET

Client: Landfill	Project No.:		
Project: Head-on-Liner Calculation	Calculated By: XZ	Date: 3/6/2012	
Calculation: Head-on-liner calculation using numerical approach	Checked By: TY	Date: 3/9/2012	
	Approved By: KF	Date: 5/30/2012	

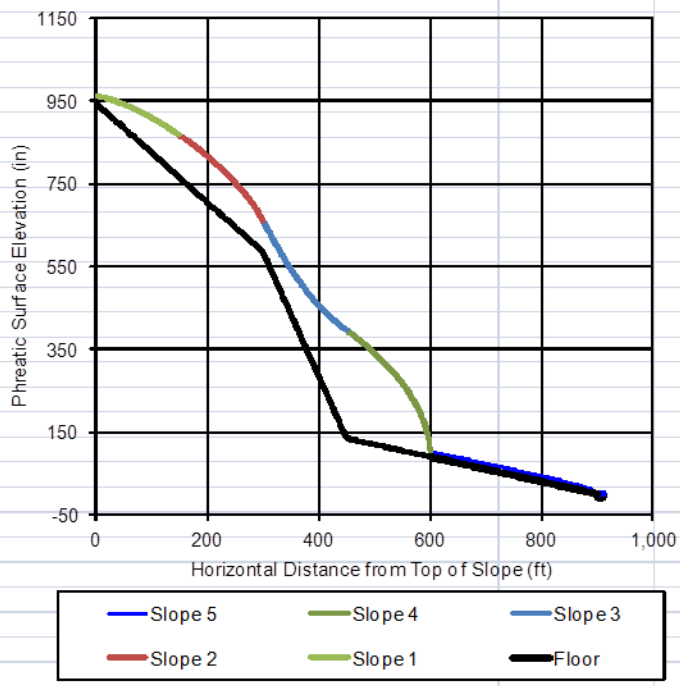
HEAD ON LINER CALCULATIONS

			SLOPE 5	SLOPE 4	SLOPE 3	SLOPE 2	SLOPE 1
			Bottom				Top
Slope in the direction of flow	S	ft./ft.	2.50%	2.50%	25.00%	10.00%	10.00%
Slope angle	α	radians	0.0250	0.0250	0.2450	0.0997	0.0997
Flow length in the direction of flow	L	ft.	300	150	150	150	150
Rate of vertical inflow per unit area	r	gal/acre/day	1,000	2,000	3,000	4,000	4,000
Thickness of sand (or protective soil)	t_{sand}	in	10.3	10.0	12.0	12.0	12.0
		ft.	0.858	0.833	1.000	1.000	1.000
Permeability of sand (or protective soil)	K_{sand}	cm/sec	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Thickness of geonet	t_{geonet}	in.	0.200	0.000	0.000	0.000	0.000
		ft.	0.017	0.000	0.000	0.000	0.000
Geonet transmissivity	m2/s	m2/s	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Reduction Factor			9.11	9.11	9.11	9.11	9.11
Permeability of geonet	K_{geonet}	cm/sec	2.16E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Combined (apparent) permeability	K_{app}	**cm/sec**	**8.25E-02**	**1.00E-03**	**1.00E-03**	**1.00E-03**	**1.00E-03**
			7.97E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Leachate Head at Discharge Point	h at L=0	in	1.0	12.56	260.82	76.52	102.66
Step Size	dL	in	0.5	0.5	0.5	0.5	0.5
Unit Width	W	ft	1	1	1	1	1

Maximum head on liner (McEnroe numerical) in each slope	in	13.31	260.82	260.82	112.22	102.66
Maximum head on liner location (McEnroe numerical) in each slope	ft	760.75	450.00	450.00	213.79	150.00
		9.04	62910.07	61910.79	10044.19	8218.51
Maximum head on liner (McEnroe numerical) in all slope	in	260.82				

Maximum head on liner (McEnroe 93 with free drain)	in	5.32
	R	0.02
Maximum head on liner (McEnroe 93 with free drain+Superposition)	in	6.32

Average		*Average*
McEnroe 93		
k	*2.82E-02*	*HOL*
S	*8.75%*	*(in)*
q	*2500*	*11.44*



McEnroe 1993 "Maximum Saturated Depth over Landfill Liner"
Journal of Environmental Engineering

For Slope 1

$$y_{i+1} = y_i + \left(\tan\alpha_1 - \frac{r_1 x_i}{k_1 y_i \cos^2\alpha_1}\right)(x_{i+1} - x_i)$$

Fore Slopes 2 - 5

$$y_{i+1} = y_i + \left(\tan\alpha_j - \frac{\sum_{f=1}^{j-1} r_f L_f + r_j\left(x_i - \sum_{f=1}^{j-1} L_f\right)}{k_j y_i \cos^2\alpha_j}\right)(x_{i+1} - x_i)$$

Figure 3. Input and Output Sheet in the Head-on-Liner Calculation Spreadsheet

CALCULATION SHEET

Client: Landfill	Project No.:		
Project: Head-on-Liner Calculation	Calculated By: XZ	Date: 3/6/2012	
Calculation: Head-on-liner calculation using numerical approach	Checked By: TY	Date: 3/9/2012	
	Approved By: KF	Date: 5/30/2012	

EXAMPLE 1: Variance in Leachate Infiltration Rates

INPUT PARAMETERS (dx=0.5 in)							
		Infiltration Rate (gpad)	Drainage Length (ft)	Slope	Combined k (cm/s)	Liquid Depth at Lowest Point (in)	Max Head-on-Liner (in)
Numerical Solution	Slope 1	3,000	140	2.00%	0.10	-	2.90
	Slope 2	2,000	235	2.00%	0.10	-	5.95
	Slope 3	1,000	200	2.00%	0.10	-	7.18
	Slope 4	500	75	2.00%	0.10	-	7.43
	Slope 5	500	350	2.00%	0.10	1.0	8.08
						OVERALL	8.08
McEnroe 93 Method		3,000	1,000	2.00%	0.10	free drain	16.63

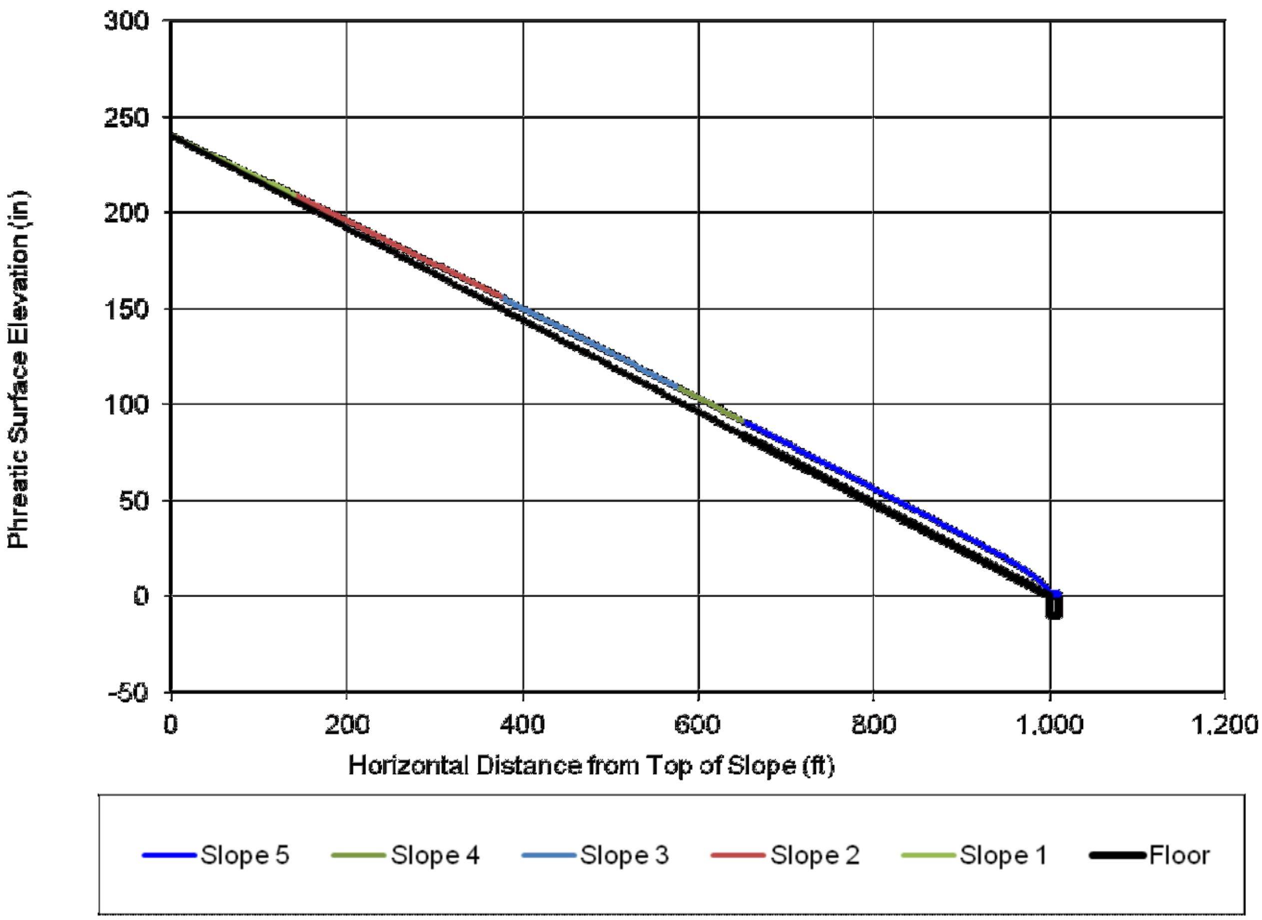


Figure 4. Design Example 1
Variance in Leachate Infiltration Rates

EXAMPLE 2: Variance in Slopes

INPUT PARAMETERS (dx=0.5 in)							
		Infiltration Rate (gpad)	Drainage Length (ft)	Slope	Combined k (cm/s)	Liquid Depth at Lowest Point (in)	Max Head-on-Liner (in)
Numerical Solution	Slope 1	3,000	140	20.00%	0.10	-	0.83
	Slope 2	3,000	235	12.00%	0.10	-	1.48
	Slope 3	3,000	200	10.00%	0.10	-	12.28
	Slope 4	3,000	75	2.00%	0.10	-	13.82
	Slope 5	3,000	350	2.00%	0.10	1.0	16.64
						OVERALL	16.64
McEnroe 93 Method		3,000	1,000	2.00%	0.10	free drain	16.63

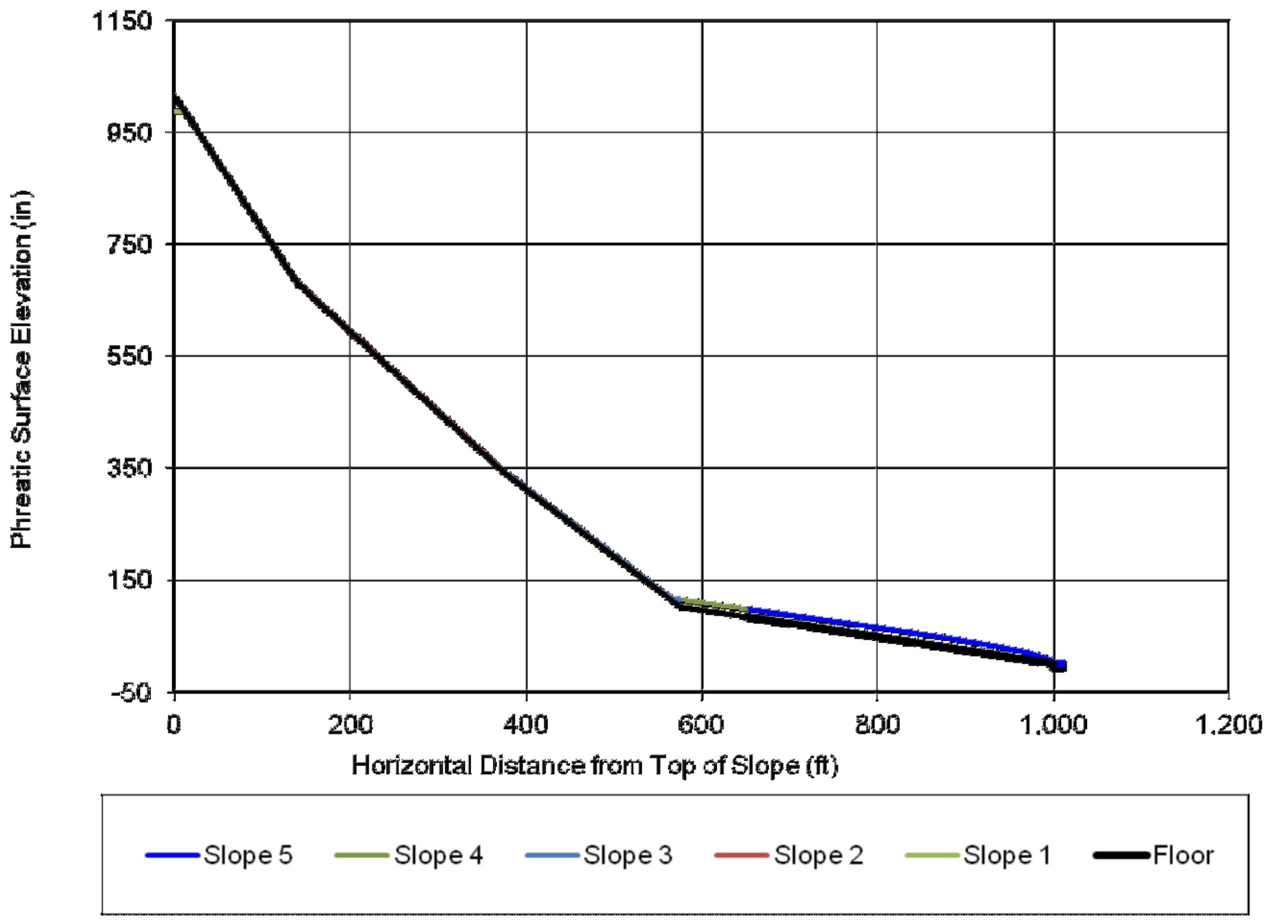


Figure 5. Design Example 2
Variance in Slopes

CALCULATION SHEET

Client: Landfill	Project No.:		
Project: Head-on-Liner Calculation	Calculated By: XZ	Date: 3/6/2012	
Calculation: Head-on-liner calculation using numerical approach	Checked By: TY	Date: 3/9/2012	
	Approved By: KF	Date: 5/30/2012	

EXAMPLE 3: Variance in Slopes and Leachate Infiltration Rates

INPUT PARAMETERS (dx=0.5 in)							
		Infiltration Rate (gpad)	Drainage Length (ft)	Slope	Combined k (cm/s)	Liquid Depth at Lowest Point (in)	Max Head-on-Liner (in)
Numerical Solution	Slope 1	3,000	140	20.00%	0.10	-	0.83
	Slope 2	2,000	235	12.00%	0.10	-	1.17
	Slope 3	1,000	200	10.00%	0.10	-	7.18
	Slope 4	500	75	2.00%	0.10	-	7.43
	Slope 5	500	350	2.00%	0.10	1.0	8.08
						OVERALL	8.08
McEnroe 93 Method		3,000	1,000	2.00%	0.10	free drain	16.63

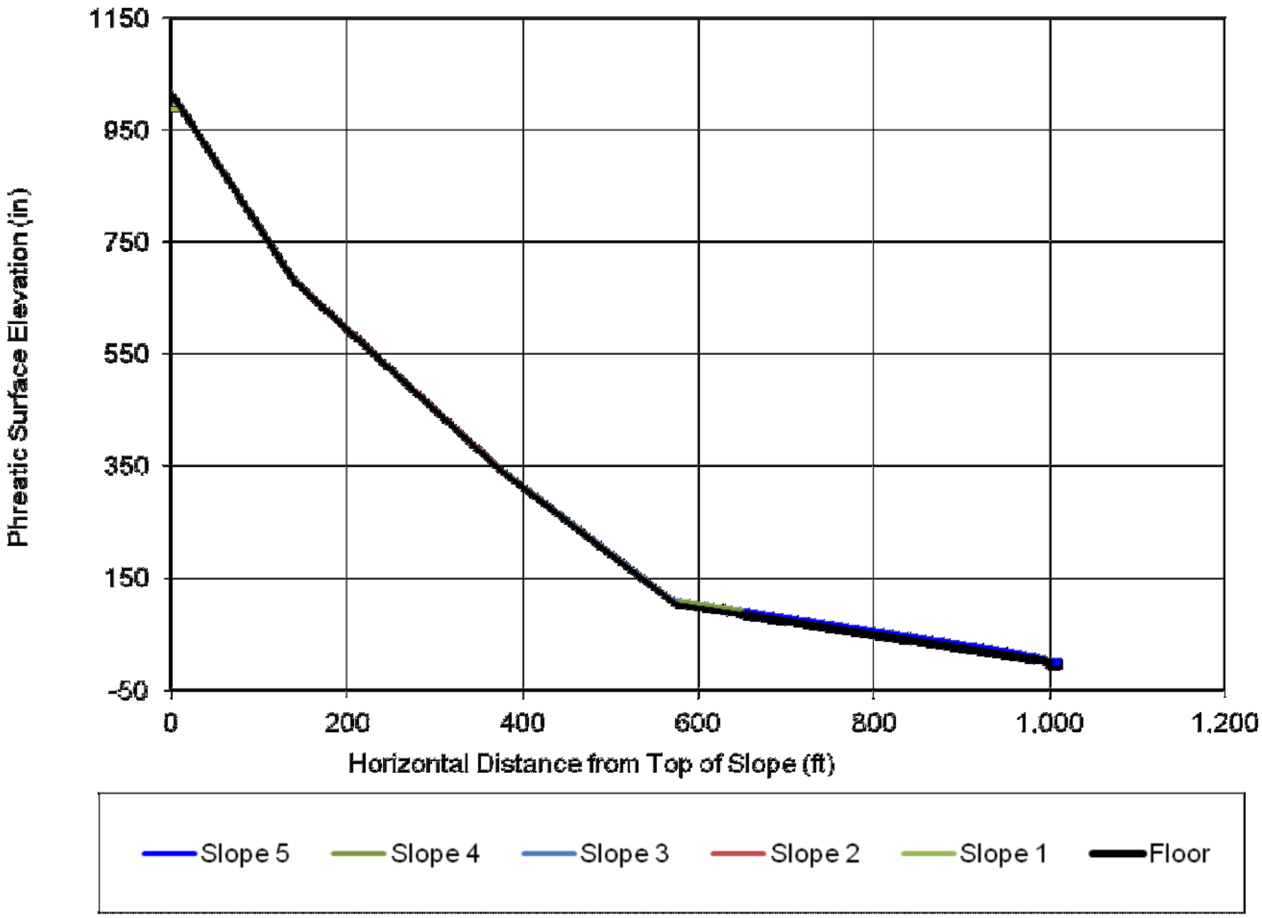


Figure 6. Design Example 3
Variance in Leachate Infiltration Rates and Slopes

EXAMPLE 4: Variance in Combined Permeabilitiy

INPUT PARAMETERS (dx=0.5 in)									
		Infiltration Rate (gpad)	Drainage Length (ft)	Slope	Combined k (cm/s)	Geonet Layer	Saturated Sand Thickness (in)	Liquid Depth at Lowest Point (in)	Max Head-on-Liner (in)
Numerical Solution	Slope 1	3,000	150	2.50%	0.050	no	-	-	5.30
	Slope 2	3,000	150	2.50%	0.050	no	-	-	10.35
	Slope 3	3,000	150	2.50%	0.050	no	-	-	11.73
	Slope 4	3,000	150	2.50%	0.184	yes	6.00	-	5.84
	Slope 5	3,000	150	2.50%	0.166	yes	7.00	1.0	6.49
								OVERALL	11.73
McEnroe 93 Method		3,000	750	2.50%	0.050			free drain	19.45

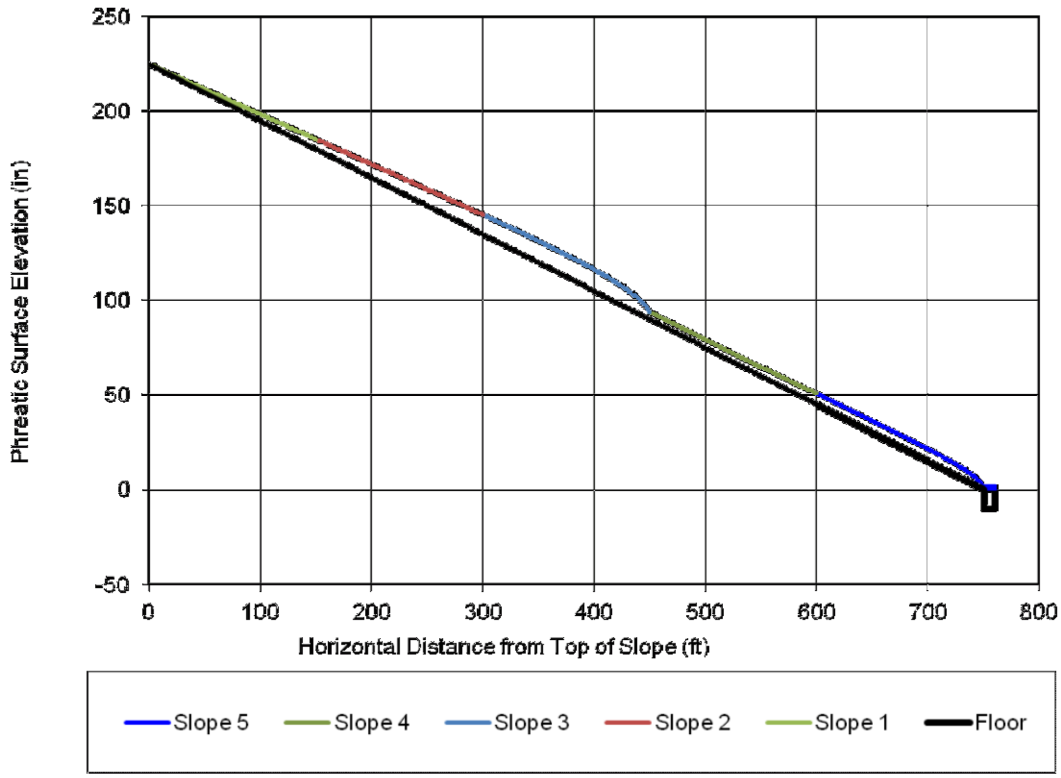


**Figure 7. Design Example 4:
Variance in Combined Permeability (using geocomposite)**

EXAMPLE 5: Variance in Slopes, Leachate Infiltration Rates, and Combined Permeability

INPUT PARAMETERS (dx=0.5 in)									
		Infiltration Rate (gpad)	Drainage Length (ft)	Slope	Combined k (cm/s)	Geonet Layer	Saturated Sand Thickness (in)	Liquid Depth at Lowest Point (in)	Max Head-on-Liner (in)
Numerical Solution	Slope 1	4,000	150	10.00%	0.020	no	-	-	4.03
	Slope 2	4,000	150	10.00%	0.020	no	-	-	7.39
	Slope 3	3,000	150	25.00%	0.020	no	-	-	8.48
	Slope 4	2,000	150	2.50%	0.103	yes	10.00	-	10.15
	Slope 5	500	300	2.50%	0.101	yes	10.30	1.0	10.48
								OVERALL	10.48
McEnroe 93 Method		4,000	900	2.50%	0.020			free drain	64.99

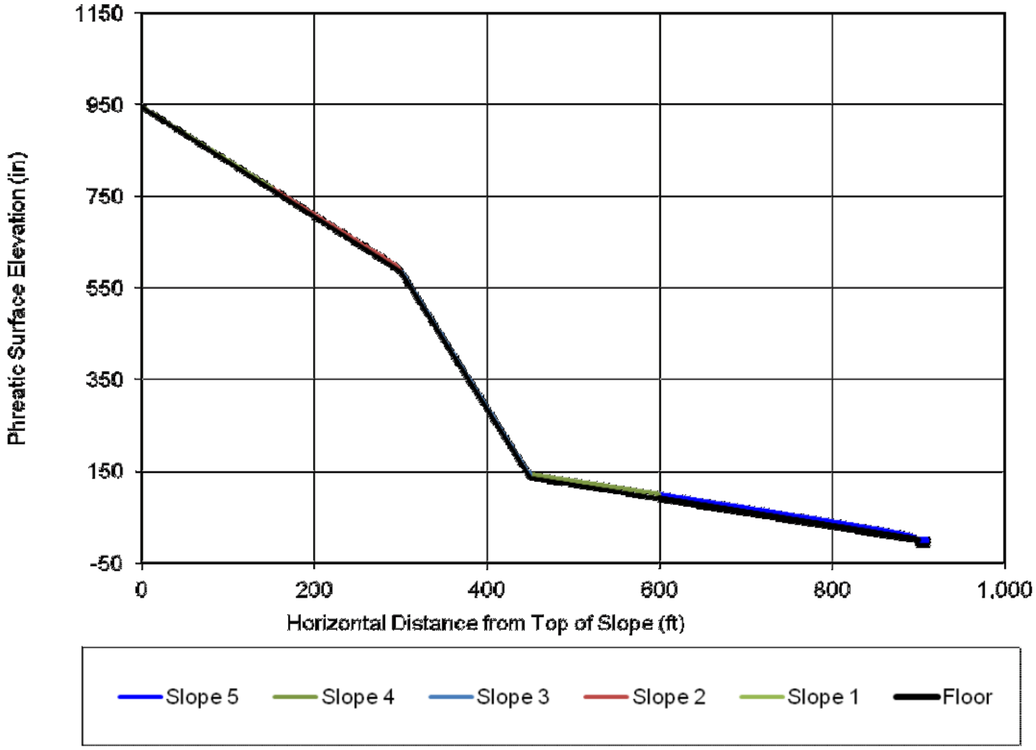


Figure 8. Design Example 5:
Variance in Slopes, Leachate Infiltration Rates, and Combined Permeability

EXAMPLE 6: No Resisted Trench (free drain condition is not satisfied)

INPUT PARAMETERS (dx=0.5 in)									
		Infiltration Rate (gpad)	Drainage Length (ft)	Slope	Combined k (cm/s)	Geonet Layer	Saturated Sand Thickness (in)	Liquid Depth at Lowest Point (in)	Max Head-on-Liner (in)
Numerical Solution	Slope 1	3,000	100	2.00%	0.661	yes	1.00	-	0.96
	Slope 2	3,000	100	2.00%	0.248	yes	3.79	-	3.94
	Slope 3	3,000	100	2.00%	0.120	yes	7.72	-	7.89
	Slope 4	3,000	100	2.00%	0.095	yes	10.22	-	10.39
	Slope 5	3,000	100	2.00%	0.078	yes	10.63	9.0	10.74
								OVERALL	10.74
McEnroe 93 Method		3,000	500	2.00%	0.078		free drain+superposition		19.39

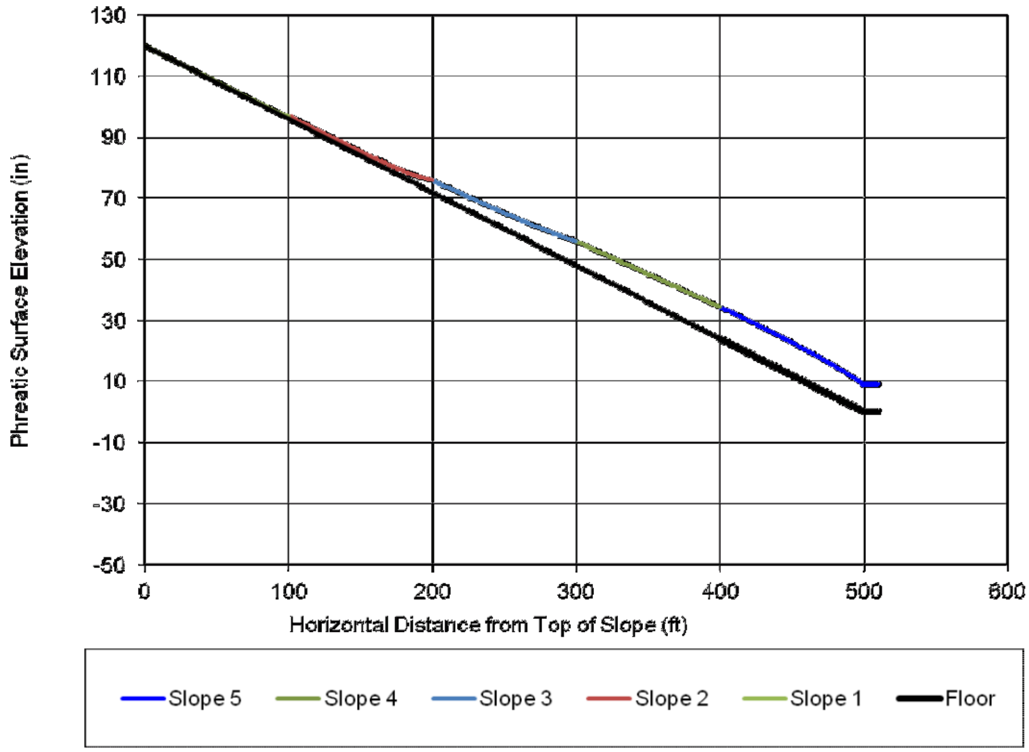


Figure 9. Design Example 6:
Free drain condition is not satisfied

Attachment B-5.2

Leachate Generation Calculations

CALCULATION SHEET

Client: US Ecology – Wayne Disposal
Project: 2021 WDI Permit Modification Application
Calculation: Leachate Generation (HELP Model) Analysis

Project No.: 1208070039
Calculated By: NG Date: 11/17/2020
Checked By: CAB Date: 11/18/2020
Approved By: XZ Date: 11/20/2020

LEACHATE GENERATION (HELP MODEL) ANALYSIS

OBJECTIVE

Estimate the leachate generation rate in the proposed cells for MC6F Cells 1 to 4 at Wayne Disposal Inc. (WDI) using the Hydraulic Evaluation of Landfill Performance (HELP) computer program. Select the appropriate leachate generation rate for the design of leachate collection and removal system.

DESIGN CRITERIA, ASSUMPTIONS AND METHODOLOGY

In the HELP model analysis, only the open condition was considered since it is expected to be the highest leachate generation and therefore the most critical period for a leachate collection system from a flow capacity standpoint. The slope of Cells 1, 3, and 4 are 6%. The slope of Cell 2's floor is 4%. All 4 Cells have 3H:1V sideslopes.

Steeper floor sections lead to additional leachate generation in HELP Model, so the floor section for all 4 cells was modeled as a 6% slope with a drainage flow length of 300 feet. For the sideslope section, a slope of 33.33% and a flow length of 75 feet was utilized. A modeling period of 5 years was utilized for open conditions.

Initial soil moisture contents were set equal to the field capacity for each vertical percolation layer assuming a steady state condition. For waste, the is conservatively modeled as a loamy fine sand with a thickness of 10 feet. Other soil and geosynthetic properties are generally modeled using HELP default values.

The hydrologic evaluation was conducted using HELP Model (4.0.1) from USEPA for both data input and result output.

HELP Model Version 4 Input

1. Synthetically generated climatological data for Belleville, Michigan was used to simulate the weather conditions at the site. Wind speed and humidity data which are used by HELP to simulate evapotranspiration were imported from the National Solar Radiation Data Base for Willow Run Airport, which is adjacent to WDI.
2. The growing season was estimated at approximately 160 days in length (http://geo.msu.edu/extra/geogmich/growseason&frost.html) starting on Day 100 (mid-April) and ending on day 260 (mid-September).
3. The pinhole density for the geomembrane liner is assumed to be one hole per acre. The diameter of the hole is assumed as 0.1 cm with a corresponding opening area of approximately 0.008 cm^2. Note that the above assumption was made for conservatism since pinholes (manufacturing defects) are very unlikely when producing polyethylene (PE) geomembranes.

4. The installation defect for the geomembrane liner was assumed at a density of one hole per acre. The area of the hole was assumed to be 1.0 cm^2.
5. The placement quality for the geomembrane liner was assumed to be "good." According to the HELP Model User's Guide for Version 4, a "good" placement quality assumes "good field installation with well-prepared, smooth soil surface, and geomembrane wrinkle control to insure good contact between geomembrane and adjacent soil that limits drainage rate."

5. A one-acre design area was used for modeling purposes to compute unit quantities.

6. The following system was used to model the leachate generation for the proposed cell floor and sideslope liner system (from top to bottom):

   - 120 inches of waste material – modeled as a custom waste layer based on HELP default material #5 (loamy fine sand)
   - 12-inch sand protective layer – modeled as a sand with $1x10^{-3}$ cm/s permeability
   - Geocomposite drainage layer
   - 80-mil HDPE geomembrane
   - 2 layers of Geosynthetic clay liner (GCL) – modeled as a GCL with 2x thickness
   - 60 inches of clayey soil – modeled as HELP default material #25 – clay loam.
   - Geocomposite drainage layer
   - 80-mil HDPE geomembrane
   - 2 layers of (GCL) – modeled as a GCL with 2x thickness
   - 24-inch compacted soil layer – modeled as HELP default material #14 Silty Clay

6. Open condition inputs:

   - Bare soil conditions.
   - Evaporative zone depth = 12 in.
   - Maximum leaf area index = 0 (recommended by HELP Model for bare ground).
   - Fraction of area allowing runoff = 0 %.

CALCULATIONS AND RESULTS

Multiple simulations were conducted for cell floor, side slope, and overfill liner conditions by varying drainage length of the drainage layer for each cell. The output from HELP for each of the analyzed scenarios is included in Attachment 1. The peak daily leachate generation rates for the cell floor, side slope and overfill liner under open and intermediate cover conditions were estimated and presented in the following table.

Table 1- Leachate Percolation Rate

Scenario	**Percolation (in/day)**	**Percolation (gal/acre/day)**
Sideslopes (33.33%)	0.2541	6,899
Floor (6%)	0.2347	6,373

CONCLUSIONS

Results of the HELP analyses are summarized in Table 1. These maximum percolation rates will be used in the leachate collection pipes and geocomposite drainage layer.

ATTACHMENT 5.2.1

HELP Model Analysis - Sideslope

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 4.0 BETA (2018)
DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Title: Wayne Disposal-Initial Lift-Si… **Simulated On:** 11/22/2020 18:35

Layer 1

Type 1 - Vertical Percolation Layer (Cover Soil)
Sandy Waste Material
Material Texture Number 83

Thickness	=	120	inches
Porosity	=	0.457	vol/vol
Field Capacity	=	0.131	vol/vol
Wilting Point	=	0.058	vol/vol
Initial Soil Water Content	=	0.2206	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-03	cm/sec

Layer 2

Type 1 - Vertical Percolation Layer
Custom Soil 1
Material Texture Number 43

Thickness	=	12	inches
Porosity	=	0.417	vol/vol
Field Capacity	=	0.045	vol/vol
Wilting Point	=	0.018	vol/vol
Initial Soil Water Content	=	0.1689	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-03	cm/sec

Layer 3

Type 2 - Lateral Drainage Layer
Drainage Net (0.5 cm)
Material Texture Number 20

Thickness	=	0.2	inches
Porosity	=	0.85	vol/vol
Field Capacity	=	0.01	vol/vol
Wilting Point	=	0.005	vol/vol
Initial Soil Water Content	=	0.0108	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E+01	cm/sec
Slope	=	33.33333	%
Drainage Length	=	75	ft

Layer 4

Type 4 - Flexible Membrane Liner
HDPE Membrane
Material Texture Number 35

Thickness	=	0.08	inches
Effective Sat. Hyd. Conductivity	=	2.00E-13	cm/sec
FML Pinhole Density	=	1	Holes/Acre
FML Installation Defects	=	1	Holes/Acre
FML Placement Quality	=	3	Good

Layer 5
Type 3 - Barrier Soil Liner
Bentonite (High)
Material Texture Number 17

Thickness	=	0.5	inches
Porosity	=	0.75	vol/vol
Field Capacity	=	0.747	vol/vol
Wilting Point	=	0.4	vol/vol
Initial Soil Water Content	=	0.75	vol/vol
Effective Sat. Hyd. Conductivity	=	3.00E-09	cm/sec

Layer 6
Type 1 - Vertical Percolation Layer
CL - Clay Loam (Moderate)
Material Texture Number 25

Thickness	=	60	inches
Porosity	=	0.437	vol/vol
Field Capacity	=	0.373	vol/vol
Wilting Point	=	0.266	vol/vol
Initial Soil Water Content	=	0.373	vol/vol
Effective Sat. Hyd. Conductivity	=	3.60E-06	cm/sec

Layer 7
Type 2 - Lateral Drainage Layer
Drainage Net (0.5 cm)
Material Texture Number 20

Thickness	=	0.5	inches
Porosity	=	0.85	vol/vol
Field Capacity	=	0.01	vol/vol
Wilting Point	=	0.005	vol/vol
Initial Soil Water Content	=	0.01	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E+01	cm/sec
Slope	=	33.33333	%
Drainage Length	=	75	ft

Layer 8

Type 4 - Flexible Membrane Liner

HDPE Membrane

Material Texture Number 35

Thickness	=	0.08	inches
Effective Sat. Hyd. Conductivity	=	2.00E-13	cm/sec
FML Pinhole Density	=	1	Holes/Acre
FML Installation Defects	=	1	Holes/Acre
FML Placement Quality	=	3	Good

Layer 9

Type 3 - Barrier Soil Liner

Bentonite (High)

Material Texture Number 17

Thickness	=	0.5	inches
Porosity	=	0.75	vol/vol
Field Capacity	=	0.747	vol/vol
Wilting Point	=	0.4	vol/vol
Initial Soil Water Content	=	0.75	vol/vol
Effective Sat. Hyd. Conductivity	=	3.00E-09	cm/sec

Layer 10

Type 1 - Vertical Percolation Layer

SiC - Silty Clay

Material Texture Number 14

Thickness	=	24	inches
Porosity	=	0.479	vol/vol
Field Capacity	=	0.371	vol/vol
Wilting Point	=	0.251	vol/vol
Initial Soil Water Content	=	0.3709	vol/vol
Effective Sat. Hyd. Conductivity	=	2.50E-05	cm/sec

Note: Initial moisture content of the layers and snow water were computed as nearly steady-state values by HELP.

General Design and Evaporative Zone Data

SCS Runoff Curve Number	=	97.2	
Fraction of Area Allowing Runoff	=	0	%
Area projected on a horizontal plane	=	1	acres
Evaporative Zone Depth	=	12	inches
Initial Water in Evaporative Zone	=	0.696	inches
Upper Limit of Evaporative Storage	=	5.484	inches
Lower Limit of Evaporative Storage	=	0.696	inches

Initial Snow Water	=	0	inches
Initial Water in Layer Materials	=	60.544	inches
Total Initial Water	=	60.544	inches
Total Subsurface Inflow	=	0	inches/year

Note: SCS Runoff Curve Number was calculated by HELP.

Evapotranspiration and Weather Data

Station Latitude	=	42.18	Degrees
Maximum Leaf Area Index	=	0	
Start of Growing Season (Julian Date)	=	100	days
End of Growing Season (Julian Date)	=	260	days
Average Wind Speed	=	9	mph
Average 1st Quarter Relative Humidity	=	72	%
Average 2nd Quarter Relative Humidity	=	68	%
Average 3rd Quarter Relative Humidity	=	73	%
Average 4th Quarter Relative Humidity	=	74	%

Note: Evapotranspiration data was obtained for Belleville, Michigan

Normal Mean Monthly Precipitation (inches)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
1.538481	1.745211	2.296427	2.857607	4.464435	2.825752
2.250299	3.02094	2.983072	2.062363	2.406094	1.756356

Note: Precipitation was simulated based on HELP V4 weather simulation for:
Lat/Long: 42.18/-83.49

Normal Mean Monthly Temperature (Degrees Fahrenheit)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
25.6	33.7	47.8	46.5	63.1	73.4
83.7	75.9	66.4	54.7	44.5	44

Note: Temperature was simulated based on HELP V4 weather simulation for:
Lat/Long: 42.18/-83.49
Solar radiation was simulated based on HELP V4 weather simulation for:
Lat/Long: 42.18/-83.49

Daily Output for Year 1

Title: Wayne Disposal-Initial Lift-Sideslope
Simulated On: 11/22/2020 18:38

Column key:
Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5
Head #2: drainage from Layer 8
Drain #2: drainage from Layer 7
Leak #2: leakage thru Layer 9
Leak #3: leakage thru Layer 10

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1	Head #2	Drain #2	Leak #2	Head #3	Drain #3	Leak #3
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)
1			0.00	0.000	0.000	0.0580	0.0002	0.0409	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
2			0.04	0.000	0.006	0.0580	0.0002	0.0466	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
3			0.04	0.000	0.006	0.0580	0.0001	0.0258	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
4	*		0.34	0.000	0.025	0.0580	0.0002	0.0377	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
5			0.10	0.000	0.000	0.0580	0.0003	0.0698	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
6			0.02	0.000	0.005	0.0580	0.0002	0.0514	5.90E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
7	*		0.00	0.000	0.003	0.0580	0.0005	0.1183	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
8			0.00	0.000	0.000	0.0580	0.0005	0.1211	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
9			0.00	0.000	0.000	0.0580	0.0004	0.0979	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
10			0.00	0.000	0.000	0.0580	0.0003	0.0753	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
11			0.04	0.000	0.006	0.0580	0.0003	0.0675	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
12			0.02	0.000	0.008	0.0580	0.0001	0.0266	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
13			0.00	0.000	0.000	0.0580	0.0002	0.0347	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
14	*		0.00	0.000	0.000	0.0580	0.0002	0.0463	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
15	*		0.23	0.000	0.026	0.0580	0.0002	0.0565	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
16	*		0.08	0.000	0.024	0.0580	0.0002	0.0465	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
17	*		0.00	0.000	0.029	0.0580	0.0002	0.0501	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
18			0.00	0.000	0.019	0.0580	0.0003	0.0619	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
19	*		0.00	0.000	0.000	0.0580	0.0002	0.0478	6.66E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
20	*		0.00	0.000	0.000	0.0580	0.0004	0.0900	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
21	*		0.00	0.000	0.000	0.0580	0.0004	0.0909	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
22	*		0.14	0.000	0.030	0.0580	0.0004	0.0869	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
23	*		0.86	0.000	0.023	0.0580	0.0003	0.0645	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
24	*		0.05	0.000	0.011	0.0580	0.0002	0.0564	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
25	*		0.00	0.000	0.012	0.0580	0.0002	0.0550	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
26	*	*	0.16	0.000	0.005	0.0580	0.0002	0.0512	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
27	*	*	0.08	0.000	0.000	0.0580	0.0003	0.0656	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
28	*	*	0.00	0.000	0.021	0.0580	0.0003	0.0671	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
29	*	*	0.00	0.000	0.019	0.0580	0.0003	0.0641	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
30	*	*	0.00	0.000	0.023	0.0580	0.0003	0.0603	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
31		*	0.05	0.000	0.000	0.0621	0.0003	0.0570	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
32	*	*	0.00	0.000	0.028	0.0621	0.0002	0.0545	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
33		*	0.00	0.000	0.000	0.1490	0.0002	0.0529	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
34	*	*	0.03	0.000	0.031	0.1490	0.0002	0.0521	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
35	*	*	0.00	0.000	0.001	0.1490	0.0002	0.0518	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
36	*	*	0.10	0.000	0.010	0.1490	0.0002	0.0518	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
37	*	*	0.16	0.000	0.000	0.1490	0.0002	0.0521	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
38		*	0.00	0.000	0.012	0.1673	0.0002	0.0524	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

39		*	0.00	0.000	0.014	0.1673	0.0002	0.0526	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
40		*	0.01	0.000	0.001	0.1677	0.0002	0.0529	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
41		*	0.14	0.000	0.001	0.1794	0.0002	0.0530	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
42		*	0.00	0.000	0.000	0.1794	0.0002	0.0530	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
43		*	0.00	0.000	0.001	0.1795	0.0002	0.0529	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
44		*	0.19	0.000	0.001	0.1949	0.0002	0.0527	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
45		*	0.27	0.000	0.001	0.2172	0.0002	0.0524	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
46		*	0.00	0.000	0.000	0.2172	0.0002	0.0520	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
47		*	0.00	0.000	0.000	0.2172	0.0002	0.0516	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
48			0.00	0.000	0.102	0.1778	0.0002	0.0544	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
49			0.00	0.000	0.049	0.1633	0.0002	0.0493	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
50	*		0.00	0.000	0.000	0.1581	0.0002	0.0382	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
51	*		0.01	0.000	0.005	0.1544	0.0002	0.0399	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
52	*		0.00	0.000	0.003	0.1516	0.0002	0.0537	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
53			0.02	0.000	0.084	0.1439	0.0003	0.0647	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
54			0.10	0.000	0.048	0.1455	0.0003	0.0637	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
55	*		0.53	0.000	0.018	0.1464	0.0002	0.0562	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
56	*		0.00	0.000	0.008	0.1472	0.0003	0.0607	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
57	*		0.07	0.000	0.004	0.1480	0.0003	0.0574	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
58	*		0.19	0.000	0.007	0.1490	0.0002	0.0503	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
59	*		0.13	0.000	0.000	0.1498	0.0002	0.0455	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
60	*		0.01	0.000	0.000	0.1506	0.0002	0.0392	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
61			0.00	0.000	0.000	0.2136	0.0001	0.0326	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
62			0.04	0.000	0.085	0.1824	0.0002	0.0376	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
63			0.00	0.000	0.070	0.1663	0.0001	0.0149	3.64E-09	0.0000	0.0000	9.81E-11	0.0000	0.0000	0.00E+00
64			0.00	0.000	0.073	0.1553	0.0000	0.0005	1.67E-09	0.0000	0.0000	9.51E-11	0.0000	0.0000	0.00E+00
65			1.31	0.000	0.102	0.2354	0.0001	0.0187	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
66			0.00	0.000	0.055	0.1811	0.0001	0.0222	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
67			0.00	0.000	0.083	0.1635	0.0001	0.0186	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
68			0.10	0.000	0.095	0.1588	0.0001	0.0260	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
69			0.01	0.000	0.054	0.1523	0.0001	0.0301	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
70			0.06	0.000	0.100	0.1452	0.0002	0.0394	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
71			0.13	0.000	0.086	0.1475	0.0002	0.0410	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
72	*		0.05	0.000	0.073	0.1449	0.0002	0.0405	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
73	*		0.10	0.000	0.015	0.1455	0.0002	0.0367	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
74	*		0.00	0.000	0.008	0.1461	0.0001	0.0317	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
75	*	*	0.05	0.000	0.005	0.1461	0.0001	0.0278	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
76	*	*	0.00	0.000	0.062	0.1461	0.0001	0.0214	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
77		*	0.00	0.000	0.026	0.1461	0.0000	0.0083	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
78		*	0.75	0.000	0.001	0.2081	0.0000	0.0001	1.06E-09	0.0000	0.0000	9.21E-11	0.0000	0.0000	0.00E+00
79		*	0.24	0.000	0.001	0.2277	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
80		*	0.11	0.000	0.001	0.2368	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
81		*	0.00	0.000	0.000	0.2368	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
82		*	0.00	0.000	0.000	0.2368	0.0000	0.0004	1.60E-09	0.0000	0.0000	9.48E-11	0.0000	0.0000	0.00E+00
83		*	0.00	0.000	0.000	0.2368	0.0000	0.0113	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
84		*	0.00	0.000	0.000	0.2368	0.0001	0.0269	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

85		*	0.00	0.000	0.000	0.2368	0.0002	0.0409	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
86	*	*	0.00	0.000	0.000	0.2368	0.0002	0.0518	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
87	*	*	0.00	0.000	0.000	0.2368	0.0003	0.0596	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
88		*	0.21	0.000	0.001	0.2545	0.0003	0.0647	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
89		*	0.06	0.000	0.001	0.2593	0.0003	0.0677	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
90		*	0.00	0.000	0.000	0.2593	0.0003	0.0692	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
91			0.74	0.000	0.124	0.2224	0.0003	0.0730	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
92			0.11	0.000	0.219	0.1794	0.0002	0.0432	6.66E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
93			0.00	0.000	0.237	0.1510	0.0004	0.0860	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
94			0.00	0.000	0.197	0.1302	0.0004	0.0932	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
95			0.00	0.000	0.118	0.1197	0.0004	0.0876	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
96			0.00	0.000	0.049	0.1151	0.0004	0.0968	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
97			0.00	0.000	0.038	0.1106	0.0004	0.0815	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
98			0.01	0.000	0.032	0.1072	0.0003	0.0610	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
99			0.02	0.000	0.028	0.1060	0.0002	0.0349	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
100			0.02	0.000	0.026	0.1049	0.0001	0.0231	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
101			0.01	0.000	0.024	0.1028	0.0001	0.0131	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
102	*		0.10	0.000	0.031	0.1040	0.0000	0.0050	6.77E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
103	*		0.20	0.000	0.034	0.1052	0.0001	0.0140	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
104	*		0.21	0.000	0.034	0.1064	0.0001	0.0260	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
105			0.00	0.000	0.069	0.1291	0.0002	0.0394	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
106			0.02	0.000	0.022	0.1284	0.0002	0.0526	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
107			0.01	0.000	0.021	0.1272	0.0003	0.0594	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
108			0.19	0.000	0.020	0.1411	0.0003	0.0729	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
109			0.00	0.000	0.156	0.1277	0.0003	0.0739	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
110			0.33	0.000	0.019	0.1518	0.0004	0.0852	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
111			0.00	0.000	0.165	0.1349	0.0003	0.0758	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
112	*		0.09	0.000	0.041	0.1283	0.0003	0.0780	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
113	*		0.29	0.000	0.021	0.1255	0.0003	0.0741	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
114			0.00	0.000	0.052	0.1421	0.0003	0.0749	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
115			0.56	0.000	0.112	0.1757	0.0004	0.0852	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
116			0.11	0.000	0.303	0.1356	0.0004	0.0996	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
117			0.30	0.000	0.308	0.1276	0.0003	0.0612	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
118			0.00	0.000	0.339	0.0953	0.0004	0.1006	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
119			0.06	0.000	0.112	0.0878	0.0004	0.0941	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
120			0.05	0.000	0.050	0.0840	0.0004	0.0816	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
121			0.34	0.000	0.038	0.0954	0.0004	0.0921	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
122			0.03	0.000	0.206	0.0628	0.0002	0.0455	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
123			0.08	0.000	0.032	0.0667	0.0002	0.0412	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
124	*		0.00	0.000	0.000	0.0667	0.0002	0.0532	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
125	*		0.00	0.000	0.028	0.0621	0.0004	0.0801	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
126			0.00	0.000	0.004	0.0580	0.0002	0.0456	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
127			0.00	0.000	0.000	0.0580	0.0002	0.0517	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
128			0.00	0.000	0.000	0.0580	0.0002	0.0463	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
129			0.00	0.000	0.000	0.0580	0.0002	0.0345	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
130			0.00	0.000	0.000	0.0580	0.0001	0.0217	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

131	0.09	0.000	0.002	0.0580	0.0001	0.0263	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
132	0.43	0.000	0.009	0.0580	0.0000	0.0009	1.76E-09	0.0000	0.0000	9.53E-11	0.0000	0.0000	0.00E+00
133	0.63	0.000	0.058	0.0647	0.0000	0.0008	2.63E-09	0.0000	0.0000	9.71E-11	0.0000	0.0000	0.00E+00
134	0.56	0.000	0.031	0.0646	0.0000	0.0027	1.79E-09	0.0000	0.0000	9.54E-11	0.0000	0.0000	0.00E+00
135	0.03	0.000	0.008	0.0625	0.0002	0.0419	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
136	0.06	0.000	0.010	0.0630	0.0003	0.0731	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
137	0.00	0.000	0.023	0.0586	0.0004	0.0897	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
138	0.03	0.000	0.017	0.0592	0.0003	0.0764	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
139	0.00	0.000	0.006	0.0580	0.0003	0.0587	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
140	0.00	0.000	0.000	0.0580	0.0001	0.0291	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
141	0.03	0.000	0.004	0.0580	0.0001	0.0131	4.40E-09	0.0000	0.0000	9.85E-11	0.0000	0.0000	0.00E+00
142	0.20	0.000	0.015	0.0580	0.0000	0.0009	1.13E-09	0.0000	0.0000	9.25E-11	0.0000	0.0000	0.00E+00
143	0.20	0.000	0.014	0.0580	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
144	0.27	0.000	0.129	0.0580	0.0001	0.0315	4.46E-09	0.0000	0.0000	9.86E-11	0.0000	0.0000	0.00E+00
145	0.20	0.000	0.070	0.0580	0.0005	0.1185	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
146	0.00	0.000	0.000	0.0580	0.0006	0.1335	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
147	0.56	0.000	0.044	0.0580	0.0007	0.1483	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
148	0.48	0.000	0.074	0.0580	0.0002	0.0464	6.70E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
149	0.03	0.000	0.025	0.0580	0.0004	0.0908	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
150	0.02	0.000	0.012	0.0580	0.0006	0.1257	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
151	0.00	0.000	0.003	0.0580	0.0004	0.0936	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
152	0.00	0.000	0.000	0.0580	0.0002	0.0533	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
153	0.00	0.000	0.000	0.0580	0.0000	0.0046	3.10E-09	0.0000	0.0000	9.76E-11	0.0000	0.0000	0.00E+00
154	0.00	0.000	0.000	0.0580	0.0000	0.0002	6.00E-10	0.0000	0.0000	8.63E-11	0.0000	0.0000	0.00E+00
155	0.00	0.000	0.000	0.0580	0.0001	0.0299	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
156	0.00	0.000	0.000	0.0580	0.0004	0.0845	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
157	0.00	0.000	0.000	0.0580	0.0005	0.1235	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
158	0.02	0.000	0.003	0.0580	0.0006	0.1417	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
159	0.00	0.000	0.000	0.0580	0.0006	0.1459	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
160	0.00	0.000	0.000	0.0580	0.0007	0.1546	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
161	0.00	0.000	0.000	0.0580	0.0007	0.1489	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
162	0.00	0.000	0.000	0.0580	0.0006	0.1417	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
163	0.09	0.000	0.002	0.0580	0.0006	0.1357	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
164	0.00	0.000	0.000	0.0580	0.0005	0.1219	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
165	0.50	0.000	0.008	0.0646	0.0006	0.1374	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
166	0.58	0.000	0.117	0.0646	0.0005	0.1133	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
167	0.33	0.000	0.145	0.0642	0.0005	0.1084	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
168	0.00	0.000	0.024	0.0586	0.0007	0.1539	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
169	0.00	0.000	0.003	0.0580	0.0006	0.1409	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
170	0.69	0.000	0.046	0.0580	0.0006	0.1296	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
171	0.00	0.000	0.000	0.0580	0.0002	0.0483	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
172	0.00	0.000	0.000	0.0580	0.0004	0.0904	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
173	0.06	0.000	0.025	0.0580	0.0004	0.1002	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
174	0.00	0.000	0.003	0.0580	0.0003	0.0592	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
175	0.00	0.000	0.000	0.0580	0.0001	0.0336	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
176	0.22	0.000	0.018	0.0580	0.0001	0.0238	4.64E-09	0.0000	0.0000	9.87E-11	0.0000	0.0000	0.00E+00

177	0.00	0.000	0.000	0.0580	0.0000	0.0031	1.60E-09	0.0000	0.0000	9.48E-11	0.0000	0.0000	0.00E+00
178	0.00	0.000	0.000	0.0580	0.0002	0.0544	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
179	0.08	0.000	0.003	0.0580	0.0004	0.0808	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
180	0.85	0.000	0.012	0.0650	0.0002	0.0563	6.03E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
181	0.49	0.000	0.078	0.0645	0.0004	0.0819	5.68E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
182	0.00	0.000	0.025	0.0584	0.0007	0.1645	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
183	0.00	0.000	0.001	0.0580	0.0008	0.1734	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
184	0.00	0.000	0.003	0.0580	0.0006	0.1308	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
185	0.27	0.000	0.023	0.0641	0.0003	0.0756	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
186	0.03	0.000	0.013	0.0622	0.0000	0.0018	1.23E-09	0.0000	0.0000	9.32E-11	0.0000	0.0000	0.00E+00
187	0.44	0.000	0.018	0.0645	0.0002	0.0547	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
188	0.07	0.000	0.023	0.0629	0.0002	0.0564	4.26E-09	0.0000	0.0000	9.85E-11	0.0000	0.0000	0.00E+00
189	0.00	0.000	0.022	0.0592	0.0008	0.1767	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
190	0.01	0.000	0.011	0.0580	0.0006	0.1363	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
191	0.00	0.000	0.000	0.0580	0.0004	0.0871	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
192	0.00	0.000	0.000	0.0580	0.0003	0.0656	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
193	0.00	0.000	0.000	0.0580	0.0003	0.0777	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
194	0.04	0.000	0.004	0.0580	0.0005	0.1051	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
195	0.03	0.000	0.003	0.0580	0.0006	0.1293	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
196	0.00	0.000	0.000	0.0580	0.0007	0.1675	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
197	0.00	0.000	0.000	0.0580	0.0008	0.1741	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
198	0.24	0.000	0.010	0.0580	0.0007	0.1573	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
199	0.01	0.000	0.003	0.0580	0.0006	0.1396	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
200	0.00	0.000	0.000	0.0580	0.0007	0.1679	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
201	0.00	0.000	0.000	0.0580	0.0006	0.1435	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
202	0.00	0.000	0.000	0.0580	0.0005	0.1214	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
203	0.00	0.000	0.000	0.0580	0.0005	0.1089	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
204	1.03	0.000	0.012	0.0651	0.0005	0.1071	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
205	0.04	0.000	0.011	0.0626	0.0003	0.0763	6.05E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
206	0.07	0.000	0.013	0.0631	0.0007	0.1564	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
207	0.09	0.000	0.024	0.0631	0.0006	0.1455	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
208	0.00	0.000	0.022	0.0587	0.0004	0.0949	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
209	0.00	0.000	0.002	0.0580	0.0004	0.0794	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
210	0.00	0.000	0.000	0.0580	0.0003	0.0661	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
211	0.00	0.000	0.000	0.0580	0.0002	0.0442	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
212	0.82	0.000	0.015	0.0649	0.0002	0.0433	6.80E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
213	0.00	0.000	0.025	0.0584	0.0001	0.0199	3.27E-09	0.0000	0.0000	9.78E-11	0.0000	0.0000	0.00E+00
214	0.00	0.000	0.001	0.0580	0.0005	0.1241	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
215	0.00	0.000	0.000	0.0580	0.0006	0.1342	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
216	0.75	0.000	0.023	0.0649	0.0004	0.0977	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
217	0.01	0.000	0.021	0.0605	0.0000	0.0094	2.37E-09	0.0000	0.0000	9.67E-11	0.0000	0.0000	0.00E+00
218	0.06	0.000	0.010	0.0629	0.0005	0.1217	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
219	0.43	0.000	0.040	0.0644	0.0004	0.1010	6.47E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
220	0.27	0.000	0.050	0.0641	0.0001	0.0151	2.74E-09	0.0000	0.0000	9.72E-11	0.0000	0.0000	0.00E+00
221	0.00	0.000	0.024	0.0585	0.0005	0.1132	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
222	0.00	0.000	0.001	0.0580	0.0006	0.1438	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

223		0.11	0.000	0.012	0.0580	0.0003	0.0781	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
224		0.02	0.000	0.006	0.0580	0.0000	0.0081	3.07E-09	0.0000	0.0000	9.76E-11	0.0000	0.0000	0.00E+00
225		0.02	0.000	0.004	0.0580	0.0002	0.0547	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
226		0.14	0.000	0.004	0.0580	0.0004	0.0848	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
227		0.02	0.000	0.004	0.0580	0.0006	0.1271	6.38E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
228		0.00	0.000	0.000	0.0580	0.0008	0.1925	6.92E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
229		0.14	0.000	0.003	0.0580	0.0007	0.1623	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
230		0.17	0.000	0.027	0.0580	0.0005	0.1183	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
231		0.00	0.000	0.000	0.0580	0.0008	0.1847	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
232		0.00	0.000	0.000	0.0580	0.0009	0.2031	6.93E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
233		0.00	0.000	0.000	0.0580	0.0006	0.1426	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
234		0.03	0.000	0.004	0.0580	0.0005	0.1073	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
235		0.01	0.000	0.004	0.0580	0.0004	0.0875	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
236		0.00	0.000	0.002	0.0580	0.0005	0.1077	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
237		0.08	0.000	0.003	0.0580	0.0005	0.1201	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
238		0.47	0.000	0.012	0.0645	0.0005	0.1107	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
239		0.17	0.000	0.053	0.0638	0.0005	0.1197	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
240		0.00	0.000	0.009	0.0606	0.0008	0.1717	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
241		0.00	0.000	0.014	0.0580	0.0008	0.1711	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
242		0.01	0.000	0.012	0.0580	0.0006	0.1281	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
243		0.39	0.000	0.023	0.0580	0.0005	0.1021	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
244		0.00	0.000	0.000	0.0580	0.0001	0.0146	2.94E-09	0.0000	0.0000	9.75E-11	0.0000	0.0000	0.00E+00
245		0.17	0.000	0.018	0.0580	0.0005	0.0936	3.78E-09	0.0000	0.0000	9.82E-11	0.0000	0.0000	0.00E+00
246		0.07	0.000	0.004	0.0580	0.0004	0.0806	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
247		0.00	0.000	0.000	0.0580	0.0003	0.0722	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
248		0.00	0.000	0.000	0.0580	0.0004	0.0911	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
249		0.00	0.000	0.000	0.0580	0.0003	0.0656	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
250		0.00	0.000	0.000	0.0580	0.0002	0.0450	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
251		0.04	0.000	0.003	0.0580	0.0002	0.0452	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
252		0.02	0.000	0.003	0.0580	0.0002	0.0398	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
253		0.03	0.000	0.003	0.0580	0.0004	0.0841	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
254		0.60	0.000	0.009	0.0580	0.0005	0.1061	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
255		0.00	0.000	0.000	0.0580	0.0005	0.1028	6.36E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
256		0.00	0.000	0.000	0.0580	0.0008	0.1814	6.92E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
257		0.07	0.000	0.010	0.0580	0.0007	0.1581	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
258		0.01	0.000	0.006	0.0580	0.0003	0.0724	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
259	*	0.58	0.000	0.033	0.0580	0.0004	0.0867	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
260		0.00	0.000	0.041	0.0580	0.0003	0.0713	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
261		0.00	0.000	0.000	0.0580	0.0001	0.0233	3.71E-09	0.0000	0.0000	9.81E-11	0.0000	0.0000	0.00E+00
262		0.00	0.000	0.000	0.0580	0.0005	0.1206	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
263		0.00	0.000	0.000	0.0580	0.0005	0.1185	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
264		0.00	0.000	0.000	0.0580	0.0004	0.0820	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
265		0.00	0.000	0.004	0.0580	0.0002	0.0541	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
266		0.07	0.000	0.019	0.0580	0.0002	0.0494	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
267		0.21	0.000	0.055	0.0580	0.0001	0.0313	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
268		0.00	0.000	0.000	0.0580	0.0003	0.0651	5.60E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00

269		0.00	0.000	0.000	0.0580	0.0006	0.1351	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
270		0.28	0.000	0.015	0.0580	0.0006	0.1285	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
271		0.00	0.000	0.003	0.0580	0.0003	0.0728	5.78E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
272		0.17	0.000	0.031	0.0580	0.0006	0.1459	6.90E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
273		0.02	0.000	0.016	0.0580	0.0003	0.0646	5.94E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
274		0.02	0.000	0.012	0.0580	0.0005	0.1242	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
275		0.29	0.000	0.023	0.0580	0.0005	0.1170	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
276		0.00	0.000	0.000	0.0580	0.0001	0.0294	4.41E-09	0.0000	0.0000	9.86E-11	0.0000	0.0000	0.00E+00
277	*	0.00	0.000	0.000	0.0580	0.0005	0.1067	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
278	*	0.00	0.000	0.002	0.0580	0.0004	0.0996	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
279		0.00	0.000	0.000	0.0580	0.0003	0.0750	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
280		0.00	0.000	0.000	0.0580	0.0002	0.0556	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
281	*	0.00	0.000	0.000	0.0580	0.0002	0.0468	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
282	*	0.00	0.000	0.002	0.0580	0.0002	0.0486	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
283		0.00	0.000	0.000	0.0580	0.0003	0.0577	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
284		0.00	0.000	0.000	0.0580	0.0003	0.0694	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
285		0.06	0.000	0.003	0.0580	0.0004	0.0831	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
286		0.04	0.000	0.002	0.0580	0.0003	0.0774	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
287		0.12	0.000	0.002	0.0580	0.0004	0.0892	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
288		0.51	0.000	0.008	0.0580	0.0004	0.1009	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
289		0.00	0.000	0.000	0.0580	0.0004	0.0949	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
290		0.00	0.000	0.000	0.0580	0.0007	0.1477	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
291		0.01	0.000	0.008	0.0580	0.0006	0.1439	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
292		0.00	0.000	0.000	0.0580	0.0005	0.1103	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
293		0.00	0.000	0.003	0.0580	0.0004	0.0824	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
294		0.13	0.000	0.013	0.0580	0.0003	0.0747	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
295		0.14	0.000	0.011	0.0580	0.0001	0.0270	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
296		0.22	0.000	0.042	0.0580	0.0001	0.0126	6.37E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
297		0.00	0.000	0.000	0.0580	0.0001	0.0216	4.05E-09	0.0000	0.0000	9.84E-11	0.0000	0.0000	0.00E+00
298		0.00	0.000	0.000	0.0580	0.0004	0.0964	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
299	*	0.00	0.000	0.000	0.0580	0.0005	0.1100	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
300		0.00	0.000	0.000	0.0580	0.0004	0.0903	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
301		0.00	0.000	0.000	0.0580	0.0003	0.0688	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
302		0.00	0.000	0.000	0.0580	0.0002	0.0522	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
303		0.00	0.000	0.003	0.0580	0.0002	0.0422	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
304		0.00	0.000	0.000	0.0580	0.0002	0.0389	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
305		0.19	0.000	0.012	0.0580	0.0002	0.0487	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
306		0.00	0.000	0.000	0.0580	0.0001	0.0253	5.51E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
307	*	0.00	0.000	0.000	0.0580	0.0003	0.0679	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
308	*	0.18	0.000	0.022	0.0580	0.0004	0.0815	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
309	*	0.07	0.000	0.012	0.0580	0.0003	0.0679	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
310		0.00	0.000	0.023	0.0580	0.0003	0.0711	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
311		0.00	0.000	0.000	0.0580	0.0002	0.0474	6.39E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
312		0.45	0.000	0.011	0.0580	0.0005	0.1054	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
313		0.80	0.000	0.022	0.0649	0.0002	0.0503	6.12E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
314		0.00	0.000	0.005	0.0610	0.0003	0.0718	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

315		0.00	0.000	0.005	0.0600	0.0004	0.0980	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
316		0.33	0.000	0.029	0.0642	0.0006	0.1261	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
317		0.00	0.000	0.004	0.0611	0.0002	0.0388	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
318		0.40	0.000	0.019	0.0644	0.0004	0.0967	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
319	*	0.00	0.000	0.003	0.0615	0.0001	0.0201	5.58E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
320	*	0.08	0.000	0.020	0.0624	0.0003	0.0733	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
321		0.00	0.000	0.044	0.0613	0.0004	0.0864	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
322		0.00	0.000	0.004	0.0605	0.0003	0.0607	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
323		0.06	0.000	0.008	0.0630	0.0002	0.0408	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
324	*	0.00	0.000	0.003	0.0612	0.0000	0.0041	1.14E-09	0.0000	0.0000	9.26E-11	0.0000	0.0000	0.00E+00
325		0.07	0.000	0.004	0.0632	0.0001	0.0159	4.78E-09	0.0000	0.0000	9.87E-11	0.0000	0.0000	0.00E+00
326	*	0.14	0.000	0.029	0.0624	0.0000	0.0075	3.29E-09	0.0000	0.0000	9.78E-11	0.0000	0.0000	0.00E+00
327		0.05	0.000	0.052	0.0634	0.0003	0.0660	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
328		0.00	0.000	0.004	0.0611	0.0003	0.0673	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
329		0.00	0.000	0.006	0.0600	0.0006	0.1280	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
330		0.01	0.000	0.009	0.0601	0.0006	0.1248	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
331		0.18	0.000	0.036	0.0638	0.0005	0.1217	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
332		0.00	0.000	0.006	0.0609	0.0003	0.0705	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
333		1.21	0.000	0.044	0.0652	0.0004	0.0955	6.26E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
334		0.00	0.000	0.008	0.0607	0.0004	0.0864	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
335		0.00	0.000	0.008	0.0594	0.0006	0.1371	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
336		0.03	0.000	0.007	0.0611	0.0006	0.1439	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
337		0.00	0.000	0.006	0.0601	0.0005	0.1026	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
338		0.00	0.000	0.009	0.0586	0.0002	0.0519	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
339		0.00	0.000	0.002	0.0580	0.0001	0.0197	6.78E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
340		0.72	0.000	0.047	0.0648	0.0002	0.0344	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
341		0.02	0.000	0.004	0.0624	0.0001	0.0276	3.65E-09	0.0000	0.0000	9.81E-11	0.0000	0.0000	0.00E+00
342		0.02	0.000	0.007	0.0622	0.0006	0.1422	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
343		0.00	0.000	0.006	0.0607	0.0006	0.1276	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
344		0.00	0.000	0.005	0.0598	0.0004	0.0863	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
345		0.00	0.000	0.007	0.0586	0.0003	0.0588	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
346		0.00	0.000	0.002	0.0580	0.0002	0.0508	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
347	*	0.00	0.000	0.000	0.0580	0.0003	0.0690	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
348		0.00	0.000	0.000	0.0580	0.0004	0.0900	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
349		0.20	0.000	0.016	0.0580	0.0005	0.1068	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
350		0.02	0.000	0.004	0.0580	0.0005	0.1070	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
351	*	0.07	0.000	0.027	0.0580	0.0006	0.1468	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
352		0.00	0.000	0.027	0.0580	0.0006	0.1342	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
353		0.02	0.000	0.006	0.0580	0.0006	0.1312	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
354		0.05	0.000	0.005	0.0580	0.0005	0.1134	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
355		0.06	0.000	0.005	0.0580	0.0004	0.0957	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
356		0.06	0.000	0.005	0.0580	0.0005	0.1064	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
357		0.06	0.000	0.006	0.0580	0.0005	0.1162	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
358		0.22	0.000	0.036	0.0580	0.0006	0.1275	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
359		0.15	0.000	0.009	0.0580	0.0004	0.0965	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
360		0.00	0.000	0.000	0.0580	0.0005	0.1215	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

361		0.00	0.000	0.000	0.0580	0.0006	0.1466	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
362	*	0.00	0.000	0.004	0.0580	0.0006	0.1279	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
363	*	0.00	0.000	0.000	0.0580	0.0004	0.0963	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
364	*	0.00	0.000	0.000	0.0580	0.0003	0.0702	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
365	*	0.00	0.000	0.000	0.0580	0.0002	0.0516	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 1			
	inches	cubic feet	percent
Precipitation	35.38	128,415.6	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	7.840	28,459.6	22.16
Drainage Collected from Layer 3	27.5394	99,967.9	77.85
Percolation/Leakage through Layer 5	0.000002	0.0085	0.00
Average Head on Top of Layer 4	0.0003	---	---
Drainage Collected from Layer 7	0.0000	0.0084	0.00
Percolation/Leakage through Layer 9	0.000000	0.0001	0.00
Average Head on Top of Layer 8	0.0000	---	---
Percolation/Leakage through Layer 10	0.000000	0.0000	0.00
Change in Water Storage	-0.0033	-11.9	-0.01
Soil Water at Start of Year	60.5435	219,772.9	171.14
Soil Water at End of Year	60.5402	219,761.0	171.13
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 2

Column key: Head #1: drainage from Layer 4 | Head #2: drainage from Layer 8
Drain #1: drainage from Layer 3 | Drain #2: drainage from Layer 7
Leak #1: leakage thru Layer 5 | Leak #2: leakage thru Layer 9 | Leak #3: leakage thru Layer 10

Title: Wayne Disposal-Initial Lift-Sideslope
Simulated On: 11/22/2020 18:38

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1	Head #2	Drain #2	Leak #2	Head #3	Drain #3	Leak #3
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)
1	*		0.12	0.000	0.008	0.0580	0.0002	0.0462	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
2	*		0.00	0.000	0.005	0.0580	0.0001	0.0301	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
3	*		0.00	0.000	0.006	0.0580	0.0002	0.0349	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
4	*		0.07	0.000	0.008	0.0580	0.0002	0.0488	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
5	*		0.00	0.000	0.005	0.0580	0.0003	0.0631	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
6	*		0.05	0.000	0.007	0.0580	0.0003	0.0737	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
7	*		0.00	0.000	0.005	0.0580	0.0004	0.0800	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
8	*	*	0.00	0.000	0.003	0.0580	0.0004	0.0798	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
9	*	*	0.30	0.000	0.004	0.0580	0.0004	0.0914	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
10	*	*	0.00	0.000	0.017	0.0580	0.0004	0.0878	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
11	*	*	0.00	0.000	0.023	0.0580	0.0004	0.0812	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
12	*	*	0.38	0.000	0.021	0.0580	0.0003	0.0753	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
13		*	0.07	0.000	0.000	0.1072	0.0003	0.0709	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
14		*	0.00	0.000	0.018	0.1190	0.0003	0.0679	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
15		*	0.00	0.000	0.000	0.1190	0.0003	0.0661	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
16		*	0.00	0.000	0.000	0.1190	0.0003	0.0651	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
17		*	0.00	0.000	0.000	0.1190	0.0003	0.0646	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
18	*	*	0.00	0.000	0.000	0.1190	0.0003	0.0643	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
19	*	*	0.00	0.000	0.000	0.1190	0.0003	0.0641	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
20	*	*	0.01	0.000	0.006	0.1190	0.0003	0.0639	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
21		*	0.00	0.000	0.000	0.1190	0.0003	0.0636	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
22		*	0.00	0.000	0.000	0.1190	0.0003	0.0632	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
23		*	0.00	0.000	0.000	0.1190	0.0003	0.0627	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
24	*	*	0.11	0.000	0.017	0.1190	0.0003	0.0622	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
25	*	*	0.00	0.000	0.011	0.1190	0.0003	0.0615	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
26	*	*	0.00	0.000	0.005	0.1190	0.0003	0.0608	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
27	*	*	0.00	0.000	0.007	0.1190	0.0003	0.0600	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
28	*	*	0.02	0.000	0.000	0.1190	0.0003	0.0592	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
29	*	*	0.00	0.000	0.016	0.1190	0.0003	0.0584	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
30	*	*	0.00	0.000	0.006	0.1190	0.0003	0.0575	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
31	*	*	0.00	0.000	0.025	0.1190	0.0002	0.0566	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
32	*	*	0.00	0.000	0.039	0.1190	0.0002	0.0557	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
33		*	0.00	0.000	0.007	0.1190	0.0002	0.0549	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
34	*	*	0.00	0.000	0.000	0.1190	0.0002	0.0540	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
35		*	0.00	0.000	0.000	0.1190	0.0002	0.0531	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
36	*	*	0.64	0.000	0.030	0.1190	0.0002	0.0522	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
37	*	*	0.00	0.000	0.013	0.1190	0.0002	0.0514	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
38	*	*	0.00	0.000	0.022	0.1190	0.0002	0.0506	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

39		*	0.00	0.000	0.000	0.1665	0.0002	0.0497	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
40	*	*	0.00	0.000	0.000	0.1665	0.0002	0.0489	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
41	*	*	0.01	0.000	0.007	0.1665	0.0002	0.0481	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
42	*	*	0.02	0.000	0.019	0.1665	0.0002	0.0474	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
43	*	*	0.00	0.000	0.003	0.1665	0.0002	0.0466	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
44	*	*	0.00	0.000	0.000	0.1665	0.0002	0.0459	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
45	*	*	0.00	0.000	0.000	0.1665	0.0002	0.0451	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
46		*	0.00	0.000	0.000	0.1665	0.0002	0.0444	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
47	*	*	0.00	0.000	0.001	0.1665	0.0002	0.0437	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
48		*	0.16	0.000	0.001	0.1799	0.0002	0.0430	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
49		*	0.12	0.000	0.001	0.1899	0.0002	0.0424	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
50		*	0.08	0.000	0.001	0.1967	0.0002	0.0417	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
51		*	0.03	0.000	0.001	0.1989	0.0002	0.0411	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
52		*	0.02	0.000	0.001	0.2002	0.0002	0.0405	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
53		*	0.00	0.000	0.000	0.2002	0.0002	0.0399	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
54	*	*	0.00	0.000	0.000	0.2002	0.0002	0.0393	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
55		*	0.00	0.000	0.000	0.2002	0.0002	0.0387	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
56		*	0.00	0.000	0.000	0.2002	0.0002	0.0382	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
57	*	*	0.00	0.000	0.000	0.2002	0.0002	0.0376	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
58	*	*	0.01	0.000	0.012	0.2002	0.0002	0.0371	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
59		*	0.23	0.000	0.001	0.2196	0.0002	0.0366	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
60		*	0.02	0.000	0.001	0.2211	0.0002	0.0361	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
61		*	0.20	0.000	0.001	0.2377	0.0002	0.0356	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
62		*	0.00	0.000	0.000	0.2377	0.0002	0.0351	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
63		*	0.03	0.000	0.001	0.2404	0.0002	0.0346	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
64	*	*	0.05	0.000	0.051	0.2404	0.0002	0.0342	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
65	*	*	0.03	0.000	0.017	0.2404	0.0001	0.0337	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
66	*	*	0.21	0.000	0.015	0.2404	0.0001	0.0333	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
67		*	0.07	0.000	0.011	0.2634	0.0001	0.0329	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
68	*	*	0.42	0.000	0.016	0.2634	0.0001	0.0324	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
69	*	*	0.27	0.000	0.016	0.2634	0.0001	0.0320	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
70	*	*	0.00	0.000	0.024	0.2634	0.0001	0.0316	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
71		*	0.00	0.000	0.000	0.3163	0.0001	0.0312	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
72	*	*	0.00	0.000	0.000	0.3163	0.0001	0.0308	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
73		*	0.00	0.000	0.000	0.3163	0.0001	0.0305	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
74	*	*	0.00	0.000	0.000	0.3163	0.0001	0.0301	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
75	*	*	0.14	0.000	0.034	0.3163	0.0001	0.0297	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
76		*	0.01	0.000	0.119	0.3166	0.0001	0.0294	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
77		*	0.45	0.000	0.001	0.3541	0.0001	0.0290	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
78		*	0.33	0.000	0.001	0.3811	0.0001	0.0287	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
79	*	*	0.00	0.000	0.000	0.3811	0.0001	0.0284	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
80	*	*	0.01	0.000	0.010	0.3811	0.0001	0.0281	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
81	*	*	0.00	0.000	0.000	0.3811	0.0001	0.0277	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
82		*	0.00	0.000	0.000	0.3811	0.0001	0.0274	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
83		*	0.00	0.000	0.000	0.3811	0.0001	0.0271	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
84		*	0.00	0.000	0.000	0.3811	0.0001	0.0268	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

85		*	0.06	0.000	0.001	0.3862	0.0001	0.0265	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
86	*	*	0.68	0.000	0.016	0.3862	0.0001	0.0262	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
87	*	*	0.02	0.000	0.029	0.3862	0.0001	0.0260	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
88	*	*	0.00	0.000	0.018	0.3862	0.0001	0.0257	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
89		*	0.11	0.000	0.000	0.4488	0.0001	0.0254	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
90	*	*	0.06	0.000	0.032	0.4488	0.0001	0.0251	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
91	*	*	0.38	0.000	0.012	0.4488	0.0001	0.0249	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
92	*	*	0.03	0.000	0.000	0.4488	0.0001	0.0246	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
93	*	*	0.05	0.000	0.000	0.4488	0.0001	0.0244	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
94	*	*	0.27	0.000	0.018	0.4488	0.0001	0.0241	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
95	*	*	0.00	0.000	0.045	0.4488	0.0001	0.0239	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
96	*	*	0.72	0.000	0.027	0.4488	0.0001	0.0237	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
97		*	0.10	0.000	0.000	0.4570	0.0001	0.0248	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
98		*	0.07	0.000	0.001	0.4570	0.0000	0.0095	6.77E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
99		*	0.04	0.000	0.001	0.4570	0.0001	0.0183	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
100		*	0.10	0.000	0.001	0.4570	0.0001	0.0239	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
101	*	*	0.00	0.000	0.000	0.4570	0.0001	0.0272	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
102	*	*	0.00	0.000	0.000	0.4570	0.0001	0.0288	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
103	*	*	0.00	0.000	0.000	0.4570	0.0001	0.0294	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
104		*	0.06	0.000	0.001	0.4570	0.0002	0.0441	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
105	*	*	0.00	0.000	0.003	0.4570	0.0001	0.0205	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
106		*	0.00	0.000	0.000	0.4570	0.0001	0.0219	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
107		*	0.00	0.000	0.000	0.4570	0.0001	0.0228	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
108		*	0.00	0.000	0.000	0.4570	0.0001	0.0242	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
109		*	0.00	0.000	0.000	0.4570	0.0001	0.0277	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
110		*	0.00	0.000	0.000	0.4570	0.0001	0.0286	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
111		*	0.00	0.000	0.000	0.4570	0.0001	0.0279	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
112		*	0.00	0.000	0.000	0.4570	0.0001	0.0263	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
113		*	0.00	0.000	0.000	0.4570	0.0001	0.0242	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
114		*	0.10	0.000	0.001	0.4570	0.0001	0.0221	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
115			0.00	0.000	0.222	0.2441	0.0000	0.0024	2.56E-09	0.0000	0.0000	9.70E-11	0.0000	0.0000	0.00E+00
116			0.00	0.000	0.122	0.2181	0.0000	0.0031	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
117			0.00	0.000	0.237	0.1904	0.0000	0.0065	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
118			0.00	0.000	0.130	0.1746	0.0000	0.0091	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
119			0.00	0.000	0.054	0.1677	0.0001	0.0140	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
120			0.08	0.000	0.042	0.1691	0.0001	0.0256	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
121			0.00	0.000	0.035	0.1638	0.0001	0.0229	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
122			0.39	0.000	0.032	0.1914	0.0001	0.0208	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
123			0.06	0.000	0.260	0.1727	0.0001	0.0189	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
124			0.83	0.000	0.029	0.2377	0.0001	0.0174	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
125			0.00	0.000	0.213	0.2116	0.0001	0.0133	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
126			0.36	0.000	0.170	0.2140	0.0000	0.0097	4.77E-09	0.0000	0.0000	9.87E-11	0.0000	0.0000	0.00E+00
127			0.15	0.000	0.191	0.2021	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
128			0.09	0.000	0.282	0.1811	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
129			0.02	0.000	0.219	0.1609	0.0000	0.0000	2.52E-11	0.0000	0.0000	2.02E-11	0.0000	0.0000	0.00E+00
130			0.18	0.000	0.133	0.1620	0.0000	0.0046	6.57E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

131	0.36	0.000	0.186	0.1756	0.0000	0.0110	6.70E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
132	0.00	0.000	0.296	0.1493	0.0002	0.0350	6.79E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
133	0.00	0.000	0.126	0.1374	0.0001	0.0256	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
134	0.00	0.000	0.054	0.1237	0.0001	0.0263	6.41E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
135	0.47	0.000	0.042	0.1546	0.0000	0.0000	2.52E-11	0.0000	0.0000	2.02E-11	0.0000	0.0000	0.00E+00
136	0.10	0.000	0.327	0.1260	0.0002	0.0353	3.51E-09	0.0000	0.0000	9.80E-11	0.0000	0.0000	0.00E+00
137	0.15	0.000	0.036	0.1241	0.0001	0.0285	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
138	0.06	0.000	0.153	0.1053	0.0002	0.0551	6.73E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
139	0.21	0.000	0.032	0.1140	0.0003	0.0719	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
140	0.05	0.000	0.106	0.1072	0.0005	0.1128	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
141	0.15	0.000	0.081	0.1086	0.0004	0.0963	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
142	0.01	0.000	0.084	0.1007	0.0003	0.0774	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
143	0.06	0.000	0.103	0.0927	0.0003	0.0697	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
144	0.02	0.000	0.084	0.0802	0.0002	0.0430	6.79E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
145	0.14	0.000	0.055	0.0875	0.0001	0.0149	4.10E-09	0.0000	0.0000	9.84E-11	0.0000	0.0000	0.00E+00
146	0.07	0.000	0.042	0.0863	0.0003	0.0625	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
147	0.00	0.000	0.035	0.0786	0.0002	0.0417	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
148	0.11	0.000	0.032	0.0847	0.0001	0.0323	6.05E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
149	0.15	0.000	0.288	0.0618	0.0004	0.0837	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
150	0.16	0.000	0.029	0.0728	0.0001	0.0277	4.61E-09	0.0000	0.0000	9.86E-11	0.0000	0.0000	0.00E+00
151	0.00	0.000	0.162	0.0580	0.0004	0.0812	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
152	0.00	0.000	0.000	0.0580	0.0004	0.0857	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
153	0.00	0.000	0.000	0.0580	0.0003	0.0759	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
154	0.00	0.000	0.000	0.0580	0.0003	0.0650	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
155	0.00	0.000	0.000	0.0580	0.0003	0.0585	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
156	0.00	0.000	0.000	0.0580	0.0003	0.0572	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
157	0.18	0.000	0.009	0.0580	0.0003	0.0657	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
158	0.03	0.000	0.003	0.0580	0.0002	0.0469	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
159	0.00	0.000	0.000	0.0580	0.0003	0.0720	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
160	0.01	0.000	0.003	0.0580	0.0004	0.0961	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
161	0.00	0.000	0.000	0.0580	0.0004	0.0902	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
162	0.00	0.000	0.000	0.0580	0.0004	0.0844	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
163	0.00	0.000	0.000	0.0580	0.0003	0.0778	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
164	0.00	0.000	0.000	0.0580	0.0003	0.0730	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
165	0.00	0.000	0.000	0.0580	0.0003	0.0703	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
166	0.00	0.000	0.000	0.0580	0.0003	0.0692	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
167	0.00	0.000	0.000	0.0580	0.0003	0.0692	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
168	0.63	0.000	0.007	0.0580	0.0003	0.0742	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
169	0.21	0.000	0.086	0.0580	0.0002	0.0400	6.16E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
170	0.06	0.000	0.014	0.0580	0.0004	0.0931	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
171	0.00	0.000	0.000	0.0580	0.0004	0.0996	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
172	0.00	0.000	0.000	0.0580	0.0005	0.1023	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
173	0.00	0.000	0.000	0.0580	0.0004	0.0920	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
174	0.00	0.000	0.000	0.0580	0.0003	0.0723	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
175	0.00	0.000	0.000	0.0580	0.0002	0.0531	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
176	0.00	0.000	0.000	0.0580	0.0002	0.0370	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

177	0.00	0.000	0.000	0.0580	0.0001	0.0252	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
178	0.00	0.000	0.000	0.0580	0.0001	0.0188	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
179	0.00	0.000	0.000	0.0580	0.0001	0.0184	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
180	0.00	0.000	0.000	0.0580	0.0001	0.0229	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
181	0.00	0.000	0.000	0.0580	0.0001	0.0308	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
182	0.09	0.000	0.003	0.0580	0.0002	0.0456	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
183	0.00	0.000	0.000	0.0580	0.0001	0.0334	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
184	0.00	0.000	0.000	0.0580	0.0003	0.0600	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
185	0.00	0.000	0.000	0.0580	0.0003	0.0696	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
186	0.00	0.000	0.000	0.0580	0.0003	0.0715	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
187	0.00	0.000	0.000	0.0580	0.0003	0.0706	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
188	0.00	0.000	0.000	0.0580	0.0003	0.0690	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
189	0.00	0.000	0.000	0.0580	0.0003	0.0675	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
190	0.00	0.000	0.000	0.0580	0.0003	0.0663	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
191	0.00	0.000	0.000	0.0580	0.0003	0.0653	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
192	0.77	0.000	0.007	0.0649	0.0003	0.0689	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
193	1.02	0.000	0.110	0.0651	0.0002	0.0404	6.36E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
194	0.00	0.000	0.021	0.0590	0.0003	0.0606	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
195	0.03	0.000	0.017	0.0600	0.0004	0.0851	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
196	0.10	0.000	0.024	0.0632	0.0005	0.1062	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
197	0.59	0.000	0.056	0.0647	0.0004	0.0892	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
198	0.00	0.000	0.024	0.0585	0.0001	0.0167	5.77E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
199	0.01	0.000	0.009	0.0580	0.0002	0.0471	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
200	0.21	0.000	0.056	0.0580	0.0004	0.0903	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
201	0.04	0.000	0.032	0.0580	0.0001	0.0211	5.61E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
202	0.22	0.000	0.024	0.0580	0.0003	0.0773	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
203	0.00	0.000	0.000	0.0580	0.0000	0.0054	2.03E-09	0.0000	0.0000	9.60E-11	0.0000	0.0000	0.00E+00
204	0.00	0.000	0.000	0.0580	0.0003	0.0590	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
205	0.00	0.000	0.000	0.0580	0.0003	0.0625	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
206	0.00	0.000	0.000	0.0580	0.0002	0.0408	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
207	0.00	0.000	0.000	0.0580	0.0001	0.0201	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
208	0.00	0.000	0.000	0.0580	0.0001	0.0124	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
209	0.00	0.000	0.000	0.0580	0.0001	0.0210	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
210	0.00	0.000	0.000	0.0580	0.0002	0.0411	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
211	0.00	0.000	0.000	0.0580	0.0003	0.0638	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
212	0.00	0.000	0.000	0.0580	0.0004	0.0825	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
213	0.00	0.000	0.000	0.0580	0.0004	0.0949	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
214	0.00	0.000	0.000	0.0580	0.0004	0.1018	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
215	0.00	0.000	0.000	0.0580	0.0005	0.1049	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
216	0.00	0.000	0.000	0.0580	0.0005	0.1055	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
217	0.00	0.000	0.000	0.0580	0.0005	0.1047	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
218	0.00	0.000	0.000	0.0580	0.0005	0.1030	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
219	0.00	0.000	0.000	0.0580	0.0004	0.1009	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
220	0.14	0.000	0.002	0.0580	0.0004	0.1006	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
221	0.00	0.000	0.000	0.0580	0.0004	0.0868	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
222	0.00	0.000	0.000	0.0580	0.0004	0.1002	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

223	0.00	0.000	0.000	0.0580	0.0004	0.0979	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
224	0.00	0.000	0.000	0.0580	0.0004	0.0919	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
225	0.01	0.000	0.002	0.0580	0.0004	0.0869	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
226	0.00	0.000	0.000	0.0580	0.0003	0.0792	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
227	0.02	0.000	0.002	0.0580	0.0004	0.0818	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
228	0.00	0.000	0.000	0.0580	0.0003	0.0656	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
229	0.00	0.000	0.000	0.0580	0.0003	0.0743	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
230	0.00	0.000	0.000	0.0580	0.0003	0.0755	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
231	0.00	0.000	0.000	0.0580	0.0003	0.0738	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
232	0.00	0.000	0.000	0.0580	0.0003	0.0714	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
233	0.00	0.000	0.000	0.0580	0.0003	0.0689	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
234	0.04	0.000	0.002	0.0580	0.0003	0.0703	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
235	0.10	0.000	0.002	0.0580	0.0003	0.0608	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
236	0.00	0.000	0.000	0.0580	0.0002	0.0515	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
237	0.00	0.000	0.000	0.0580	0.0003	0.0656	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
238	0.00	0.000	0.000	0.0580	0.0003	0.0682	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
239	0.00	0.000	0.000	0.0580	0.0003	0.0663	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
240	0.00	0.000	0.000	0.0580	0.0003	0.0628	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
241	0.00	0.000	0.000	0.0580	0.0003	0.0593	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
242	0.22	0.000	0.005	0.0580	0.0002	0.0561	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
243	0.00	0.000	0.000	0.0580	0.0002	0.0449	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
244	0.00	0.000	0.000	0.0580	0.0002	0.0564	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
245	0.00	0.000	0.000	0.0580	0.0003	0.0579	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
246	0.00	0.000	0.000	0.0580	0.0002	0.0554	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
247	0.00	0.000	0.000	0.0580	0.0002	0.0516	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
248	0.37	0.000	0.005	0.0580	0.0003	0.0570	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
249	0.11	0.000	0.014	0.0580	0.0002	0.0369	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
250	0.02	0.000	0.020	0.0580	0.0001	0.0120	5.37E-09	0.0000	0.0000	9.89E-11	0.0000	0.0000	0.00E+00
251	0.00	0.000	0.000	0.0580	0.0002	0.0385	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
252	0.00	0.000	0.000	0.0580	0.0002	0.0525	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
253	1.08	0.000	0.029	0.0651	0.0003	0.0779	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
254	0.03	0.000	0.014	0.0623	0.0001	0.0272	6.79E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
255	0.00	0.000	0.017	0.0591	0.0002	0.0375	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
256	0.05	0.000	0.009	0.0626	0.0002	0.0421	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
257	0.00	0.000	0.007	0.0606	0.0002	0.0518	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
258	0.00	0.000	0.010	0.0590	0.0002	0.0561	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
259	0.00	0.000	0.004	0.0580	0.0002	0.0470	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
260	0.00	0.000	0.000	0.0580	0.0002	0.0411	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
261	0.03	0.000	0.005	0.0580	0.0002	0.0350	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
262	0.30	0.000	0.016	0.0580	0.0001	0.0304	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
263	0.03	0.000	0.005	0.0580	0.0000	0.0001	2.53E-11	0.0000	0.0000	2.02E-11	0.0000	0.0000	0.00E+00
264	0.00	0.000	0.000	0.0580	0.0000	0.0019	2.07E-09	0.0000	0.0000	9.61E-11	0.0000	0.0000	0.00E+00
265	0.00	0.000	0.000	0.0580	0.0001	0.0231	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
266	0.00	0.000	0.000	0.0580	0.0001	0.0317	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
267	0.00	0.000	0.000	0.0580	0.0001	0.0289	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
268	0.42	0.000	0.016	0.0580	0.0002	0.0377	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

269		0.07	0.000	0.009	0.0580	0.0000	0.0001	2.53E-11	0.0000	0.0000	2.02E-11	0.0000	0.0000	0.00E+00
270		0.00	0.000	0.000	0.0580	0.0000	0.0024	2.44E-09	0.0000	0.0000	9.68E-11	0.0000	0.0000	0.00E+00
271		0.00	0.000	0.000	0.0580	0.0002	0.0367	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
272		0.00	0.000	0.000	0.0580	0.0002	0.0505	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
273		0.38	0.000	0.011	0.0580	0.0002	0.0545	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
274		0.00	0.000	0.000	0.0580	0.0000	0.0002	2.53E-11	0.0000	0.0000	2.02E-11	0.0000	0.0000	0.00E+00
275		0.00	0.000	0.000	0.0580	0.0001	0.0241	6.25E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
276		0.29	0.000	0.026	0.0580	0.0003	0.0655	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
277		0.00	0.000	0.000	0.0580	0.0000	0.0012	1.49E-09	0.0000	0.0000	9.44E-11	0.0000	0.0000	0.00E+00
278		0.00	0.000	0.000	0.0580	0.0002	0.0381	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
279		0.00	0.000	0.000	0.0580	0.0003	0.0588	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
280		0.00	0.000	0.000	0.0580	0.0002	0.0504	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
281		0.00	0.000	0.000	0.0580	0.0002	0.0346	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
282		0.00	0.000	0.000	0.0580	0.0001	0.0203	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
283	*	0.00	0.000	0.000	0.0580	0.0001	0.0123	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
284		0.00	0.000	0.000	0.0580	0.0001	0.0130	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
285	*	0.00	0.000	0.000	0.0580	0.0001	0.0215	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
286		0.00	0.000	0.000	0.0580	0.0002	0.0349	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
287		0.00	0.000	0.000	0.0580	0.0002	0.0492	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
288		0.13	0.000	0.003	0.0580	0.0003	0.0657	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
289		0.00	0.000	0.003	0.0580	0.0002	0.0564	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
290		0.00	0.000	0.000	0.0580	0.0004	0.0855	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
291		0.16	0.000	0.005	0.0580	0.0004	0.0962	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
292		0.00	0.000	0.000	0.0580	0.0003	0.0669	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
293		0.00	0.000	0.000	0.0580	0.0004	0.0948	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
294		0.00	0.000	0.000	0.0580	0.0004	0.0926	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
295		0.00	0.000	0.000	0.0580	0.0004	0.0838	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
296		0.55	0.000	0.008	0.0580	0.0004	0.0832	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
297		0.00	0.000	0.000	0.0580	0.0001	0.0326	5.78E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
298		0.00	0.000	0.000	0.0580	0.0004	0.0828	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
299		0.02	0.000	0.008	0.0580	0.0005	0.1026	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
300		0.28	0.000	0.038	0.0580	0.0005	0.1026	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
301		0.00	0.000	0.000	0.0580	0.0001	0.0172	5.57E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
302		0.00	0.000	0.003	0.0580	0.0003	0.0595	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
303		0.00	0.000	0.000	0.0580	0.0003	0.0726	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
304		0.12	0.000	0.008	0.0580	0.0003	0.0764	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
305		0.00	0.000	0.000	0.0580	0.0001	0.0140	5.10E-09	0.0000	0.0000	9.89E-11	0.0000	0.0000	0.00E+00
306		0.03	0.000	0.005	0.0580	0.0002	0.0495	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
307		0.00	0.000	0.000	0.0580	0.0001	0.0266	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
308		0.00	0.000	0.000	0.0580	0.0002	0.0388	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
309		0.00	0.000	0.000	0.0580	0.0002	0.0396	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
310	*	0.00	0.000	0.000	0.0580	0.0002	0.0374	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
311	*	0.00	0.000	0.000	0.0580	0.0002	0.0359	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
312		0.00	0.000	0.000	0.0580	0.0002	0.0365	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
313		0.00	0.000	0.000	0.0580	0.0002	0.0393	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
314		0.00	0.000	0.000	0.0580	0.0002	0.0437	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

315	*	0.24	0.000	0.020	0.0580	0.0002	0.0541	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
316		0.18	0.000	0.005	0.0580	0.0002	0.0471	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
317	*	0.03	0.000	0.033	0.0580	0.0001	0.0325	5.15E-09	0.0000	0.0000	9.89E-11	0.0000	0.0000	0.00E+00
318	*	0.43	0.000	0.011	0.0580	0.0004	0.0959	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
319		0.22	0.000	0.000	0.0580	0.0004	0.1016	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
320		0.00	0.000	0.000	0.0580	0.0001	0.0312	6.28E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
321	*	0.00	0.000	0.000	0.0580	0.0003	0.0711	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
322		0.00	0.000	0.000	0.0580	0.0004	0.0881	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
323		0.00	0.000	0.000	0.0580	0.0004	0.0902	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
324	*	0.00	0.000	0.000	0.0580	0.0003	0.0735	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
325		0.00	0.000	0.000	0.0580	0.0002	0.0544	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
326		0.00	0.000	0.000	0.0580	0.0002	0.0375	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
327		0.00	0.000	0.000	0.0580	0.0001	0.0251	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
328		0.00	0.000	0.000	0.0580	0.0001	0.0185	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
329		0.00	0.000	0.000	0.0580	0.0001	0.0184	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
330		0.00	0.000	0.000	0.0580	0.0001	0.0238	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
331		0.00	0.000	0.000	0.0580	0.0001	0.0327	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
332		0.00	0.000	0.000	0.0580	0.0002	0.0428	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
333		0.02	0.000	0.004	0.0580	0.0003	0.0569	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
334		0.34	0.000	0.014	0.0580	0.0002	0.0521	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
335		0.16	0.000	0.010	0.0580	0.0003	0.0588	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
336		0.00	0.000	0.000	0.0580	0.0002	0.0489	6.16E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
337		0.00	0.000	0.000	0.0580	0.0005	0.1098	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
338		0.00	0.000	0.000	0.0580	0.0005	0.1115	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
339		0.00	0.000	0.000	0.0580	0.0004	0.0934	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
340		0.00	0.000	0.000	0.0580	0.0003	0.0753	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
341	*	0.00	0.000	0.000	0.0580	0.0003	0.0605	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
342		0.01	0.000	0.004	0.0580	0.0002	0.0506	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
343		0.00	0.000	0.000	0.0580	0.0002	0.0403	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
344	*	0.00	0.000	0.000	0.0580	0.0002	0.0382	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
345	*	0.00	0.000	0.000	0.0580	0.0002	0.0381	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
346		0.06	0.000	0.003	0.0580	0.0002	0.0472	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
347		0.11	0.000	0.003	0.0580	0.0002	0.0351	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
348		0.00	0.000	0.000	0.0580	0.0001	0.0246	6.18E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
349		0.01	0.000	0.003	0.0580	0.0003	0.0597	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
350		0.21	0.000	0.009	0.0580	0.0003	0.0769	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
351		0.05	0.000	0.006	0.0580	0.0002	0.0455	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
352		0.00	0.000	0.000	0.0580	0.0002	0.0518	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
353		0.00	0.000	0.000	0.0580	0.0004	0.0802	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
354		0.00	0.000	0.000	0.0580	0.0003	0.0787	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
355		0.02	0.000	0.005	0.0580	0.0003	0.0735	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
356		0.02	0.000	0.004	0.0580	0.0003	0.0576	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
357		0.05	0.000	0.004	0.0580	0.0002	0.0556	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
358		0.00	0.000	0.002	0.0580	0.0001	0.0177	6.78E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
359		0.13	0.000	0.003	0.0580	0.0002	0.0529	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
360		0.03	0.000	0.003	0.0580	0.0001	0.0235	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

361	*	0.00	0.000	0.000	0.0580	0.0001	0.0311	6.79E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
362	*	0.00	0.000	0.000	0.0580	0.0002	0.0564	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
363	*	0.01	0.000	0.010	0.0580	0.0003	0.0607	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
364	*	0.00	0.000	0.000	0.0580	0.0003	0.0573	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
365	*	0.10	0.000	0.024	0.0580	0.0003	0.0598	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 2			
	inches	cubic feet	percent
Precipitation	23.58	85,610.0	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	6.624	24,046.0	28.09
Drainage Collected from Layer 3	18.1332	65,823.6	76.89
Percolation/Leakage through Layer 5	0.000002	0.0087	0.00
Average Head on Top of Layer 4	0.0002	---	---
Drainage Collected from Layer 7	0.0000	0.0086	0.00
Percolation/Leakage through Layer 9	0.000000	0.0001	0.00
Average Head on Top of Layer 8	0.0000	---	---
Percolation/Leakage through Layer 10	0.000000	0.0000	0.00
Change in Water Storage	-1.1734	-4,259.6	-4.98
Soil Water at Start of Year	60.5402	219,761.0	256.70
Soil Water at End of Year	59.3153	215,314.7	251.51
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0514	186.8	0.22
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 3

Column key: Head #1: drainage from Layer 4 | Head #2: drainage from Layer 8
Drain #1: drainage from Layer 3 | Drain #2: drainage from Layer 7
Leak #1: leakage thru Layer 5 | Leak #2: leakage thru Layer 9 | Leak #3: leakage thru Layer 10

Title: Wayne Disposal-Initial Lift-Sideslope
Simulated On: 11/22/2020 18:38

Day	Freezing Status* Air	Soil	Rain (inches)	Runoff (inches)	ET (inches)	Evap. Zone Water (in/in)	Head #1 (inches)	Drain #1 (inches)	Leak #1 (inches)	Head #2 (inches)	Drain #2 (inches)	Leak #2 (inches)	Head #3 (inches)	Drain #3 (inches)	Leak #3 (inches)
1			0.01	0.000	0.055	0.0580	0.0001	0.0339	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
2			0.00	0.000	0.000	0.0580	0.0002	0.0371	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
3	*		0.00	0.000	0.000	0.0580	0.0002	0.0394	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
4			0.00	0.000	0.000	0.0580	0.0002	0.0398	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
5			0.00	0.000	0.000	0.0580	0.0002	0.0395	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
6	*		0.00	0.000	0.000	0.0580	0.0002	0.0391	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
7	*		0.00	0.000	0.000	0.0580	0.0002	0.0390	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
8	*		0.00	0.000	0.000	0.0580	0.0002	0.0393	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
9	*		0.00	0.000	0.000	0.0580	0.0002	0.0399	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
10	*		0.00	0.000	0.000	0.0580	0.0002	0.0407	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
11			0.04	0.000	0.003	0.0580	0.0002	0.0473	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
12	*		0.10	0.000	0.017	0.0580	0.0002	0.0393	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
13	*		0.00	0.000	0.018	0.0580	0.0002	0.0375	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
14	*		0.15	0.000	0.022	0.0580	0.0002	0.0392	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
15	*		0.00	0.000	0.027	0.0580	0.0002	0.0418	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
16	*		0.00	0.000	0.025	0.0580	0.0002	0.0453	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
17	*	*	0.13	0.000	0.023	0.0580	0.0002	0.0420	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
18	*	*	0.13	0.000	0.000	0.0580	0.0003	0.0577	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
19	*	*	0.10	0.000	0.022	0.0580	0.0003	0.0614	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
20	*	*	0.00	0.000	0.018	0.0580	0.0003	0.0599	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
21	*	*	0.00	0.000	0.000	0.0580	0.0002	0.0566	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
22	*	*	0.21	0.000	0.008	0.0580	0.0002	0.0529	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
23	*	*	0.00	0.000	0.017	0.0580	0.0002	0.0494	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
24	*	*	0.00	0.000	0.000	0.0580	0.0002	0.0463	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
25		*	0.00	0.000	0.011	0.0710	0.0002	0.0437	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
26	*	*	0.16	0.000	0.016	0.0710	0.0002	0.0416	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
27		*	0.12	0.000	0.000	0.1217	0.0002	0.0399	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
28		*	0.00	0.000	0.000	0.1217	0.0002	0.0386	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
29		*	0.00	0.000	0.000	0.1217	0.0002	0.0376	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
30		*	0.00	0.000	0.000	0.1217	0.0002	0.0369	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
31		*	0.00	0.000	0.000	0.1217	0.0002	0.0363	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
32		*	0.01	0.000	0.001	0.1223	0.0002	0.0359	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
33		*	0.26	0.000	0.001	0.1435	0.0002	0.0356	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
34	*	*	0.00	0.000	0.000	0.1435	0.0002	0.0354	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
35		*	0.19	0.000	0.001	0.1596	0.0002	0.0353	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
36		*	0.00	0.000	0.000	0.1596	0.0002	0.0351	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
37		*	0.00	0.000	0.000	0.1596	0.0002	0.0350	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
38		*	0.00	0.000	0.000	0.1596	0.0002	0.0350	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

39		0.00	0.000	0.097	0.1425	0.0002	0.0375	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
40		0.00	0.000	0.104	0.1266	0.0002	0.0359	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
41		0.00	0.000	0.048	0.1199	0.0001	0.0329	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
42		0.10	0.000	0.092	0.1180	0.0001	0.0316	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
43		0.00	0.000	0.084	0.1083	0.0001	0.0314	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
44		0.05	0.000	0.066	0.1058	0.0001	0.0232	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
45		0.43	0.000	0.051	0.1364	0.0002	0.0376	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
46	*	0.00	0.000	0.028	0.1332	0.0002	0.0344	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
47	*	0.01	0.000	0.015	0.1332	0.0002	0.0346	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
48	*	0.04	0.000	0.031	0.1333	0.0002	0.0450	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
49	*	0.01	0.000	0.006	0.1316	0.0002	0.0511	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
50	*	0.01	0.000	0.012	0.1297	0.0002	0.0407	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
51	*	0.00	0.000	0.000	0.1281	0.0001	0.0310	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
52	*	0.00	0.000	0.000	0.1267	0.0001	0.0273	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
53	*	0.00	0.000	0.000	0.1255	0.0001	0.0271	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
54	*	0.23	0.000	0.008	0.1261	0.0001	0.0280	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
55	*	0.01	0.000	0.000	0.1268	0.0001	0.0294	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
56		0.06	0.000	0.046	0.1427	0.0001	0.0339	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
57	*	0.03	0.000	0.033	0.1423	0.0001	0.0255	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
58		0.00	0.000	0.063	0.1346	0.0002	0.0410	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
59		0.00	0.000	0.128	0.1205	0.0002	0.0345	6.79E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
60		0.09	0.000	0.091	0.1191	0.0001	0.0237	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
61		0.09	0.000	0.097	0.1169	0.0001	0.0252	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
62	*	0.00	0.000	0.057	0.1100	0.0001	0.0268	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
63	*	0.00	0.000	0.050	0.1042	0.0001	0.0194	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
64	*	0.00	0.000	0.000	0.1037	0.0001	0.0160	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
65	*	0.00	0.000	0.056	0.0978	0.0001	0.0300	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
66		0.00	0.000	0.072	0.0907	0.0001	0.0281	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
67		0.08	0.000	0.053	0.0922	0.0001	0.0261	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
68		0.02	0.000	0.045	0.0896	0.0001	0.0265	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
69		0.00	0.000	0.034	0.0867	0.0001	0.0289	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
70		0.08	0.000	0.030	0.0907	0.0002	0.0344	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
71		0.07	0.000	0.026	0.0937	0.0001	0.0300	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
72	*	0.00	0.000	0.023	0.0916	0.0001	0.0246	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
73		0.00	0.000	0.021	0.0899	0.0001	0.0232	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
74		0.00	0.000	0.019	0.0883	0.0001	0.0233	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
75		0.00	0.000	0.019	0.0868	0.0001	0.0227	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
76		0.01	0.000	0.018	0.0853	0.0001	0.0252	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
77		0.00	0.000	0.018	0.0838	0.0001	0.0211	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
78		0.02	0.000	0.017	0.0839	0.0001	0.0182	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
79		0.23	0.000	0.016	0.1011	0.0001	0.0161	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
80		0.00	0.000	0.075	0.0949	0.0001	0.0131	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
81		0.00	0.000	0.015	0.0937	0.0001	0.0125	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
82		0.00	0.000	0.014	0.0925	0.0001	0.0132	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
83	*	0.00	0.000	0.000	0.0923	0.0001	0.0153	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
84	*	0.12	0.000	0.025	0.0938	0.0001	0.0141	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

85	*		0.00	0.000	0.016	0.0952	0.0001	0.0138	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
86	*		0.00	0.000	0.035	0.0951	0.0001	0.0134	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
87			0.00	0.000	0.014	0.0939	0.0001	0.0120	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
88			0.00	0.000	0.013	0.0928	0.0001	0.0131	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
89	*		0.00	0.000	0.000	0.0926	0.0001	0.0157	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
90	*		0.05	0.000	0.035	0.0938	0.0001	0.0148	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
91			0.00	0.000	0.013	0.0926	0.0001	0.0145	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
92	*		0.00	0.000	0.012	0.0915	0.0001	0.0138	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
93	*		0.16	0.000	0.081	0.0930	0.0001	0.0166	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
94	*		0.04	0.000	0.019	0.0944	0.0001	0.0165	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
95	*		0.00	0.000	0.026	0.0959	0.0001	0.0166	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
96	*		0.00	0.000	0.017	0.0959	0.0001	0.0169	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
97	*		0.00	0.000	0.000	0.0957	0.0001	0.0173	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
98	*		0.00	0.000	0.000	0.0956	0.0001	0.0178	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
99	*		0.00	0.000	0.003	0.0955	0.0001	0.0183	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
100	*	*	0.00	0.000	0.000	0.0955	0.0001	0.0180	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
101	*	*	0.42	0.000	0.008	0.0955	0.0001	0.0194	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
102	*	*	0.37	0.000	0.015	0.0955	0.0001	0.0203	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
103	*	*	0.23	0.000	0.026	0.0955	0.0001	0.0210	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
104	*	*	0.03	0.000	0.017	0.0955	0.0001	0.0214	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
105	*	*	0.00	0.000	0.008	0.0955	0.0001	0.0217	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
106	*	*	0.00	0.000	0.019	0.0955	0.0001	0.0219	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
107	*	*	0.00	0.000	0.000	0.0955	0.0001	0.0219	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
108	*	*	0.02	0.000	0.018	0.0955	0.0001	0.0220	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
109	*	*	0.27	0.000	0.000	0.0955	0.0001	0.0219	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
110		*	0.08	0.000	0.000	0.1029	0.0001	0.0219	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
111		*	0.06	0.000	0.000	0.2093	0.0001	0.0218	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
112		*	0.00	0.000	0.001	0.2095	0.0001	0.0218	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
113		*	0.00	0.000	0.000	0.2095	0.0001	0.0217	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
114		*	0.02	0.000	0.001	0.2109	0.0001	0.0216	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
115		*	0.01	0.000	0.001	0.2118	0.0001	0.0215	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
116		*	0.41	0.000	0.001	0.2462	0.0001	0.0215	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
117		*	0.23	0.000	0.001	0.2650	0.0001	0.0214	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
118		*	0.12	0.000	0.001	0.2749	0.0001	0.0213	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
119		*	0.09	0.000	0.001	0.2825	0.0001	0.0212	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
120			0.08	0.000	0.082	0.2230	0.0001	0.0239	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
121	*		0.00	0.000	0.067	0.2033	0.0001	0.0162	6.57E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
122			0.02	0.000	0.095	0.1908	0.0000	0.0081	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
123	*		0.18	0.000	0.047	0.1877	0.0001	0.0168	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
124	*		0.00	0.000	0.075	0.1859	0.0001	0.0225	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
125	*		0.00	0.000	0.015	0.1828	0.0001	0.0259	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
126	*	*	0.08	0.000	0.030	0.1828	0.0001	0.0276	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
127	*	*	0.52	0.000	0.025	0.1828	0.0001	0.0283	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
128	*	*	0.01	0.000	0.000	0.1828	0.0001	0.0283	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
129		*	0.00	0.000	0.031	0.1911	0.0001	0.0279	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
130		*	0.19	0.000	0.021	0.2402	0.0001	0.0272	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

131	*	0.11	0.000	0.001	0.2496	0.0001	0.0277	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
132	*	0.00	0.000	0.000	0.2496	0.0001	0.0295	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
133	*	0.00	0.000	0.000	0.2496	0.0001	0.0294	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
134	*	0.35	0.000	0.001	0.2787	0.0001	0.0282	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
135	*	0.01	0.000	0.001	0.2798	0.0001	0.0265	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
136	*	0.26	0.000	0.001	0.3015	0.0001	0.0244	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
137	*	0.00	0.000	0.000	0.3015	0.0001	0.0222	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
138	*	0.24	0.000	0.001	0.3211	0.0001	0.0200	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
139		0.00	0.000	0.289	0.2391	0.0001	0.0189	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
140		0.77	0.000	0.261	0.2668	0.0000	0.0025	9.94E-10	0.0000	0.0000	9.15E-11	0.0000	0.0000	0.00E+00
141		0.00	0.000	0.086	0.2519	0.0000	0.0025	2.77E-09	0.0000	0.0000	9.73E-11	0.0000	0.0000	0.00E+00
142		0.30	0.000	0.199	0.2442	0.0000	0.0045	6.27E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
143		0.00	0.000	0.214	0.2187	0.0000	0.0044	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
144		0.00	0.000	0.117	0.2023	0.0000	0.0072	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
145		0.00	0.000	0.182	0.1837	0.0000	0.0094	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
146		0.90	0.000	0.159	0.2427	0.0000	0.0111	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
147		0.00	0.000	0.272	0.2178	0.0001	0.0124	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
148		0.06	0.000	0.221	0.2034	0.0001	0.0134	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
149		0.01	0.000	0.186	0.1880	0.0001	0.0167	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
150		0.33	0.000	0.104	0.2039	0.0001	0.0238	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
151		0.01	0.000	0.082	0.1957	0.0001	0.0197	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
152		0.00	0.000	0.192	0.1767	0.0001	0.0206	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
153		0.00	0.000	0.119	0.1644	0.0001	0.0180	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
154		0.00	0.000	0.054	0.1594	0.0000	0.0079	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
155		0.01	0.000	0.043	0.1567	0.0001	0.0139	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
156		0.39	0.000	0.036	0.1832	0.0001	0.0168	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
157		0.50	0.000	0.105	0.2125	0.0000	0.0105	4.50E-09	0.0000	0.0000	9.86E-11	0.0000	0.0000	0.00E+00
158		0.35	0.000	0.318	0.1888	0.0001	0.0154	6.77E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
159		0.18	0.000	0.117	0.1845	0.0000	0.0018	1.03E-09	0.0000	0.0000	9.18E-11	0.0000	0.0000	0.00E+00
160		0.82	0.000	0.223	0.2277	0.0000	0.0029	1.25E-09	0.0000	0.0000	9.33E-11	0.0000	0.0000	0.00E+00
161		0.08	0.000	0.192	0.1827	0.0000	0.0099	3.50E-09	0.0000	0.0000	9.80E-11	0.0000	0.0000	0.00E+00
162		0.00	0.000	0.192	0.1572	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
163		0.04	0.000	0.210	0.1292	0.0000	0.0020	9.27E-10	0.0000	0.0000	9.09E-11	0.0000	0.0000	0.00E+00
164		0.13	0.000	0.357	0.0968	0.0000	0.0029	3.92E-09	0.0000	0.0000	9.83E-11	0.0000	0.0000	0.00E+00
165		0.42	0.000	0.123	0.1176	0.0000	0.0061	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
166		0.25	0.000	0.118	0.1284	0.0000	0.0111	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
167		0.80	0.000	0.299	0.1449	0.0001	0.0291	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
168		0.16	0.000	0.256	0.1147	0.0000	0.0092	4.03E-09	0.0000	0.0000	9.83E-11	0.0000	0.0000	0.00E+00
169		0.00	0.000	0.156	0.0942	0.0000	0.0080	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
170		0.00	0.000	0.220	0.0637	0.0001	0.0167	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
171		0.00	0.000	0.068	0.0580	0.0001	0.0148	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
172		0.01	0.000	0.012	0.0580	0.0002	0.0367	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
173		0.00	0.000	0.000	0.0580	0.0001	0.0318	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
174		0.00	0.000	0.000	0.0580	0.0001	0.0279	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
175		0.06	0.000	0.004	0.0580	0.0001	0.0249	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
176		0.03	0.000	0.004	0.0580	0.0000	0.0032	2.63E-09	0.0000	0.0000	9.71E-11	0.0000	0.0000	0.00E+00

177	0.03	0.000	0.004	0.0580	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
178	0.35	0.000	0.012	0.0580	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
179	0.00	0.000	0.000	0.0580	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
180	0.07	0.000	0.004	0.0580	0.0002	0.0357	6.80E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
181	0.05	0.000	0.003	0.0580	0.0001	0.0278	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
182	0.00	0.000	0.000	0.0580	0.0002	0.0406	6.59E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
183	0.00	0.000	0.000	0.0580	0.0003	0.0707	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
184	0.18	0.000	0.010	0.0580	0.0003	0.0790	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
185	0.00	0.000	0.003	0.0580	0.0001	0.0179	3.91E-09	0.0000	0.0000	9.83E-11	0.0000	0.0000	0.00E+00
186	0.00	0.000	0.000	0.0580	0.0003	0.0710	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
187	0.00	0.000	0.000	0.0580	0.0003	0.0769	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
188	0.21	0.000	0.008	0.0580	0.0003	0.0790	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
189	0.00	0.000	0.000	0.0580	0.0001	0.0296	4.78E-09	0.0000	0.0000	9.87E-11	0.0000	0.0000	0.00E+00
190	0.00	0.000	0.000	0.0580	0.0004	0.0861	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
191	0.11	0.000	0.003	0.0580	0.0004	0.0993	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
192	0.00	0.000	0.000	0.0580	0.0002	0.0395	5.82E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
193	0.00	0.000	0.000	0.0580	0.0004	0.0871	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
194	0.02	0.000	0.003	0.0580	0.0004	0.0899	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
195	0.00	0.000	0.000	0.0580	0.0003	0.0711	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
196	0.00	0.000	0.000	0.0580	0.0003	0.0737	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
197	0.06	0.000	0.003	0.0580	0.0003	0.0791	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
198	0.00	0.000	0.000	0.0580	0.0002	0.0493	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
199	0.00	0.000	0.000	0.0580	0.0004	0.0804	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
200	0.00	0.000	0.000	0.0580	0.0004	0.0864	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
201	0.00	0.000	0.000	0.0580	0.0004	0.0847	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
202	0.00	0.000	0.000	0.0580	0.0004	0.0817	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
203	0.07	0.000	0.003	0.0580	0.0004	0.0841	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
204	0.07	0.000	0.003	0.0580	0.0003	0.0683	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
205	0.05	0.000	0.003	0.0580	0.0003	0.0696	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
206	0.21	0.000	0.006	0.0580	0.0003	0.0770	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
207	0.00	0.000	0.000	0.0580	0.0003	0.0661	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
208	0.00	0.000	0.000	0.0580	0.0005	0.1213	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
209	0.00	0.000	0.000	0.0580	0.0005	0.1126	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
210	0.29	0.000	0.006	0.0580	0.0005	0.1089	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
211	0.00	0.000	0.000	0.0580	0.0001	0.0271	6.28E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
212	0.00	0.000	0.000	0.0580	0.0003	0.0709	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
213	0.02	0.000	0.002	0.0580	0.0004	0.0858	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
214	0.00	0.000	0.000	0.0580	0.0003	0.0622	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
215	0.00	0.000	0.000	0.0580	0.0003	0.0568	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
216	0.00	0.000	0.000	0.0580	0.0002	0.0478	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
217	0.00	0.000	0.000	0.0580	0.0002	0.0392	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
218	0.00	0.000	0.000	0.0580	0.0001	0.0330	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
219	0.00	0.000	0.000	0.0580	0.0001	0.0298	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
220	2.00	0.000	0.010	0.0655	0.0001	0.0302	4.95E-09	0.0000	0.0000	9.88E-11	0.0000	0.0000	0.00E+00
221	0.00	0.000	0.013	0.0601	0.0001	0.0123	4.34E-09	0.0000	0.0000	9.85E-11	0.0000	0.0000	0.00E+00
222	0.00	0.000	0.011	0.0580	0.0002	0.0516	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

223		0.00	0.000	0.000	0.0580	0.0004	0.0941	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
224		0.00	0.000	0.000	0.0580	0.0003	0.0792	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
225		0.08	0.000	0.006	0.0580	0.0003	0.0572	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
226		0.12	0.000	0.005	0.0580	0.0000	0.0112	3.14E-09	0.0000	0.0000	9.77E-11	0.0000	0.0000	0.00E+00
227		0.03	0.000	0.005	0.0580	0.0000	0.0001	3.34E-10	0.0000	0.0000	7.74E-11	0.0000	0.0000	0.00E+00
228		0.75	0.000	0.014	0.0649	0.0002	0.0476	5.75E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
229		1.24	0.000	0.194	0.0652	0.0001	0.0204	3.57E-09	0.0000	0.0000	9.80E-11	0.0000	0.0000	0.00E+00
230		0.00	0.000	0.022	0.0588	0.0005	0.1057	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
231		0.00	0.000	0.008	0.0580	0.0007	0.1571	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
232		0.25	0.000	0.091	0.0580	0.0004	0.1014	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
233		0.01	0.000	0.009	0.0580	0.0001	0.0184	3.84E-09	0.0000	0.0000	9.82E-11	0.0000	0.0000	0.00E+00
234		0.00	0.000	0.000	0.0580	0.0002	0.0526	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
235		0.00	0.000	0.000	0.0580	0.0003	0.0574	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
236		0.00	0.000	0.000	0.0580	0.0004	0.0997	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
237		0.00	0.000	0.000	0.0580	0.0007	0.1509	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
238		0.00	0.000	0.000	0.0580	0.0008	0.1817	6.92E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
239		0.11	0.000	0.004	0.0580	0.0008	0.1878	6.92E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
240		0.94	0.000	0.020	0.0650	0.0008	0.1905	6.92E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
241		0.55	0.000	0.144	0.0646	0.0009	0.2124	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
242		0.08	0.000	0.029	0.0631	0.0011	0.2421	6.95E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
243		0.12	0.000	0.058	0.0634	0.0009	0.2138	6.93E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
244		0.00	0.000	0.022	0.0588	0.0005	0.1054	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
245		0.00	0.000	0.003	0.0580	0.0002	0.0553	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
246		0.00	0.000	0.000	0.0580	0.0002	0.0387	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
247		0.05	0.000	0.005	0.0580	0.0002	0.0566	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
248		0.00	0.000	0.000	0.0580	0.0005	0.1137	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
249		0.00	0.000	0.000	0.0580	0.0008	0.1770	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
250		0.00	0.000	0.000	0.0580	0.0008	0.1793	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
251	*	0.00	0.000	0.000	0.0580	0.0008	0.1757	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
252		0.00	0.000	0.000	0.0580	0.0008	0.1724	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
253		0.00	0.000	0.000	0.0580	0.0007	0.1687	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
254		0.00	0.000	0.000	0.0580	0.0007	0.1643	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
255		0.07	0.000	0.003	0.0580	0.0007	0.1580	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
256		1.10	0.000	0.015	0.0651	0.0007	0.1477	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
257		0.41	0.000	0.068	0.0644	0.0007	0.1504	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
258		0.11	0.000	0.048	0.0634	0.0009	0.1973	6.92E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
259		0.00	0.000	0.007	0.0607	0.0008	0.1753	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
260		0.00	0.000	0.014	0.0584	0.0006	0.1471	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
261		0.00	0.000	0.001	0.0580	0.0004	0.0802	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
262		0.00	0.000	0.000	0.0580	0.0001	0.0329	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
263		0.00	0.000	0.000	0.0580	0.0001	0.0147	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
264		0.51	0.000	0.024	0.0580	0.0002	0.0373	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
265		0.00	0.000	0.000	0.0580	0.0004	0.0811	4.85E-09	0.0000	0.0000	9.87E-11	0.0000	0.0000	0.00E+00
266		0.00	0.000	0.000	0.0580	0.0008	0.1790	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
267		0.00	0.000	0.000	0.0580	0.0006	0.1302	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
268		0.00	0.000	0.000	0.0580	0.0004	0.0924	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

269		0.00	0.000	0.000	0.0580	0.0004	0.0829	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
270		0.00	0.000	0.000	0.0580	0.0004	0.0939	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
271		0.00	0.000	0.000	0.0580	0.0005	0.1115	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
272		0.00	0.000	0.000	0.0580	0.0006	0.1258	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
273		0.00	0.000	0.000	0.0580	0.0006	0.1340	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
274		0.00	0.000	0.000	0.0580	0.0006	0.1372	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
275		0.05	0.000	0.003	0.0580	0.0006	0.1369	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
276		0.06	0.000	0.003	0.0580	0.0006	0.1267	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
277		0.00	0.000	0.000	0.0580	0.0006	0.1333	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
278		0.01	0.000	0.003	0.0580	0.0007	0.1488	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
279		0.04	0.000	0.003	0.0580	0.0006	0.1353	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
280		0.00	0.000	0.000	0.0580	0.0005	0.1104	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
281		0.57	0.000	0.009	0.0580	0.0006	0.1267	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
282		0.00	0.000	0.000	0.0580	0.0004	0.0896	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
283		0.00	0.000	0.000	0.0580	0.0006	0.1474	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
284		0.00	0.000	0.000	0.0580	0.0006	0.1354	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
285		0.00	0.000	0.000	0.0580	0.0005	0.1032	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
286		0.00	0.000	0.000	0.0580	0.0003	0.0760	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
287		0.00	0.000	0.000	0.0580	0.0003	0.0567	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
288		0.00	0.000	0.000	0.0580	0.0002	0.0454	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
289		0.00	0.000	0.000	0.0580	0.0002	0.0419	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
290		0.00	0.000	0.000	0.0580	0.0002	0.0445	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
291		0.00	0.000	0.000	0.0580	0.0002	0.0509	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
292		0.00	0.000	0.000	0.0580	0.0003	0.0586	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
293		0.00	0.000	0.000	0.0580	0.0003	0.0659	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
294		0.00	0.000	0.000	0.0580	0.0003	0.0718	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
295		0.03	0.000	0.002	0.0580	0.0004	0.0795	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
296	*	0.42	0.000	0.018	0.0580	0.0003	0.0706	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
297	*	0.00	0.000	0.011	0.0580	0.0003	0.0749	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
298	*	0.00	0.000	0.022	0.0580	0.0004	0.0813	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
299	*	0.00	0.000	0.023	0.0580	0.0004	0.0858	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
300		0.00	0.000	0.017	0.0580	0.0004	0.0894	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
301		0.09	0.000	0.006	0.0580	0.0004	0.0826	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
302		0.41	0.000	0.024	0.0580	0.0004	0.0857	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
303		0.08	0.000	0.008	0.0580	0.0003	0.0639	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
304		0.04	0.000	0.010	0.0580	0.0005	0.1038	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
305		0.00	0.000	0.004	0.0580	0.0005	0.1033	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
306		0.05	0.000	0.005	0.0580	0.0005	0.1107	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
307		0.39	0.000	0.023	0.0580	0.0004	0.0937	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
308	*	0.00	0.000	0.000	0.0580	0.0001	0.0174	6.27E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
309	*	0.01	0.000	0.010	0.0580	0.0002	0.0437	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
310		0.14	0.000	0.006	0.0580	0.0004	0.0863	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
311	*	0.02	0.000	0.024	0.0580	0.0001	0.0176	6.78E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
312		0.11	0.000	0.006	0.0580	0.0003	0.0745	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
313		0.05	0.000	0.006	0.0580	0.0001	0.0186	5.94E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
314		0.00	0.000	0.000	0.0580	0.0001	0.0310	6.79E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

315			0.00	0.000	0.000	0.0580	0.0003	0.0569	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
316			0.00	0.000	0.000	0.0580	0.0002	0.0540	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
317			0.70	0.000	0.019	0.0648	0.0002	0.0540	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
318			0.14	0.000	0.033	0.0636	0.0000	0.0009	1.26E-10	0.0000	0.0000	5.60E-11	0.0000	0.0000	0.00E+00
319			0.00	0.000	0.007	0.0607	0.0001	0.0125	5.64E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
320			0.00	0.000	0.003	0.0601	0.0002	0.0464	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
321	*		0.00	0.000	0.003	0.0596	0.0003	0.0711	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
322	*		0.00	0.000	0.002	0.0592	0.0003	0.0593	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
323	*		0.00	0.000	0.000	0.0592	0.0002	0.0376	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
324			0.43	0.000	0.018	0.0645	0.0001	0.0329	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
325	*		0.00	0.000	0.000	0.0615	0.0000	0.0003	2.92E-10	0.0000	0.0000	7.50E-11	0.0000	0.0000	0.00E+00
326	*		0.00	0.000	0.002	0.0611	0.0001	0.0194	5.38E-09	0.0000	0.0000	9.89E-11	0.0000	0.0000	0.00E+00
327	*		0.01	0.000	0.007	0.0606	0.0002	0.0469	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
328			0.37	0.000	0.025	0.0643	0.0003	0.0610	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
329			0.00	0.000	0.004	0.0611	0.0000	0.0022	1.10E-09	0.0000	0.0000	9.23E-11	0.0000	0.0000	0.00E+00
330			0.00	0.000	0.003	0.0605	0.0002	0.0541	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
331	*		0.00	0.000	0.000	0.0605	0.0003	0.0725	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
332			0.00	0.000	0.004	0.0598	0.0003	0.0611	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
333			0.00	0.000	0.006	0.0588	0.0002	0.0431	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
334			0.00	0.000	0.003	0.0580	0.0001	0.0324	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
335	*		0.03	0.000	0.022	0.0580	0.0002	0.0397	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
336	*		0.08	0.000	0.020	0.0580	0.0002	0.0536	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
337	*		0.07	0.000	0.024	0.0580	0.0003	0.0590	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
338			0.05	0.000	0.043	0.0580	0.0003	0.0787	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
339	*		0.16	0.000	0.022	0.0580	0.0004	0.0817	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
340	*		0.00	0.000	0.009	0.0580	0.0005	0.1099	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
341	*		0.00	0.000	0.005	0.0580	0.0005	0.1117	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
342	*		0.00	0.000	0.012	0.0580	0.0005	0.1066	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
343	*		0.00	0.000	0.014	0.0580	0.0004	0.1003	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
344			0.13	0.000	0.005	0.0580	0.0005	0.1026	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
345	*	*	0.00	0.000	0.000	0.0580	0.0003	0.0711	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
346	*	*	0.00	0.000	0.000	0.0580	0.0005	0.1065	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
347	*	*	0.00	0.000	0.000	0.0580	0.0004	0.1004	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
348		*	0.00	0.000	0.000	0.0580	0.0004	0.0874	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
349		*	0.00	0.000	0.000	0.0580	0.0003	0.0760	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
350		*	0.24	0.000	0.001	0.0782	0.0003	0.0679	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
351		*	0.12	0.000	0.001	0.0880	0.0003	0.0630	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
352		*	0.38	0.000	0.001	0.1197	0.0003	0.0607	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
353		*	0.02	0.000	0.001	0.1215	0.0003	0.0601	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
354		*	0.01	0.000	0.001	0.1225	0.0003	0.0607	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
355	*	*	0.00	0.000	0.000	0.1225	0.0003	0.0618	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
356	*	*	0.00	0.000	0.000	0.1225	0.0003	0.0630	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
357	*	*	0.07	0.000	0.020	0.1225	0.0003	0.0641	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
358	*	*	0.01	0.000	0.010	0.1225	0.0003	0.0650	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
359	*	*	0.13	0.000	0.015	0.1225	0.0003	0.0655	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
360		*	0.23	0.000	0.000	0.1548	0.0003	0.0658	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

361	*	0.03	0.000	0.001	0.1571	0.0003	0.0657	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
362	*	0.00	0.000	0.000	0.1571	0.0003	0.0654	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
363	*	0.00	0.000	0.000	0.1571	0.0003	0.0650	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
364	*	0.00	0.000	0.000	0.1571	0.0003	0.0644	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
365	*	0.00	0.000	0.000	0.1571	0.0003	0.0636	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 3			
	inches	cubic feet	percent
Precipitation	30.94	112,313.6	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	10.321	37,463.6	33.36
Drainage Collected from Layer 3	19.6966	71,498.8	63.66
Percolation/Leakage through Layer 5	0.000002	0.0086	0.00
Average Head on Top of Layer 4	0.0002	---	---
Drainage Collected from Layer 7	0.0000	0.0085	0.00
Percolation/Leakage through Layer 9	0.000000	0.0001	0.00
Average Head on Top of Layer 8	0.0000	---	---
Percolation/Leakage through Layer 10	0.000000	0.0000	0.00
Change in Water Storage	0.9232	3,351.1	2.98
Soil Water at Start of Year	59.3153	215,314.7	191.71
Soil Water at End of Year	60.2900	218,852.6	194.86
Snow Water at Start of Year	0.0514	186.8	0.17
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 4

Column key: Head #1: drainage from Layer 4 | Head #2: drainage from Layer 8
Drain #1: drainage from Layer 3 | Drain #2: drainage from Layer 7
Leak #1: leakage thru Layer 5 | Leak #2: leakage thru Layer 9 | Leak #3: leakage thru Layer 10

Title: Wayne Disposal-Initial Lift-Sideslope
Simulated On: 11/22/2020 18:38

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1	Head #2	Drain #2	Leak #2	Head #3	Drain #3	Leak #3
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)
1		*	0.00	0.000	0.000	0.1571	0.0003	0.0628	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
2		*	0.31	0.000	0.001	0.1826	0.0003	0.0620	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
3			0.00	0.000	0.026	0.1477	0.0003	0.0641	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
4			0.00	0.000	0.028	0.1372	0.0003	0.0575	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
5			0.00	0.000	0.029	0.1306	0.0002	0.0441	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
6	*		0.00	0.000	0.027	0.1256	0.0002	0.0557	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
7	*		0.00	0.000	0.028	0.1214	0.0003	0.0704	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
8	*		0.00	0.000	0.023	0.1180	0.0003	0.0747	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
9			0.00	0.000	0.029	0.1147	0.0003	0.0699	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
10	*		0.02	0.000	0.019	0.1138	0.0003	0.0682	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
11	*		0.01	0.000	0.007	0.1130	0.0003	0.0599	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
12	*		0.08	0.000	0.005	0.1138	0.0002	0.0519	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
13	*		0.00	0.000	0.004	0.1147	0.0002	0.0450	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
14	*		0.00	0.000	0.005	0.1157	0.0002	0.0393	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
15	*	*	0.07	0.000	0.000	0.1157	0.0001	0.0312	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
16		*	0.04	0.000	0.028	0.1234	0.0001	0.0323	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
17	*	*	0.12	0.000	0.033	0.1234	0.0001	0.0312	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
18	*	*	0.51	0.000	0.029	0.1234	0.0001	0.0293	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
19		*	0.00	0.000	0.010	0.1368	0.0001	0.0273	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
20		*	0.40	0.000	0.000	0.2032	0.0001	0.0258	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
21	*	*	0.36	0.000	0.018	0.2032	0.0001	0.0248	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
22		*	0.07	0.000	0.000	0.2376	0.0001	0.0245	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
23		*	0.09	0.000	0.001	0.2448	0.0001	0.0249	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
24		*	0.00	0.000	0.001	0.2449	0.0001	0.0258	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
25		*	0.00	0.000	0.000	0.2449	0.0001	0.0271	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
26		*	0.00	0.000	0.000	0.2449	0.0001	0.0287	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
27		*	0.00	0.000	0.000	0.2449	0.0001	0.0305	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
28		*	0.00	0.000	0.000	0.2449	0.0001	0.0323	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
29		*	0.00	0.000	0.000	0.2449	0.0001	0.0339	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
30		*	0.00	0.000	0.000	0.2449	0.0002	0.0355	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
31	*	*	0.01	0.000	0.006	0.2449	0.0002	0.0368	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
32		*	0.00	0.000	0.000	0.2449	0.0002	0.0379	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
33	*	*	0.13	0.000	0.038	0.2449	0.0002	0.0388	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
34	*	*	0.00	0.000	0.034	0.2449	0.0002	0.0395	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
35	*	*	0.10	0.000	0.017	0.2449	0.0002	0.0401	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
36	*	*	0.06	0.000	0.000	0.2449	0.0002	0.0404	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
37	*	*	0.01	0.000	0.000	0.2449	0.0002	0.0407	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
38	*	*	0.00	0.000	0.020	0.2449	0.0002	0.0408	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

39	*	*	0.00	0.000	0.033	0.2449	0.0002	0.0408	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
40		*	0.00	0.000	0.037	0.2523	0.0002	0.0407	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
41		*	0.00	0.000	0.029	0.2523	0.0002	0.0406	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
42		*	0.06	0.000	0.001	0.2568	0.0002	0.0404	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
43	*	*	0.00	0.000	0.000	0.2568	0.0002	0.0401	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
44	*	*	0.20	0.000	0.012	0.2568	0.0002	0.0398	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
45		*	0.02	0.000	0.017	0.2723	0.0002	0.0395	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
46		*	0.00	0.000	0.000	0.2723	0.0002	0.0392	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
47		*	0.09	0.000	0.001	0.2794	0.0002	0.0388	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
48		*	0.05	0.000	0.001	0.2835	0.0002	0.0385	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
49		*	0.00	0.000	0.000	0.2835	0.0002	0.0381	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
50		*	0.08	0.000	0.001	0.2900	0.0002	0.0377	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
51			0.06	0.000	0.155	0.2158	0.0002	0.0399	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
52			0.33	0.000	0.224	0.2128	0.0001	0.0215	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
53			0.00	0.000	0.075	0.1988	0.0001	0.0294	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
54			0.00	0.000	0.052	0.1921	0.0002	0.0419	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
55			0.01	0.000	0.057	0.1856	0.0002	0.0469	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
56			0.03	0.000	0.136	0.1728	0.0002	0.0498	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
57			0.00	0.000	0.110	0.1606	0.0002	0.0450	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
58			0.00	0.000	0.085	0.1520	0.0002	0.0434	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
59	*		0.00	0.000	0.000	0.1498	0.0002	0.0417	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
60	*		0.00	0.000	0.000	0.1485	0.0002	0.0386	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
61	*		0.02	0.000	0.024	0.1476	0.0002	0.0399	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
62			0.20	0.000	0.055	0.1586	0.0002	0.0434	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
63	*		0.00	0.000	0.000	0.1583	0.0002	0.0347	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
64	*		0.00	0.000	0.000	0.1573	0.0002	0.0371	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
65			0.02	0.000	0.108	0.1484	0.0001	0.0316	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
66			0.06	0.000	0.093	0.1445	0.0001	0.0284	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
67			0.00	0.000	0.106	0.1355	0.0001	0.0169	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
68			0.03	0.000	0.049	0.1331	0.0001	0.0217	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
69			0.10	0.000	0.053	0.1374	0.0001	0.0131	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
70	*		0.05	0.000	0.039	0.1369	0.0001	0.0207	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
71	*		0.01	0.000	0.005	0.1362	0.0000	0.0108	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
72			0.23	0.000	0.041	0.1512	0.0000	0.0100	5.34E-09	0.0000	0.0000	9.89E-11	0.0000	0.0000	0.00E+00
73			0.12	0.000	0.078	0.1542	0.0000	0.0045	1.76E-09	0.0000	0.0000	9.54E-11	0.0000	0.0000	0.00E+00
74			0.09	0.000	0.110	0.1489	0.0001	0.0144	6.75E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
75			0.00	0.000	0.064	0.1389	0.0000	0.0055	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
76			0.27	0.000	0.189	0.1419	0.0000	0.0015	5.06E-09	0.0000	0.0000	9.88E-11	0.0000	0.0000	0.00E+00
77			0.00	0.000	0.150	0.1255	0.0000	0.0001	1.93E-09	0.0000	0.0000	9.58E-11	0.0000	0.0000	0.00E+00
78			0.26	0.000	0.245	0.1253	0.0000	0.0025	2.44E-09	0.0000	0.0000	9.68E-11	0.0000	0.0000	0.00E+00
79			0.00	0.000	0.285	0.0979	0.0001	0.0139	4.36E-09	0.0000	0.0000	9.85E-11	0.0000	0.0000	0.00E+00
80			0.02	0.000	0.069	0.0859	0.0001	0.0210	6.00E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
81			0.09	0.000	0.053	0.0869	0.0000	0.0029	2.93E-09	0.0000	0.0000	9.74E-11	0.0000	0.0000	0.00E+00
82			0.00	0.000	0.040	0.0782	0.0001	0.0243	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
83			0.00	0.000	0.034	0.0724	0.0001	0.0117	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
84			0.35	0.000	0.031	0.0955	0.0001	0.0320	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

85		0.01	0.000	0.028	0.0828	0.0002	0.0382	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
86		0.00	0.000	0.025	0.0778	0.0001	0.0227	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
87		0.11	0.000	0.024	0.0847	0.0001	0.0309	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
88		0.04	0.000	0.023	0.0845	0.0002	0.0401	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
89		0.00	0.000	0.020	0.0795	0.0002	0.0485	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
90		0.00	0.000	0.021	0.0763	0.0001	0.0316	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
91		0.13	0.000	0.020	0.0855	0.0001	0.0236	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
92		0.00	0.000	0.018	0.0805	0.0002	0.0458	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
93		0.14	0.000	0.019	0.0900	0.0001	0.0206	6.79E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
94		0.66	0.000	0.057	0.0988	0.0002	0.0376	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
95		0.05	0.000	0.068	0.0835	0.0000	0.0062	4.27E-09	0.0000	0.0000	9.85E-11	0.0000	0.0000	0.00E+00
96	*	0.41	0.000	0.030	0.0841	0.0000	0.0101	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
97		0.15	0.000	0.000	0.0917	0.0001	0.0273	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
98		0.29	0.000	0.000	0.1060	0.0002	0.0372	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
99	*	0.52	0.000	0.023	0.0912	0.0000	0.0059	5.56E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
100	*	0.17	0.000	0.034	0.0897	0.0001	0.0126	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
101		0.00	0.000	0.097	0.1044	0.0002	0.0363	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
102		0.00	0.000	0.079	0.0823	0.0000	0.0100	6.77E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
103		0.06	0.000	0.119	0.0708	0.0001	0.0156	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
104		0.01	0.000	0.058	0.0610	0.0001	0.0218	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
105		0.30	0.000	0.058	0.0642	0.0002	0.0432	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
106		0.01	0.000	0.015	0.0614	0.0000	0.0092	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
107		0.03	0.000	0.017	0.0620	0.0001	0.0313	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
108		0.03	0.000	0.009	0.0625	0.0002	0.0419	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
109	*	0.02	0.000	0.019	0.0611	0.0002	0.0356	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
110		0.00	0.000	0.010	0.0593	0.0001	0.0309	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
111		0.00	0.000	0.007	0.0580	0.0001	0.0145	5.63E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
112	*	0.14	0.000	0.052	0.0580	0.0000	0.0036	2.87E-09	0.0000	0.0000	9.74E-11	0.0000	0.0000	0.00E+00
113		0.00	0.000	0.065	0.0580	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
114		0.00	0.000	0.000	0.0580	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
115		0.00	0.000	0.000	0.0580	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
116		0.01	0.000	0.004	0.0580	0.0000	0.0112	6.78E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
117		0.00	0.000	0.004	0.0580	0.0001	0.0277	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
118		0.00	0.000	0.003	0.0580	0.0002	0.0558	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
119		1.05	0.000	0.017	0.0651	0.0003	0.0775	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
120		0.12	0.000	0.043	0.0635	0.0002	0.0550	5.83E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
121		0.04	0.000	0.021	0.0624	0.0005	0.1211	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
122		0.00	0.000	0.011	0.0601	0.0006	0.1303	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
123		0.00	0.000	0.008	0.0589	0.0005	0.1193	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
124		0.00	0.000	0.004	0.0580	0.0004	0.0847	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
125		0.00	0.000	0.000	0.0580	0.0003	0.0568	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
126		0.00	0.000	0.000	0.0580	0.0002	0.0350	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
127		0.16	0.000	0.010	0.0580	0.0001	0.0336	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
128		0.01	0.000	0.004	0.0580	0.0000	0.0058	2.66E-09	0.0000	0.0000	9.71E-11	0.0000	0.0000	0.00E+00
129		0.00	0.000	0.000	0.0580	0.0002	0.0482	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
130		0.00	0.000	0.000	0.0580	0.0003	0.0740	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

131	0.00	0.000	0.000	0.0580	0.0003	0.0785	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
132	0.17	0.000	0.011	0.0580	0.0004	0.0840	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
133	0.00	0.000	0.000	0.0580	0.0002	0.0565	6.73E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
134	0.08	0.000	0.003	0.0580	0.0005	0.1086	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
135	0.34	0.000	0.010	0.0580	0.0003	0.0786	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
136	0.00	0.000	0.000	0.0580	0.0003	0.0659	6.07E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
137	0.00	0.000	0.000	0.0580	0.0006	0.1395	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
138	0.45	0.000	0.055	0.0580	0.0007	0.1503	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
139	0.02	0.000	0.024	0.0580	0.0002	0.0358	6.02E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
140	0.91	0.000	0.116	0.0650	0.0005	0.1048	6.63E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
141	0.28	0.000	0.069	0.0641	0.0002	0.0461	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
142	0.63	0.000	0.078	0.0647	0.0003	0.0784	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
143	0.03	0.000	0.028	0.0615	0.0003	0.0778	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
144	0.01	0.000	0.012	0.0603	0.0005	0.1038	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
145	0.20	0.000	0.097	0.0638	0.0004	0.0828	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
146	0.09	0.000	0.019	0.0633	0.0002	0.0476	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
147	0.00	0.000	0.014	0.0599	0.0000	0.0022	4.27E-10	0.0000	0.0000	8.15E-11	0.0000	0.0000	0.00E+00
148	0.00	0.000	0.010	0.0580	0.0000	0.0082	5.47E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
149	0.00	0.000	0.000	0.0580	0.0001	0.0311	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
150	0.00	0.000	0.000	0.0580	0.0003	0.0618	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
151	0.01	0.000	0.004	0.0580	0.0004	0.0917	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
152	0.00	0.000	0.000	0.0580	0.0005	0.1178	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
153	0.00	0.000	0.000	0.0580	0.0006	0.1420	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
154	0.10	0.000	0.004	0.0580	0.0006	0.1471	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
155	0.00	0.000	0.000	0.0580	0.0006	0.1436	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
156	0.00	0.000	0.000	0.0580	0.0007	0.1671	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
157	0.00	0.000	0.000	0.0580	0.0007	0.1524	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
158	0.00	0.000	0.000	0.0580	0.0006	0.1386	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
159	0.00	0.000	0.000	0.0580	0.0006	0.1296	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
160	0.00	0.000	0.000	0.0580	0.0005	0.1239	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
161	0.67	0.000	0.009	0.0580	0.0005	0.1212	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
162	0.03	0.000	0.017	0.0580	0.0004	0.0971	6.66E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
163	0.00	0.000	0.000	0.0580	0.0007	0.1661	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
164	0.00	0.000	0.000	0.0580	0.0006	0.1435	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
165	0.00	0.000	0.000	0.0580	0.0005	0.1039	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
166	0.11	0.000	0.005	0.0580	0.0004	0.0867	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
167	0.11	0.000	0.004	0.0580	0.0001	0.0283	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
168	0.04	0.000	0.004	0.0580	0.0001	0.0262	4.65E-09	0.0000	0.0000	9.87E-11	0.0000	0.0000	0.00E+00
169	0.04	0.000	0.004	0.0580	0.0004	0.0845	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
170	0.00	0.000	0.003	0.0580	0.0004	0.0896	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
171	0.00	0.000	0.000	0.0580	0.0004	0.0983	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
172	0.41	0.000	0.011	0.0580	0.0004	0.0962	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
173	0.98	0.000	0.097	0.0651	0.0002	0.0355	3.81E-09	0.0000	0.0000	9.82E-11	0.0000	0.0000	0.00E+00
174	0.16	0.000	0.054	0.0637	0.0002	0.0559	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
175	0.04	0.000	0.014	0.0626	0.0005	0.1028	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
176	0.00	0.000	0.024	0.0580	0.0006	0.1270	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

177	0.00	0.000	0.000	0.0580	0.0004	0.0990	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
178	0.00	0.000	0.000	0.0580	0.0003	0.0675	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
179	0.00	0.000	0.000	0.0580	0.0001	0.0267	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
180	0.00	0.000	0.000	0.0580	0.0000	0.0053	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
181	0.22	0.000	0.016	0.0580	0.0001	0.0186	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
182	0.00	0.000	0.000	0.0580	0.0002	0.0350	4.48E-09	0.0000	0.0000	9.86E-11	0.0000	0.0000	0.00E+00
183	0.74	0.000	0.013	0.0649	0.0005	0.1158	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
184	0.00	0.000	0.027	0.0580	0.0004	0.0824	5.75E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
185	0.00	0.000	0.000	0.0580	0.0008	0.1748	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
186	0.26	0.000	0.056	0.0580	0.0007	0.1613	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
187	0.00	0.000	0.003	0.0580	0.0002	0.0480	4.93E-09	0.0000	0.0000	9.88E-11	0.0000	0.0000	0.00E+00
188	0.14	0.000	0.005	0.0580	0.0005	0.1222	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
189	0.00	0.000	0.004	0.0580	0.0002	0.0501	5.30E-09	0.0000	0.0000	9.89E-11	0.0000	0.0000	0.00E+00
190	0.00	0.000	0.000	0.0580	0.0004	0.1006	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
191	0.00	0.000	0.000	0.0580	0.0003	0.0793	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
192	0.00	0.000	0.000	0.0580	0.0003	0.0623	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
193	0.04	0.000	0.004	0.0580	0.0003	0.0658	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
194	0.05	0.000	0.003	0.0580	0.0003	0.0701	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
195	0.00	0.000	0.000	0.0580	0.0005	0.1081	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
196	0.00	0.000	0.000	0.0580	0.0006	0.1468	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
197	0.00	0.000	0.000	0.0580	0.0006	0.1382	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
198	0.00	0.000	0.000	0.0580	0.0006	0.1271	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
199	0.00	0.000	0.000	0.0580	0.0005	0.1201	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
200	0.00	0.000	0.000	0.0580	0.0005	0.1164	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
201	0.00	0.000	0.000	0.0580	0.0005	0.1144	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
202	0.06	0.000	0.003	0.0580	0.0005	0.1144	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
203	0.00	0.000	0.000	0.0580	0.0004	0.1006	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
204	0.02	0.000	0.003	0.0580	0.0005	0.1199	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
205	0.00	0.000	0.000	0.0580	0.0005	0.1081	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
206	0.00	0.000	0.000	0.0580	0.0005	0.1137	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
207	0.00	0.000	0.000	0.0580	0.0005	0.1083	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
208	0.00	0.000	0.000	0.0580	0.0004	0.1015	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
209	0.00	0.000	0.000	0.0580	0.0004	0.0959	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
210	0.00	0.000	0.000	0.0580	0.0004	0.0915	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
211	0.00	0.000	0.000	0.0580	0.0004	0.0882	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
212	0.00	0.000	0.000	0.0580	0.0004	0.0856	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
213	0.00	0.000	0.000	0.0580	0.0004	0.0834	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
214	0.00	0.000	0.000	0.0580	0.0004	0.0815	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
215	0.00	0.000	0.000	0.0580	0.0004	0.0798	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
216	0.00	0.000	0.000	0.0580	0.0003	0.0782	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
217	0.00	0.000	0.000	0.0580	0.0003	0.0766	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
218	0.00	0.000	0.000	0.0580	0.0003	0.0750	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
219	0.00	0.000	0.000	0.0580	0.0003	0.0735	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
220	0.15	0.000	0.003	0.0580	0.0003	0.0747	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
221	0.00	0.000	0.000	0.0580	0.0003	0.0616	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
222	0.04	0.000	0.003	0.0580	0.0003	0.0772	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

223	0.00	0.000	0.000	0.0580	0.0003	0.0605	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
224	0.00	0.000	0.000	0.0580	0.0003	0.0704	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
225	0.01	0.000	0.002	0.0580	0.0003	0.0733	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
226	0.00	0.000	0.000	0.0580	0.0003	0.0626	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
227	0.00	0.000	0.000	0.0580	0.0003	0.0633	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
228	0.32	0.000	0.006	0.0580	0.0003	0.0672	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
229	0.00	0.000	0.000	0.0580	0.0002	0.0352	6.79E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
230	0.00	0.000	0.000	0.0580	0.0003	0.0656	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
231	0.01	0.000	0.002	0.0580	0.0003	0.0732	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
232	0.10	0.000	0.002	0.0580	0.0003	0.0762	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
233	0.18	0.000	0.006	0.0580	0.0002	0.0507	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
234	0.00	0.000	0.000	0.0580	0.0001	0.0115	5.07E-09	0.0000	0.0000	9.88E-11	0.0000	0.0000	0.00E+00
235	0.00	0.000	0.000	0.0580	0.0002	0.0399	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
236	0.20	0.000	0.005	0.0580	0.0004	0.0835	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
237	0.00	0.000	0.000	0.0580	0.0001	0.0219	6.78E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
238	0.03	0.000	0.002	0.0580	0.0002	0.0443	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
239	0.24	0.000	0.005	0.0580	0.0003	0.0724	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
240	0.28	0.000	0.048	0.0580	0.0001	0.0315	5.48E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
241	0.16	0.000	0.028	0.0580	0.0001	0.0145	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
242	0.29	0.000	0.099	0.0580	0.0001	0.0308	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
243	0.00	0.000	0.002	0.0580	0.0002	0.0390	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
244	0.02	0.000	0.008	0.0580	0.0002	0.0423	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
245	0.04	0.000	0.011	0.0580	0.0002	0.0526	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
246	0.00	0.000	0.000	0.0580	0.0002	0.0437	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
247	0.00	0.000	0.000	0.0580	0.0002	0.0512	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
248	0.00	0.000	0.000	0.0580	0.0002	0.0431	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
249	0.00	0.000	0.000	0.0580	0.0002	0.0365	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
250	0.00	0.000	0.000	0.0580	0.0001	0.0314	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
251	0.00	0.000	0.000	0.0580	0.0001	0.0212	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
252	0.00	0.000	0.000	0.0580	0.0000	0.0092	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
253	0.00	0.000	0.000	0.0580	0.0000	0.0010	3.53E-09	0.0000	0.0000	9.80E-11	0.0000	0.0000	0.00E+00
254	0.00	0.000	0.000	0.0580	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
255	0.00	0.000	0.000	0.0580	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
256	0.00	0.000	0.000	0.0580	0.0000	0.0005	2.50E-09	0.0000	0.0000	9.69E-11	0.0000	0.0000	0.00E+00
257	0.00	0.000	0.000	0.0580	0.0000	0.0077	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
258	0.00	0.000	0.000	0.0580	0.0001	0.0180	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
259	0.26	0.000	0.009	0.0580	0.0002	0.0340	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
260	0.28	0.000	0.009	0.0580	0.0001	0.0327	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
261	0.00	0.000	0.000	0.0580	0.0001	0.0184	4.54E-09	0.0000	0.0000	9.86E-11	0.0000	0.0000	0.00E+00
262	0.00	0.000	0.003	0.0580	0.0003	0.0720	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
263	0.00	0.000	0.000	0.0580	0.0004	0.0887	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
264	0.00	0.000	0.000	0.0580	0.0004	0.0822	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
265	0.00	0.000	0.000	0.0580	0.0003	0.0697	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
266	0.00	0.000	0.000	0.0580	0.0003	0.0576	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
267	0.00	0.000	0.000	0.0580	0.0002	0.0474	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
268	0.00	0.000	0.000	0.0580	0.0002	0.0396	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

269		0.83	0.000	0.007	0.0649	0.0002	0.0454	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
270	*	0.00	0.000	0.007	0.0608	0.0000	0.0025	1.96E-09	0.0000	0.0000	9.59E-11	0.0000	0.0000	0.00E+00
271		1.07	0.000	0.058	0.0651	0.0002	0.0470	5.16E-09	0.0000	0.0000	9.89E-11	0.0000	0.0000	0.00E+00
272		0.28	0.000	0.045	0.0641	0.0001	0.0258	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
273		0.11	0.000	0.049	0.0634	0.0002	0.0490	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
274		0.00	0.000	0.014	0.0599	0.0003	0.0594	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
275		0.00	0.000	0.007	0.0589	0.0004	0.0808	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
276		0.02	0.000	0.018	0.0593	0.0003	0.0652	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
277		0.09	0.000	0.015	0.0632	0.0002	0.0518	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
278		0.04	0.000	0.009	0.0627	0.0001	0.0272	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
279		0.06	0.000	0.010	0.0630	0.0000	0.0019	2.08E-09	0.0000	0.0000	9.61E-11	0.0000	0.0000	0.00E+00
280		0.00	0.000	0.005	0.0610	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
281		0.00	0.000	0.003	0.0603	0.0000	0.0088	4.11E-09	0.0000	0.0000	9.84E-11	0.0000	0.0000	0.00E+00
282		0.05	0.000	0.005	0.0629	0.0002	0.0485	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
283		0.00	0.000	0.003	0.0612	0.0002	0.0490	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
284		0.00	0.000	0.002	0.0606	0.0003	0.0717	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
285		0.00	0.000	0.002	0.0602	0.0004	0.0890	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
286		0.00	0.000	0.002	0.0599	0.0004	0.0949	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
287		0.16	0.000	0.011	0.0638	0.0005	0.1024	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
288		0.27	0.000	0.010	0.0641	0.0004	0.0854	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
289		0.00	0.000	0.007	0.0608	0.0003	0.0762	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
290		0.01	0.000	0.006	0.0610	0.0006	0.1427	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
291	*	0.00	0.000	0.003	0.0608	0.0006	0.1302	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
292		0.02	0.000	0.010	0.0618	0.0004	0.1013	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
293		0.42	0.000	0.024	0.0644	0.0004	0.0925	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
294		0.03	0.000	0.012	0.0623	0.0001	0.0208	4.34E-09	0.0000	0.0000	9.85E-11	0.0000	0.0000	0.00E+00
295		0.02	0.000	0.018	0.0617	0.0004	0.0879	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
296		0.34	0.000	0.056	0.0643	0.0005	0.1212	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
297		0.20	0.000	0.039	0.0639	0.0001	0.0242	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
298		0.50	0.000	0.022	0.0646	0.0003	0.0605	6.60E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
299		0.04	0.000	0.006	0.0627	0.0003	0.0568	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
300		0.47	0.000	0.031	0.0645	0.0004	0.0859	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
301		0.00	0.000	0.007	0.0608	0.0002	0.0550	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
302		0.00	0.000	0.010	0.0591	0.0004	0.0908	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
303		0.00	0.000	0.005	0.0580	0.0004	0.0885	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
304		0.00	0.000	0.000	0.0580	0.0003	0.0654	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
305		0.02	0.000	0.012	0.0580	0.0001	0.0262	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
306		0.28	0.000	0.021	0.0580	0.0000	0.0105	2.84E-09	0.0000	0.0000	9.73E-11	0.0000	0.0000	0.00E+00
307		0.00	0.000	0.000	0.0580	0.0000	0.0017	1.10E-09	0.0000	0.0000	9.24E-11	0.0000	0.0000	0.00E+00
308		0.00	0.000	0.000	0.0580	0.0002	0.0530	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
309		0.00	0.000	0.000	0.0580	0.0003	0.0754	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
310		0.00	0.000	0.000	0.0580	0.0003	0.0786	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
311	*	0.00	0.000	0.000	0.0580	0.0004	0.0850	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
312		0.00	0.000	0.000	0.0580	0.0004	0.0959	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
313		0.00	0.000	0.000	0.0580	0.0005	0.1070	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
314		0.00	0.000	0.000	0.0580	0.0005	0.1155	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

315			0.00	0.000	0.000	0.0580	0.0005	0.1204	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
316			0.00	0.000	0.000	0.0580	0.0005	0.1224	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
317			0.00	0.000	0.000	0.0580	0.0005	0.1222	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
318			0.03	0.000	0.004	0.0580	0.0005	0.1217	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
319			0.09	0.000	0.004	0.0580	0.0005	0.1106	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
320			0.42	0.000	0.011	0.0580	0.0005	0.1142	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
321	*		0.49	0.000	0.023	0.0580	0.0005	0.1110	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
322	*		0.11	0.000	0.008	0.0580	0.0007	0.1605	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
323	*		0.35	0.000	0.005	0.0580	0.0006	0.1318	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
324	*		0.09	0.000	0.000	0.0580	0.0005	0.1022	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
325			0.37	0.000	0.000	0.0653	0.0004	0.0799	5.51E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
326	*		0.00	0.000	0.006	0.0613	0.0002	0.0364	6.30E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
327			0.00	0.000	0.005	0.0603	0.0004	0.0839	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
328			0.00	0.000	0.004	0.0597	0.0005	0.1152	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
329	*		0.00	0.000	0.000	0.0597	0.0004	0.0875	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
330	*		0.00	0.000	0.000	0.0597	0.0002	0.0480	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
331	*		0.00	0.000	0.000	0.0597	0.0001	0.0148	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
332	*		0.00	0.000	0.000	0.0597	0.0000	0.0051	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
333	*		0.00	0.000	0.000	0.0597	0.0001	0.0217	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
334	*		0.00	0.000	0.000	0.0597	0.0002	0.0528	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
335	*		0.46	0.000	0.014	0.0613	0.0004	0.0829	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
336	*		0.02	0.000	0.013	0.0624	0.0005	0.1067	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
337	*	*	0.05	0.000	0.000	0.0624	0.0005	0.1094	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
338	*	*	0.00	0.000	0.009	0.0624	0.0005	0.1219	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
339	*	*	0.00	0.000	0.017	0.0624	0.0005	0.1229	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
340		*	0.00	0.000	0.000	0.0995	0.0005	0.1205	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
341		*	0.00	0.000	0.000	0.0995	0.0005	0.1171	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
342		*	0.00	0.000	0.000	0.0995	0.0005	0.1136	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
343		*	0.08	0.000	0.002	0.1062	0.0005	0.1102	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
344		*	0.02	0.000	0.002	0.1076	0.0005	0.1069	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
345		*	0.00	0.000	0.000	0.1076	0.0005	0.1037	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
346		*	0.79	0.000	0.002	0.1736	0.0004	0.1006	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
347		*	0.11	0.000	0.002	0.1825	0.0004	0.0977	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
348		*	0.02	0.000	0.002	0.1842	0.0004	0.0948	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
349		*	0.09	0.000	0.002	0.1918	0.0004	0.0921	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
350			0.03	0.000	0.042	0.1490	0.0004	0.0917	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
351			0.12	0.000	0.076	0.1443	0.0003	0.0772	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
352			0.12	0.000	0.049	0.1476	0.0003	0.0696	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
353			0.05	0.000	0.043	0.1472	0.0005	0.1205	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
354			0.03	0.000	0.061	0.1399	0.0005	0.1084	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
355			0.01	0.000	0.033	0.1344	0.0003	0.0739	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
356	*		0.15	0.000	0.016	0.1338	0.0003	0.0647	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
357	*		0.12	0.000	0.014	0.1331	0.0003	0.0683	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
358	*		0.02	0.000	0.000	0.1330	0.0003	0.0595	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
359	*	*	0.00	0.000	0.011	0.1330	0.0002	0.0508	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
360	*	*	0.08	0.000	0.000	0.1330	0.0003	0.0579	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

361	*	*	0.00	0.000	0.009	0.1330	0.0002	0.0536	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
362	*	*	0.00	0.000	0.015	0.1330	0.0002	0.0463	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
363	*	*	0.00	0.000	0.015	0.1330	0.0002	0.0394	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
364	*	*	0.00	0.000	0.000	0.1330	0.0002	0.0341	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
365	*	*	0.17	0.000	0.000	0.1330	0.0001	0.0311	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 4			
	inches	cubic feet	percent
Precipitation	29.81	108,212.4	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	6.849	24,860.1	22.97
Drainage Collected from Layer 3	22.3772	81,229.3	75.06
Percolation/Leakage through Layer 5	0.000002	0.0086	0.00
Average Head on Top of Layer 4	0.0003	---	---
Drainage Collected from Layer 7	0.0000	0.0084	0.00
Percolation/Leakage through Layer 9	0.000000	0.0001	0.00
Average Head on Top of Layer 8	0.0000	---	---
Percolation/Leakage through Layer 10	0.000000	0.0000	0.00
Change in Water Storage	0.5848	2,122.9	1.96
Soil Water at Start of Year	60.2900	218,852.6	202.24
Soil Water at End of Year	60.4750	219,524.1	202.86
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.3998	1,451.4	1.34
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 5

Column key: Head #1: drainage from Layer 4 | Head #2: drainage from Layer 8
Drain #1: drainage from Layer 3 | Drain #2: drainage from Layer 7
Leak #1: leakage thru Layer 5 | Leak #2: leakage thru Layer 9 | Leak #3: leakage thru Layer 10

Title: Wayne Disposal-Initial Lift-Sideslope
Simulated On: 11/22/2020 18:38

Day	Freezing Status* Air	Soil	Rain (inches)	Runoff (inches)	ET (inches)	Evap. Zone Water (in/in)	Head #1 (inches)	Drain #1 (inches)	Leak #1 (inches)	Head #2 (inches)	Drain #2 (inches)	Leak #2 (inches)	Head #3 (inches)	Drain #3 (inches)	Leak #3 (inches)
1		*	0.00	0.000	0.000	0.1663	0.0001	0.0318	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
2		*	0.00	0.000	0.000	0.1663	0.0002	0.0347	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
3		*	0.00	0.000	0.000	0.1663	0.0002	0.0384	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
4		*	0.00	0.000	0.000	0.1663	0.0002	0.0424	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
5		*	0.00	0.000	0.000	0.1663	0.0002	0.0462	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
6		*	0.14	0.000	0.002	0.1782	0.0002	0.0494	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
7		*	0.01	0.000	0.002	0.1785	0.0002	0.0521	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
8		*	0.07	0.000	0.002	0.1844	0.0002	0.0541	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
9		*	0.00	0.000	0.000	0.1844	0.0002	0.0556	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
10		*	0.00	0.000	0.000	0.1844	0.0002	0.0565	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
11	*	*	0.01	0.000	0.010	0.1844	0.0003	0.0570	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
12	*	*	0.00	0.000	0.000	0.1844	0.0003	0.0572	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
13	*	*	0.00	0.000	0.000	0.1844	0.0003	0.0572	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
14	*	*	0.00	0.000	0.000	0.1844	0.0003	0.0569	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
15	*	*	0.00	0.000	0.000	0.1844	0.0002	0.0565	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
16		*	0.26	0.000	0.002	0.2056	0.0002	0.0560	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
17		*	0.01	0.000	0.002	0.2062	0.0002	0.0554	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
18	*	*	0.00	0.000	0.000	0.2062	0.0002	0.0547	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
19	*	*	0.01	0.000	0.006	0.2062	0.0002	0.0540	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
20	*	*	0.00	0.000	0.000	0.2062	0.0002	0.0533	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
21	*	*	0.00	0.000	0.000	0.2062	0.0002	0.0526	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
22	*	*	0.00	0.000	0.000	0.2062	0.0002	0.0518	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
23	*	*	0.07	0.000	0.015	0.2062	0.0002	0.0510	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
24		*	0.03	0.000	0.034	0.2099	0.0002	0.0503	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
25	*	*	0.02	0.000	0.018	0.2099	0.0002	0.0495	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
26		*	0.01	0.000	0.002	0.2102	0.0002	0.0488	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
27	*	*	0.01	0.000	0.013	0.2102	0.0002	0.0480	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
28	*	*	0.28	0.000	0.016	0.2102	0.0002	0.0473	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
29	*	*	0.00	0.000	0.007	0.2102	0.0002	0.0466	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
30	*	*	0.09	0.000	0.004	0.2102	0.0002	0.0458	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
31	*	*	0.10	0.000	0.000	0.2102	0.0002	0.0451	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
32	*	*	0.67	0.000	0.009	0.2102	0.0002	0.0445	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
33	*	*	0.00	0.000	0.005	0.2102	0.0002	0.0438	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
34	*	*	0.00	0.000	0.000	0.2102	0.0002	0.0431	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
35	*	*	0.00	0.000	0.000	0.2102	0.0002	0.0425	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
36	*	*	0.00	0.000	0.000	0.2102	0.0002	0.0419	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
37		*	0.01	0.000	0.000	0.3011	0.0002	0.0412	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
38		*	0.00	0.000	0.000	0.3011	0.0002	0.0406	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

39		*	0.00	0.000	0.000	0.3011	0.0002	0.0400	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
40		*	0.02	0.000	0.002	0.3029	0.0002	0.0395	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
41		*	0.09	0.000	0.002	0.3104	0.0002	0.0389	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
42		*	0.19	0.000	0.002	0.3263	0.0002	0.0384	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
43		*	0.00	0.000	0.000	0.3263	0.0002	0.0378	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
44		*	0.20	0.000	0.002	0.3431	0.0002	0.0373	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
45	*	*	0.00	0.000	0.000	0.3431	0.0002	0.0368	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
46	*	*	0.10	0.000	0.014	0.3431	0.0002	0.0363	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
47	*	*	0.00	0.000	0.017	0.3431	0.0002	0.0358	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
48		*	0.00	0.000	0.060	0.3436	0.0002	0.0353	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
49	*	*	0.00	0.000	0.000	0.3436	0.0002	0.0348	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
50	*	*	0.00	0.000	0.000	0.3436	0.0002	0.0344	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
51	*	*	0.00	0.000	0.000	0.3436	0.0001	0.0339	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
52	*	*	0.21	0.000	0.010	0.3436	0.0001	0.0335	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
53	*	*	0.06	0.000	0.018	0.3436	0.0001	0.0330	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
54	*	*	0.18	0.000	0.009	0.3436	0.0001	0.0326	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
55	*	*	0.13	0.000	0.006	0.3436	0.0001	0.0322	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
56	*	*	0.00	0.000	0.004	0.3436	0.0001	0.0318	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
57	*	*	0.55	0.000	0.003	0.3436	0.0001	0.0314	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
58	*	*	0.04	0.000	0.006	0.3436	0.0001	0.0310	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
59	*	*	0.38	0.000	0.003	0.3436	0.0001	0.0307	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
60	*	*	0.00	0.000	0.000	0.3436	0.0001	0.0303	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
61		*	0.04	0.000	0.000	0.4449	0.0001	0.0299	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
62		*	0.00	0.000	0.003	0.4570	0.0001	0.0308	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
63		*	0.00	0.000	0.000	0.4570	0.0001	0.0259	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
64		*	0.00	0.000	0.000	0.4570	0.0001	0.0281	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
65		*	0.00	0.000	0.000	0.4570	0.0001	0.0292	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
66	*	*	0.00	0.000	0.000	0.4570	0.0001	0.0296	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
67		*	0.00	0.000	0.000	0.4570	0.0001	0.0296	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
68		*	0.07	0.000	0.002	0.4570	0.0001	0.0329	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
69		*	0.56	0.000	0.002	0.4570	0.0001	0.0293	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
70		*	0.07	0.000	0.002	0.4570	0.0000	0.0109	6.78E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
71		*	0.00	0.000	0.000	0.4570	0.0001	0.0213	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
72		*	0.00	0.000	0.000	0.4570	0.0001	0.0278	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
73			0.00	0.000	0.069	0.2544	0.0001	0.0323	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
74			0.00	0.000	0.102	0.2285	0.0001	0.0318	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
75			0.21	0.000	0.056	0.2321	0.0001	0.0324	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
76			0.00	0.000	0.093	0.2187	0.0001	0.0321	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
77			0.00	0.000	0.118	0.2050	0.0001	0.0320	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
78			0.00	0.000	0.109	0.1925	0.0002	0.0405	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
79			0.22	0.000	0.084	0.2013	0.0002	0.0389	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
80			0.00	0.000	0.169	0.1851	0.0001	0.0334	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
81			0.00	0.000	0.175	0.1680	0.0001	0.0291	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
82			0.00	0.000	0.154	0.1545	0.0001	0.0258	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
83			0.00	0.000	0.130	0.1431	0.0001	0.0231	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
84			0.00	0.000	0.054	0.1376	0.0001	0.0209	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

85		0.01	0.000	0.043	0.1339	0.0001	0.0119	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
86	*	0.05	0.000	0.045	0.1336	0.0000	0.0009	1.86E-09	0.0000	0.0000	9.56E-11	0.0000	0.0000	0.00E+00
87		0.04	0.000	0.036	0.1332	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
88		0.33	0.000	0.032	0.1575	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
89		0.50	0.000	0.029	0.1966	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
90		0.02	0.000	0.240	0.1668	0.0000	0.0015	2.63E-09	0.0000	0.0000	9.71E-11	0.0000	0.0000	0.00E+00
91		0.00	0.000	0.111	0.1442	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
92		0.00	0.000	0.240	0.1172	0.0001	0.0163	3.25E-09	0.0000	0.0000	9.78E-11	0.0000	0.0000	0.00E+00
93		0.20	0.000	0.131	0.1183	0.0001	0.0122	3.70E-09	0.0000	0.0000	9.81E-11	0.0000	0.0000	0.00E+00
94		0.00	0.000	0.054	0.1085	0.0004	0.0846	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
95		0.00	0.000	0.041	0.1001	0.0003	0.0632	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
96		0.10	0.000	0.036	0.1015	0.0003	0.0707	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
97		0.02	0.000	0.032	0.0993	0.0003	0.0761	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
98		0.16	0.000	0.029	0.1088	0.0004	0.0842	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
99		0.16	0.000	0.027	0.1190	0.0003	0.0715	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
100		0.00	0.000	0.271	0.0868	0.0003	0.0716	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
101		0.00	0.000	0.024	0.0808	0.0001	0.0195	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
102		0.00	0.000	0.022	0.0766	0.0001	0.0306	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
103		0.00	0.000	0.021	0.0729	0.0002	0.0459	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
104		0.00	0.000	0.020	0.0699	0.0002	0.0482	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
105		0.00	0.000	0.019	0.0683	0.0002	0.0476	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
106		0.00	0.000	0.018	0.0668	0.0002	0.0533	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
107	*	0.07	0.000	0.067	0.0668	0.0002	0.0492	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
108	*	0.02	0.000	0.035	0.0653	0.0002	0.0435	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
109		0.14	0.000	0.018	0.0756	0.0002	0.0395	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
110		0.03	0.000	0.018	0.0764	0.0002	0.0382	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
111		0.46	0.000	0.017	0.0973	0.0002	0.0470	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
112		0.00	0.000	0.138	0.0693	0.0002	0.0367	6.32E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
113	*	0.03	0.000	0.053	0.0674	0.0001	0.0228	4.52E-09	0.0000	0.0000	9.86E-11	0.0000	0.0000	0.00E+00
114	*	0.00	0.000	0.001	0.0674	0.0004	0.0809	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
115	*	0.00	0.000	0.000	0.0674	0.0004	0.0868	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
116	*	0.09	0.000	0.039	0.0691	0.0003	0.0761	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
117	*	0.01	0.000	0.036	0.0696	0.0003	0.0634	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
118	*	0.10	0.000	0.020	0.0712	0.0002	0.0529	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
119	*	0.22	0.000	0.027	0.0728	0.0002	0.0455	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
120	*	0.06	0.000	0.012	0.0745	0.0002	0.0415	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
121	*	0.05	0.000	0.010	0.0761	0.0002	0.0405	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
122	*	0.07	0.000	0.009	0.0778	0.0002	0.0418	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
123	*	0.30	0.000	0.009	0.0794	0.0002	0.0447	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
124	*	0.00	0.000	0.018	0.0810	0.0002	0.0483	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
125	*	0.62	0.000	0.000	0.0826	0.0002	0.0522	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
126	*	0.66	0.000	0.000	0.0837	0.0003	0.0577	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
127		0.59	0.000	0.000	0.1104	0.0003	0.0574	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
128		0.32	0.000	0.000	0.1100	0.0001	0.0308	5.82E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
129		0.17	0.000	0.139	0.0929	0.0003	0.0754	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
130		0.14	0.000	0.096	0.0933	0.0004	0.0910	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

131	1.28	0.000	0.136	0.1093	0.0004	0.0915	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
132	0.15	0.000	0.165	0.0891	0.0002	0.0510	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
133	0.27	0.000	0.403	0.0640	0.0004	0.0828	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
134	0.04	0.000	0.028	0.0622	0.0004	0.0816	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
135	0.11	0.000	0.020	0.0635	0.0003	0.0624	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
136	0.00	0.000	0.019	0.0592	0.0000	0.0029	5.28E-10	0.0000	0.0000	8.46E-11	0.0000	0.0000	0.00E+00
137	0.00	0.000	0.006	0.0580	0.0000	0.0002	2.54E-11	0.0000	0.0000	2.03E-11	0.0000	0.0000	0.00E+00
138	0.84	0.000	0.024	0.0649	0.0001	0.0123	4.29E-09	0.0000	0.0000	9.85E-11	0.0000	0.0000	0.00E+00
139	0.00	0.000	0.027	0.0580	0.0006	0.1282	5.17E-09	0.0000	0.0000	9.89E-11	0.0000	0.0000	0.00E+00
140	0.00	0.000	0.000	0.0580	0.0011	0.2541	6.96E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
141	0.00	0.000	0.000	0.0580	0.0006	0.1286	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
142	0.00	0.000	0.000	0.0580	0.0003	0.0764	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
143	0.02	0.000	0.005	0.0580	0.0005	0.1183	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
144	0.00	0.000	0.000	0.0580	0.0008	0.1837	6.92E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
145	0.00	0.000	0.000	0.0580	0.0010	0.2168	6.94E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
146	0.00	0.000	0.000	0.0580	0.0010	0.2159	6.93E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
147	0.13	0.000	0.003	0.0580	0.0009	0.2044	6.93E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
148	0.12	0.000	0.003	0.0580	0.0009	0.1977	6.92E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
149	0.01	0.000	0.003	0.0580	0.0010	0.2159	6.93E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
150	0.03	0.000	0.003	0.0580	0.0009	0.2121	6.93E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
151	0.00	0.000	0.000	0.0580	0.0007	0.1690	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
152	0.00	0.000	0.000	0.0580	0.0007	0.1569	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
153	0.00	0.000	0.000	0.0580	0.0006	0.1381	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
154	0.14	0.000	0.003	0.0580	0.0006	0.1275	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
155	0.00	0.000	0.000	0.0580	0.0005	0.1091	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
156	0.00	0.000	0.000	0.0580	0.0006	0.1433	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
157	0.00	0.000	0.000	0.0580	0.0006	0.1310	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
158	0.17	0.000	0.008	0.0580	0.0005	0.1198	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
159	0.00	0.000	0.000	0.0580	0.0004	0.0897	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
160	0.00	0.000	0.000	0.0580	0.0006	0.1263	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
161	0.00	0.000	0.000	0.0580	0.0005	0.1162	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
162	0.00	0.000	0.000	0.0580	0.0005	0.1022	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
163	0.01	0.000	0.002	0.0580	0.0004	0.0929	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
164	0.25	0.000	0.007	0.0580	0.0004	0.0893	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
165	0.02	0.000	0.002	0.0580	0.0003	0.0656	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
166	0.09	0.000	0.002	0.0580	0.0005	0.1083	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
167	0.07	0.000	0.002	0.0580	0.0003	0.0756	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
168	0.05	0.000	0.013	0.0580	0.0004	0.0898	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
169	0.00	0.000	0.000	0.0580	0.0005	0.1046	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
170	0.00	0.000	0.000	0.0580	0.0005	0.1131	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
171	0.02	0.000	0.002	0.0580	0.0004	0.0980	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
172	0.01	0.000	0.002	0.0580	0.0003	0.0683	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
173	0.00	0.000	0.000	0.0580	0.0003	0.0584	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
174	0.00	0.000	0.000	0.0580	0.0002	0.0557	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
175	0.00	0.000	0.000	0.0580	0.0002	0.0528	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
176	0.00	0.000	0.000	0.0580	0.0002	0.0517	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

177	0.48	0.000	0.006	0.0580	0.0003	0.0597	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
178	0.12	0.000	0.031	0.0580	0.0001	0.0249	5.68E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
179	0.04	0.000	0.028	0.0580	0.0003	0.0661	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
180	0.01	0.000	0.008	0.0580	0.0004	0.0978	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
181	0.00	0.000	0.005	0.0580	0.0004	0.1009	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
182	0.21	0.000	0.018	0.0580	0.0004	0.0963	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
183	0.00	0.000	0.000	0.0580	0.0001	0.0174	4.74E-09	0.0000	0.0000	9.87E-11	0.0000	0.0000	0.00E+00
184	0.28	0.000	0.014	0.0580	0.0004	0.0853	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
185	0.01	0.000	0.011	0.0580	0.0000	0.0060	3.13E-09	0.0000	0.0000	9.77E-11	0.0000	0.0000	0.00E+00
186	0.00	0.000	0.000	0.0580	0.0002	0.0493	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
187	0.00	0.000	0.000	0.0580	0.0003	0.0731	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
188	0.00	0.000	0.000	0.0580	0.0003	0.0649	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
189	0.00	0.000	0.000	0.0580	0.0002	0.0492	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
190	0.00	0.000	0.000	0.0580	0.0002	0.0344	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
191	0.00	0.000	0.000	0.0580	0.0001	0.0243	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
192	0.00	0.000	0.000	0.0580	0.0001	0.0208	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
193	0.17	0.000	0.009	0.0580	0.0001	0.0322	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
194	0.02	0.000	0.003	0.0580	0.0001	0.0127	4.94E-09	0.0000	0.0000	9.88E-11	0.0000	0.0000	0.00E+00
195	0.00	0.000	0.000	0.0580	0.0002	0.0432	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
196	0.00	0.000	0.000	0.0580	0.0003	0.0693	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
197	0.00	0.000	0.000	0.0580	0.0003	0.0740	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
198	0.01	0.000	0.002	0.0580	0.0003	0.0729	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
199	0.00	0.000	0.000	0.0580	0.0003	0.0664	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
200	0.00	0.000	0.000	0.0580	0.0003	0.0673	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
201	0.10	0.000	0.002	0.0580	0.0003	0.0731	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
202	0.00	0.000	0.000	0.0580	0.0002	0.0501	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
203	0.00	0.000	0.000	0.0580	0.0003	0.0725	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
204	0.00	0.000	0.000	0.0580	0.0003	0.0768	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
205	0.76	0.000	0.007	0.0649	0.0004	0.0818	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
206	0.00	0.000	0.027	0.0580	0.0002	0.0387	6.26E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
207	0.00	0.000	0.000	0.0580	0.0004	0.0838	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
208	0.00	0.000	0.000	0.0580	0.0004	0.0968	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
209	0.00	0.000	0.000	0.0580	0.0004	0.0972	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
210	0.00	0.000	0.002	0.0580	0.0004	0.0805	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
211	0.77	0.000	0.016	0.0649	0.0003	0.0729	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
212	0.10	0.000	0.040	0.0633	0.0000	0.0044	2.83E-09	0.0000	0.0000	9.73E-11	0.0000	0.0000	0.00E+00
213	0.01	0.000	0.028	0.0596	0.0001	0.0307	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
214	0.23	0.000	0.099	0.0639	0.0003	0.0712	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
215	0.31	0.000	0.095	0.0642	0.0003	0.0589	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
216	0.00	0.000	0.012	0.0603	0.0000	0.0069	3.73E-09	0.0000	0.0000	9.82E-11	0.0000	0.0000	0.00E+00
217	0.73	0.000	0.056	0.0648	0.0003	0.0581	5.61E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
218	0.00	0.000	0.019	0.0592	0.0001	0.0136	5.40E-09	0.0000	0.0000	9.90E-11	0.0000	0.0000	0.00E+00
219	0.16	0.000	0.032	0.0637	0.0003	0.0676	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
220	0.12	0.000	0.058	0.0634	0.0002	0.0523	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
221	0.00	0.000	0.014	0.0599	0.0002	0.0451	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
222	0.00	0.000	0.010	0.0580	0.0002	0.0511	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

223		0.00	0.000	0.000	0.0580	0.0002	0.0351	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
224		0.00	0.000	0.000	0.0580	0.0001	0.0125	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
225		0.00	0.000	0.000	0.0580	0.0000	0.0002	1.06E-09	0.0000	0.0000	9.20E-11	0.0000	0.0000	0.00E+00
226		0.00	0.000	0.000	0.0580	0.0000	0.0059	5.24E-09	0.0000	0.0000	9.89E-11	0.0000	0.0000	0.00E+00
227		0.32	0.000	0.014	0.0580	0.0002	0.0362	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
228		0.03	0.000	0.004	0.0580	0.0002	0.0522	5.36E-09	0.0000	0.0000	9.89E-11	0.0000	0.0000	0.00E+00
229		0.00	0.000	0.000	0.0580	0.0005	0.1230	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
230		0.00	0.000	0.000	0.0580	0.0006	0.1302	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
231		0.58	0.000	0.011	0.0580	0.0005	0.1142	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
232		0.28	0.000	0.067	0.0580	0.0002	0.0553	5.30E-09	0.0000	0.0000	9.89E-11	0.0000	0.0000	0.00E+00
233		0.00	0.000	0.000	0.0580	0.0006	0.1346	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
234		0.00	0.000	0.000	0.0580	0.0007	0.1529	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
235		0.00	0.000	0.000	0.0580	0.0005	0.1180	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
236		0.00	0.000	0.000	0.0580	0.0003	0.0686	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
237		0.00	0.000	0.000	0.0580	0.0001	0.0331	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
238		0.04	0.000	0.005	0.0580	0.0001	0.0265	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
239		0.00	0.000	0.000	0.0580	0.0001	0.0231	5.01E-09	0.0000	0.0000	9.88E-11	0.0000	0.0000	0.00E+00
240		0.11	0.000	0.004	0.0580	0.0004	0.0805	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
241		0.00	0.000	0.000	0.0580	0.0004	0.0858	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
242		0.00	0.000	0.000	0.0580	0.0006	0.1358	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
243		0.00	0.000	0.000	0.0580	0.0006	0.1287	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
244		0.00	0.000	0.000	0.0580	0.0005	0.1166	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
245		0.00	0.000	0.000	0.0580	0.0005	0.1086	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
246		0.00	0.000	0.000	0.0580	0.0005	0.1047	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
247		0.27	0.000	0.009	0.0580	0.0005	0.1055	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
248		0.00	0.000	0.000	0.0580	0.0004	0.0870	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
249		0.01	0.000	0.003	0.0580	0.0006	0.1272	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
250		0.09	0.000	0.003	0.0580	0.0005	0.1163	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
251		0.01	0.000	0.003	0.0580	0.0003	0.0727	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
252		0.00	0.000	0.000	0.0580	0.0005	0.1057	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
253		0.00	0.000	0.000	0.0580	0.0005	0.1025	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
254		0.00	0.000	0.000	0.0580	0.0004	0.0904	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
255		0.00	0.000	0.000	0.0580	0.0004	0.0800	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
256		0.00	0.000	0.000	0.0580	0.0003	0.0733	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
257		0.00	0.000	0.000	0.0580	0.0003	0.0700	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
258		0.14	0.000	0.002	0.0580	0.0003	0.0745	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
259		0.53	0.000	0.007	0.0646	0.0003	0.0610	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
260		0.22	0.000	0.025	0.0640	0.0002	0.0410	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
261		0.97	0.000	0.072	0.0650	0.0004	0.0945	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
262	*	0.00	0.000	0.005	0.0610	0.0004	0.0955	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
263		0.00	0.000	0.004	0.0603	0.0005	0.1027	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
264	*	0.00	0.000	0.000	0.0603	0.0005	0.1171	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
265		0.00	0.000	0.011	0.0584	0.0004	0.0915	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
266		0.00	0.000	0.001	0.0580	0.0003	0.0589	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
267		0.00	0.000	0.000	0.0580	0.0001	0.0284	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
268		1.82	0.000	0.074	0.0655	0.0001	0.0212	4.74E-09	0.0000	0.0000	9.87E-11	0.0000	0.0000	0.00E+00

269	*		0.00	0.000	0.004	0.0611	0.0000	0.0040	1.94E-09	0.0000	0.0000	9.58E-11	0.0000	0.0000	0.00E+00
270	*		0.00	0.000	0.000	0.0609	0.0004	0.0919	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
271			0.34	0.000	0.027	0.0643	0.0004	0.0915	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
272	*		0.11	0.000	0.035	0.0624	0.0001	0.0146	2.57E-09	0.0000	0.0000	9.70E-11	0.0000	0.0000	0.00E+00
273	*		0.00	0.000	0.058	0.0614	0.0003	0.0735	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
274	*		0.11	0.000	0.035	0.0624	0.0002	0.0545	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
275	*		0.04	0.000	0.055	0.0624	0.0002	0.0398	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
276	*		0.01	0.000	0.000	0.0624	0.0004	0.0861	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
277			0.01	0.000	0.019	0.0617	0.0006	0.1460	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
278	*		0.00	0.000	0.000	0.0612	0.0008	0.1825	6.92E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
279	*		0.60	0.000	0.027	0.0624	0.0008	0.1886	6.92E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
280			0.45	0.000	0.000	0.0651	0.0008	0.1726	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
281			0.03	0.000	0.009	0.0624	0.0008	0.1797	6.77E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
282			0.00	0.000	0.005	0.0610	0.0011	0.2457	6.95E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
283	*		0.00	0.000	0.000	0.0609	0.0007	0.1692	6.91E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
284			0.07	0.000	0.008	0.0632	0.0004	0.0988	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
285			0.00	0.000	0.014	0.0599	0.0001	0.0262	6.18E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
286			0.38	0.000	0.025	0.0644	0.0004	0.0906	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
287			0.04	0.000	0.009	0.0627	0.0005	0.1179	5.74E-09	0.0000	0.0000	9.91E-11	0.0000	0.0000	0.00E+00
288			0.45	0.000	0.022	0.0645	0.0008	0.1829	6.92E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
289	*		0.04	0.000	0.027	0.0624	0.0005	0.1231	6.44E-09	0.0000	0.0000	9.92E-11	0.0000	0.0000	0.00E+00
290	*		0.00	0.000	0.000	0.0614	0.0009	0.2078	6.93E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
291	*		0.00	0.000	0.004	0.0605	0.0006	0.1414	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
292	*		0.00	0.000	0.000	0.0605	0.0003	0.0772	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
293	*		0.00	0.000	0.000	0.0604	0.0003	0.0571	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
294	*		0.00	0.000	0.000	0.0604	0.0003	0.0752	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
295			0.00	0.000	0.005	0.0595	0.0005	0.1093	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
296			0.00	0.000	0.007	0.0580	0.0006	0.1361	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
297			0.00	0.000	0.000	0.0580	0.0007	0.1544	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
298			0.00	0.000	0.000	0.0580	0.0007	0.1618	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
299	*		0.00	0.000	0.000	0.0580	0.0007	0.1579	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
300	*		0.00	0.000	0.000	0.0580	0.0007	0.1524	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
301	*		0.00	0.000	0.000	0.0580	0.0006	0.1470	6.90E-09	0.0000	0.0000	9.94E-11	0.0000	0.0000	0.00E+00
302	*	*	0.01	0.000	0.007	0.0580	0.0006	0.1419	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
303	*	*	0.29	0.000	0.015	0.0580	0.0006	0.1369	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
304	*	*	0.14	0.000	0.000	0.0580	0.0006	0.1321	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
305		*	0.21	0.000	0.000	0.0898	0.0006	0.1275	6.89E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
306		*	0.00	0.000	0.008	0.1069	0.0005	0.1230	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
307	*	*	0.00	0.000	0.018	0.1069	0.0005	0.1186	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
308	*	*	0.00	0.000	0.014	0.1069	0.0005	0.1145	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
309	*	*	0.20	0.000	0.023	0.1069	0.0005	0.1106	6.88E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
310		*	0.00	0.000	0.037	0.1185	0.0005	0.1068	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
311		*	0.01	0.000	0.001	0.1195	0.0005	0.1032	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
312		*	0.01	0.000	0.001	0.1206	0.0004	0.0998	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
313		*	0.16	0.000	0.001	0.1340	0.0004	0.0966	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
314		*	0.05	0.000	0.001	0.1379	0.0004	0.0936	6.87E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

315		*	0.00	0.000	0.000	0.1379	0.0004	0.0907	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
316		*	0.00	0.000	0.000	0.1379	0.0004	0.0879	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
317		*	0.00	0.000	0.000	0.1379	0.0004	0.0853	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
318		*	0.27	0.000	0.001	0.1600	0.0004	0.0829	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
319		*	0.00	0.000	0.000	0.1600	0.0004	0.0805	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
320			0.00	0.000	0.111	0.1414	0.0004	0.0805	6.86E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
321			0.00	0.000	0.064	0.1289	0.0003	0.0747	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
322			0.00	0.000	0.032	0.1229	0.0003	0.0708	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
323	*		0.00	0.000	0.028	0.1184	0.0003	0.0687	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
324			0.21	0.000	0.055	0.1298	0.0003	0.0697	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
325			0.00	0.000	0.039	0.1244	0.0003	0.0730	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
326			0.00	0.000	0.041	0.1196	0.0003	0.0666	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
327			0.00	0.000	0.073	0.1121	0.0003	0.0715	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
328			0.00	0.000	0.078	0.1051	0.0003	0.0651	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
329			0.00	0.000	0.040	0.1018	0.0003	0.0711	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
330	*		0.00	0.000	0.000	0.1017	0.0003	0.0721	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
331	*		0.24	0.000	0.018	0.1031	0.0003	0.0661	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
332	*		0.00	0.000	0.018	0.1046	0.0003	0.0602	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
333	*		0.25	0.000	0.021	0.1061	0.0002	0.0550	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
334			0.01	0.000	0.000	0.1389	0.0002	0.0509	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
335	*		0.08	0.000	0.024	0.1404	0.0002	0.0463	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
336			0.16	0.000	0.011	0.1545	0.0002	0.0474	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
337	*		0.05	0.000	0.028	0.1499	0.0002	0.0456	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
338	*		0.00	0.000	0.025	0.1404	0.0002	0.0410	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
339	*		0.15	0.000	0.027	0.1378	0.0002	0.0352	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
340	*		0.29	0.000	0.022	0.1358	0.0001	0.0318	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
341			0.00	0.000	0.000	0.1368	0.0001	0.0281	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
342			0.04	0.000	0.010	0.1633	0.0001	0.0318	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
343			0.11	0.000	0.065	0.1538	0.0003	0.0625	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
344			0.05	0.000	0.061	0.1454	0.0002	0.0437	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
345			0.00	0.000	0.058	0.1357	0.0001	0.0312	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
346			0.00	0.000	0.056	0.1280	0.0002	0.0443	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
347			0.00	0.000	0.052	0.1215	0.0002	0.0516	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
348			0.18	0.000	0.052	0.1310	0.0002	0.0530	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
349			0.47	0.000	0.055	0.1640	0.0003	0.0575	6.84E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
350			0.00	0.000	0.045	0.1462	0.0003	0.0621	6.85E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
351			0.00	0.000	0.040	0.1353	0.0002	0.0347	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
352			0.00	0.000	0.031	0.1288	0.0001	0.0258	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
353	*		0.13	0.000	0.029	0.1281	0.0001	0.0305	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
354	*		0.01	0.000	0.024	0.1278	0.0001	0.0327	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
355			0.01	0.000	0.046	0.1270	0.0002	0.0358	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
356	*		0.00	0.000	0.000	0.1256	0.0002	0.0408	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
357			0.00	0.000	0.043	0.1204	0.0002	0.0413	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
358			0.00	0.000	0.044	0.1156	0.0002	0.0354	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
359			0.00	0.000	0.066	0.1092	0.0001	0.0296	6.83E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
360			0.00	0.000	0.055	0.1046	0.0001	0.0238	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

361		0.02	0.000	0.056	0.1019	0.0001	0.0254	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
362		0.02	0.000	0.058	0.0979	0.0001	0.0247	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
363		0.02	0.000	0.041	0.0949	0.0001	0.0214	6.82E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
364	*	0.00	0.000	0.000	0.0946	0.0000	0.0108	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00
365		0.05	0.000	0.039	0.0949	0.0000	0.0096	6.81E-09	0.0000	0.0000	9.93E-11	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 5

	inches	cubic feet	percent
Precipitation	31.32	113,706.2	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	8.071	29,299.0	25.77
Drainage Collected from Layer 3	24.9143	90,439.0	79.54
Percolation/Leakage through Layer 5	0.000002	0.0087	0.00
Average Head on Top of Layer 4	0.0003	---	---
Drainage Collected from Layer 7	0.0000	0.0085	0.00
Percolation/Leakage through Layer 9	0.000000	0.0001	0.00
Average Head on Top of Layer 8	0.0000	---	---
Percolation/Leakage through Layer 10	0.000000	0.0000	0.00
Change in Water Storage	-1.6617	-6,031.8	-5.30
Soil Water at Start of Year	60.4750	219,524.1	193.06
Soil Water at End of Year	59.2131	214,943.7	189.03
Snow Water at Start of Year	0.3998	1,451.4	1.28
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	0.0000	0.0000	0.00

Average Annual Totals Summary

Title: Wayne Disposal-Initial Lift-Sideslope
Simulated on: 11/22/2020 18:39

	Average Annual Totals for Years 1 - 5*			
	(inches)	[std dev]	(cubic feet)	(percent)
Precipitation	30.21	[4.26]	109,651.5	100.00
Runoff	0.000	[0]	0.0000	0.00
Evapotranspiration	7.941	[1.468]	28,825.7	26.29
Subprofile1				
Lateral drainage collected from Layer 3	22.5322	[3.8132]	81,791.7	74.59
Percolation/leakage through Layer 5	0.000002	[0]	0.0086	0.00
Average Head on Top of Layer 4	0.0003	[0]	---	---
Subprofile2				
Lateral drainage collected from Layer 7	0.0000	[0]	0.0085	0.00
Percolation/leakage through Layer 9	0.000000	[0]	0.0001	0.00
Average Head on Top of Layer 8	0.0000	[0]	---	---
Subprofile3				
Percolation/leakage through Layer 10	0.000000	[0]	0.0000	0.00
Water storage				
Change in water storage	-0.2661	[1.1156]	-965.8	-0.88

* Note: Average inches are converted to volume based on the user-specified area.

Peak Values Summary

Title: Wayne Disposal-Initial Lift-Sideslope
Simulated on: 11/22/2020 18:39

	Peak Values for Years 1 - 5*	
	(inches)	(cubic feet)
Precipitation	2.00	7,253.1
Runoff	0.000	0.0000
Subprofile1		
Drainage collected from Layer 3	0.2541	922.5
Percolation/leakage through Layer 5	0.000000	0.0000
Average head on Layer 4	0.0011	---
Maximum head on Layer 4	0.0022	---
Location of maximum head in Layer 3	0.00	(feet from drain)
Subprofile2		
Drainage collected from Layer 7	0.0000	0.0000
Percolation/leakage through Layer 9	0.000000	0.0000
Average head on Layer 8	0.0000	---
Maximum head on Layer 8	0.0000	---
Location of maximum head in Layer 7	0.00	(feet from drain)
Subprofile3		
Percolation/leakage through Layer 10	0.000000	0.0000
Other Parameters		
Snow water	1.8054	6,553.5
Maximum vegetation soil water	0.4570	(vol/vol)
Minimum vegetation soil water	0.0580	(vol/vol)

Final Water Storage in Landfill Profile at End of Simulation Period

Title: Wayne Disposal-Initial Lift-Sideslope
Simulated on: 11/22/2020 18:40
Simulation period: 5 years

	Final Water Storage	
Layer	(inches)	(vol/vol)
1	25.4885	0.2124
2	1.6854	0.1404
3	0.0020	0.0102
4	0.0000	0.0000
5	0.3750	0.7500
6	22.3800	0.3730
7	0.0050	0.0100
8	0.0000	0.0000
9	0.3750	0.7500
10	8.9022	0.3709
Snow water	0.0000	---

ATTACHMENT 5.2.1

HELP Model Analysis - Floor

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 4.0 BETA (2018)
DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Title: Wayne Disposal - Initial Lift **Simulated On:** 11/20/2020 16:22

Layer 1
Type 1 - Vertical Percolation Layer (Cover Soil)
Sandy Waste Material
Material Texture Number 83

Thickness	=	120	inches
Porosity	=	0.457	vol/vol
Field Capacity	=	0.131	vol/vol
Wilting Point	=	0.058	vol/vol
Initial Soil Water Content	=	0.1888	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-03	cm/sec

Layer 2
Type 1 - Vertical Percolation Layer
Custom Soil 1
Material Texture Number 43

Thickness	=	12	inches
Porosity	=	0.417	vol/vol
Field Capacity	=	0.045	vol/vol
Wilting Point	=	0.018	vol/vol
Initial Soil Water Content	=	0.0477	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-03	cm/sec

Layer 3
Type 2 - Lateral Drainage Layer
Drainage Net (0.5 cm)
Material Texture Number 20

Thickness	=	0.2	inches
Porosity	=	0.85	vol/vol
Field Capacity	=	0.01	vol/vol
Wilting Point	=	0.005	vol/vol
Initial Soil Water Content	=	0.01	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E+01	cm/sec
Slope	=	6	%
Drainage Length	=	300	ft

Layer 4

Type 4 - Flexible Membrane Liner
HDPE Membrane
Material Texture Number 35

Thickness	=	0.08	inches
Effective Sat. Hyd. Conductivity	=	2.00E-13	cm/sec
FML Pinhole Density	=	1	Holes/Acre
FML Installation Defects	=	1	Holes/Acre
FML Placement Quality	=	3	Good

Layer 5
Type 3 - Barrier Soil Liner
Bentonite (High)
Material Texture Number 17

Thickness	=	0.5	inches
Porosity	=	0.75	vol/vol
Field Capacity	=	0.747	vol/vol
Wilting Point	=	0.4	vol/vol
Initial Soil Water Content	=	0.75	vol/vol
Effective Sat. Hyd. Conductivity	=	3.00E-09	cm/sec

Layer 6
Type 1 - Vertical Percolation Layer
CL - Clay Loam (Moderate)
Material Texture Number 25

Thickness	=	60	inches
Porosity	=	0.437	vol/vol
Field Capacity	=	0.373	vol/vol
Wilting Point	=	0.266	vol/vol
Initial Soil Water Content	=	0.373	vol/vol
Effective Sat. Hyd. Conductivity	=	3.60E-06	cm/sec

Layer 7
Type 2 - Lateral Drainage Layer
Drainage Net (0.5 cm)
Material Texture Number 20

Thickness	=	0.5	inches
Porosity	=	0.85	vol/vol
Field Capacity	=	0.01	vol/vol
Wilting Point	=	0.005	vol/vol
Initial Soil Water Content	=	0.01	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E+01	cm/sec
Slope	=	6	%
Drainage Length	=	300	ft

Layer 8

Type 4 - Flexible Membrane Liner

HDPE Membrane

Material Texture Number 35

Thickness	=	0.08	inches
Effective Sat. Hyd. Conductivity	=	2.00E-13	cm/sec
FML Pinhole Density	=	1	Holes/Acre
FML Installation Defects	=	1	Holes/Acre
FML Placement Quality	=	3	Good

Layer 9

Type 3 - Barrier Soil Liner

Bentonite (High)

Material Texture Number 17

Thickness	=	0.5	inches
Porosity	=	0.75	vol/vol
Field Capacity	=	0.747	vol/vol
Wilting Point	=	0.4	vol/vol
Initial Soil Water Content	=	0.75	vol/vol
Effective Sat. Hyd. Conductivity	=	3.00E-09	cm/sec

Layer 10

Type 1 - Vertical Percolation Layer

SiC - Silty Clay

Material Texture Number 14

Thickness	=	24	inches
Porosity	=	0.479	vol/vol
Field Capacity	=	0.371	vol/vol
Wilting Point	=	0.251	vol/vol
Initial Soil Water Content	=	0.3709	vol/vol
Effective Sat. Hyd. Conductivity	=	2.50E-05	cm/sec

Note: Initial moisture content of the layers and snow water were computed as nearly steady-state values by HELP.

General Design and Evaporative Zone Data

SCS Runoff Curve Number	=	96.9	
Fraction of Area Allowing Runoff	=	0	%
Area projected on a horizontal plane	=	1	acres
Evaporative Zone Depth	=	12	inches
Initial Water in Evaporative Zone	=	2.646	inches
Upper Limit of Evaporative Storage	=	5.484	inches
Lower Limit of Evaporative Storage	=	0.696	inches

Initial Snow Water	=	0	inches
Initial Water in Layer Materials	=	55.263	inches
Total Initial Water	=	55.263	inches
Total Subsurface Inflow	=	0	inches/year

Note: SCS Runoff Curve Number was calculated by HELP.

Evapotranspiration and Weather Data

Station Latitude	=	42.18	Degrees
Maximum Leaf Area Index	=	0	
Start of Growing Season (Julian Date)	=	100	days
End of Growing Season (Julian Date)	=	260	days
Average Wind Speed	=	9	mph
Average 1st Quarter Relative Humidity	=	72	%
Average 2nd Quarter Relative Humidity	=	68	%
Average 3rd Quarter Relative Humidity	=	73	%
Average 4th Quarter Relative Humidity	=	74	%

Note: Evapotranspiration data was obtained for Belleville, Michigan

Normal Mean Monthly Precipitation (inches)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
1.727469	1.491737	2.04112	2.196136	3.069454	3.054674
3.434996	2.908791	3.528608	1.797602	1.974739	2.783078

Note: Precipitation was simulated based on HELP V4 weather simulation for:
Lat/Long: 42.18/-83.49

Normal Mean Monthly Temperature (Degrees Fahrenheit)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
33.1	33.8	37.3	60.7	63.6	77.2
82.8	79.7	75.8	60.9	36.2	33.9

Note: Temperature was simulated based on HELP V4 weather simulation for:
Lat/Long: 42.18/-83.49
Solar radiation was simulated based on HELP V4 weather simulation for:
Lat/Long: 42.18/-83.49

Daily Output for Year 1

Column key: Head #1: drainage from Layer 4 | Head #2: drainage from Layer 8
Drain #1: drainage from Layer 3 | Drain #2: drainage from Layer 7
Leak #1: leakage thru Layer 5 | Leak #2: leakage thru Layer 9 | Leak #3: leakage thru Layer 10

Title: Wayne Disposal - Initial Lift
Simulated On: 11/20/2020 16:24

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1	Head #2	Drain #2	Leak #2	Head #3	Drain #3	Leak #3
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.000	0.2164	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
2	*		0.01	0.000	0.005	0.2137	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
3	*		0.03	0.000	0.024	0.2115	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
4	*		0.11	0.000	0.028	0.2104	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
5	*	*	0.06	0.000	0.029	0.2104	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
6		*	0.07	0.000	0.000	0.2155	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
7	*	*	0.00	0.000	0.026	0.2155	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
8	*	*	0.00	0.000	0.021	0.2155	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
9		*	0.44	0.000	0.000	0.2573	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
10		*	0.02	0.000	0.000	0.2589	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
11	*	*	0.42	0.000	0.025	0.2589	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
12	*	*	0.35	0.000	0.010	0.2589	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
13		*	0.00	0.000	0.030	0.2589	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
14		*	0.00	0.000	0.000	0.2887	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
15		*	0.00	0.000	0.000	0.3174	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
16		*	0.02	0.000	0.000	0.3191	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
17	*	*	0.01	0.000	0.006	0.3191	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
18		*	0.23	0.000	0.000	0.3380	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
19		*	0.00	0.000	0.000	0.3382	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
20	*	*	0.03	0.000	0.030	0.3382	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
21		*	0.01	0.000	0.000	0.3391	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
22		*	0.08	0.000	0.000	0.3461	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
23		*	0.00	0.000	0.000	0.3461	0.0000	0.0000	4.86E-09	0.0000	0.0000	1.43E-09	0.0000	0.0000	0.00E+00
24		*	0.00	0.000	0.000	0.3461	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
25		*	0.03	0.000	0.000	0.3485	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
26		*	0.00	0.000	0.000	0.3485	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
27	*	*	0.45	0.000	0.026	0.3485	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
28		*	0.04	0.000	0.000	0.3699	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
29		*	0.01	0.000	0.056	0.3828	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
30			0.00	0.000	0.080	0.2435	0.0000	0.0000	4.85E-09	0.0000	0.0000	1.43E-09	0.0000	0.0000	0.00E+00
31	*		0.00	0.000	0.044	0.2265	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
32			0.35	0.000	0.054	0.2425	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
33			0.04	0.000	0.071	0.2347	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
34	*		0.00	0.000	0.038	0.2279	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
35			0.00	0.000	0.084	0.2172	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
36	*		0.03	0.000	0.033	0.2125	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
37			0.16	0.000	0.070	0.2162	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
38			0.07	0.000	0.065	0.2134	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00

39			0.43	0.000	0.058	0.2420	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
40	*		0.04	0.000	0.024	0.2413	0.0000	0.0000	9.61E-10	0.0000	0.0000	6.52E-10	0.0000	0.0000	0.00E+00
41	*		0.00	0.000	0.000	0.2382	0.0000	0.0000	1.94E-09	0.0000	0.0000	9.91E-10	0.0000	0.0000	0.00E+00
42	*		0.00	0.000	0.000	0.2294	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
43	*		0.00	0.000	0.000	0.2231	0.0000	0.0000	1.93E-09	0.0000	0.0000	9.89E-10	0.0000	0.0000	0.00E+00
44	*		0.00	0.000	0.047	0.2143	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
45	*		0.06	0.000	0.038	0.2120	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
46	*		0.15	0.000	0.000	0.2102	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
47	*		0.02	0.000	0.031	0.2090	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
48			0.05	0.000	0.044	0.2157	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
49			0.00	0.000	0.093	0.2055	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
50			0.00	0.000	0.082	0.1974	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
51	*		0.09	0.000	0.038	0.1975	0.0000	0.0000	2.92E-09	0.0000	0.0000	1.19E-09	0.0000	0.0000	0.00E+00
52	*		0.13	0.000	0.000	0.1975	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
53			0.09	0.000	0.042	0.2113	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
54			0.00	0.000	0.091	0.2020	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
55	*		0.01	0.000	0.008	0.2011	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
56			0.17	0.000	0.066	0.2088	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
57			0.02	0.000	0.148	0.1969	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
58	*		0.12	0.000	0.059	0.1975	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
59			0.00	0.000	0.117	0.1905	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
60			0.12	0.000	0.054	0.1948	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
61			0.57	0.000	0.061	0.2368	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
62			0.00	0.000	0.092	0.2284	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
63			0.00	0.000	0.065	0.2230	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
64			0.00	0.000	0.056	0.2139	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
65	*		0.00	0.000	0.072	0.2025	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
66	*		0.00	0.000	0.000	0.1985	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
67	*		0.00	0.000	0.000	0.1953	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
68	*		0.00	0.000	0.058	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
69	*	*	0.00	0.000	0.000	0.1881	0.0000	0.0000	9.64E-10	0.0000	0.0000	6.53E-10	0.0000	0.0000	0.00E+00
70	*	*	0.08	0.000	0.032	0.1881	0.0000	0.0000	4.37E-09	0.0000	0.0000	1.38E-09	0.0000	0.0000	0.00E+00
71		*	0.00	0.000	0.053	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
72	*	*	0.00	0.000	0.000	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
73	*	*	0.00	0.000	0.000	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
74	*	*	0.00	0.000	0.000	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
75	*	*	0.00	0.000	0.000	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
76	*	*	0.00	0.000	0.000	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
77	*	*	0.00	0.000	0.000	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
78	*	*	0.03	0.000	0.029	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
79	*	*	0.07	0.000	0.040	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
80	*	*	0.69	0.000	0.010	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
81	*	*	0.00	0.000	0.013	0.1881	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
82		*	0.08	0.000	0.000	0.2527	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
83		*	0.00	0.000	0.000	0.2527	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
84	*	*	0.00	0.000	0.000	0.2527	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00

85	*	*	0.10	0.000	0.045	0.2527	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
86	*	*	0.00	0.000	0.024	0.2527	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
87		*	0.00	0.000	0.036	0.2527	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
88		*	0.00	0.000	0.000	0.2527	0.0000	0.0000	6.80E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
89	*	*	0.05	0.000	0.045	0.2527	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
90	*	*	0.00	0.000	0.000	0.2527	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
91		*	0.03	0.000	0.000	0.2551	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
92		*	0.00	0.000	0.000	0.2551	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
93		*	0.00	0.000	0.000	0.2551	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
94		*	0.00	0.000	0.000	0.2551	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
95		*	0.00	0.000	0.000	0.2551	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
96		*	0.00	0.000	0.000	0.2551	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
97		*	0.00	0.000	0.000	0.2551	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
98		*	0.00	0.000	0.000	0.2551	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
99		*	0.00	0.000	0.000	0.2551	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
100		*	0.00	0.000	0.000	0.2551	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
101		*	0.00	0.000	0.000	0.2551	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
102			0.00	0.000	0.305	0.2267	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
103			0.00	0.000	0.137	0.2043	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
104			0.15	0.000	0.153	0.1979	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
105			0.22	0.000	0.153	0.1993	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
106			0.00	0.000	0.288	0.1722	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
107			0.00	0.000	0.130	0.1594	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
108			0.00	0.000	0.054	0.1537	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
109			0.01	0.000	0.042	0.1502	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
110			0.00	0.000	0.034	0.1458	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
111			0.00	0.000	0.031	0.1416	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
112			0.05	0.000	0.028	0.1422	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
113			0.05	0.000	0.026	0.1427	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
114			0.07	0.000	0.024	0.1452	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
115			0.01	0.000	0.022	0.1429	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
116			0.00	0.000	0.021	0.1404	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
117			0.00	0.000	0.020	0.1379	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
118			0.00	0.000	0.019	0.1355	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
119			0.00	0.000	0.018	0.1333	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
120			0.03	0.000	0.018	0.1336	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
121			0.03	0.000	0.017	0.1341	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
122			0.32	0.000	0.017	0.1587	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
123			0.06	0.000	0.016	0.1619	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
124			0.52	0.000	0.016	0.2033	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
125			0.00	0.000	0.108	0.1937	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
126			0.00	0.000	0.259	0.1719	0.0000	0.0005	1.95E-09	0.0000	0.0000	9.93E-10	0.0000	0.0000	0.00E+00
127			0.00	0.000	0.241	0.1518	0.0000	0.0000	9.60E-10	0.0000	0.0000	6.51E-10	0.0000	0.0000	0.00E+00
128			0.02	0.000	0.130	0.1421	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
129			0.20	0.000	0.054	0.1537	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
130			0.01	0.000	0.042	0.1503	0.0000	0.0000	1.60E-09	0.0000	0.0000	8.94E-10	0.0000	0.0000	0.00E+00

131		0.03	0.000	0.035	0.1497	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
132		0.56	0.000	0.031	0.1932	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
133		0.00	0.000	0.106	0.1842	0.0000	0.0001	3.40E-09	0.0000	0.0000	1.27E-09	0.0000	0.0000	0.00E+00
134	*	0.01	0.000	0.059	0.1798	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
135		0.63	0.000	0.116	0.2227	0.0000	0.0005	5.20E-09	0.0000	0.0000	1.46E-09	0.0000	0.0000	0.00E+00
136		0.04	0.000	0.288	0.2018	0.0003	0.0032	4.87E-09	0.0000	0.0000	1.43E-09	0.0000	0.0000	0.00E+00
137		0.00	0.000	0.266	0.1788	0.0004	0.0043	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
138		0.00	0.000	0.232	0.1589	0.0001	0.0015	6.33E-09	0.0000	0.0000	1.53E-09	0.0000	0.0000	0.00E+00
139		0.00	0.000	0.130	0.1480	0.0000	0.0003	1.95E-09	0.0000	0.0000	9.93E-10	0.0000	0.0000	0.00E+00
140		0.00	0.000	0.054	0.1436	0.0001	0.0009	6.31E-09	0.0000	0.0000	1.53E-09	0.0000	0.0000	0.00E+00
141		0.01	0.000	0.042	0.1411	0.0004	0.0043	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
142		0.05	0.000	0.035	0.1427	0.0007	0.0074	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
143		0.03	0.000	0.031	0.1421	0.0008	0.0092	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
144		0.00	0.000	0.028	0.1399	0.0010	0.0110	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
145		0.00	0.000	0.025	0.1377	0.0011	0.0129	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
146		0.00	0.000	0.024	0.1350	0.0017	0.0187	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
147		0.00	0.000	0.022	0.1324	0.0014	0.0159	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
148		0.40	0.000	0.022	0.1627	0.0013	0.0144	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
149		0.12	0.000	0.021	0.1707	0.0007	0.0083	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
150		0.04	0.000	0.020	0.1723	0.0009	0.0105	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
151		0.00	0.000	0.019	0.1703	0.0013	0.0144	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
152		0.05	0.000	0.019	0.1725	0.0013	0.0149	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
153		0.24	0.000	0.018	0.1902	0.0016	0.0181	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
154		0.11	0.000	0.229	0.1788	0.0016	0.0176	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
155		0.16	0.000	0.297	0.1671	0.0008	0.0093	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
156		0.00	0.000	0.130	0.1556	0.0018	0.0200	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
157		0.04	0.000	0.055	0.1534	0.0019	0.0210	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
158		0.00	0.000	0.041	0.1492	0.0017	0.0190	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
159		0.00	0.000	0.035	0.1456	0.0015	0.0175	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
160		0.04	0.000	0.032	0.1459	0.0016	0.0180	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
161		0.00	0.000	0.028	0.1430	0.0017	0.0191	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
162		0.00	0.000	0.025	0.1404	0.0018	0.0200	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
163		0.32	0.000	0.025	0.1646	0.0018	0.0208	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
164		0.00	0.000	0.022	0.1624	0.0019	0.0218	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
165		0.00	0.000	0.021	0.1603	0.0020	0.0226	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
166		0.06	0.000	0.021	0.1630	0.0020	0.0230	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
167		0.00	0.000	0.020	0.1614	0.0021	0.0233	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
168		0.63	0.000	0.019	0.2118	0.0021	0.0233	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
169		0.35	0.000	0.265	0.2188	0.0019	0.0220	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
170		0.00	0.000	0.148	0.2061	0.0023	0.0256	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
171		0.00	0.000	0.137	0.1940	0.0023	0.0258	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
172		0.00	0.000	0.200	0.1769	0.0019	0.0219	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
173		0.00	0.000	0.351	0.1472	0.0017	0.0195	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
174		0.19	0.000	0.131	0.1522	0.0017	0.0196	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
175		0.00	0.000	0.054	0.1476	0.0015	0.0175	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
176		0.00	0.000	0.041	0.1442	0.0016	0.0185	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

177	0.00	0.000	0.035	0.1413	0.0018	0.0199	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
178	0.00	0.000	0.031	0.1387	0.0018	0.0206	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
179	0.00	0.000	0.026	0.1361	0.0022	0.0250	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
180	0.07	0.000	0.027	0.1391	0.0022	0.0246	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
181	0.10	0.000	0.025	0.1444	0.0019	0.0214	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
182	0.03	0.000	0.024	0.1440	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
183	0.45	0.000	0.022	0.1789	0.0015	0.0169	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
184	0.06	0.000	0.189	0.1674	0.0012	0.0134	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
185	0.67	0.000	0.021	0.2208	0.0012	0.0134	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
186	0.00	0.000	0.171	0.2063	0.0010	0.0111	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
187	0.00	0.000	0.115	0.1959	0.0015	0.0170	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
188	0.00	0.000	0.253	0.1736	0.0017	0.0193	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
189	0.00	0.000	0.261	0.1513	0.0011	0.0127	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
190	0.00	0.000	0.130	0.1399	0.0015	0.0168	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
191	0.00	0.000	0.054	0.1351	0.0013	0.0151	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
192	0.03	0.000	0.043	0.1337	0.0012	0.0137	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
193	1.04	0.000	0.036	0.2171	0.0015	0.0173	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
194	0.11	0.000	0.142	0.2141	0.0018	0.0204	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
195	0.14	0.000	0.302	0.2003	0.0020	0.0230	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
196	0.75	0.000	0.320	0.2342	0.0023	0.0259	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
197	0.00	0.000	0.126	0.2227	0.0020	0.0227	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
198	0.22	0.000	0.357	0.2108	0.0015	0.0170	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
199	0.01	0.000	0.306	0.1854	0.0015	0.0168	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
200	0.45	0.000	0.131	0.2115	0.0015	0.0166	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
201	0.00	0.000	0.267	0.1865	0.0018	0.0209	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
202	0.00	0.000	0.201	0.1669	0.0017	0.0194	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
203	0.02	0.000	0.131	0.1567	0.0011	0.0127	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
204	0.00	0.000	0.054	0.1518	0.0009	0.0101	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
205	0.05	0.000	0.043	0.1515	0.0016	0.0178	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
206	0.21	0.000	0.036	0.1647	0.0016	0.0176	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
207	0.80	0.000	0.032	0.2279	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
208	0.00	0.000	0.112	0.2180	0.0010	0.0113	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
209	0.54	0.000	0.193	0.2457	0.0017	0.0189	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
210	0.00	0.000	0.256	0.2239	0.0011	0.0124	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
211	0.00	0.000	0.250	0.2008	0.0013	0.0145	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
212	0.00	0.000	0.303	0.1696	0.0022	0.0245	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
213	0.00	0.000	0.130	0.1561	0.0017	0.0191	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
214	0.00	0.000	0.054	0.1503	0.0008	0.0094	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
215	0.37	0.000	0.043	0.1736	0.0019	0.0219	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
216	0.28	0.000	0.037	0.1908	0.0015	0.0170	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
217	0.00	0.000	0.128	0.1775	0.0006	0.0065	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
218	0.00	0.000	0.031	0.1732	0.0006	0.0069	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
219	0.00	0.000	0.028	0.1692	0.0010	0.0109	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
220	0.00	0.000	0.025	0.1657	0.0012	0.0138	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
221	0.00	0.000	0.024	0.1626	0.0014	0.0159	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
222	0.05	0.000	0.024	0.1635	0.0015	0.0173	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

223		0.00	0.000	0.021	0.1609	0.0016	0.0182	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
224		0.00	0.000	0.020	0.1585	0.0017	0.0187	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
225		0.00	0.000	0.019	0.1562	0.0017	0.0189	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
226		0.14	0.000	0.020	0.1655	0.0017	0.0189	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
227		0.14	0.000	0.020	0.1746	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
228		0.32	0.000	0.273	0.1779	0.0021	0.0235	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
229		0.00	0.000	0.158	0.1646	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
230		0.20	0.000	0.123	0.1709	0.0016	0.0180	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
231		0.35	0.000	0.138	0.1881	0.0017	0.0191	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
232		0.25	0.000	0.149	0.1958	0.0017	0.0191	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
233		0.39	0.000	0.411	0.1932	0.0018	0.0200	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
234		0.15	0.000	0.127	0.1952	0.0015	0.0167	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
235		0.16	0.000	0.143	0.1956	0.0016	0.0186	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
236		0.00	0.000	0.331	0.1670	0.0015	0.0174	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
237		0.00	0.000	0.238	0.1465	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
238		0.00	0.000	0.130	0.1352	0.0010	0.0110	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
239		0.02	0.000	0.056	0.1318	0.0008	0.0090	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
240		0.00	0.000	0.041	0.1282	0.0008	0.0094	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
241		0.02	0.000	0.037	0.1266	0.0009	0.0098	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
242		0.50	0.000	0.033	0.1651	0.0009	0.0098	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
243		0.18	0.000	0.390	0.1468	0.0012	0.0136	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
244		0.33	0.000	0.030	0.1717	0.0006	0.0069	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
245		0.28	0.000	0.248	0.1747	0.0007	0.0081	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
246		0.07	0.000	0.299	0.1559	0.0007	0.0082	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
247		0.06	0.000	0.132	0.1502	0.0007	0.0084	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
248		0.00	0.000	0.056	0.1459	0.0008	0.0086	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
249		0.00	0.000	0.041	0.1425	0.0007	0.0084	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
250		0.26	0.000	0.037	0.1607	0.0007	0.0082	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
251		0.00	0.000	0.087	0.1535	0.0007	0.0079	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
252		0.18	0.000	0.033	0.1660	0.0007	0.0075	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
253		0.32	0.000	0.153	0.1795	0.0006	0.0071	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
254		0.19	0.000	0.185	0.1801	0.0006	0.0067	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
255		0.00	0.000	0.212	0.1624	0.0006	0.0062	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
256		0.00	0.000	0.207	0.1452	0.0005	0.0060	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
257		0.08	0.000	0.132	0.1412	0.0005	0.0053	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
258		0.08	0.000	0.056	0.1436	0.0004	0.0050	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
259		0.00	0.000	0.041	0.1402	0.0004	0.0047	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
260		0.00	0.000	0.035	0.1373	0.0004	0.0044	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
261		0.00	0.000	0.032	0.1347	0.0004	0.0042	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
262		0.42	0.000	0.029	0.1670	0.0004	0.0041	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
263		0.09	0.000	0.133	0.1631	0.0004	0.0042	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
264		0.00	0.000	0.067	0.1575	0.0004	0.0041	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
265	*	0.00	0.000	0.083	0.1505	0.0003	0.0038	6.85E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
266		0.18	0.000	0.055	0.1613	0.0003	0.0039	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
267		0.00	0.000	0.167	0.1474	0.0004	0.0043	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
268		0.00	0.000	0.041	0.1439	0.0004	0.0043	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00

269	*	0.00	0.000	0.035	0.1410	0.0004	0.0046	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
270	*	0.00	0.000	0.000	0.1410	0.0004	0.0050	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
271		0.00	0.000	0.031	0.1385	0.0005	0.0054	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
272		0.00	0.000	0.028	0.1362	0.0005	0.0058	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
273		0.00	0.000	0.025	0.1340	0.0006	0.0063	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
274		0.00	0.000	0.024	0.1321	0.0006	0.0068	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
275		0.00	0.000	0.022	0.1302	0.0006	0.0073	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
276		0.00	0.000	0.021	0.1285	0.0007	0.0078	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
277		0.00	0.000	0.020	0.1268	0.0008	0.0085	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
278		0.00	0.000	0.019	0.1252	0.0008	0.0086	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
279		0.08	0.000	0.020	0.1303	0.0008	0.0091	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
280	*	0.01	0.000	0.011	0.1303	0.0009	0.0096	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
281		0.13	0.000	0.019	0.1399	0.0009	0.0101	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
282		0.00	0.000	0.017	0.1385	0.0009	0.0106	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
283		0.00	0.000	0.016	0.1371	0.0010	0.0110	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
284		0.01	0.000	0.017	0.1365	0.0010	0.0115	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
285		0.01	0.000	0.017	0.1359	0.0010	0.0118	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
286		0.00	0.000	0.015	0.1346	0.0011	0.0122	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
287		0.00	0.000	0.015	0.1334	0.0011	0.0125	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
288		0.00	0.000	0.014	0.1322	0.0011	0.0128	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
289		0.00	0.000	0.014	0.1311	0.0012	0.0131	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
290		0.00	0.000	0.014	0.1299	0.0012	0.0134	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
291		0.00	0.000	0.013	0.1288	0.0012	0.0136	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
292		0.00	0.000	0.013	0.1277	0.0012	0.0138	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
293		0.04	0.000	0.014	0.1301	0.0012	0.0140	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
294		0.00	0.000	0.013	0.1290	0.0013	0.0142	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
295		0.00	0.000	0.012	0.1280	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
296		0.00	0.000	0.012	0.1270	0.0013	0.0146	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
297		0.00	0.000	0.012	0.1260	0.0013	0.0145	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
298		0.00	0.000	0.012	0.1250	0.0013	0.0146	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
299		0.00	0.000	0.012	0.1240	0.0013	0.0147	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
300		0.00	0.000	0.011	0.1231	0.0013	0.0148	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
301		0.00	0.000	0.012	0.1224	0.0013	0.0149	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
302		0.00	0.000	0.011	0.1214	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
303		0.00	0.000	0.011	0.1205	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
304		0.00	0.000	0.011	0.1196	0.0013	0.0149	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
305		0.63	0.000	0.011	0.1708	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
306	*	0.02	0.000	0.045	0.1683	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
307		0.00	0.000	0.089	0.1609	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
308	*	0.12	0.000	0.038	0.1625	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
309	*	0.01	0.000	0.015	0.1641	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
310	*	0.13	0.000	0.019	0.1658	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
311	*	0.39	0.000	0.007	0.1674	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
312	*	0.06	0.000	0.000	0.1691	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
313	*	0.04	0.000	0.000	0.1707	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
314	*	0.28	0.000	0.008	0.1723	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

315		0.15	0.000	0.000	0.2035	0.0013	0.0149	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
316		0.18	0.000	0.000	0.2671	0.0013	0.0149	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
317	*	0.00	0.000	0.000	0.2532	0.0014	0.0157	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
318	*	0.00	0.000	0.034	0.2344	0.0014	0.0161	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
319		0.00	0.000	0.043	0.2218	0.0014	0.0153	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
320	*	0.00	0.000	0.036	0.2128	0.0013	0.0147	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
321	*	0.00	0.000	0.000	0.2083	0.0013	0.0142	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
322	*	0.07	0.000	0.025	0.2062	0.0012	0.0133	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
323	*	0.01	0.000	0.022	0.2047	0.0005	0.0052	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
324	*	0.00	0.000	0.036	0.1993	0.0006	0.0067	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
325		0.00	0.000	0.069	0.1912	0.0010	0.0109	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
326		0.00	0.000	0.089	0.1818	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
327		0.00	0.000	0.076	0.1744	0.0014	0.0161	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
328		0.00	0.000	0.049	0.1689	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
329		0.41	0.000	0.072	0.1956	0.0016	0.0186	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
330		0.32	0.000	0.036	0.2172	0.0017	0.0192	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
331		0.06	0.000	0.073	0.2147	0.0017	0.0194	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
332		0.45	0.000	0.094	0.2437	0.0017	0.0194	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
333		0.00	0.000	0.076	0.2365	0.0017	0.0192	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
334		0.00	0.000	0.065	0.2274	0.0021	0.0236	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
335		0.00	0.000	0.105	0.2108	0.0024	0.0272	7.11E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
336		0.00	0.000	0.040	0.2021	0.0020	0.0223	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
337	*	0.05	0.000	0.017	0.1994	0.0010	0.0109	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
338		0.00	0.000	0.048	0.1933	0.0010	0.0110	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
339		0.13	0.000	0.072	0.1965	0.0010	0.0118	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
340		0.05	0.000	0.060	0.1938	0.0011	0.0124	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
341		0.01	0.000	0.047	0.1884	0.0011	0.0128	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
342	*	0.00	0.000	0.000	0.1865	0.0012	0.0130	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
343	*	0.19	0.000	0.008	0.1868	0.0012	0.0132	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
344		0.00	0.000	0.011	0.1989	0.0012	0.0132	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
345		0.00	0.000	0.040	0.1947	0.0012	0.0132	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
346		0.11	0.000	0.068	0.1967	0.0012	0.0132	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
347		0.01	0.000	0.100	0.1889	0.0011	0.0130	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
348		0.35	0.000	0.133	0.2060	0.0014	0.0153	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
349		0.05	0.000	0.047	0.2054	0.0012	0.0137	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
350		0.00	0.000	0.048	0.2007	0.0010	0.0114	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
351	*	0.00	0.000	0.000	0.2005	0.0010	0.0114	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
352	*	0.02	0.000	0.011	0.2006	0.0011	0.0121	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
353	*	0.36	0.000	0.005	0.2015	0.0014	0.0157	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
354	*	0.14	0.000	0.007	0.2023	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
355	*	0.01	0.000	0.009	0.2033	0.0013	0.0142	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
356	*	0.07	0.000	0.005	0.2045	0.0011	0.0120	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
357	*	0.07	0.000	0.006	0.2062	0.0007	0.0082	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
358	*	0.14	0.000	0.000	0.2078	0.0009	0.0101	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
359		0.00	0.000	0.012	0.2198	0.0010	0.0118	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
360		0.28	0.000	0.000	0.2815	0.0011	0.0124	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

361		0.08	0.000	0.065	0.2552	0.0010	0.0111	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
362		0.00	0.000	0.059	0.2353	0.0010	0.0111	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
363	*	0.01	0.000	0.029	0.2256	0.0002	0.0019	6.83E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
364		0.00	0.000	0.036	0.2171	0.0001	0.0014	6.82E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
365		0.14	0.000	0.041	0.2205	0.0002	0.0023	6.84E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 1			
	inches	cubic feet	percent
Precipitation	29.83	108,269.8	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	22.874	83,033.1	76.69
Drainage Collected from Layer 3	3.1469	11,423.4	10.55
Percolation/Leakage through Layer 5	0.000002	0.0070	0.00
Average Head on Top of Layer 4	0.0008	---	---
Drainage Collected from Layer 7	0.0000	0.0054	0.00
Percolation/Leakage through Layer 9	0.000000	0.0016	0.00
Average Head on Top of Layer 8	0.0000	---	---
Percolation/Leakage through Layer 10	0.000000	0.0000	0.00
Change in Water Storage	3.8053	13,813.3	12.76
Soil Water at Start of Year	55.2626	200,603.4	185.28
Soil Water at End of Year	59.0680	214,416.7	198.04
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 2

Title: Wayne Disposal - Initial Lift
Simulated On: 11/20/2020 16:24

Column key: Head #1: drainage from Layer 4; Drain #1: drainage from Layer 3; Leak #1: leakage thru Layer 5; Head #2: drainage from Layer 8; Drain #2: drainage from Layer 7; Leak #2: leakage thru Layer 9; Leak #3: leakage thru Layer 10

Day	Freezing Status* Air	Soil	Rain (inches)	Runoff (inches)	ET (inches)	Evap. Zone Water (in/in)	Head #1 (inches)	Drain #1 (inches)	Leak #1 (inches)	Head #2 (inches)	Drain #2 (inches)	Leak #2 (inches)	Head #3 (inches)	Drain #3 (inches)	Leak #3 (inches)
1	*		0.01	0.000	0.005	0.2164	0.0003	0.0032	6.85E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
2	*		0.00	0.000	0.030	0.2112	0.0003	0.0039	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
3	*		0.00	0.000	0.028	0.2062	0.0004	0.0045	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
4	*		0.00	0.000	0.033	0.2007	0.0004	0.0051	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
5	*	*	0.06	0.000	0.025	0.2007	0.0005	0.0056	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
6	*	*	0.14	0.000	0.012	0.2007	0.0005	0.0060	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
7	*	*	0.07	0.000	0.010	0.2007	0.0006	0.0063	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
8	*	*	0.02	0.000	0.010	0.2007	0.0006	0.0066	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
9	*	*	0.01	0.000	0.010	0.2007	0.0008	0.0091	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
10	*	*	0.14	0.000	0.000	0.2007	0.0011	0.0126	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
11		*	0.09	0.000	0.000	0.2397	0.0011	0.0122	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
12		*	0.33	0.000	0.000	0.2669	0.0010	0.0115	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
13		*	0.13	0.000	0.000	0.2779	0.0010	0.0109	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
14	*	*	0.11	0.000	0.019	0.2779	0.0009	0.0103	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
15	*	*	0.03	0.000	0.026	0.2779	0.0009	0.0098	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
16		*	0.00	0.000	0.048	0.2815	0.0008	0.0093	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
17		*	0.16	0.000	0.000	0.2948	0.0008	0.0089	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
18		*	0.00	0.000	0.000	0.2948	0.0008	0.0085	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
19		*	0.01	0.000	0.000	0.2957	0.0007	0.0081	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
20		*	0.00	0.000	0.000	0.2957	0.0007	0.0078	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
21	*	*	0.00	0.000	0.000	0.2957	0.0007	0.0075	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
22	*	*	0.00	0.000	0.000	0.2957	0.0006	0.0072	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
23	*	*	0.09	0.000	0.020	0.2957	0.0006	0.0069	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
24		*	0.00	0.000	0.034	0.2989	0.0006	0.0065	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
25	*	*	0.00	0.000	0.000	0.2989	0.0004	0.0043	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
26		*	0.15	0.000	0.000	0.3110	0.0001	0.0017	6.83E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
27		*	0.11	0.000	0.000	0.3198	0.0000	0.0000	2.41E-09	0.0000	0.0000	1.10E-09	0.0000	0.0000	0.00E+00
28	*	*	0.10	0.000	0.021	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
29	*	*	0.36	0.000	0.019	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
30	*	*	0.21	0.000	0.000	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
31	*	*	0.02	0.000	0.024	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
32	*	*	0.00	0.000	0.011	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
33	*	*	0.00	0.000	0.011	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
34	*	*	0.18	0.000	0.016	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
35	*	*	0.07	0.000	0.007	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
36	*	*	0.06	0.000	0.000	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
37	*	*	0.00	0.000	0.000	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
38	*	*	0.00	0.000	0.020	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00

39	*	*	0.05	0.000	0.008	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
40	*	*	0.11	0.000	0.004	0.3198	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
41	*	*	0.13	0.000	0.000	0.3198	0.0000	0.0004	3.89E-09	0.0000	0.0000	1.33E-09	0.0000	0.0000	0.00E+00
42	*	*	0.14	0.000	0.006	0.3198	0.0002	0.0026	6.84E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
43	*	*	0.02	0.000	0.000	0.3198	0.0005	0.0051	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
44	*	*	0.11	0.000	0.000	0.3198	0.0007	0.0075	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
45		*	0.00	0.000	0.000	0.3513	0.0009	0.0098	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
46		*	0.00	0.000	0.000	0.4075	0.0011	0.0119	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
47		*	0.00	0.000	0.025	0.4366	0.0012	0.0139	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
48		*	0.00	0.000	0.000	0.4366	0.0014	0.0156	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
49		*	0.00	0.000	0.000	0.4366	0.0015	0.0171	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
50	*	*	0.08	0.000	0.032	0.4366	0.0016	0.0184	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
51	*	*	0.00	0.000	0.044	0.4366	0.0017	0.0195	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
52		*	0.17	0.000	0.053	0.4471	0.0018	0.0204	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
53	*	*	0.00	0.000	0.000	0.4471	0.0019	0.0212	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
54	*	*	0.00	0.000	0.000	0.4471	0.0019	0.0218	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
55		*	0.00	0.000	0.000	0.4471	0.0020	0.0223	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
56	*	*	0.21	0.000	0.014	0.4471	0.0020	0.0227	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
57		*	0.00	0.000	0.035	0.4570	0.0021	0.0237	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
58		*	0.00	0.000	0.000	0.4570	0.0020	0.0222	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
59	*	*	0.00	0.000	0.000	0.4570	0.0020	0.0228	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
60	*	*	0.00	0.000	0.000	0.4570	0.0021	0.0234	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
61	*	*	0.00	0.000	0.000	0.4570	0.0021	0.0238	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
62	*	*	0.02	0.000	0.016	0.4570	0.0021	0.0239	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
63	*	*	0.00	0.000	0.000	0.4570	0.0021	0.0240	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
64	*	*	0.00	0.000	0.000	0.4570	0.0021	0.0239	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
65	*	*	0.00	0.000	0.000	0.4570	0.0021	0.0238	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
66	*	*	0.14	0.000	0.018	0.4570	0.0021	0.0237	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
67		*	0.15	0.000	0.049	0.4570	0.0023	0.0260	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
68	*	*	1.22	0.000	0.029	0.4570	0.0015	0.0167	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
69	*	*	0.17	0.000	0.026	0.4570	0.0018	0.0204	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
70	*	*	0.00	0.000	0.024	0.4570	0.0021	0.0232	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
71	*	*	0.00	0.000	0.011	0.4570	0.0022	0.0248	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
72		*	0.00	0.000	0.000	0.4570	0.0022	0.0254	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
73		*	0.00	0.000	0.000	0.4570	0.0028	0.0314	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
74		*	0.00	0.000	0.000	0.4570	0.0011	0.0121	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
75		*	0.00	0.000	0.000	0.4570	0.0015	0.0173	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
76		*	0.00	0.000	0.000	0.4570	0.0019	0.0218	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
77		*	0.04	0.000	0.000	0.4570	0.0022	0.0245	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
78		*	0.07	0.000	0.000	0.4570	0.0033	0.0372	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
79		*	0.00	0.000	0.000	0.4570	0.0018	0.0206	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
80		*	0.00	0.000	0.000	0.4570	0.0019	0.0219	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
81		*	0.11	0.000	0.000	0.4570	0.0033	0.0374	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
82		*	0.01	0.000	0.000	0.4570	0.0014	0.0159	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
83	*	*	0.00	0.000	0.000	0.4570	0.0015	0.0169	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
84	*	*	0.00	0.000	0.000	0.4570	0.0016	0.0186	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

85	*	*	0.00	0.000	0.000	0.4570	0.0019	0.0210	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
86	*	*	0.01	0.000	0.012	0.4570	0.0023	0.0262	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
87	*	*	0.68	0.000	0.016	0.4570	0.0025	0.0281	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
88	*	*	0.00	0.000	0.007	0.4570	0.0024	0.0277	7.11E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
89	*	*	0.00	0.000	0.020	0.4570	0.0022	0.0251	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
90	*	*	0.01	0.000	0.010	0.4570	0.0020	0.0226	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
91		*	0.07	0.000	0.000	0.4570	0.0018	0.0204	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
92		*	0.32	0.000	0.000	0.4570	0.0004	0.0040	3.38E-09	0.0000	0.0000	1.27E-09	0.0000	0.0000	0.00E+00
93		*	0.00	0.000	0.000	0.4570	0.0000	0.0000	9.73E-10	0.0000	0.0000	6.57E-10	0.0000	0.0000	0.00E+00
94		*	0.01	0.000	0.000	0.4570	0.0002	0.0028	6.84E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
95		*	0.13	0.000	0.000	0.4570	0.0020	0.0223	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
96		*	0.03	0.000	0.000	0.4570	0.0002	0.0023	6.83E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
97	*	*	0.05	0.000	0.049	0.4570	0.0005	0.0054	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
98	*	*	0.00	0.000	0.000	0.4570	0.0008	0.0092	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
99	*	*	0.00	0.000	0.000	0.4570	0.0019	0.0219	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
100	*	*	0.00	0.000	0.000	0.4570	0.0022	0.0253	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
101	*	*	0.00	0.000	0.000	0.4570	0.0020	0.0227	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
102		*	0.01	0.000	0.000	0.4570	0.0018	0.0206	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
103	*	*	0.00	0.000	0.000	0.4570	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
104	*	*	0.00	0.000	0.000	0.4570	0.0015	0.0172	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
105	*	*	0.00	0.000	0.000	0.4570	0.0014	0.0153	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
106		*	0.00	0.000	0.000	0.4570	0.0007	0.0082	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
107		*	0.03	0.000	0.000	0.4570	0.0011	0.0122	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
108		*	0.56	0.000	0.000	0.4570	0.0001	0.0009	3.38E-09	0.0000	0.0000	1.27E-09	0.0000	0.0000	0.00E+00
109		*	0.04	0.000	0.000	0.4570	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
110		*	0.25	0.000	0.000	0.4570	0.0010	0.0112	6.41E-09	0.0000	0.0000	1.54E-09	0.0000	0.0000	0.00E+00
111		*	0.07	0.000	0.000	0.4570	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
112		*	0.65	0.000	0.000	0.4570	0.0015	0.0172	5.95E-09	0.0000	0.0000	1.51E-09	0.0000	0.0000	0.00E+00
113		*	0.00	0.000	0.000	0.4570	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
114		*	0.00	0.000	0.000	0.4570	0.0003	0.0030	3.93E-09	0.0000	0.0000	1.34E-09	0.0000	0.0000	0.00E+00
115	*	*	0.00	0.000	0.001	0.4570	0.0021	0.0238	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
116		*	0.35	0.000	0.000	0.4570	0.0043	0.0487	7.32E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
117	*	*	0.00	0.000	0.000	0.4570	0.0003	0.0036	3.43E-09	0.0000	0.0000	1.27E-09	0.0000	0.0000	0.00E+00
118	*	*	0.00	0.000	0.000	0.4570	0.0019	0.0216	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
119		*	0.00	0.000	0.000	0.4570	0.0044	0.0501	7.33E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
120	*	*	0.61	0.000	0.052	0.4570	0.0039	0.0438	7.27E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
121		*	0.05	0.000	0.000	0.4570	0.0033	0.0370	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
122	*	*	0.01	0.000	0.037	0.4570	0.0002	0.0025	2.44E-09	0.0000	0.0000	1.11E-09	0.0000	0.0000	0.00E+00
123		*	0.00	0.000	0.128	0.4570	0.0029	0.0333	6.68E-09	0.0000	0.0000	1.55E-09	0.0000	0.0000	0.00E+00
124		*	0.00	0.000	0.000	0.4570	0.0003	0.0029	3.85E-09	0.0000	0.0000	1.33E-09	0.0000	0.0000	0.00E+00
125			0.09	0.000	0.099	0.2504	0.0016	0.0182	4.56E-09	0.0000	0.0000	1.40E-09	0.0000	0.0000	0.00E+00
126			0.05	0.000	0.150	0.2287	0.0018	0.0208	5.57E-09	0.0000	0.0000	1.48E-09	0.0000	0.0000	0.00E+00
127			0.00	0.000	0.252	0.2001	0.0066	0.0747	7.56E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
128			0.00	0.000	0.246	0.1764	0.0051	0.0577	7.40E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
129			0.00	0.000	0.130	0.1621	0.0005	0.0055	3.74E-09	0.0000	0.0000	1.31E-09	0.0000	0.0000	0.00E+00
130			0.00	0.000	0.054	0.1547	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00

131	0.00	0.000	0.041	0.1495	0.0023	0.0257	3.67E-09	0.0000	0.0000	1.30E-09	0.0000	0.0000	0.00E+00
132	0.00	0.000	0.035	0.1454	0.0144	0.1627	8.32E-09	0.0000	0.0000	1.63E-09	0.0000	0.0000	0.00E+00
133	1.21	0.000	0.031	0.2426	0.0198	0.2237	8.83E-09	0.0000	0.0000	1.65E-09	0.0000	0.0000	0.00E+00
134	0.31	0.000	0.126	0.2573	0.0205	0.2319	8.90E-09	0.0000	0.0000	1.65E-09	0.0000	0.0000	0.00E+00
135	0.06	0.000	0.182	0.2433	0.0208	0.2347	8.92E-09	0.0000	0.0000	1.65E-09	0.0000	0.0000	0.00E+00
136	0.03	0.000	0.193	0.2181	0.0182	0.2053	8.68E-09	0.0000	0.0000	1.64E-09	0.0000	0.0000	0.00E+00
137	0.10	0.000	0.227	0.2006	0.0188	0.2128	8.74E-09	0.0000	0.0000	1.64E-09	0.0000	0.0000	0.00E+00
138	0.00	0.000	0.221	0.1770	0.0203	0.2295	8.88E-09	0.0000	0.0000	1.65E-09	0.0000	0.0000	0.00E+00
139	0.00	0.000	0.112	0.1645	0.0183	0.2065	8.69E-09	0.0000	0.0000	1.64E-09	0.0000	0.0000	0.00E+00
140	0.00	0.000	0.054	0.1591	0.0164	0.1855	8.52E-09	0.0000	0.0000	1.63E-09	0.0000	0.0000	0.00E+00
141	0.00	0.000	0.041	0.1544	0.0138	0.1559	8.27E-09	0.0000	0.0000	1.63E-09	0.0000	0.0000	0.00E+00
142	0.00	0.000	0.035	0.1503	0.0113	0.1281	8.03E-09	0.0000	0.0000	1.62E-09	0.0000	0.0000	0.00E+00
143	0.08	0.000	0.031	0.1537	0.0104	0.1179	7.94E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
144	0.00	0.000	0.028	0.1503	0.0104	0.1171	7.93E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
145	0.00	0.000	0.025	0.1472	0.0105	0.1189	7.95E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
146	0.00	0.000	0.021	0.1447	0.0108	0.1219	7.98E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
147	0.01	0.000	0.023	0.1427	0.0109	0.1229	7.98E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
148	0.01	0.000	0.022	0.1409	0.0107	0.1213	7.97E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
149	0.16	0.000	0.021	0.1517	0.0106	0.1194	7.95E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
150	0.00	0.000	0.019	0.1496	0.0104	0.1177	7.94E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
151	0.11	0.000	0.019	0.1569	0.0104	0.1172	7.93E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
152	0.15	0.000	0.018	0.1677	0.0100	0.1129	7.90E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
153	0.00	0.000	0.017	0.1658	0.0097	0.1094	7.87E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
154	0.72	0.000	0.017	0.2241	0.0095	0.1073	7.85E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
155	0.00	0.000	0.139	0.2122	0.0090	0.1012	7.79E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
156	0.00	0.000	0.128	0.2005	0.0091	0.1023	7.80E-09	0.0000	0.0000	1.61E-09	0.0000	0.0000	0.00E+00
157	0.36	0.000	0.122	0.2201	0.0082	0.0927	7.72E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
158	0.00	0.000	0.119	0.2100	0.0086	0.0977	7.76E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
159	0.00	0.000	0.119	0.2001	0.0085	0.0955	7.74E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
160	0.00	0.000	0.301	0.1738	0.0084	0.0945	7.73E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
161	0.00	0.000	0.130	0.1623	0.0077	0.0865	7.66E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
162	0.39	0.000	0.054	0.1889	0.0075	0.0851	7.65E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
163	0.07	0.000	0.306	0.1681	0.0069	0.0774	7.58E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
164	0.08	0.000	0.042	0.1707	0.0068	0.0764	7.57E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
165	0.09	0.000	0.035	0.1746	0.0071	0.0798	7.60E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
166	0.00	0.000	0.177	0.1590	0.0076	0.0855	7.65E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
167	0.00	0.000	0.031	0.1565	0.0069	0.0781	7.59E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
168	0.19	0.000	0.028	0.1702	0.0072	0.0810	7.61E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
169	0.28	0.000	0.126	0.1830	0.0070	0.0786	7.59E-09	0.0000	0.0000	1.60E-09	0.0000	0.0000	0.00E+00
170	0.37	0.000	0.176	0.1985	0.0063	0.0716	7.53E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
171	0.34	0.000	0.305	0.2011	0.0057	0.0640	7.46E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
172	0.00	0.000	0.282	0.1776	0.0056	0.0629	7.45E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
173	0.00	0.000	0.171	0.1632	0.0057	0.0645	7.46E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
174	0.83	0.000	0.131	0.2210	0.0056	0.0638	7.46E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
175	0.10	0.000	0.301	0.2040	0.0052	0.0591	7.41E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
176	0.05	0.000	0.327	0.1797	0.0055	0.0621	7.44E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00

177	0.02	0.000	0.179	0.1656	0.0045	0.0511	7.34E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
178	0.09	0.000	0.131	0.1619	0.0044	0.0495	7.32E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
179	0.22	0.000	0.055	0.1753	0.0049	0.0558	7.38E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
180	0.26	0.000	0.337	0.1683	0.0050	0.0564	7.39E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
181	0.00	0.000	0.041	0.1646	0.0050	0.0569	7.39E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
182	0.00	0.000	0.035	0.1615	0.0049	0.0549	7.37E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
183	0.00	0.000	0.031	0.1587	0.0047	0.0532	7.36E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
184	0.00	0.000	0.028	0.1563	0.0045	0.0513	7.34E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
185	0.00	0.000	0.025	0.1541	0.0044	0.0501	7.33E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
186	0.00	0.000	0.024	0.1522	0.0044	0.0499	7.33E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
187	0.48	0.000	0.023	0.1903	0.0043	0.0489	7.32E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
188	0.08	0.000	0.128	0.1863	0.0044	0.0492	7.32E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
189	0.00	0.000	0.229	0.1667	0.0041	0.0459	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
190	0.00	0.000	0.130	0.1558	0.0036	0.0408	7.24E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
191	0.00	0.000	0.054	0.1513	0.0038	0.0427	7.26E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
192	0.41	0.000	0.042	0.1820	0.0039	0.0435	7.27E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
193	0.00	0.000	0.375	0.1507	0.0038	0.0435	7.27E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
194	0.02	0.000	0.036	0.1492	0.0038	0.0434	7.27E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
195	0.00	0.000	0.032	0.1469	0.0037	0.0418	7.25E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
196	0.07	0.000	0.029	0.1498	0.0036	0.0411	7.24E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
197	0.09	0.000	0.027	0.1551	0.0036	0.0403	7.24E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
198	0.00	0.000	0.024	0.1530	0.0035	0.0397	7.23E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
199	0.00	0.000	0.022	0.1510	0.0034	0.0389	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
200	0.08	0.000	0.022	0.1556	0.0034	0.0385	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
201	0.00	0.000	0.020	0.1538	0.0034	0.0380	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
202	0.00	0.000	0.019	0.1521	0.0033	0.0377	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
203	0.00	0.000	0.018	0.1505	0.0033	0.0373	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
204	0.01	0.000	0.019	0.1496	0.0033	0.0370	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
205	0.01	0.000	0.018	0.1485	0.0032	0.0367	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
206	0.11	0.000	0.018	0.1562	0.0032	0.0363	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
207	0.00	0.000	0.016	0.1547	0.0032	0.0360	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
208	0.00	0.000	0.016	0.1533	0.0032	0.0358	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
209	0.04	0.000	0.017	0.1555	0.0031	0.0356	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
210	0.23	0.000	0.016	0.1734	0.0031	0.0347	7.18E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
211	0.32	0.000	0.287	0.1750	0.0032	0.0362	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
212	0.01	0.000	0.179	0.1606	0.0030	0.0340	7.17E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
213	0.06	0.000	0.111	0.1557	0.0027	0.0310	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
214	0.00	0.000	0.054	0.1511	0.0027	0.0305	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
215	0.00	0.000	0.041	0.1475	0.0028	0.0319	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
216	0.00	0.000	0.035	0.1445	0.0029	0.0328	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
217	0.05	0.000	0.032	0.1456	0.0029	0.0332	7.17E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
218	0.42	0.000	0.029	0.1779	0.0030	0.0336	7.17E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
219	0.52	0.000	0.314	0.1943	0.0030	0.0342	7.18E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
220	0.00	0.000	0.315	0.1680	0.0028	0.0314	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
221	0.00	0.000	0.312	0.1420	0.0028	0.0321	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
222	0.00	0.000	0.130	0.1312	0.0029	0.0323	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00

223	0.08	0.000	0.055	0.1335	0.0028	0.0318	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
224	0.00	0.000	0.041	0.1301	0.0028	0.0314	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
225	0.00	0.000	0.034	0.1273	0.0027	0.0308	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
226	0.00	0.000	0.031	0.1247	0.0027	0.0302	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
227	0.00	0.000	0.024	0.1227	0.0026	0.0296	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
228	0.00	0.000	0.025	0.1206	0.0026	0.0289	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
229	0.29	0.000	0.026	0.1430	0.0025	0.0283	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
230	0.00	0.000	0.022	0.1412	0.0025	0.0278	7.11E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
231	0.02	0.000	0.023	0.1411	0.0024	0.0273	7.11E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
232	0.21	0.000	0.022	0.1568	0.0024	0.0269	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
233	0.08	0.000	0.021	0.1621	0.0023	0.0264	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
234	0.00	0.000	0.018	0.1606	0.0023	0.0260	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
235	0.00	0.000	0.018	0.1591	0.0023	0.0256	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
236	0.44	0.000	0.019	0.1943	0.0022	0.0253	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
237	0.00	0.000	0.253	0.1732	0.0022	0.0250	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
238	0.19	0.000	0.224	0.1702	0.0022	0.0247	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
239	0.52	0.000	0.317	0.1869	0.0022	0.0244	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
240	0.28	0.000	0.239	0.1904	0.0021	0.0242	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
241	0.00	0.000	0.290	0.1662	0.0021	0.0239	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
242	0.00	0.000	0.130	0.1554	0.0021	0.0236	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
243	0.00	0.000	0.054	0.1509	0.0021	0.0234	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
244	0.00	0.000	0.041	0.1475	0.0021	0.0232	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
245	0.03	0.000	0.037	0.1470	0.0020	0.0230	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
246	0.06	0.000	0.033	0.1494	0.0020	0.0228	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
247	0.01	0.000	0.030	0.1479	0.0020	0.0227	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
248	0.02	0.000	0.028	0.1469	0.0020	0.0225	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
249	0.01	0.000	0.026	0.1457	0.0020	0.0223	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
250	0.00	0.000	0.022	0.1438	0.0020	0.0221	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
251	0.00	0.000	0.021	0.1421	0.0019	0.0220	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
252	0.21	0.000	0.022	0.1578	0.0019	0.0218	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
253	0.29	0.000	0.021	0.1803	0.0019	0.0216	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
254	0.13	0.000	0.234	0.1717	0.0019	0.0215	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
255	0.03	0.000	0.240	0.1540	0.0019	0.0216	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
256	0.04	0.000	0.132	0.1460	0.0019	0.0210	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
257	0.00	0.000	0.054	0.1415	0.0018	0.0209	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
258	0.00	0.000	0.041	0.1381	0.0018	0.0208	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
259	0.00	0.000	0.035	0.1352	0.0018	0.0207	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
260	0.00	0.000	0.031	0.1326	0.0018	0.0205	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
261	0.00	0.000	0.028	0.1303	0.0018	0.0204	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
262	0.08	0.000	0.027	0.1344	0.0018	0.0203	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
263	0.23	0.000	0.025	0.1514	0.0018	0.0201	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
264	0.00	0.000	0.022	0.1496	0.0018	0.0200	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
265	0.00	0.000	0.021	0.1478	0.0018	0.0199	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
266	0.10	0.000	0.021	0.1542	0.0017	0.0198	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
267	0.02	0.000	0.020	0.1544	0.0017	0.0196	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
268	0.00	0.000	0.018	0.1529	0.0017	0.0195	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

269		0.00	0.000	0.018	0.1514	0.0017	0.0194	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
270		0.00	0.000	0.017	0.1500	0.0017	0.0193	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
271		0.00	0.000	0.016	0.1485	0.0017	0.0194	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
272		0.00	0.000	0.016	0.1472	0.0017	0.0190	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
273		0.00	0.000	0.016	0.1459	0.0017	0.0187	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
274		0.00	0.000	0.015	0.1446	0.0016	0.0185	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
275		0.04	0.000	0.016	0.1464	0.0016	0.0183	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
276	*	0.00	0.000	0.000	0.1464	0.0016	0.0182	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
277	*	0.00	0.000	0.000	0.1464	0.0016	0.0181	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
278	*	0.01	0.000	0.006	0.1464	0.0016	0.0181	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
279		0.00	0.000	0.014	0.1452	0.0016	0.0180	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
280		0.00	0.000	0.014	0.1441	0.0016	0.0180	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
281		0.00	0.000	0.014	0.1429	0.0016	0.0179	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
282		0.00	0.000	0.014	0.1419	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
283		1.06	0.000	0.014	0.2289	0.0016	0.0176	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
284	*	0.22	0.000	0.025	0.2306	0.0015	0.0175	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
285		0.09	0.000	0.087	0.2452	0.0015	0.0174	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
286		0.00	0.000	0.056	0.2380	0.0016	0.0181	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
287	*	0.03	0.000	0.030	0.2325	0.0016	0.0183	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
288		0.29	0.000	0.055	0.2439	0.0015	0.0174	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
289		0.00	0.000	0.067	0.2324	0.0015	0.0168	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
290	*	0.00	0.000	0.039	0.2260	0.0014	0.0155	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
291		0.00	0.000	0.065	0.2158	0.0015	0.0164	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
292	*	0.00	0.000	0.000	0.2104	0.0014	0.0161	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
293	*	0.00	0.000	0.000	0.2062	0.0014	0.0158	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
294		0.00	0.000	0.099	0.1945	0.0014	0.0156	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
295	*	0.00	0.000	0.055	0.1879	0.0012	0.0140	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
296	*	0.00	0.000	0.055	0.1807	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
297	*	0.00	0.000	0.000	0.1784	0.0011	0.0127	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
298	*	0.00	0.000	0.000	0.1766	0.0008	0.0088	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
299		0.00	0.000	0.071	0.1693	0.0010	0.0113	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
300	*	0.00	0.000	0.000	0.1686	0.0013	0.0142	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
301		0.00	0.000	0.100	0.1592	0.0016	0.0179	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
302		0.00	0.000	0.130	0.1471	0.0017	0.0190	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
303		0.03	0.000	0.055	0.1439	0.0018	0.0202	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
304		0.16	0.000	0.042	0.1528	0.0018	0.0199	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
305		0.06	0.000	0.036	0.1546	0.0018	0.0204	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
306		0.02	0.000	0.032	0.1527	0.0018	0.0205	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
307		0.00	0.000	0.028	0.1502	0.0018	0.0204	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
308		0.20	0.000	0.026	0.1641	0.0018	0.0201	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
309		0.00	0.000	0.041	0.1603	0.0018	0.0198	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
310		0.27	0.000	0.095	0.1746	0.0017	0.0197	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
311	*	0.10	0.000	0.029	0.1761	0.0017	0.0187	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
312		0.33	0.000	0.009	0.2071	0.0017	0.0195	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
313		0.15	0.000	0.091	0.2116	0.0021	0.0233	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
314		0.04	0.000	0.048	0.2111	0.0015	0.0164	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

315	*	0.14	0.000	0.019	0.2123	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
316	*	0.00	0.000	0.013	0.2133	0.0018	0.0208	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
317	*	0.00	0.000	0.025	0.2143	0.0016	0.0178	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
318		0.03	0.000	0.059	0.2140	0.0011	0.0127	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
319		0.00	0.000	0.070	0.2082	0.0009	0.0105	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
320		0.03	0.000	0.055	0.2062	0.0011	0.0129	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
321	*	0.19	0.000	0.023	0.2069	0.0015	0.0173	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
322	*	0.02	0.000	0.013	0.2066	0.0014	0.0162	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
323	*	0.13	0.000	0.012	0.2065	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
324		0.00	0.000	0.017	0.2228	0.0012	0.0131	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
325		0.00	0.000	0.059	0.2164	0.0010	0.0110	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
326		0.05	0.000	0.067	0.2136	0.0008	0.0091	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
327	*	0.01	0.000	0.030	0.2093	0.0011	0.0124	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
328	*	0.00	0.000	0.029	0.2058	0.0004	0.0048	5.42E-09	0.0000	0.0000	1.47E-09	0.0000	0.0000	0.00E+00
329	*	0.00	0.000	0.000	0.2056	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
330	*	0.00	0.000	0.000	0.2041	0.0008	0.0089	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
331	*	0.00	0.000	0.027	0.1997	0.0011	0.0124	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
332		0.44	0.000	0.036	0.2313	0.0005	0.0062	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
333		0.06	0.000	0.045	0.2311	0.0004	0.0045	5.23E-09	0.0000	0.0000	1.46E-09	0.0000	0.0000	0.00E+00
334		0.06	0.000	0.038	0.2306	0.0007	0.0075	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
335		0.00	0.000	0.039	0.2273	0.0000	0.0000	9.69E-10	0.0000	0.0000	6.55E-10	0.0000	0.0000	0.00E+00
336	*	0.20	0.000	0.029	0.2255	0.0010	0.0108	5.96E-09	0.0000	0.0000	1.51E-09	0.0000	0.0000	0.00E+00
337		0.12	0.000	0.020	0.2423	0.0008	0.0095	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
338		0.00	0.000	0.057	0.2335	0.0006	0.0071	6.39E-09	0.0000	0.0000	1.54E-09	0.0000	0.0000	0.00E+00
339		0.00	0.000	0.091	0.2237	0.0003	0.0033	4.30E-09	0.0000	0.0000	1.38E-09	0.0000	0.0000	0.00E+00
340		0.00	0.000	0.084	0.2107	0.0010	0.0113	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
341		0.00	0.000	0.073	0.1996	0.0004	0.0040	4.67E-09	0.0000	0.0000	1.41E-09	0.0000	0.0000	0.00E+00
342		0.00	0.000	0.052	0.1911	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
343	*	0.05	0.000	0.023	0.1899	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
344		0.32	0.000	0.054	0.2104	0.0001	0.0006	4.87E-09	0.0000	0.0000	1.43E-09	0.0000	0.0000	0.00E+00
345	*	0.20	0.000	0.021	0.2101	0.0002	0.0025	6.84E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
346	*	0.00	0.000	0.021	0.2098	0.0004	0.0042	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
347	*	0.04	0.000	0.020	0.2101	0.0005	0.0056	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
348		0.06	0.000	0.017	0.2217	0.0006	0.0068	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
349		0.14	0.000	0.066	0.2263	0.0007	0.0084	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
350		0.78	0.000	0.062	0.2848	0.0008	0.0089	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
351		0.00	0.000	0.038	0.2506	0.0015	0.0164	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
352	*	0.00	0.000	0.000	0.2351	0.0009	0.0103	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
353	*	0.11	0.000	0.008	0.2278	0.0006	0.0069	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
354	*	0.02	0.000	0.000	0.2230	0.0007	0.0077	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
355		0.00	0.000	0.034	0.2224	0.0007	0.0084	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
356		0.08	0.000	0.040	0.2214	0.0008	0.0089	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
357		0.04	0.000	0.039	0.2186	0.0008	0.0094	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
358		0.00	0.000	0.063	0.2105	0.0009	0.0097	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
359		0.00	0.000	0.078	0.2013	0.0009	0.0099	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
360		0.00	0.000	0.072	0.1926	0.0009	0.0101	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

361	0.04	0.000	0.083	0.1866	0.0009	0.0102	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
362	0.01	0.000	0.080	0.1800	0.0009	0.0103	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
363	0.09	0.000	0.068	0.1805	0.0009	0.0103	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
364	0.00	0.000	0.033	0.1772	0.0009	0.0103	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
365	0.12	0.000	0.041	0.1827	0.0011	0.0119	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 2			
	inches	cubic feet	percent
Precipitation	29.49	107,053.6	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	18.093	65,677.2	61.35
Drainage Collected from Layer 3	11.5556	41,946.7	39.18
Percolation/Leakage through Layer 5	0.000002	0.0087	0.00
Average Head on Top of Layer 4	0.0028	---	---
Drainage Collected from Layer 7	0.0000	0.0068	0.00
Percolation/Leakage through Layer 9	0.000001	0.0020	0.00
Average Head on Top of Layer 8	0.0000	---	---
Percolation/Leakage through Layer 10	0.000000	0.0000	0.00
Change in Water Storage	-0.1571	-570.3	-0.53
Soil Water at Start of Year	59.0680	214,416.7	200.29
Soil Water at End of Year	58.9108	213,846.4	199.76
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 3

Title: Wayne Disposal - Initial Lift
Simulated On: 11/20/2020 16:24

Column key: Head #1: drainage from Layer 4 | Drain #1: drainage from Layer 3 | Leak #1: leakage thru Layer 5 | Head #2: drainage from Layer 8 | Drain #2: drainage from Layer 7 | Leak #2: leakage thru Layer 9 | Leak #3: leakage thru Layer 10

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1	Head #2	Drain #2	Leak #2	Head #3	Drain #3	Leak #3
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)
1			0.15	0.000	0.068	0.1889	0.0013	0.0141	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
2			0.00	0.000	0.067	0.1831	0.0012	0.0131	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
3			0.00	0.000	0.052	0.1780	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
4			0.05	0.000	0.039	0.1783	0.0012	0.0134	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
5			0.12	0.000	0.045	0.1838	0.0011	0.0125	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
6			0.01	0.000	0.066	0.1791	0.0010	0.0118	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
7	*		0.03	0.000	0.023	0.1788	0.0010	0.0111	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
8	*		0.05	0.000	0.012	0.1801	0.0009	0.0105	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
9	*		0.10	0.000	0.017	0.1815	0.0009	0.0100	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
10	*		0.00	0.000	0.025	0.1829	0.0008	0.0095	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
11	*		0.00	0.000	0.010	0.1843	0.0008	0.0091	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
12	*		0.13	0.000	0.007	0.1857	0.0008	0.0087	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
13	*		0.01	0.000	0.014	0.1870	0.0007	0.0083	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
14	*		0.00	0.000	0.008	0.1883	0.0007	0.0079	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
15	*		0.00	0.000	0.027	0.1896	0.0007	0.0076	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
16			0.00	0.000	0.064	0.1851	0.0006	0.0073	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
17			0.34	0.000	0.094	0.2056	0.0004	0.0040	5.68E-09	0.0000	0.0000	1.49E-09	0.0000	0.0000	0.00E+00
18			0.32	0.000	0.113	0.2221	0.0004	0.0045	6.38E-09	0.0000	0.0000	1.54E-09	0.0000	0.0000	0.00E+00
19			0.00	0.000	0.073	0.2159	0.0000	0.0003	2.88E-09	0.0000	0.0000	1.19E-09	0.0000	0.0000	0.00E+00
20	*		0.00	0.000	0.034	0.2125	0.0000	0.0004	3.36E-09	0.0000	0.0000	1.26E-09	0.0000	0.0000	0.00E+00
21	*		0.00	0.000	0.002	0.2124	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
22			0.00	0.000	0.058	0.2076	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
23			0.00	0.000	0.046	0.2022	0.0001	0.0009	4.39E-09	0.0000	0.0000	1.38E-09	0.0000	0.0000	0.00E+00
24			0.00	0.000	0.047	0.1953	0.0000	0.0000	9.63E-10	0.0000	0.0000	6.53E-10	0.0000	0.0000	0.00E+00
25	*		0.00	0.000	0.041	0.1892	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
26			0.02	0.000	0.043	0.1852	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
27	*		0.00	0.000	0.039	0.1799	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
28			0.07	0.000	0.043	0.1806	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
29			0.07	0.000	0.053	0.1815	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
30			0.04	0.000	0.057	0.1795	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
31			0.00	0.000	0.096	0.1702	0.0001	0.0007	2.54E-09	0.0000	0.0000	1.13E-09	0.0000	0.0000	0.00E+00
32	*		0.02	0.000	0.045	0.1667	0.0001	0.0011	6.24E-09	0.0000	0.0000	1.53E-09	0.0000	0.0000	0.00E+00
33	*		0.31	0.000	0.011	0.1674	0.0001	0.0013	6.34E-09	0.0000	0.0000	1.53E-09	0.0000	0.0000	0.00E+00
34	*		0.08	0.000	0.018	0.1684	0.0004	0.0047	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
35	*		0.00	0.000	0.018	0.1695	0.0009	0.0104	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
36	*	*	0.00	0.000	0.023	0.1695	0.0011	0.0119	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
37		*	0.19	0.000	0.000	0.2074	0.0016	0.0184	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
38		*	0.00	0.000	0.000	0.2074	0.0020	0.0223	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

39		*	0.00	0.000	0.000	0.2074	0.0021	0.0242	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
40		*	0.06	0.000	0.000	0.2120	0.0022	0.0249	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
41		*	0.04	0.000	0.000	0.2149	0.0022	0.0247	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
42		*	0.02	0.000	0.000	0.2164	0.0021	0.0241	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
43		*	0.01	0.000	0.000	0.2168	0.0021	0.0232	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
44		*	0.00	0.000	0.000	0.2168	0.0020	0.0222	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
45		*	0.00	0.000	0.000	0.2168	0.0019	0.0213	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
46	*	*	0.11	0.000	0.037	0.2168	0.0018	0.0203	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
47	*	*	0.00	0.000	0.018	0.2168	0.0017	0.0195	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
48	*	*	0.16	0.000	0.016	0.2168	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
49	*	*	0.04	0.000	0.000	0.2168	0.0016	0.0182	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
50		*	0.02	0.000	0.028	0.2359	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
51		*	0.21	0.000	0.000	0.2531	0.0015	0.0174	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
52		*	0.00	0.000	0.000	0.2531	0.0015	0.0171	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
53		*	0.00	0.000	0.000	0.2531	0.0015	0.0170	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
54	*	*	0.05	0.000	0.025	0.2531	0.0015	0.0170	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
55		*	0.15	0.000	0.020	0.2655	0.0015	0.0171	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
56		*	0.04	0.000	0.000	0.2691	0.0015	0.0172	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
57		*	0.01	0.000	0.000	0.2699	0.0015	0.0174	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
58			0.08	0.000	0.175	0.2423	0.0019	0.0212	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
59			0.04	0.000	0.225	0.2161	0.0018	0.0200	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
60			0.00	0.000	0.182	0.1941	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
61			0.00	0.000	0.132	0.1790	0.0010	0.0113	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
62			0.00	0.000	0.129	0.1659	0.0003	0.0033	6.85E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
63			0.00	0.000	0.054	0.1591	0.0011	0.0123	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
64			0.02	0.000	0.042	0.1555	0.0018	0.0204	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
65			0.00	0.000	0.035	0.1511	0.0023	0.0260	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
66			0.01	0.000	0.031	0.1485	0.0026	0.0291	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
67			0.01	0.000	0.028	0.1461	0.0027	0.0308	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
68			0.01	0.000	0.026	0.1441	0.0029	0.0328	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
69	*		0.08	0.000	0.071	0.1437	0.0031	0.0348	7.18E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
70	*		0.00	0.000	0.024	0.1412	0.0024	0.0272	7.11E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
71	*		0.00	0.000	0.000	0.1403	0.0027	0.0303	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
72	*		0.00	0.000	0.000	0.1400	0.0023	0.0261	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
73	*		0.00	0.000	0.025	0.1379	0.0022	0.0253	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
74			0.00	0.000	0.021	0.1357	0.0025	0.0282	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
75	*		0.00	0.000	0.020	0.1333	0.0026	0.0293	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
76			0.00	0.000	0.019	0.1309	0.0023	0.0260	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
77			0.00	0.000	0.018	0.1287	0.0019	0.0212	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
78			0.91	0.000	0.018	0.2025	0.0017	0.0190	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
79			0.00	0.000	0.155	0.1891	0.0015	0.0164	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
80			0.00	0.000	0.159	0.1757	0.0009	0.0097	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
81			0.49	0.000	0.244	0.1961	0.0012	0.0136	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
82			0.00	0.000	0.196	0.1793	0.0012	0.0138	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
83			0.00	0.000	0.188	0.1633	0.0009	0.0106	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
84			0.00	0.000	0.227	0.1444	0.0007	0.0078	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00

85		0.23	0.000	0.130	0.1525	0.0010	0.0112	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
86		0.00	0.000	0.054	0.1476	0.0010	0.0117	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
87		0.00	0.000	0.041	0.1438	0.0009	0.0100	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
88	*	0.00	0.000	0.000	0.1433	0.0008	0.0092	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
89	*	0.00	0.000	0.000	0.1430	0.0007	0.0078	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
90	*	0.00	0.000	0.000	0.1426	0.0006	0.0070	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
91	*	0.00	0.000	0.000	0.1423	0.0006	0.0067	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
92	*	0.01	0.000	0.049	0.1392	0.0006	0.0064	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
93		0.08	0.000	0.031	0.1428	0.0006	0.0073	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
94		0.18	0.000	0.028	0.1548	0.0007	0.0081	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
95		0.60	0.000	0.026	0.2021	0.0008	0.0089	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
96		0.00	0.000	0.121	0.1919	0.0008	0.0086	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
97		0.36	0.000	0.065	0.2160	0.0009	0.0107	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
98		0.22	0.000	0.110	0.2253	0.0011	0.0122	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
99		0.00	0.000	0.147	0.2125	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
100		0.00	0.000	0.371	0.1810	0.0011	0.0124	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
101		0.00	0.000	0.417	0.1458	0.0009	0.0103	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
102		0.00	0.000	0.130	0.1347	0.0010	0.0117	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
103		0.00	0.000	0.054	0.1302	0.0010	0.0116	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
104		0.00	0.000	0.041	0.1267	0.0014	0.0153	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
105		0.00	0.000	0.035	0.1234	0.0016	0.0180	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
106		0.84	0.000	0.031	0.1883	0.0020	0.0230	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
107		0.00	0.000	0.241	0.1659	0.0017	0.0198	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
108		0.16	0.000	0.028	0.1749	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
109		0.11	0.000	0.239	0.1628	0.0013	0.0144	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
110		0.82	0.000	0.026	0.2278	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
111		0.10	0.000	0.093	0.2274	0.0014	0.0157	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
112		0.03	0.000	0.086	0.2215	0.0014	0.0162	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
113		0.31	0.000	0.224	0.2286	0.0011	0.0127	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
114		0.02	0.000	0.063	0.2248	0.0017	0.0194	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
115	*	0.45	0.000	0.029	0.2235	0.0028	0.0317	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
116		0.12	0.000	0.006	0.2652	0.0023	0.0254	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
117		0.00	0.000	0.200	0.2393	0.0021	0.0240	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
118		0.05	0.000	0.091	0.2221	0.0025	0.0284	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
119		0.05	0.000	0.137	0.2077	0.0022	0.0246	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
120		0.28	0.000	0.191	0.2104	0.0007	0.0078	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
121		0.00	0.000	0.194	0.1906	0.0013	0.0145	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
122		0.00	0.000	0.348	0.1598	0.0019	0.0213	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
123		0.00	0.000	0.130	0.1469	0.0023	0.0258	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
124		0.54	0.000	0.054	0.1864	0.0025	0.0283	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
125		0.00	0.000	0.221	0.1670	0.0026	0.0293	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
126		0.00	0.000	0.041	0.1633	0.0026	0.0295	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
127		0.00	0.000	0.035	0.1595	0.0026	0.0292	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
128		0.00	0.000	0.031	0.1560	0.0027	0.0305	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
129		0.00	0.000	0.028	0.1527	0.0027	0.0303	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
130		0.62	0.000	0.026	0.2012	0.0026	0.0289	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00

131	0.00	0.000	0.130	0.1892	0.0026	0.0298	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
132	0.00	0.000	0.328	0.1615	0.0018	0.0206	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
133	0.00	0.000	0.130	0.1502	0.0021	0.0236	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
134	0.00	0.000	0.054	0.1451	0.0022	0.0248	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
135	0.00	0.000	0.041	0.1411	0.0020	0.0226	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
136	0.14	0.000	0.035	0.1495	0.0018	0.0205	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
137	0.03	0.000	0.031	0.1491	0.0017	0.0187	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
138	0.00	0.000	0.028	0.1465	0.0015	0.0173	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
139	0.00	0.000	0.025	0.1440	0.0014	0.0154	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
140	0.00	0.000	0.024	0.1417	0.0012	0.0141	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
141	0.09	0.000	0.023	0.1470	0.0011	0.0129	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
142	0.35	0.000	0.022	0.1742	0.0010	0.0118	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
143	0.00	0.000	0.178	0.1593	0.0008	0.0085	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
144	0.00	0.000	0.020	0.1572	0.0011	0.0123	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
145	0.00	0.000	0.019	0.1553	0.0009	0.0099	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
146	0.00	0.000	0.018	0.1534	0.0007	0.0081	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
147	0.37	0.000	0.018	0.1824	0.0006	0.0068	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
148	0.01	0.000	0.210	0.1652	0.0009	0.0099	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
149	1.01	0.000	0.132	0.2382	0.0001	0.0015	6.82E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
150	0.25	0.000	0.277	0.2354	0.0007	0.0078	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
151	0.02	0.000	0.260	0.2151	0.0001	0.0011	6.20E-09	0.0000	0.0000	1.53E-09	0.0000	0.0000	0.00E+00
152	0.00	0.000	0.245	0.1943	0.0004	0.0047	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
153	0.00	0.000	0.197	0.1750	0.0011	0.0126	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
154	0.00	0.000	0.130	0.1616	0.0008	0.0086	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
155	0.00	0.000	0.054	0.1560	0.0003	0.0031	6.85E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
156	0.00	0.000	0.041	0.1505	0.0005	0.0057	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
157	0.00	0.000	0.035	0.1456	0.0003	0.0039	6.29E-09	0.0000	0.0000	1.53E-09	0.0000	0.0000	0.00E+00
158	0.00	0.000	0.031	0.1421	0.0002	0.0023	3.43E-09	0.0000	0.0000	1.27E-09	0.0000	0.0000	0.00E+00
159	0.00	0.000	0.028	0.1379	0.0009	0.0104	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
160	0.00	0.000	0.025	0.1339	0.0008	0.0089	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
161	0.00	0.000	0.024	0.1302	0.0006	0.0066	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
162	0.00	0.000	0.022	0.1269	0.0006	0.0071	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
163	0.00	0.000	0.021	0.1239	0.0009	0.0098	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
164	0.00	0.000	0.020	0.1208	0.0014	0.0156	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
165	0.00	0.000	0.019	0.1186	0.0011	0.0119	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
166	0.00	0.000	0.018	0.1170	0.0015	0.0166	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
167	0.00	0.000	0.018	0.1146	0.0026	0.0296	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
168	0.00	0.000	0.017	0.1121	0.0027	0.0300	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
169	0.00	0.000	0.016	0.1096	0.0024	0.0267	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
170	0.00	0.000	0.016	0.1073	0.0021	0.0240	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
171	0.00	0.000	0.016	0.1052	0.0020	0.0225	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
172	0.00	0.000	0.015	0.1032	0.0019	0.0218	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
173	0.00	0.000	0.015	0.1013	0.0019	0.0215	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
174	0.06	0.000	0.016	0.1047	0.0019	0.0214	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
175	0.01	0.000	0.015	0.1034	0.0019	0.0213	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
176	0.06	0.000	0.010	0.1071	0.0018	0.0206	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

177	0.00	0.000	0.013	0.1059	0.0016	0.0183	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
178	0.24	0.000	0.014	0.1240	0.0019	0.0218	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
179	0.44	0.000	0.014	0.1590	0.0020	0.0225	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
180	0.00	0.000	0.013	0.1573	0.0021	0.0232	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
181	0.00	0.000	0.012	0.1556	0.0018	0.0205	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
182	0.00	0.000	0.012	0.1540	0.0016	0.0176	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
183	0.00	0.000	0.012	0.1525	0.0014	0.0159	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
184	0.00	0.000	0.012	0.1511	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
185	0.00	0.000	0.012	0.1498	0.0013	0.0145	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
186	0.00	0.000	0.011	0.1485	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
187	0.00	0.000	0.011	0.1473	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
188	0.59	0.000	0.013	0.1947	0.0013	0.0147	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
189	0.34	0.000	0.353	0.1928	0.0018	0.0207	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
190	0.00	0.000	0.355	0.1621	0.0014	0.0162	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
191	0.09	0.000	0.329	0.1411	0.0011	0.0125	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
192	0.14	0.000	0.131	0.1415	0.0006	0.0071	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
193	0.36	0.000	0.055	0.1667	0.0007	0.0078	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
194	0.05	0.000	0.115	0.1606	0.0011	0.0122	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
195	0.16	0.000	0.183	0.1581	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
196	0.59	0.000	0.140	0.1952	0.0010	0.0118	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
197	0.01	0.000	0.134	0.1852	0.0013	0.0145	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
198	0.00	0.000	0.186	0.1697	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
199	0.00	0.000	0.202	0.1529	0.0015	0.0174	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
200	0.00	0.000	0.130	0.1420	0.0016	0.0180	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
201	0.16	0.000	0.055	0.1504	0.0016	0.0182	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
202	0.04	0.000	0.043	0.1498	0.0016	0.0181	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
203	0.26	0.000	0.036	0.1683	0.0016	0.0179	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
204	0.11	0.000	0.141	0.1657	0.0016	0.0176	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
205	0.17	0.000	0.269	0.1570	0.0017	0.0191	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
206	0.22	0.000	0.277	0.1519	0.0014	0.0164	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
207	0.31	0.000	0.132	0.1666	0.0014	0.0155	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
208	0.00	0.000	0.226	0.1477	0.0014	0.0157	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
209	1.05	0.000	0.056	0.2305	0.0014	0.0154	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
210	0.00	0.000	0.331	0.2029	0.0014	0.0154	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
211	0.37	0.000	0.128	0.2231	0.0014	0.0154	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
212	0.00	0.000	0.122	0.2129	0.0014	0.0154	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
213	0.07	0.000	0.120	0.2085	0.0014	0.0157	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
214	0.62	0.000	0.250	0.2382	0.0017	0.0190	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
215	0.02	0.000	0.098	0.2300	0.0015	0.0170	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
216	0.03	0.000	0.093	0.2238	0.0010	0.0117	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
217	0.05	0.000	0.116	0.2145	0.0014	0.0161	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
218	0.20	0.000	0.105	0.2176	0.0014	0.0154	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
219	0.02	0.000	0.124	0.2055	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
220	0.06	0.000	0.333	0.1800	0.0012	0.0136	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
221	0.00	0.000	0.170	0.1641	0.0010	0.0113	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
222	0.00	0.000	0.129	0.1523	0.0009	0.0102	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

223	0.00	0.000	0.054	0.1465	0.0013	0.0145	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
224	0.97	0.000	0.043	0.2219	0.0016	0.0180	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
225	0.00	0.000	0.219	0.2023	0.0010	0.0113	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
226	0.00	0.000	0.207	0.1841	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
227	0.00	0.000	0.209	0.1653	0.0018	0.0207	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
228	0.00	0.000	0.130	0.1536	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
229	0.70	0.000	0.056	0.2063	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
230	0.05	0.000	0.237	0.1898	0.0020	0.0224	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
231	0.00	0.000	0.112	0.1801	0.0017	0.0187	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
232	0.00	0.000	0.108	0.1710	0.0018	0.0206	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
233	0.00	0.000	0.102	0.1624	0.0020	0.0230	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
234	0.01	0.000	0.126	0.1527	0.0022	0.0248	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
235	0.05	0.000	0.056	0.1516	0.0024	0.0267	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
236	0.00	0.000	0.041	0.1480	0.0022	0.0253	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
237	0.00	0.000	0.035	0.1449	0.0021	0.0240	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
238	0.00	0.000	0.031	0.1422	0.0020	0.0229	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
239	0.12	0.000	0.030	0.1497	0.0018	0.0206	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
240	0.81	0.000	0.028	0.2149	0.0019	0.0212	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
241	0.00	0.000	0.120	0.2047	0.0018	0.0209	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
242	0.00	0.000	0.205	0.1871	0.0019	0.0213	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
243	0.00	0.000	0.194	0.1701	0.0020	0.0223	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
244	0.00	0.000	0.234	0.1500	0.0014	0.0155	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
245	0.00	0.000	0.130	0.1387	0.0012	0.0136	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
246	0.10	0.000	0.056	0.1424	0.0009	0.0102	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
247	0.16	0.000	0.044	0.1517	0.0008	0.0086	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
248	0.03	0.000	0.037	0.1515	0.0008	0.0095	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
249	0.10	0.000	0.033	0.1574	0.0009	0.0107	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
250	0.00	0.000	0.028	0.1551	0.0010	0.0115	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
251	0.00	0.000	0.025	0.1530	0.0011	0.0120	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
252	0.00	0.000	0.024	0.1508	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
253	0.00	0.000	0.022	0.1484	0.0014	0.0155	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
254	0.07	0.000	0.023	0.1514	0.0013	0.0146	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
255	0.37	0.000	0.022	0.1799	0.0011	0.0129	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
256	0.11	0.000	0.123	0.1778	0.0011	0.0130	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
257	0.01	0.000	0.210	0.1607	0.0006	0.0067	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
258	0.70	0.000	0.132	0.2077	0.0007	0.0085	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
259	0.00	0.000	0.091	0.1999	0.0004	0.0042	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
260	0.00	0.000	0.123	0.1895	0.0007	0.0079	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
261	0.00	0.000	0.110	0.1798	0.0010	0.0111	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
262	0.00	0.000	0.099	0.1711	0.0009	0.0107	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
263	0.08	0.000	0.073	0.1713	0.0011	0.0122	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
264	0.03	0.000	0.071	0.1676	0.0009	0.0104	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
265	0.41	0.000	0.091	0.1941	0.0008	0.0094	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
266	0.01	0.000	0.088	0.1868	0.0009	0.0101	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
267	0.00	0.000	0.100	0.1782	0.0009	0.0105	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
268	0.78	0.000	0.093	0.2351	0.0009	0.0099	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

269		0.00	0.000	0.117	0.2251	0.0010	0.0117	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
270		0.14	0.000	0.289	0.2131	0.0009	0.0097	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
271		0.75	0.000	0.092	0.2670	0.0015	0.0167	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
272		0.00	0.000	0.128	0.2445	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
273		0.03	0.000	0.158	0.2201	0.0016	0.0178	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
274		0.18	0.000	0.237	0.2075	0.0014	0.0158	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
275		0.00	0.000	0.221	0.1840	0.0009	0.0106	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
276		0.00	0.000	0.197	0.1657	0.0001	0.0014	4.98E-09	0.0000	0.0000	1.44E-09	0.0000	0.0000	0.00E+00
277		0.00	0.000	0.081	0.1571	0.0006	0.0069	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
278		0.00	0.000	0.054	0.1513	0.0010	0.0115	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
279		0.00	0.000	0.041	0.1465	0.0013	0.0148	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
280	*	0.00	0.000	0.035	0.1421	0.0015	0.0172	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
281	*	0.00	0.000	0.000	0.1409	0.0017	0.0187	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
282		0.00	0.000	0.031	0.1373	0.0017	0.0196	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
283		0.00	0.000	0.028	0.1341	0.0018	0.0201	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
284		0.00	0.000	0.025	0.1310	0.0018	0.0202	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
285		0.94	0.000	0.025	0.2062	0.0018	0.0202	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
286		0.36	0.000	0.118	0.2256	0.0019	0.0217	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
287		0.01	0.000	0.116	0.2160	0.0017	0.0190	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
288		0.00	0.000	0.115	0.2050	0.0023	0.0257	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
289		0.06	0.000	0.189	0.1940	0.0016	0.0183	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
290		0.00	0.000	0.088	0.1870	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
291		0.00	0.000	0.107	0.1770	0.0020	0.0225	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
292		0.00	0.000	0.127	0.1656	0.0016	0.0186	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
293		0.00	0.000	0.054	0.1593	0.0018	0.0203	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
294		0.48	0.000	0.042	0.1936	0.0017	0.0196	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
295		0.00	0.000	0.092	0.1846	0.0013	0.0149	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
296		0.00	0.000	0.077	0.1770	0.0010	0.0115	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
297	*	0.00	0.000	0.000	0.1761	0.0008	0.0091	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
298	*	0.00	0.000	0.002	0.1756	0.0005	0.0057	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
299	*	0.00	0.000	0.000	0.1750	0.0007	0.0082	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
300	*	0.00	0.000	0.000	0.1744	0.0010	0.0110	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
301	*	0.00	0.000	0.000	0.1737	0.0011	0.0125	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
302	*	0.00	0.000	0.049	0.1690	0.0011	0.0120	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
303		0.00	0.000	0.062	0.1627	0.0013	0.0142	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
304	*	0.00	0.000	0.000	0.1619	0.0009	0.0104	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
305	*	0.00	0.000	0.000	0.1613	0.0008	0.0086	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
306		0.00	0.000	0.076	0.1542	0.0009	0.0101	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
307		0.00	0.000	0.047	0.1501	0.0004	0.0044	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
308		0.00	0.000	0.041	0.1463	0.0006	0.0073	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
309	*	0.00	0.000	0.000	0.1457	0.0009	0.0106	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
310	*	0.00	0.000	0.000	0.1451	0.0008	0.0091	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
311	*	0.00	0.000	0.000	0.1446	0.0007	0.0080	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
312	*	0.00	0.000	0.035	0.1412	0.0007	0.0083	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
313		0.00	0.000	0.031	0.1382	0.0006	0.0071	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
314		0.00	0.000	0.028	0.1355	0.0005	0.0059	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00

315			0.20	0.000	0.026	0.1499	0.0005	0.0055	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
316	*		0.11	0.000	0.030	0.1514	0.0004	0.0046	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
317	*		0.13	0.000	0.012	0.1528	0.0005	0.0056	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
318	*		0.00	0.000	0.026	0.1542	0.0005	0.0061	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
319	*		0.00	0.000	0.025	0.1556	0.0006	0.0063	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
320	*	*	0.00	0.000	0.012	0.1556	0.0004	0.0040	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
321	*	*	0.00	0.000	0.005	0.1556	0.0004	0.0048	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
322	*	*	0.19	0.000	0.002	0.1556	0.0005	0.0055	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
323	*	*	0.00	0.000	0.002	0.1556	0.0005	0.0060	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
324	*	*	0.00	0.000	0.004	0.1556	0.0006	0.0063	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
325	*	*	0.00	0.000	0.002	0.1556	0.0006	0.0065	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
326	*	*	0.00	0.000	0.004	0.1556	0.0006	0.0066	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
327	*	*	0.00	0.000	0.002	0.1556	0.0006	0.0066	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
328	*	*	0.00	0.000	0.004	0.1556	0.0006	0.0066	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
329	*	*	0.36	0.000	0.000	0.1556	0.0006	0.0066	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
330	*	*	0.18	0.000	0.000	0.1556	0.0006	0.0066	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
331		*	0.17	0.000	0.000	0.1857	0.0006	0.0066	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
332		*	0.00	0.000	0.027	0.1858	0.0006	0.0067	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
333	*	*	0.00	0.000	0.012	0.1858	0.0006	0.0068	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
334		*	0.00	0.000	0.000	0.2234	0.0006	0.0069	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
335		*	0.12	0.000	0.017	0.2391	0.0006	0.0071	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
336		*	0.00	0.000	0.000	0.2391	0.0006	0.0073	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
337		*	0.16	0.000	0.001	0.2527	0.0007	0.0076	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
338		*	0.00	0.000	0.000	0.2527	0.0007	0.0079	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
339		*	0.18	0.000	0.001	0.2674	0.0007	0.0082	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
340		*	0.34	0.000	0.001	0.2958	0.0008	0.0086	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
341		*	0.00	0.000	0.000	0.2958	0.0008	0.0090	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
342		*	0.00	0.000	0.000	0.2958	0.0008	0.0095	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
343		*	0.00	0.000	0.000	0.2958	0.0009	0.0099	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
344			0.00	0.000	0.037	0.2483	0.0012	0.0137	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
345	*		0.00	0.000	0.000	0.2325	0.0011	0.0129	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
346			0.00	0.000	0.043	0.2201	0.0003	0.0039	4.22E-09	0.0000	0.0000	1.37E-09	0.0000	0.0000	0.00E+00
347			0.10	0.000	0.037	0.2191	0.0001	0.0009	3.41E-09	0.0000	0.0000	1.27E-09	0.0000	0.0000	0.00E+00
348			0.15	0.000	0.037	0.2238	0.0006	0.0069	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
349	*		0.24	0.000	0.026	0.2223	0.0011	0.0121	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
350	*		0.05	0.000	0.011	0.2216	0.0014	0.0159	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
351	*		0.13	0.000	0.005	0.2197	0.0016	0.0185	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
352	*		0.00	0.000	0.012	0.2190	0.0018	0.0201	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
353			0.00	0.000	0.000	0.2412	0.0019	0.0211	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
354			0.06	0.000	0.036	0.2413	0.0022	0.0250	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
355			0.02	0.000	0.043	0.2376	0.0021	0.0237	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
356			0.69	0.000	0.033	0.2841	0.0027	0.0301	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
357			0.00	0.000	0.061	0.2491	0.0023	0.0264	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
358			0.38	0.000	0.057	0.2611	0.0009	0.0102	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
359			0.09	0.000	0.042	0.2562	0.0010	0.0111	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
360	*		0.06	0.000	0.017	0.2439	0.0011	0.0130	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

361	*		0.09	0.000	0.009	0.2373	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
362	*		0.01	0.000	0.012	0.2315	0.0013	0.0152	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
363	*		0.00	0.000	0.006	0.2273	0.0014	0.0158	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
364	*		0.09	0.000	0.003	0.2243	0.0014	0.0162	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
365	*	*	0.30	0.000	0.000	0.2243	0.0014	0.0164	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 3			
	inches	cubic feet	percent
Precipitation	33.26	120,745.0	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	26.030	94,488.6	78.25
Drainage Collected from Layer 3	5.2304	18,986.3	15.72
Percolation/Leakage through Layer 5	0.000002	0.0089	0.00
Average Head on Top of Layer 4	0.0013	---	---
Drainage Collected from Layer 7	0.0000	0.0069	0.00
Percolation/Leakage through Layer 9	0.000001	0.0020	0.00
Average Head on Top of Layer 8	0.0000	---	---
Percolation/Leakage through Layer 10	0.000000	0.0000	0.00
Change in Water Storage	2.0028	7,270.1	6.02
Soil Water at Start of Year	58.9108	213,846.4	177.11
Soil Water at End of Year	60.5065	219,638.6	181.90
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.4071	1,477.9	1.22
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 4

Title: Wayne Disposal - Initial Lift
Simulated On: 11/20/2020 16:24

Column key: Head #1: drainage from Layer 4; Drain #1: drainage from Layer 3; Leak #1: leakage thru Layer 5; Head #2: drainage from Layer 8; Drain #2: drainage from Layer 7; Leak #2: leakage thru Layer 9; Leak #3: leakage thru Layer 10

Day	Freezing Status* Air	Soil	Rain (inches)	Runoff (inches)	ET (inches)	Evap. Zone Water (in/in)	Head #1 (inches)	Drain #1 (inches)	Leak #1 (inches)	Head #2 (inches)	Drain #2 (inches)	Leak #2 (inches)	Head #3 (inches)	Drain #3 (inches)	Leak #3 (inches)
1		*	0.00	0.000	0.030	0.2243	0.0014	0.0164	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
2		*	0.00	0.000	0.000	0.2557	0.0015	0.0168	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
3	*	*	0.00	0.000	0.000	0.2557	0.0021	0.0237	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
4		*	0.00	0.000	0.000	0.2557	0.0020	0.0228	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
5		*	0.03	0.000	0.000	0.2581	0.0018	0.0206	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
6		*	0.00	0.000	0.000	0.2581	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
7	*	*	0.05	0.000	0.029	0.2581	0.0015	0.0173	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
8		*	0.00	0.000	0.022	0.2581	0.0014	0.0160	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
9		*	0.07	0.000	0.000	0.2636	0.0013	0.0148	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
10		*	0.05	0.000	0.000	0.2679	0.0012	0.0138	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
11	*	*	0.08	0.000	0.028	0.2679	0.0011	0.0129	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
12	*	*	0.00	0.000	0.013	0.2679	0.0011	0.0122	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
13	*	*	0.03	0.000	0.006	0.2679	0.0008	0.0086	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
14	*	*	0.05	0.000	0.004	0.2679	0.0002	0.0019	6.55E-09	0.0000	0.0000	1.55E-09	0.0000	0.0000	0.00E+00
15	*	*	0.00	0.000	0.007	0.2679	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
16	*	*	0.18	0.000	0.000	0.2679	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
17	*	*	0.11	0.000	0.000	0.2679	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
18		*	0.00	0.000	0.000	0.3009	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
19		*	0.00	0.000	0.000	0.3009	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
20		*	0.00	0.000	0.000	0.3009	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
21		*	0.00	0.000	0.000	0.3009	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
22	*	*	0.00	0.000	0.000	0.3009	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
23	*	*	0.05	0.000	0.031	0.3009	0.0001	0.0007	3.41E-09	0.0000	0.0000	1.27E-09	0.0000	0.0000	0.00E+00
24	*	*	0.00	0.000	0.020	0.3009	0.0005	0.0061	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
25		*	0.00	0.000	0.000	0.3009	0.0011	0.0123	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
26		*	0.00	0.000	0.000	0.3009	0.0016	0.0180	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
27		*	0.24	0.000	0.000	0.3205	0.0020	0.0230	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
28		*	0.08	0.000	0.000	0.3273	0.0024	0.0272	7.11E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
29		*	0.00	0.000	0.000	0.3273	0.0027	0.0306	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
30	*	*	0.00	0.000	0.000	0.3273	0.0029	0.0332	7.17E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
31	*	*	0.00	0.000	0.000	0.3273	0.0031	0.0352	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
32	*	*	0.00	0.000	0.000	0.3273	0.0032	0.0367	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
33	*	*	0.04	0.000	0.021	0.3273	0.0033	0.0377	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
34		*	0.00	0.000	0.020	0.3273	0.0034	0.0383	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
35		*	0.12	0.000	0.000	0.3369	0.0034	0.0387	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
36		*	0.18	0.000	0.000	0.3516	0.0034	0.0389	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
37		*	0.17	0.000	0.000	0.3656	0.0034	0.0389	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
38		*	0.10	0.000	0.000	0.3742	0.0034	0.0388	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00

39		*	0.01	0.000	0.000	0.3753	0.0034	0.0386	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
40		*	0.00	0.000	0.000	0.3753	0.0034	0.0384	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
41		*	0.00	0.000	0.000	0.3753	0.0034	0.0381	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
42	*	*	0.00	0.000	0.000	0.3753	0.0033	0.0377	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
43	*	*	0.13	0.000	0.032	0.3753	0.0033	0.0374	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
44	*	*	0.00	0.000	0.038	0.3753	0.0033	0.0370	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
45	*	*	0.00	0.000	0.039	0.3753	0.0032	0.0366	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
46	*	*	0.00	0.000	0.000	0.3753	0.0032	0.0362	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
47	*	*	0.00	0.000	0.028	0.3753	0.0032	0.0358	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
48		*	0.00	0.000	0.000	0.3753	0.0031	0.0354	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
49		*	0.00	0.000	0.000	0.3753	0.0031	0.0350	7.18E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
50		*	0.00	0.000	0.000	0.3753	0.0031	0.0346	7.18E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
51		*	0.00	0.000	0.000	0.3753	0.0030	0.0342	7.18E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
52		*	0.00	0.000	0.000	0.3753	0.0030	0.0338	7.17E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
53		*	0.00	0.000	0.000	0.3756	0.0030	0.0334	7.17E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
54	*	*	0.07	0.000	0.022	0.3756	0.0029	0.0331	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
55	*	*	0.59	0.000	0.000	0.3756	0.0029	0.0327	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
56	*	*	0.15	0.000	0.011	0.3756	0.0029	0.0323	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
57	*	*	0.00	0.000	0.021	0.3756	0.0028	0.0319	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
58	*	*	0.00	0.000	0.011	0.3756	0.0028	0.0316	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
59	*	*	0.00	0.000	0.015	0.3756	0.0028	0.0312	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
60	*	*	0.00	0.000	0.008	0.3756	0.0027	0.0309	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
61	*	*	0.00	0.000	0.010	0.3756	0.0027	0.0305	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
62	*	*	0.00	0.000	0.011	0.3756	0.0027	0.0302	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
63	*	*	0.00	0.000	0.006	0.3756	0.0026	0.0298	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
64	*	*	0.17	0.000	0.000	0.3756	0.0026	0.0295	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
65	*	*	0.00	0.000	0.015	0.3756	0.0026	0.0292	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
66	*	*	0.01	0.000	0.007	0.3756	0.0026	0.0289	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
67	*	*	0.00	0.000	0.028	0.3756	0.0025	0.0285	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
68	*	*	0.00	0.000	0.025	0.3756	0.0025	0.0282	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
69		*	0.21	0.000	0.000	0.3929	0.0025	0.0279	7.11E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
70		*	0.01	0.000	0.013	0.4570	0.0024	0.0276	7.11E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
71	*	*	0.00	0.000	0.000	0.4570	0.0024	0.0271	7.11E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
72		*	0.00	0.000	0.000	0.4570	0.0024	0.0269	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
73	*	*	0.00	0.000	0.000	0.4570	0.0024	0.0268	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
74		*	0.00	0.000	0.000	0.4570	0.0024	0.0267	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
75		*	0.00	0.000	0.000	0.4570	0.0023	0.0265	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
76		*	0.34	0.000	0.000	0.4570	0.0025	0.0282	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
77		*	0.03	0.000	0.000	0.4570	0.0023	0.0264	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
78		*	0.02	0.000	0.000	0.4570	0.0022	0.0249	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
79		*	0.03	0.000	0.000	0.4570	0.0022	0.0243	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
80	*	*	0.10	0.000	0.034	0.4570	0.0009	0.0098	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
81	*	*	0.00	0.000	0.035	0.4570	0.0018	0.0205	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
82		*	0.00	0.000	0.035	0.4570	0.0024	0.0275	7.11E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
83		*	0.00	0.000	0.000	0.4570	0.0027	0.0309	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
84		*	0.00	0.000	0.000	0.4570	0.0028	0.0321	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00

85		*	0.00	0.000	0.000	0.4570	0.0029	0.0322	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
86	*	*	0.04	0.000	0.037	0.4570	0.0027	0.0307	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
87	*	*	0.00	0.000	0.000	0.4570	0.0026	0.0294	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
88		*	0.03	0.000	0.000	0.4570	0.0032	0.0367	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
89		*	0.00	0.000	0.000	0.4570	0.0018	0.0203	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
90		*	0.00	0.000	0.000	0.4570	0.0018	0.0205	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
91		*	0.17	0.000	0.000	0.4570	0.0026	0.0298	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
92			0.00	0.000	0.116	0.2416	0.0012	0.0139	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
93	*		0.04	0.000	0.099	0.2235	0.0008	0.0088	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
94			0.03	0.000	0.095	0.2097	0.0012	0.0132	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
95			0.00	0.000	0.134	0.1930	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
96			0.10	0.000	0.162	0.1847	0.0016	0.0184	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
97	*		0.17	0.000	0.041	0.1833	0.0021	0.0243	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
98	*		0.00	0.000	0.084	0.1821	0.0029	0.0329	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
99			0.00	0.000	0.195	0.1646	0.0025	0.0282	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
100			0.01	0.000	0.130	0.1529	0.0023	0.0258	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
101			0.00	0.000	0.043	0.1489	0.0021	0.0233	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
102			0.05	0.000	0.042	0.1488	0.0019	0.0210	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
103			0.01	0.000	0.035	0.1456	0.0017	0.0192	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
104			0.00	0.000	0.031	0.1424	0.0015	0.0167	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
105			0.01	0.000	0.028	0.1406	0.0009	0.0102	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
106			0.17	0.000	0.026	0.1521	0.0001	0.0012	4.19E-09	0.0000	0.0000	1.36E-09	0.0000	0.0000	0.00E+00
107			0.00	0.000	0.024	0.1500	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
108			0.00	0.000	0.023	0.1476	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
109			0.00	0.000	0.021	0.1450	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
110			0.00	0.000	0.020	0.1425	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
111			0.00	0.000	0.019	0.1400	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
112			0.00	0.000	0.018	0.1377	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
113			0.19	0.000	0.018	0.1512	0.0005	0.0059	5.91E-09	0.0000	0.0000	1.51E-09	0.0000	0.0000	0.00E+00
114			0.00	0.000	0.017	0.1492	0.0019	0.0211	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
115			0.00	0.000	0.016	0.1473	0.0031	0.0354	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
116			0.00	0.000	0.016	0.1455	0.0041	0.0461	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
117			0.00	0.000	0.016	0.1437	0.0047	0.0530	7.36E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
118			0.00	0.000	0.015	0.1419	0.0050	0.0570	7.39E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
119			0.05	0.000	0.015	0.1446	0.0052	0.0591	7.41E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
120			0.18	0.000	0.015	0.1577	0.0053	0.0601	7.42E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
121			0.14	0.000	0.076	0.1623	0.0054	0.0611	7.43E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
122			0.00	0.000	0.142	0.1497	0.0053	0.0597	7.42E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
123	*		0.00	0.000	0.000	0.1497	0.0049	0.0555	7.38E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
124			0.00	0.000	0.121	0.1393	0.0054	0.0614	7.43E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
125			0.00	0.000	0.054	0.1347	0.0053	0.0604	7.43E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
126			0.00	0.000	0.041	0.1311	0.0054	0.0608	7.43E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
127			0.09	0.000	0.035	0.1350	0.0052	0.0585	7.41E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
128			0.00	0.000	0.031	0.1321	0.0050	0.0563	7.39E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
129			0.00	0.000	0.028	0.1297	0.0048	0.0537	7.36E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
130			0.03	0.000	0.026	0.1293	0.0047	0.0528	7.35E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00

131	0.66	0.000	0.024	0.1816	0.0046	0.0522	7.35E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
132	0.22	0.000	0.157	0.1867	0.0045	0.0507	7.33E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
133	0.00	0.000	0.160	0.1732	0.0046	0.0521	7.35E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
134	0.00	0.000	0.194	0.1567	0.0046	0.0516	7.34E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
135	0.14	0.000	0.408	0.1332	0.0047	0.0532	7.36E-09	0.0000	0.0000	1.59E-09	0.0000	0.0000	0.00E+00
136	0.49	0.000	0.131	0.1631	0.0039	0.0445	7.28E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
137	0.00	0.000	0.145	0.1505	0.0041	0.0460	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
138	0.00	0.000	0.113	0.1407	0.0041	0.0466	7.30E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
139	0.08	0.000	0.131	0.1364	0.0043	0.0481	7.31E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
140	0.18	0.000	0.055	0.1463	0.0042	0.0472	7.30E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
141	0.01	0.000	0.042	0.1437	0.0043	0.0482	7.31E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
142	0.00	0.000	0.035	0.1407	0.0043	0.0482	7.31E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
143	0.00	0.000	0.031	0.1380	0.0042	0.0476	7.30E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
144	0.00	0.000	0.028	0.1356	0.0041	0.0465	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
145	0.07	0.000	0.026	0.1395	0.0040	0.0452	7.28E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
146	0.01	0.000	0.025	0.1379	0.0039	0.0440	7.27E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
147	0.66	0.000	0.023	0.1910	0.0038	0.0428	7.26E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
148	0.02	0.000	0.459	0.1536	0.0038	0.0432	7.26E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
149	0.04	0.000	0.147	0.1450	0.0034	0.0379	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
150	0.01	0.000	0.116	0.1360	0.0035	0.0391	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
151	0.28	0.000	0.055	0.1551	0.0035	0.0391	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
152	0.18	0.000	0.325	0.1434	0.0034	0.0390	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
153	0.19	0.000	0.042	0.1557	0.0034	0.0381	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
154	0.00	0.000	0.210	0.1382	0.0033	0.0376	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
155	0.50	0.000	0.036	0.1768	0.0033	0.0372	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
156	0.09	0.000	0.164	0.1710	0.0032	0.0361	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
157	0.34	0.000	0.144	0.1870	0.0032	0.0356	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
158	0.01	0.000	0.119	0.1775	0.0031	0.0349	7.18E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
159	0.02	0.000	0.266	0.1570	0.0031	0.0347	7.18E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
160	0.79	0.000	0.118	0.2127	0.0030	0.0339	7.17E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
161	0.00	0.000	0.224	0.1940	0.0030	0.0335	7.17E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
162	0.00	0.000	0.331	0.1664	0.0030	0.0336	7.17E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
163	0.00	0.000	0.130	0.1555	0.0029	0.0332	7.17E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
164	0.24	0.000	0.055	0.1705	0.0028	0.0315	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
165	0.00	0.000	0.279	0.1472	0.0028	0.0317	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
166	0.18	0.000	0.043	0.1586	0.0028	0.0317	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
167	0.00	0.000	0.035	0.1557	0.0028	0.0316	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
168	0.00	0.000	0.031	0.1532	0.0028	0.0314	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
169	0.00	0.000	0.028	0.1509	0.0028	0.0312	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
170	0.00	0.000	0.025	0.1487	0.0027	0.0309	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
171	0.44	0.000	0.025	0.1831	0.0027	0.0306	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
172	0.04	0.000	0.153	0.1735	0.0027	0.0308	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
173	0.46	0.000	0.267	0.1889	0.0028	0.0319	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
174	0.40	0.000	0.125	0.2114	0.0024	0.0271	7.11E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
175	0.00	0.000	0.253	0.1903	0.0025	0.0281	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
176	0.01	0.000	0.312	0.1649	0.0026	0.0290	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00

177	0.00	0.000	0.130	0.1541	0.0025	0.0280	7.11E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
178	0.00	0.000	0.054	0.1495	0.0026	0.0293	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
179	0.00	0.000	0.041	0.1457	0.0027	0.0305	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
180	0.00	0.000	0.035	0.1425	0.0025	0.0281	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
181	0.00	0.000	0.031	0.1397	0.0024	0.0270	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
182	0.00	0.000	0.028	0.1372	0.0024	0.0266	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
183	0.01	0.000	0.027	0.1359	0.0022	0.0253	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
184	0.21	0.000	0.025	0.1512	0.0025	0.0278	7.11E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
185	0.24	0.000	0.024	0.1689	0.0024	0.0268	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
186	0.03	0.000	0.148	0.1587	0.0025	0.0284	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
187	0.00	0.000	0.021	0.1569	0.0023	0.0255	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
188	0.00	0.000	0.020	0.1553	0.0023	0.0264	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
189	0.00	0.000	0.019	0.1537	0.0024	0.0270	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
190	0.00	0.000	0.018	0.1521	0.0024	0.0273	7.11E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
191	0.00	0.000	0.018	0.1507	0.0024	0.0272	7.11E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
192	0.00	0.000	0.017	0.1492	0.0024	0.0270	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
193	0.00	0.000	0.016	0.1479	0.0024	0.0267	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
194	0.00	0.000	0.017	0.1466	0.0023	0.0264	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
195	0.12	0.000	0.017	0.1551	0.0023	0.0264	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
196	0.25	0.000	0.017	0.1744	0.0023	0.0261	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
197	0.18	0.000	0.286	0.1646	0.0023	0.0262	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
198	0.00	0.000	0.339	0.1362	0.0020	0.0224	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
199	0.00	0.000	0.130	0.1254	0.0020	0.0224	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
200	0.15	0.000	0.056	0.1327	0.0022	0.0244	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
201	0.00	0.000	0.041	0.1290	0.0021	0.0240	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
202	0.00	0.000	0.035	0.1257	0.0021	0.0233	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
203	0.00	0.000	0.031	0.1227	0.0020	0.0224	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
204	0.00	0.000	0.028	0.1201	0.0019	0.0214	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
205	0.42	0.000	0.027	0.1528	0.0017	0.0192	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
206	0.23	0.000	0.026	0.1698	0.0018	0.0205	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
207	0.00	0.000	0.374	0.1387	0.0018	0.0206	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
208	0.38	0.000	0.024	0.1682	0.0021	0.0235	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
209	0.13	0.000	0.183	0.1628	0.0020	0.0231	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
210	0.54	0.000	0.201	0.1902	0.0020	0.0228	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
211	0.92	0.000	0.143	0.2546	0.0019	0.0218	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
212	0.00	0.000	0.133	0.2431	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
213	0.19	0.000	0.212	0.2283	0.0020	0.0221	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
214	0.01	0.000	0.180	0.2079	0.0019	0.0213	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
215	0.00	0.000	0.264	0.1812	0.0018	0.0207	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
216	0.00	0.000	0.131	0.1675	0.0018	0.0203	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
217	0.36	0.000	0.056	0.1901	0.0018	0.0201	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
218	0.01	0.000	0.271	0.1656	0.0018	0.0199	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
219	0.04	0.000	0.043	0.1632	0.0015	0.0173	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
220	0.00	0.000	0.035	0.1591	0.0009	0.0098	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
221	0.00	0.000	0.031	0.1559	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
222	0.00	0.000	0.028	0.1530	0.0018	0.0202	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

223	0.00	0.000	0.025	0.1503	0.0021	0.0234	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
224	0.00	0.000	0.024	0.1477	0.0022	0.0254	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
225	0.00	0.000	0.022	0.1453	0.0024	0.0269	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
226	0.09	0.000	0.023	0.1500	0.0025	0.0283	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
227	0.40	0.000	0.022	0.1807	0.0023	0.0262	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
228	0.00	0.000	0.195	0.1634	0.0027	0.0302	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
229	0.21	0.000	0.021	0.1794	0.0018	0.0205	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
230	0.08	0.000	0.075	0.1796	0.0020	0.0229	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
231	0.00	0.000	0.082	0.1727	0.0021	0.0233	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
232	0.00	0.000	0.089	0.1652	0.0019	0.0213	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
233	0.25	0.000	0.132	0.1749	0.0018	0.0199	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
234	0.00	0.000	0.091	0.1671	0.0020	0.0223	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
235	0.00	0.000	0.137	0.1550	0.0022	0.0246	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
236	0.07	0.000	0.132	0.1496	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
237	0.00	0.000	0.054	0.1448	0.0016	0.0182	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
238	0.02	0.000	0.044	0.1429	0.0015	0.0166	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
239	0.59	0.000	0.037	0.1887	0.0014	0.0158	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
240	0.59	0.000	0.238	0.2176	0.0011	0.0128	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
241	0.00	0.000	0.226	0.1982	0.0015	0.0168	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
242	0.06	0.000	0.166	0.1882	0.0015	0.0174	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
243	0.00	0.000	0.246	0.1670	0.0014	0.0160	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
244	0.68	0.000	0.132	0.2127	0.0008	0.0089	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
245	0.10	0.000	0.115	0.2109	0.0006	0.0072	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
246	0.65	0.000	0.312	0.2384	0.0009	0.0098	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
247	0.04	0.000	0.352	0.2117	0.0010	0.0118	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
248	0.45	0.000	0.377	0.2177	0.0003	0.0038	6.85E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
249	0.00	0.000	0.160	0.2043	0.0005	0.0054	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
250	0.04	0.000	0.248	0.1855	0.0011	0.0120	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
251	1.38	0.000	0.132	0.2875	0.0011	0.0130	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
252	0.00	0.000	0.216	0.2384	0.0010	0.0109	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
253	0.00	0.000	0.146	0.2131	0.0009	0.0103	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
254	0.00	0.000	0.214	0.1878	0.0000	0.0000	2.28E-09	0.0000	0.0000	1.07E-09	0.0000	0.0000	0.00E+00
255	0.00	0.000	0.130	0.1726	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
256	0.00	0.000	0.054	0.1659	0.0000	0.0003	2.92E-09	0.0000	0.0000	1.20E-09	0.0000	0.0000	0.00E+00
257	0.00	0.000	0.041	0.1608	0.0002	0.0028	6.84E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
258	0.04	0.000	0.037	0.1588	0.0005	0.0054	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
259	0.00	0.000	0.021	0.1551	0.0007	0.0075	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
260	0.00	0.000	0.028	0.1508	0.0008	0.0091	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
261	0.00	0.000	0.025	0.1467	0.0009	0.0105	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
262	0.00	0.000	0.024	0.1434	0.0010	0.0115	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
263	0.00	0.000	0.022	0.1406	0.0011	0.0122	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
264	0.00	0.000	0.021	0.1381	0.0011	0.0128	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
265	1.16	0.000	0.021	0.2324	0.0012	0.0132	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
266	0.33	0.000	0.288	0.2353	0.0014	0.0157	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
267	0.15	0.000	0.225	0.2272	0.0016	0.0186	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
268	0.19	0.000	0.166	0.2281	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

269		0.00	0.000	0.097	0.2199	0.0009	0.0101	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
270		0.00	0.000	0.121	0.2064	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
271		0.00	0.000	0.139	0.1923	0.0014	0.0157	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
272		0.00	0.000	0.154	0.1781	0.0011	0.0127	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
273		0.03	0.000	0.097	0.1707	0.0011	0.0124	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
274		0.19	0.000	0.055	0.1807	0.0012	0.0135	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
275		0.00	0.000	0.067	0.1744	0.0004	0.0051	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
276	*	0.00	0.000	0.041	0.1705	0.0005	0.0057	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
277		0.00	0.000	0.035	0.1667	0.0011	0.0123	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
278		0.04	0.000	0.032	0.1667	0.0013	0.0147	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
279		0.07	0.000	0.029	0.1688	0.0012	0.0141	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
280		0.00	0.000	0.025	0.1655	0.0011	0.0129	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
281		0.00	0.000	0.024	0.1626	0.0008	0.0095	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
282		0.00	0.000	0.022	0.1599	0.0008	0.0091	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
283		0.00	0.000	0.021	0.1572	0.0008	0.0091	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
284		0.00	0.000	0.020	0.1547	0.0007	0.0083	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
285		0.02	0.000	0.020	0.1542	0.0007	0.0074	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
286		0.00	0.000	0.018	0.1519	0.0007	0.0074	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
287		0.18	0.000	0.019	0.1651	0.0004	0.0045	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
288		0.00	0.000	0.017	0.1630	0.0005	0.0053	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
289		0.00	0.000	0.016	0.1610	0.0006	0.0063	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
290		0.00	0.000	0.016	0.1591	0.0004	0.0049	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
291		0.00	0.000	0.016	0.1574	0.0004	0.0040	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
292		0.00	0.000	0.015	0.1557	0.0003	0.0039	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
293		0.46	0.000	0.016	0.1925	0.0004	0.0040	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
294		0.32	0.000	0.203	0.2016	0.0008	0.0094	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
295		0.00	0.000	0.072	0.1954	0.0001	0.0007	5.68E-09	0.0000	0.0000	1.49E-09	0.0000	0.0000	0.00E+00
296		0.00	0.000	0.078	0.1889	0.0000	0.0000	2.35E-09	0.0000	0.0000	1.09E-09	0.0000	0.0000	0.00E+00
297		0.00	0.000	0.091	0.1813	0.0002	0.0020	6.83E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
298		0.00	0.000	0.096	0.1730	0.0005	0.0051	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
299		0.00	0.000	0.087	0.1655	0.0004	0.0046	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
300		0.00	0.000	0.108	0.1561	0.0005	0.0060	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
301		0.00	0.000	0.088	0.1485	0.0003	0.0039	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
302		0.00	0.000	0.054	0.1434	0.0005	0.0062	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
303		0.00	0.000	0.041	0.1395	0.0003	0.0036	6.85E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
304		0.00	0.000	0.035	0.1362	0.0002	0.0025	6.84E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
305		0.00	0.000	0.031	0.1333	0.0002	0.0023	6.84E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
306	*	0.00	0.000	0.000	0.1331	0.0002	0.0021	6.83E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
307	*	0.00	0.000	0.000	0.1329	0.0003	0.0033	6.85E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
308		0.00	0.000	0.028	0.1306	0.0003	0.0030	6.84E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
309	*	0.00	0.000	0.000	0.1304	0.0006	0.0068	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
310		0.00	0.000	0.025	0.1280	0.0007	0.0079	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
311	*	0.00	0.000	0.024	0.1258	0.0007	0.0083	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
312	*	0.23	0.000	0.014	0.1275	0.0006	0.0071	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
313	*	0.14	0.000	0.007	0.1291	0.0008	0.0086	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
314		0.16	0.000	0.000	0.1488	0.0009	0.0102	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

315			0.30	0.000	0.000	0.1927	0.0010	0.0114	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
316			0.00	0.000	0.063	0.1873	0.0012	0.0136	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
317			0.00	0.000	0.051	0.1830	0.0011	0.0125	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
318			0.07	0.000	0.103	0.1800	0.0013	0.0149	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
319			0.19	0.000	0.089	0.1882	0.0012	0.0133	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
320			0.00	0.000	0.163	0.1746	0.0012	0.0131	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
321			0.00	0.000	0.129	0.1637	0.0013	0.0152	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
322			0.02	0.000	0.175	0.1505	0.0017	0.0194	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
323			0.00	0.000	0.128	0.1398	0.0010	0.0114	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
324			0.00	0.000	0.053	0.1352	0.0013	0.0146	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
325	*		0.14	0.000	0.022	0.1367	0.0012	0.0140	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
326	*		0.26	0.000	0.016	0.1383	0.0014	0.0153	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
327	*		0.00	0.000	0.023	0.1398	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
328	*		0.00	0.000	0.022	0.1413	0.0015	0.0170	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
329	*		0.00	0.000	0.021	0.1429	0.0016	0.0176	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
330	*		0.00	0.000	0.021	0.1444	0.0016	0.0180	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
331	*		0.00	0.000	0.023	0.1459	0.0016	0.0183	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
332	*		0.00	0.000	0.023	0.1474	0.0016	0.0185	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
333	*		0.00	0.000	0.022	0.1489	0.0017	0.0187	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
334	*		0.00	0.000	0.011	0.1505	0.0017	0.0189	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
335	*		0.01	0.000	0.006	0.1514	0.0017	0.0192	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
336	*		0.04	0.000	0.004	0.1529	0.0017	0.0192	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
337	*		0.00	0.000	0.012	0.1532	0.0017	0.0191	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
338	*		0.00	0.000	0.000	0.1531	0.0017	0.0191	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
339	*	*	0.46	0.000	0.012	0.1531	0.0016	0.0181	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
340	*	*	0.11	0.000	0.012	0.1531	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
341		*	0.14	0.000	0.000	0.1772	0.0017	0.0194	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
342	*	*	0.00	0.000	0.011	0.1772	0.0018	0.0198	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
343	*	*	0.00	0.000	0.006	0.1772	0.0018	0.0200	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
344	*	*	0.01	0.000	0.013	0.1772	0.0018	0.0201	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
345	*	*	0.20	0.000	0.007	0.1772	0.0018	0.0201	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
346	*	*	0.00	0.000	0.015	0.1772	0.0018	0.0200	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
347	*	*	0.00	0.000	0.008	0.1772	0.0018	0.0198	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
348		*	0.00	0.000	0.020	0.1828	0.0017	0.0197	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
349		*	0.00	0.000	0.000	0.2215	0.0017	0.0195	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
350	*	*	0.05	0.000	0.026	0.2215	0.0017	0.0193	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
351	*	*	0.56	0.000	0.022	0.2215	0.0017	0.0192	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
352	*	*	0.00	0.000	0.023	0.2215	0.0017	0.0190	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
353		*	0.00	0.000	0.000	0.2254	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
354		*	0.08	0.000	0.000	0.2581	0.0017	0.0187	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
355	*	*	0.12	0.000	0.016	0.2581	0.0016	0.0185	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
356		*	0.57	0.000	0.000	0.3292	0.0016	0.0184	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
357		*	0.00	0.000	0.000	0.3295	0.0016	0.0182	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
358		*	0.32	0.000	0.000	0.3558	0.0016	0.0181	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
359		*	0.00	0.000	0.000	0.3558	0.0016	0.0180	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
360	*	*	0.00	0.000	0.000	0.3558	0.0016	0.0179	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

361	*	0.00	0.000	0.000	0.3558	0.0016	0.0178	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
362	*	0.08	0.000	0.000	0.3625	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
363	*	0.20	0.000	0.000	0.3795	0.0016	0.0176	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
364	*	0.70	0.000	0.000	0.4374	0.0015	0.0175	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
365	*	0.14	0.000	0.000	0.4493	0.0015	0.0174	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 4			
	inches	cubic feet	percent
Precipitation	30.39	110,318.2	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	22.227	80,682.9	73.14
Drainage Collected from Layer 3	8.2850	30,074.5	27.26
Percolation/Leakage through Layer 5	0.000002	0.0089	0.00
Average Head on Top of Layer 4	0.0020	---	---
Drainage Collected from Layer 7	0.0000	0.0069	0.00
Percolation/Leakage through Layer 9	0.000001	0.0020	0.00
Average Head on Top of Layer 8	0.0000	---	---
Percolation/Leakage through Layer 10	0.000000	0.0000	0.00
Change in Water Storage	-0.1210	-439.2	-0.40
Soil Water at Start of Year	60.5065	219,638.6	199.10
Soil Water at End of Year	60.7926	220,677.3	200.04
Snow Water at Start of Year	0.4071	1,477.9	1.34
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 5

Title: Wayne Disposal - Initial Lift
Simulated On: 11/20/2020 16:24

Column key: Head #1: drainage from Layer 4; Drain #1: drainage from Layer 3; Leak #1: leakage thru Layer 5; Head #2: drainage from Layer 8; Drain #2: drainage from Layer 7; Leak #2: leakage thru Layer 9; Leak #3: leakage thru Layer 10

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1	Head #2	Drain #2	Leak #2	Head #3	Drain #3	Leak #3
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)
1		*	0.00	0.000	0.000	0.4493	0.0015	0.0172	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
2		*	0.00	0.000	0.000	0.4493	0.0015	0.0172	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
3		*	0.00	0.000	0.000	0.4493	0.0015	0.0171	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
4	*	*	0.00	0.000	0.000	0.4493	0.0015	0.0170	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
5		*	0.34	0.000	0.000	0.4570	0.0017	0.0187	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
6			0.00	0.000	0.078	0.2443	0.0009	0.0106	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
7			0.00	0.000	0.041	0.2269	0.0007	0.0078	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
8			0.00	0.000	0.041	0.2151	0.0012	0.0131	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
9	*		0.19	0.000	0.018	0.2111	0.0015	0.0169	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
10	*		0.00	0.000	0.024	0.2084	0.0017	0.0194	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
11			0.00	0.000	0.039	0.2111	0.0019	0.0210	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
12			0.00	0.000	0.043	0.2046	0.0019	0.0219	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
13	*		0.01	0.000	0.033	0.2005	0.0020	0.0226	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
14			0.03	0.000	0.053	0.1964	0.0028	0.0312	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
15			0.05	0.000	0.041	0.1955	0.0028	0.0315	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
16			0.01	0.000	0.042	0.1914	0.0025	0.0277	7.11E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
17			0.00	0.000	0.074	0.1833	0.0022	0.0246	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
18			0.00	0.000	0.054	0.1771	0.0020	0.0222	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
19			0.00	0.000	0.056	0.1709	0.0018	0.0201	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
20	*		0.00	0.000	0.000	0.1701	0.0016	0.0184	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
21	*		0.06	0.000	0.023	0.1711	0.0014	0.0160	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
22	*		0.05	0.000	0.026	0.1721	0.0011	0.0120	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
23	*		0.11	0.000	0.015	0.1732	0.0006	0.0068	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
24	*		0.29	0.000	0.006	0.1742	0.0001	0.0015	6.17E-09	0.0000	0.0000	1.52E-09	0.0000	0.0000	0.00E+00
25	*		0.08	0.000	0.000	0.1753	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
26	*		0.05	0.000	0.000	0.1763	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
27			0.00	0.000	0.011	0.1965	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
28			0.01	0.000	0.028	0.2096	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
29			0.04	0.000	0.051	0.2078	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
30	*		0.03	0.000	0.019	0.2080	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
31	*		0.00	0.000	0.000	0.2075	0.0002	0.0027	4.89E-09	0.0000	0.0000	1.43E-09	0.0000	0.0000	0.00E+00
32	*	*	0.00	0.000	0.000	0.2075	0.0005	0.0060	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
33	*	*	0.02	0.000	0.010	0.2075	0.0015	0.0170	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
34	*	*	0.17	0.000	0.000	0.2075	0.0023	0.0255	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
35		*	0.00	0.000	0.045	0.2190	0.0028	0.0314	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
36		*	0.00	0.000	0.000	0.2190	0.0032	0.0356	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
37		*	0.00	0.000	0.000	0.2190	0.0034	0.0386	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
38		*	0.01	0.000	0.000	0.2201	0.0036	0.0408	7.24E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00

39		*	0.00	0.000	0.000	0.2201	0.0038	0.0424	7.26E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
40	*	*	0.00	0.000	0.000	0.2201	0.0039	0.0436	7.27E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
41		*	0.00	0.000	0.000	0.2201	0.0039	0.0445	7.28E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
42	*	*	0.00	0.000	0.000	0.2201	0.0040	0.0452	7.28E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
43	*	*	0.04	0.000	0.030	0.2201	0.0040	0.0457	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
44	*	*	0.00	0.000	0.006	0.2201	0.0041	0.0460	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
45	*	*	0.00	0.000	0.000	0.2201	0.0041	0.0462	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
46		*	0.00	0.000	0.000	0.2201	0.0041	0.0463	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
47		*	0.00	0.000	0.000	0.2201	0.0041	0.0463	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
48		*	0.33	0.000	0.000	0.2479	0.0041	0.0461	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
49	*	*	0.15	0.000	0.035	0.2479	0.0041	0.0460	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
50		*	0.00	0.000	0.040	0.2486	0.0040	0.0457	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
51		*	0.00	0.000	0.063	0.2486	0.0040	0.0454	7.28E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
52		*	0.09	0.000	0.000	0.2563	0.0040	0.0451	7.28E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
53		*	0.00	0.000	0.000	0.2563	0.0040	0.0447	7.28E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
54		*	0.00	0.000	0.000	0.2563	0.0039	0.0443	7.27E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
55		*	0.00	0.000	0.000	0.2563	0.0039	0.0438	7.27E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
56		*	0.05	0.000	0.000	0.2607	0.0038	0.0434	7.26E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
57		*	0.00	0.000	0.000	0.2607	0.0038	0.0429	7.26E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
58			0.00	0.000	0.150	0.2387	0.0040	0.0446	7.28E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
59			0.02	0.000	0.098	0.2187	0.0037	0.0422	7.25E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
60			0.13	0.000	0.102	0.2140	0.0035	0.0395	7.23E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
61			0.03	0.000	0.104	0.2025	0.0034	0.0384	7.22E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
62			0.00	0.000	0.172	0.1851	0.0031	0.0354	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
63			0.00	0.000	0.144	0.1706	0.0029	0.0329	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
64			0.00	0.000	0.130	0.1583	0.0032	0.0359	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
65			0.67	0.000	0.054	0.2079	0.0043	0.0485	7.31E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
66			0.01	0.000	0.062	0.2021	0.0043	0.0481	7.31E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
67			0.00	0.000	0.172	0.1867	0.0040	0.0454	7.28E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
68			0.00	0.000	0.161	0.1723	0.0042	0.0476	7.30E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
69			0.22	0.000	0.156	0.1770	0.0040	0.0457	7.29E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
70			0.01	0.000	0.127	0.1668	0.0039	0.0437	7.27E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
71			0.10	0.000	0.133	0.1628	0.0039	0.0445	7.27E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
72			0.00	0.000	0.110	0.1528	0.0034	0.0381	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
73			0.00	0.000	0.054	0.1475	0.0031	0.0354	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
74	*		0.00	0.000	0.000	0.1467	0.0029	0.0325	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
75	*		0.00	0.000	0.000	0.1461	0.0025	0.0287	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
76			0.05	0.000	0.041	0.1461	0.0023	0.0259	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
77			0.00	0.000	0.035	0.1426	0.0023	0.0264	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
78			0.00	0.000	0.031	0.1397	0.0020	0.0231	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
79	*		0.00	0.000	0.028	0.1370	0.0020	0.0223	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
80	*		0.21	0.000	0.037	0.1383	0.0020	0.0224	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
81			0.08	0.000	0.047	0.1541	0.0018	0.0207	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
82			0.16	0.000	0.026	0.1647	0.0018	0.0202	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
83			0.16	0.000	0.121	0.1671	0.0018	0.0204	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
84			0.00	0.000	0.318	0.1403	0.0014	0.0158	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

85		0.00	0.000	0.110	0.1311	0.0013	0.0149	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
86		0.00	0.000	0.054	0.1265	0.0016	0.0181	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
87		0.62	0.000	0.041	0.1750	0.0017	0.0191	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
88	*	0.47	0.000	0.017	0.1764	0.0017	0.0197	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
89		0.07	0.000	0.060	0.2130	0.0017	0.0192	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
90	*	0.00	0.000	0.000	0.2128	0.0017	0.0189	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
91	*	0.00	0.000	0.000	0.2126	0.0017	0.0190	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
92	*	0.00	0.000	0.102	0.2038	0.0018	0.0198	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
93		0.00	0.000	0.131	0.1929	0.0015	0.0171	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
94		0.00	0.000	0.233	0.1735	0.0017	0.0192	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
95		0.00	0.000	0.210	0.1554	0.0021	0.0238	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
96		0.03	0.000	0.130	0.1458	0.0023	0.0256	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
97		0.00	0.000	0.054	0.1403	0.0018	0.0207	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
98		0.00	0.000	0.041	0.1363	0.0014	0.0162	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
99		0.00	0.000	0.024	0.1339	0.0015	0.0174	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
100		0.00	0.000	0.031	0.1311	0.0016	0.0184	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
101		0.00	0.000	0.028	0.1280	0.0023	0.0261	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
102		0.00	0.000	0.025	0.1241	0.0025	0.0279	7.11E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
103		0.08	0.000	0.024	0.1259	0.0022	0.0253	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
104		0.00	0.000	0.022	0.1218	0.0021	0.0239	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
105		0.17	0.000	0.021	0.1324	0.0020	0.0232	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
106		0.17	0.000	0.020	0.1439	0.0019	0.0214	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
107		0.23	0.000	0.019	0.1603	0.0019	0.0217	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
108		0.00	0.000	0.098	0.1514	0.0021	0.0235	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
109		0.00	0.000	0.157	0.1375	0.0024	0.0274	7.11E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
110		0.11	0.000	0.130	0.1347	0.0027	0.0306	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
111		0.00	0.000	0.054	0.1293	0.0029	0.0327	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
112		0.00	0.000	0.041	0.1251	0.0028	0.0311	7.15E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
113		0.00	0.000	0.029	0.1224	0.0025	0.0286	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
114		0.00	0.000	0.031	0.1198	0.0026	0.0290	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
115		0.00	0.000	0.028	0.1174	0.0029	0.0328	7.16E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
116		0.08	0.000	0.026	0.1214	0.0033	0.0373	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
117		0.21	0.000	0.024	0.1367	0.0027	0.0310	7.14E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
118		0.00	0.000	0.022	0.1347	0.0025	0.0278	7.11E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
119		0.12	0.000	0.021	0.1424	0.0026	0.0297	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
120		0.00	0.000	0.020	0.1402	0.0025	0.0284	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
121	*	0.00	0.000	0.019	0.1380	0.0022	0.0254	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
122	*	0.00	0.000	0.000	0.1376	0.0020	0.0229	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
123	*	0.33	0.000	0.055	0.1389	0.0019	0.0217	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
124		0.21	0.000	0.000	0.1774	0.0019	0.0209	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
125		0.00	0.000	0.141	0.1655	0.0018	0.0201	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
126	*	0.06	0.000	0.038	0.1667	0.0020	0.0229	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
127		0.00	0.000	0.216	0.1483	0.0020	0.0224	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
128		0.00	0.000	0.151	0.1356	0.0015	0.0173	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
129	*	0.08	0.000	0.078	0.1352	0.0019	0.0210	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
130	*	0.00	0.000	0.130	0.1242	0.0017	0.0189	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

131		0.00	0.000	0.054	0.1192	0.0019	0.0214	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
132		0.38	0.000	0.042	0.1467	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
133		0.25	0.000	0.135	0.1555	0.0017	0.0189	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
134		0.00	0.000	0.169	0.1408	0.0017	0.0193	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
135	*	0.00	0.000	0.100	0.1322	0.0014	0.0157	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
136		0.50	0.000	0.130	0.1629	0.0016	0.0176	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
137		0.00	0.000	0.079	0.1560	0.0015	0.0167	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
138		0.01	0.000	0.227	0.1371	0.0017	0.0195	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
139		0.30	0.000	0.130	0.1508	0.0016	0.0176	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
140		0.49	0.000	0.114	0.1820	0.0016	0.0178	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
141		0.22	0.000	0.185	0.1845	0.0017	0.0198	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
142		0.00	0.000	0.111	0.1751	0.0014	0.0161	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
143	*	0.20	0.000	0.112	0.1767	0.0015	0.0169	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
144		0.03	0.000	0.113	0.1758	0.0017	0.0189	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
145		0.00	0.000	0.229	0.1567	0.0018	0.0201	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
146		0.17	0.000	0.210	0.1537	0.0018	0.0208	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
147		0.01	0.000	0.091	0.1473	0.0019	0.0210	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
148		0.01	0.000	0.132	0.1368	0.0019	0.0219	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
149		0.13	0.000	0.130	0.1365	0.0018	0.0203	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
150		0.00	0.000	0.054	0.1324	0.0018	0.0201	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
151		0.02	0.000	0.042	0.1305	0.0018	0.0199	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
152		0.00	0.000	0.035	0.1276	0.0017	0.0196	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
153		0.00	0.000	0.031	0.1251	0.0017	0.0193	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
154		0.00	0.000	0.028	0.1228	0.0017	0.0189	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
155		0.10	0.000	0.026	0.1289	0.0016	0.0186	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
156		0.01	0.000	0.024	0.1276	0.0016	0.0183	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
157		0.00	0.000	0.022	0.1257	0.0016	0.0180	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
158		0.08	0.000	0.022	0.1306	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
159		0.29	0.000	0.021	0.1528	0.0015	0.0175	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
160		0.02	0.000	0.199	0.1380	0.0015	0.0173	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
161		0.96	0.000	0.020	0.2166	0.0015	0.0171	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
162		0.91	0.000	0.138	0.2806	0.0015	0.0170	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
163		0.11	0.000	0.160	0.2504	0.0018	0.0199	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
164		0.02	0.000	0.421	0.2034	0.0017	0.0188	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
165		0.22	0.000	0.287	0.1920	0.0013	0.0152	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
166		0.02	0.000	0.313	0.1632	0.0005	0.0057	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
167		0.15	0.000	0.131	0.1614	0.0006	0.0064	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
168		0.19	0.000	0.055	0.1709	0.0011	0.0128	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
169		0.05	0.000	0.042	0.1700	0.0016	0.0175	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
170		0.06	0.000	0.036	0.1708	0.0018	0.0206	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
171		0.00	0.000	0.031	0.1676	0.0020	0.0225	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
172		0.01	0.000	0.029	0.1656	0.0021	0.0235	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
173		0.21	0.000	0.026	0.1804	0.0021	0.0239	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
174		0.07	0.000	0.360	0.1549	0.0024	0.0274	7.11E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
175		0.00	0.000	0.024	0.1526	0.0019	0.0219	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
176		0.14	0.000	0.023	0.1623	0.0020	0.0225	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

177	0.00	0.000	0.021	0.1602	0.0021	0.0242	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
178	0.00	0.000	0.020	0.1582	0.0022	0.0246	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
179	0.00	0.000	0.019	0.1562	0.0021	0.0242	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
180	0.00	0.000	0.018	0.1544	0.0020	0.0231	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
181	0.00	0.000	0.018	0.1526	0.0019	0.0219	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
182	0.00	0.000	0.017	0.1508	0.0018	0.0204	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
183	0.00	0.000	0.018	0.1494	0.0017	0.0190	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
184	0.13	0.000	0.017	0.1584	0.0016	0.0175	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
185	0.00	0.000	0.016	0.1568	0.0014	0.0161	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
186	0.00	0.000	0.015	0.1553	0.0013	0.0147	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
187	0.11	0.000	0.016	0.1629	0.0012	0.0134	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
188	0.00	0.000	0.015	0.1614	0.0011	0.0122	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
189	0.03	0.000	0.015	0.1625	0.0010	0.0111	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
190	0.06	0.000	0.015	0.1658	0.0009	0.0099	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
191	0.01	0.000	0.015	0.1652	0.0008	0.0091	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
192	0.00	0.000	0.013	0.1639	0.0007	0.0075	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
193	0.00	0.000	0.013	0.1627	0.0006	0.0071	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
194	0.00	0.000	0.013	0.1615	0.0006	0.0069	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
195	0.00	0.000	0.012	0.1602	0.0006	0.0065	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
196	0.03	0.000	0.014	0.1611	0.0005	0.0061	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
197	0.16	0.000	0.013	0.1729	0.0005	0.0057	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
198	0.00	0.000	0.355	0.1431	0.0004	0.0044	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
199	0.00	0.000	0.012	0.1418	0.0006	0.0066	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
200	0.22	0.000	0.013	0.1586	0.0005	0.0056	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
201	0.01	0.000	0.013	0.1585	0.0004	0.0049	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
202	0.04	0.000	0.013	0.1602	0.0004	0.0046	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
203	0.02	0.000	0.013	0.1605	0.0004	0.0046	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
204	0.00	0.000	0.011	0.1594	0.0004	0.0049	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
205	0.00	0.000	0.011	0.1583	0.0005	0.0054	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
206	0.00	0.000	0.011	0.1572	0.0005	0.0060	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
207	0.00	0.000	0.010	0.1562	0.0006	0.0067	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
208	0.00	0.000	0.010	0.1551	0.0007	0.0075	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
209	0.00	0.000	0.010	0.1541	0.0007	0.0083	6.91E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
210	0.00	0.000	0.010	0.1531	0.0008	0.0090	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
211	0.00	0.000	0.010	0.1522	0.0009	0.0098	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
212	0.00	0.000	0.010	0.1512	0.0010	0.0108	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
213	0.38	0.000	0.011	0.1814	0.0010	0.0116	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
214	0.05	0.000	0.268	0.1629	0.0014	0.0160	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
215	0.11	0.000	0.011	0.1710	0.0008	0.0095	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
216	0.00	0.000	0.251	0.1494	0.0014	0.0155	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
217	0.25	0.000	0.011	0.1695	0.0008	0.0092	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
218	0.01	0.000	0.123	0.1593	0.0012	0.0133	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
219	0.03	0.000	0.011	0.1609	0.0010	0.0115	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
220	0.14	0.000	0.011	0.1714	0.0012	0.0133	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
221	0.00	0.000	0.319	0.1443	0.0015	0.0173	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
222	0.00	0.000	0.009	0.1435	0.0013	0.0142	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

223		0.00	0.000	0.009	0.1427	0.0014	0.0157	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
224		0.00	0.000	0.009	0.1419	0.0015	0.0167	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
225		0.00	0.000	0.009	0.1411	0.0015	0.0174	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
226		0.00	0.000	0.009	0.1404	0.0016	0.0179	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
227		0.00	0.000	0.009	0.1396	0.0016	0.0182	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
228		0.00	0.000	0.009	0.1388	0.0016	0.0183	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
229		0.00	0.000	0.009	0.1381	0.0016	0.0183	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
230		0.00	0.000	0.009	0.1373	0.0016	0.0183	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
231		0.17	0.000	0.010	0.1502	0.0016	0.0182	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
232		0.00	0.000	0.008	0.1495	0.0016	0.0178	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
233		0.00	0.000	0.008	0.1488	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
234		0.00	0.000	0.008	0.1481	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
235		0.00	0.000	0.008	0.1474	0.0016	0.0177	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
236		0.00	0.000	0.008	0.1467	0.0016	0.0176	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
237		0.00	0.000	0.008	0.1461	0.0015	0.0174	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
238		0.00	0.000	0.008	0.1454	0.0015	0.0173	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
239		0.00	0.000	0.008	0.1447	0.0015	0.0172	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
240		0.00	0.000	0.008	0.1441	0.0015	0.0170	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
241		0.00	0.000	0.008	0.1434	0.0015	0.0169	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
242		0.00	0.000	0.008	0.1427	0.0015	0.0169	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
243		0.00	0.000	0.008	0.1421	0.0015	0.0166	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
244		0.04	0.000	0.010	0.1447	0.0015	0.0164	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
245		0.00	0.000	0.008	0.1440	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
246		0.39	0.000	0.010	0.1756	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
247		0.00	0.000	0.228	0.1566	0.0014	0.0162	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
248		0.00	0.000	0.008	0.1560	0.0014	0.0161	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
249		0.00	0.000	0.007	0.1553	0.0014	0.0161	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
250		0.26	0.000	0.010	0.1760	0.0014	0.0160	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
251		0.00	0.000	0.176	0.1613	0.0014	0.0162	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
252		0.43	0.000	0.010	0.1962	0.0014	0.0158	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
253		0.01	0.000	0.138	0.1854	0.0014	0.0158	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
254		0.06	0.000	0.375	0.1592	0.0014	0.0160	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
255		0.95	0.000	0.132	0.2276	0.0014	0.0156	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
256		0.63	0.000	0.260	0.2583	0.0014	0.0156	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
257		0.00	0.000	0.251	0.2353	0.0014	0.0161	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
258		0.00	0.000	0.240	0.2027	0.0016	0.0179	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
259		0.00	0.000	0.265	0.1740	0.0015	0.0165	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
260		0.00	0.000	0.130	0.1607	0.0014	0.0156	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
261		0.00	0.000	0.054	0.1534	0.0013	0.0146	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
262		0.00	0.000	0.041	0.1483	0.0012	0.0132	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
263		0.00	0.000	0.035	0.1424	0.0013	0.0151	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
264		0.00	0.000	0.031	0.1370	0.0013	0.0147	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
265		0.00	0.000	0.028	0.1324	0.0013	0.0144	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
266		0.00	0.000	0.025	0.1285	0.0010	0.0111	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
267	*	0.00	0.000	0.000	0.1270	0.0008	0.0085	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
268		0.24	0.000	0.020	0.1439	0.0009	0.0107	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

269		0.74	0.000	0.024	0.2023	0.0011	0.0127	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
270		0.95	0.000	0.149	0.2685	0.0013	0.0147	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
271		0.00	0.000	0.066	0.2487	0.0021	0.0240	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
272	*	0.00	0.000	0.069	0.2278	0.0025	0.0284	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
273		0.00	0.000	0.090	0.2121	0.0013	0.0152	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
274		0.10	0.000	0.084	0.2077	0.0011	0.0128	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
275		0.05	0.000	0.105	0.1988	0.0014	0.0153	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
276		0.01	0.000	0.105	0.1875	0.0015	0.0171	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
277		0.22	0.000	0.289	0.1797	0.0016	0.0182	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
278		0.00	0.000	0.197	0.1614	0.0017	0.0189	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
279		0.00	0.000	0.081	0.1532	0.0017	0.0192	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
280		0.03	0.000	0.055	0.1501	0.0017	0.0193	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
281		0.11	0.000	0.042	0.1556	0.0017	0.0192	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
282		0.00	0.000	0.035	0.1524	0.0017	0.0189	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
283		0.00	0.000	0.031	0.1493	0.0016	0.0186	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
284		0.00	0.000	0.028	0.1463	0.0016	0.0182	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
285		0.33	0.000	0.026	0.1709	0.0017	0.0193	7.03E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
286		0.00	0.000	0.253	0.1484	0.0020	0.0231	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
287		0.00	0.000	0.024	0.1465	0.0013	0.0146	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
288		0.05	0.000	0.023	0.1488	0.0013	0.0150	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
289		0.18	0.000	0.022	0.1615	0.0016	0.0179	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
290		0.00	0.000	0.104	0.1521	0.0019	0.0209	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
291		0.66	0.000	0.021	0.2052	0.0013	0.0147	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
292		0.00	0.000	0.067	0.1996	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
293		0.01	0.000	0.057	0.1949	0.0015	0.0173	7.01E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
294	*	0.04	0.000	0.025	0.1959	0.0014	0.0161	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
295		0.00	0.000	0.063	0.1902	0.0013	0.0149	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
296		0.00	0.000	0.102	0.1809	0.0012	0.0139	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
297	*	0.00	0.000	0.050	0.1762	0.0011	0.0129	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
298		0.00	0.000	0.061	0.1711	0.0009	0.0100	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
299		1.64	0.000	0.066	0.3022	0.0008	0.0088	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
300		0.00	0.000	0.112	0.2460	0.0010	0.0111	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
301		0.00	0.000	0.063	0.2259	0.0004	0.0048	4.86E-09	0.0000	0.0000	1.43E-09	0.0000	0.0000	0.00E+00
302		0.00	0.000	0.074	0.2116	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
303		0.00	0.000	0.080	0.1996	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
304		0.00	0.000	0.112	0.1860	0.0000	0.0001	1.95E-09	0.0000	0.0000	9.92E-10	0.0000	0.0000	0.00E+00
305		0.00	0.000	0.168	0.1694	0.0001	0.0014	6.82E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
306		0.00	0.000	0.074	0.1604	0.0003	0.0030	6.84E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
307		0.27	0.000	0.054	0.1767	0.0004	0.0043	6.86E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
308		0.09	0.000	0.072	0.1773	0.0005	0.0055	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
309		0.00	0.000	0.056	0.1716	0.0006	0.0064	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
310		0.01	0.000	0.053	0.1674	0.0007	0.0074	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
311		0.00	0.000	0.093	0.1587	0.0010	0.0111	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
312		0.00	0.000	0.054	0.1530	0.0014	0.0163	6.99E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
313		0.00	0.000	0.041	0.1489	0.0013	0.0143	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
314		0.00	0.000	0.035	0.1454	0.0013	0.0144	6.97E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

315		0.04	0.000	0.031	0.1453	0.0012	0.0135	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
316		0.35	0.000	0.028	0.1718	0.0011	0.0126	6.96E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
317		0.00	0.000	0.054	0.1666	0.0011	0.0119	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
318		0.09	0.000	0.065	0.1676	0.0010	0.0112	6.94E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
319	*	0.00	0.000	0.031	0.1645	0.0009	0.0106	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
320	*	0.00	0.000	0.000	0.1641	0.0009	0.0101	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
321	*	0.00	0.000	0.000	0.1635	0.0008	0.0096	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
322	*	0.00	0.000	0.000	0.1630	0.0008	0.0091	6.92E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
323	*	0.07	0.000	0.026	0.1641	0.0008	0.0085	6.91E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
324		0.00	0.000	0.065	0.1598	0.0006	0.0066	6.89E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
325		0.00	0.000	0.125	0.1486	0.0005	0.0051	6.87E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
326		0.02	0.000	0.130	0.1392	0.0002	0.0019	6.27E-09	0.0000	0.0000	1.53E-09	0.0000	0.0000	0.00E+00
327		0.00	0.000	0.054	0.1346	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
328		0.00	0.000	0.041	0.1310	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
329		0.00	0.000	0.035	0.1278	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
330		0.00	0.000	0.028	0.1251	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
331		0.03	0.000	0.028	0.1246	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
332		0.35	0.000	0.026	0.1511	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
333		0.02	0.000	0.024	0.1504	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
334		0.02	0.000	0.023	0.1497	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
335		0.05	0.000	0.021	0.1516	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
336		0.02	0.000	0.020	0.1510	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
337		0.15	0.000	0.019	0.1615	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00	0.0000	0.0000	0.00E+00
338		0.18	0.000	0.066	0.1708	0.0000	0.0003	2.92E-09	0.0000	0.0000	1.20E-09	0.0000	0.0000	0.00E+00
339	*	0.01	0.000	0.029	0.1693	0.0003	0.0034	6.85E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
340	*	0.00	0.000	0.000	0.1690	0.0005	0.0058	6.88E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
341	*	0.01	0.000	0.008	0.1688	0.0007	0.0079	6.90E-09	0.0000	0.0000	1.56E-09	0.0000	0.0000	0.00E+00
342	*	0.00	0.000	0.000	0.1686	0.0009	0.0102	6.93E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
343	*	0.02	0.000	0.015	0.1690	0.0011	0.0125	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
344	*	0.00	0.000	0.000	0.1688	0.0013	0.0148	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
345	*	0.35	0.000	0.007	0.1703	0.0015	0.0169	7.00E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
346	*	0.00	0.000	0.014	0.1718	0.0017	0.0187	7.02E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
347	*	0.00	0.000	0.014	0.1732	0.0018	0.0204	7.04E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
348		0.00	0.000	0.005	0.1944	0.0019	0.0218	7.05E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
349	*	0.00	0.000	0.034	0.1915	0.0020	0.0231	7.06E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
350	*	0.00	0.000	0.000	0.1913	0.0021	0.0236	7.07E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
351	*	0.00	0.000	0.000	0.1912	0.0022	0.0246	7.08E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
352	*	0.63	0.000	0.026	0.1927	0.0023	0.0255	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
353	*	0.32	0.000	0.024	0.1942	0.0023	0.0259	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
354		0.02	0.000	0.000	0.2665	0.0023	0.0259	7.09E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
355		0.28	0.000	0.042	0.2745	0.0025	0.0284	7.12E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
356		0.00	0.000	0.066	0.2470	0.0026	0.0291	7.13E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
357		0.00	0.000	0.085	0.2261	0.0023	0.0262	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
358		0.13	0.000	0.139	0.2176	0.0011	0.0129	6.95E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
359		0.00	0.000	0.045	0.2086	0.0013	0.0147	6.98E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00
360		0.01	0.000	0.039	0.2032	0.0024	0.0268	7.10E-09	0.0000	0.0000	1.57E-09	0.0000	0.0000	0.00E+00

361	*	0.01	0.000	0.029	0.1988	0.0030	0.0335	7.17E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
362	*	0.00	0.000	0.000	0.1959	0.0032	0.0365	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
363		0.00	0.000	0.044	0.1897	0.0033	0.0373	7.21E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
364	*	0.00	0.000	0.001	0.1877	0.0033	0.0369	7.20E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00
365	*	0.00	0.000	0.000	0.1861	0.0032	0.0358	7.19E-09	0.0000	0.0000	1.58E-09	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 5			
	inches	cubic feet	percent
Precipitation	27.07	98,265.9	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	21.360	77,536.1	78.90
Drainage Collected from Layer 3	6.9573	25,255.2	25.70
Percolation/Leakage through Layer 5	0.000002	0.0088	0.00
Average Head on Top of Layer 4	0.0017	---	---
Drainage Collected from Layer 7	0.0000	0.0068	0.00
Percolation/Leakage through Layer 9	0.000001	0.0020	0.00
Average Head on Top of Layer 8	0.0000	---	---
Percolation/Leakage through Layer 10	0.000000	0.0000	0.00
Change in Water Storage	-1.2467	-4,525.3	-4.61
Soil Water at Start of Year	60.7926	220,677.3	224.57
Soil Water at End of Year	59.5460	216,151.9	219.97
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	0.0000	0.0000	0.00

Average Annual Totals Summary

Title: Wayne Disposal - Initial Lift
Simulated on: 11/20/2020 16:25

	Average Annual Totals for Years 1 - 5*			
	(inches)	[std dev]	(cubic feet)	(percent)
Precipitation	30.01	[2.22]	108,930.5	100.00
Runoff	0.000	[0]	0.0000	0.00
Evapotranspiration	22.117	[2.858]	80,283.6	73.70
Subprofile1				
Lateral drainage collected from Layer 3	7.0350	[3.1772]	25,537.2	23.44
Percolation/leakage through Layer 5	0.000002	[0]	0.0085	0.00
Average Head on Top of Layer 4	0.0017	[0.0008]	---	---
Subprofile2				
Lateral drainage collected from Layer 7	0.0000	[0]	0.0066	0.00
Percolation/leakage through Layer 9	0.000001	[0]	0.0019	0.00
Average Head on Top of Layer 8	0.0000	[0]	---	---
Subprofile3				
Percolation/leakage through Layer 10	0.000000	[0]	0.0000	0.00
Water storage				
Change in water storage	0.8567	[2.0258]	3,109.7	2.85

* Note: Average inches are converted to volume based on the user-specified area.

Peak Values Summary

Title: Wayne Disposal - Initial Lift
Simulated on: 11/20/2020 16:25

	Peak Values for Years 1 - 5*	
	(inches)	(cubic feet)
Precipitation	1.64	5,960.5
Runoff	0.000	0.0000
Subprofile1		
Drainage collected from Layer 3	0.2347	852.1
Percolation/leakage through Layer 5	0.000000	0.0000
Average head on Layer 4	0.0208	---
Maximum head on Layer 4	0.0415	---
Location of maximum head in Layer 3	0.00	(feet from drain)
Subprofile2		
Drainage collected from Layer 7	0.0000	0.0000
Percolation/leakage through Layer 9	0.000000	0.0000
Average head on Layer 8	0.0000	---
Maximum head on Layer 8	0.0000	---
Location of maximum head in Layer 7	0.00	(feet from drain)
Subprofile3		
Percolation/leakage through Layer 10	0.000000	0.0000
Other Parameters		
Snow water	1.4263	5,177.4
Maximum vegetation soil water	0.4570	(vol/vol)
Minimum vegetation soil water	0.1013	(vol/vol)

Final Water Storage in Landfill Profile at End of Simulation Period

Title: Wayne Disposal - Initial Lift
Simulated on: 11/20/2020 16:26
Simulation period: 5 years

	Final Water Storage	
Layer	(inches)	(vol/vol)
1	25.6134	0.2134
2	1.8908	0.1576
3	0.0046	0.0230
4	0.0000	0.0000
5	0.3750	0.7500
6	22.3800	0.3730
7	0.0050	0.0100
8	0.0000	0.0000
9	0.3750	0.7500
10	8.9022	0.3709
Snow water	0.0000	---

Attachment C

Permit Drawings

WAYNE DISPOSAL, INC. SITE NO. 2
MASTER CELL VI-F&G

VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

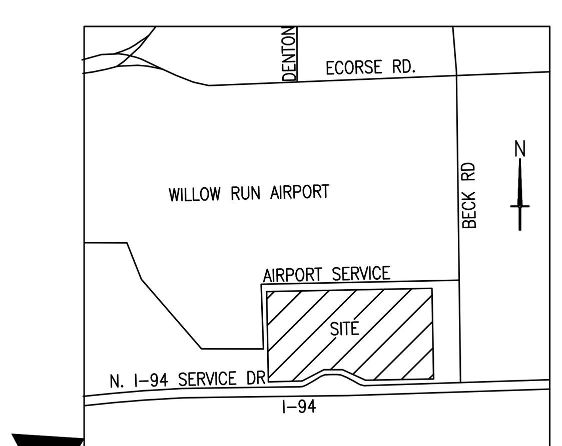
CTI PROJECT NO.1188070010

FEBRUARY 2011
REVISED: SEPTEMBER 2011
REVISED: MAY 2018
REVISED: JANUARY 2021

OWNER:
Wayne Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, Michigan 48111

ENGINEER:
CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
Novi, Michigan 48377

MICHIGAN
APPROX. SCALE: 1"=50 MILES



LOCATION MAP- WAYNE COUNTY
NO SCALE

SHEET INDEX

REVISIONS

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1–F4 REVISIONS	WRG	XZ
E	5/29/18	ADDENDUM 1		XZ
D	5/08/18	REV. BASED ON MDEQ'S COMMENTS		XZ
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS		XZ
B	9/23/11	PER MDEQ COMMENTS		DRL
A	6/10/11	PHASING DESIGNATIONS		DRL

CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
Novi, Michigan 48377
248.486.5100 (fax)248.486.5050
www.cticompanies.com

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

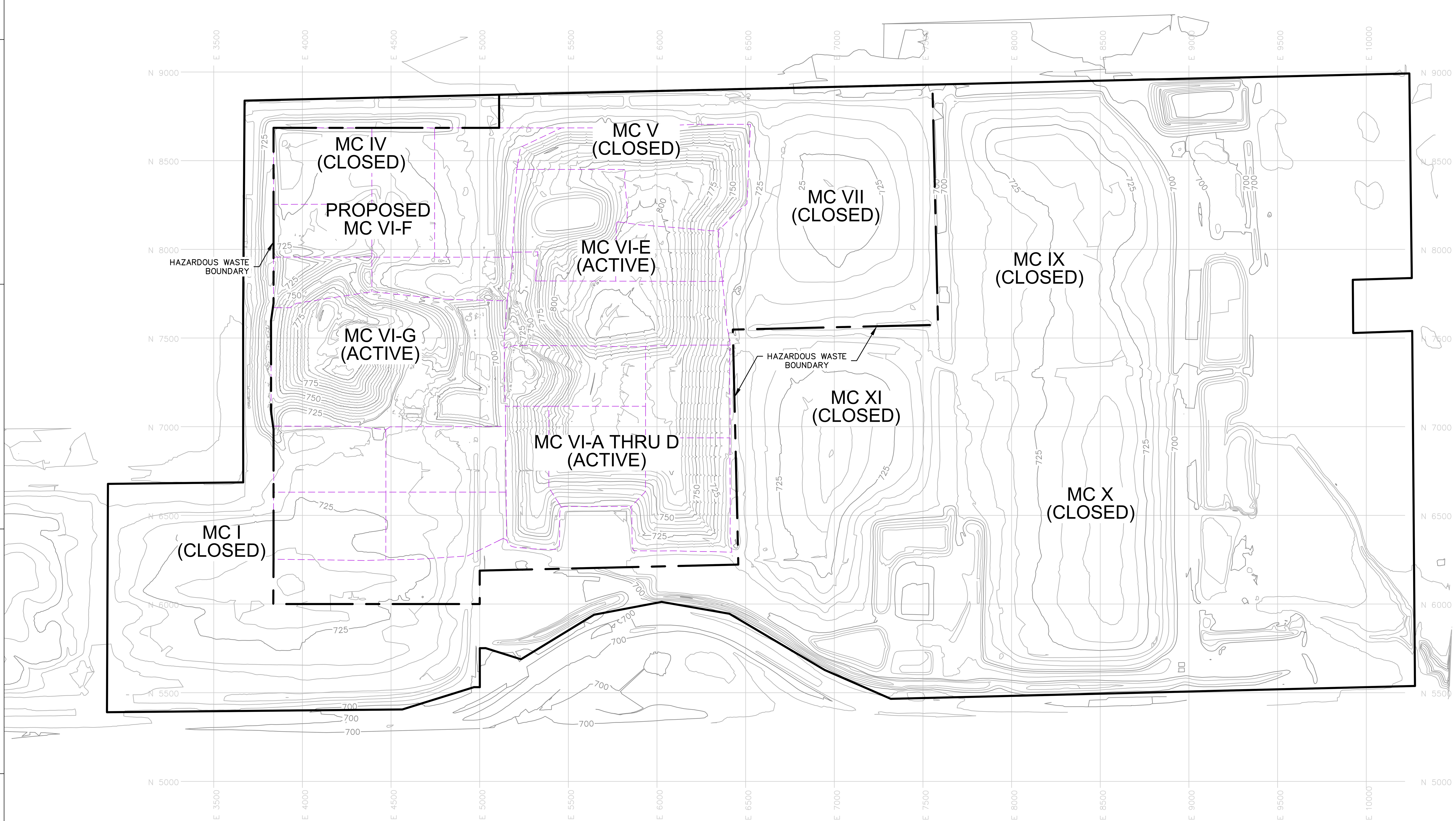
WAYNE DISPOSAL, INC. SITE NO. 2- MASTER CELL VI-F&G
TITLE SHEET
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

TITLE SHEET

PROJECT NUMBER
1208070039

SCALE
NONE

DRAWING NO
01



0 300 600
SCALE IN FEET

LEGEND

500 EXISTING MAJOR CONTOURS
EXISTING MINOR CONTOURS
HAZARDOUS WASTE BOUNDARY
PROPERTY BOUNDARY
SUBCELL BOUNDARY

NOTES:

1. THE BASE MAP WAS CREATED USING AN AERIAL SURVEY TAKEN IN 2020 BY WDI.

CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
Novi, Michigan 48377
248.486.5100 (fax)248.486.5050
www.cticompanies.com

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

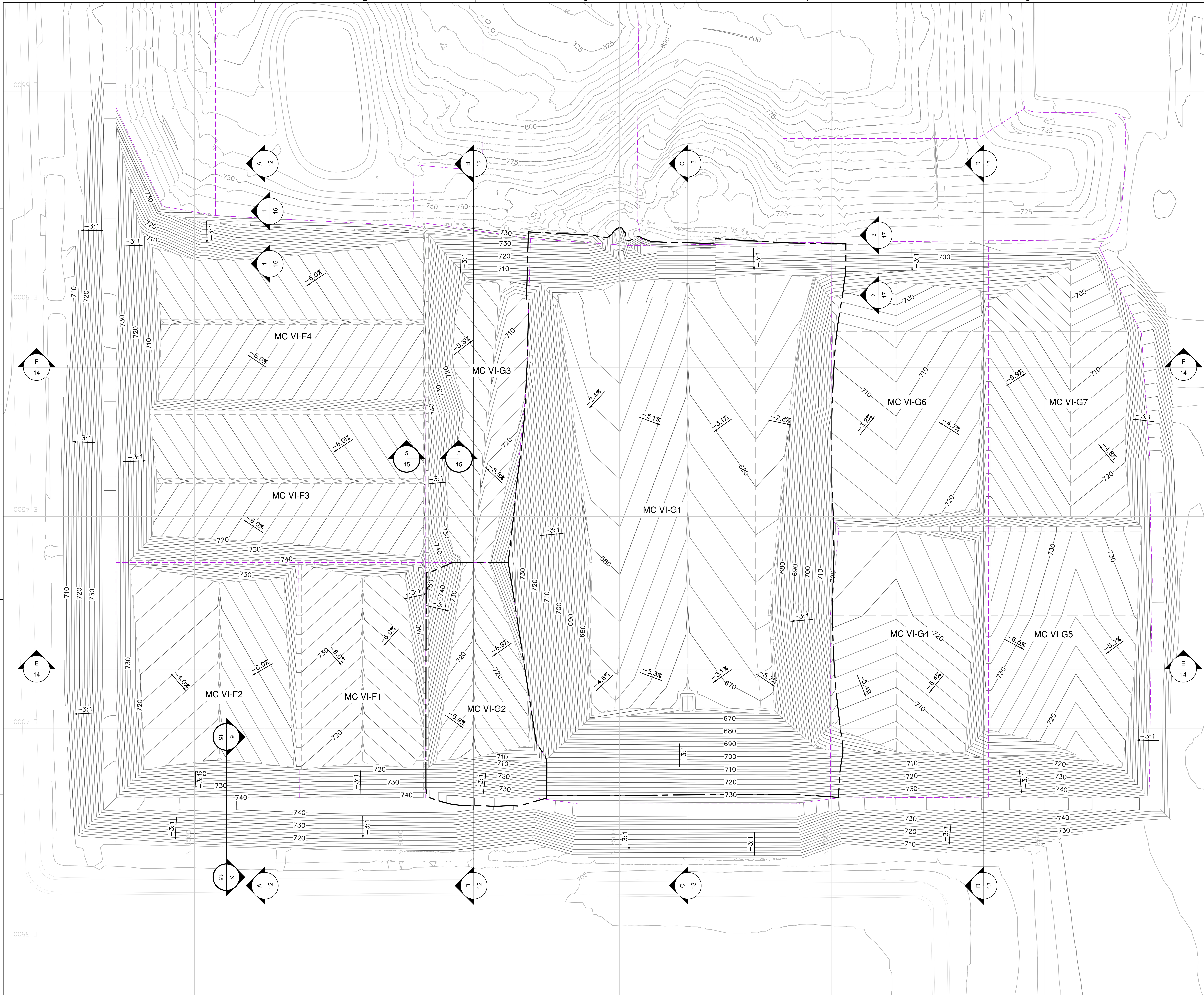
REVISIONS

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ

WAYNE DISPOSAL, INC. SITE NO. 2- MASTER CELL VI-F&G
GENERAL SITE PLAN
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

GENERAL SITE PLAN

PROJECT NUMBER 1208070039
SCALE 1" = 300'
DRAWING NO 02



LEGEND

500	EXISTING MAJOR CONTOURS
	EXISTING MAJOR CONTOURS
	PROPERTY BOUNDARY
500	MASTER CELL VI-F & G MAJOR CONTOURS
	MASTER CELL VI-F & G MINOR CONTOURS
	GRADE BREAK
	SUBCELL BOUNDARY
	AS-BUILT BOUNDARY

NOTES:

1. THE BASE MAP WAS CREATED USING AN AERIAL SURVEY TAKEN IN 2020 BY WDI.
2. GRADES DEPICTED IN MC VI-G SUBCELLS G1-G2 REPRESENT AS-BUILT TOP OF SUBGRADE.

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
Novi, Michigan 48377
248.486.5100 (fax)248.486.5050
www.cticompanies.com

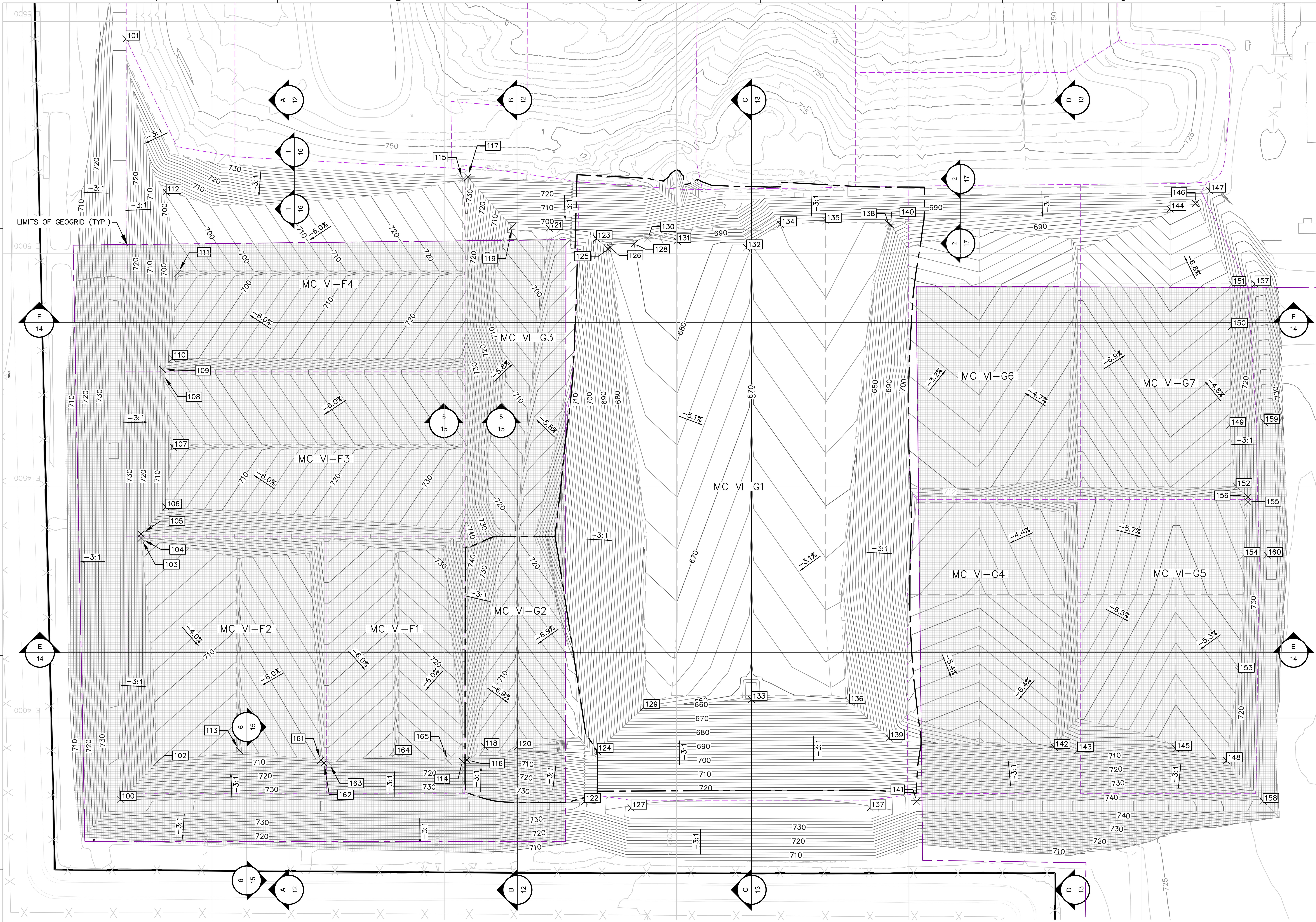
REVISIONS

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS	PAA	XZ
B	9/23/11	PER MDEQ COMMENTS		DRL
A	6/10/11	PHASING DESIGNATIONS		DRL

WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
CONSTRUCTION PHASING
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

CONSTRUCTION PHASING

PROJECT NUMBER 1208070039
SCALE 1" = 100'
DRAWING NO 03



LEGEND

500	EXISTING MAJOR CONTOURS
	EXISTING MAJOR CONTOURS
	PROPERTY BOUNDARY
500	MASTER CELL VI-F & G MAJOR CONTOURS
	MASTER CELL VI-F & G MINOR CONTOURS
	GRADE BREAK
	GRADE BREAK(MAY 2018 PERMIT)
	PROPOSED SUBCELL BOUNDARY
	EXISTING MC I/MC IV BOUNDARY
	AREA TO BE COVERED BY GEOGRID
100	PROPOSED DIKE COORDINATE POINT NO.
3:1	PROPOSED SLOPE
	AS-BUILT BOUNDARY

NOTES:

1. THE BASE MAP WAS CREATED USING AN AERIAL SURVEY TAKEN IN 2020 BY WDI.
2. GRADES DEPICTED IN MC VI-G SUBCELLS G1-G2 REPRESENT AS-BUILT TOP OF SUBGRADE.

SUBGRADE PERIMETER DIKE COORDINATES			
Point #	Northing	Easting	Elevation (ft)
100	8696.95	3825.42	730.00
101	8685.01	5462.64	720.71
102	8618.63	3904.74	705.98
103	8652.59	4386.81	721.34
104	8652.83	4387.08	721.42
105	8652.78	4396.24	721.42
106	8599.35	4454.59	703.72
107	8583.77	4583.16	699.09
108	8605.58	4739.88	704.33

SUBGRADE PERIMETER DIKE COORDINATES			
Point #	Northing	Easting	Elevation (ft)
109	8605.88	4750.21	704.32
110	8585.05	4774.98	697.17
111	8573.54	4957.47	690.49
112	8598.69	5132.62	698.35
113	8441.35	3930.96	700.80
114	7961.13	3907.15	711.29
115	7960.81	5158.83	731.11
116	7951.05	3909.68	709.54
117	7949.45	5164.97	0.00

SUBGRADE PERIMETER DIKE COORDINATES			
Point #	Northing	Easting	Elevation (ft)
118	7913.92	3939.16	700.65
119	7853.52	5057.82	0.00
120	7842.73	3938.19	697.92
121	7774.33	5054.99	702.31
122	7697.89	3821.03	730.74
123	7672.54	5032.68	686.26
124	7670.81	3928.84	694.50
125	7647.66	5010.45	678.68
126	7641.99	5012.71	680.19

SUBGRADE PERIMETER DIKE COORDINATES			
Point #	Northing	Easting	Elevation (ft)
127	7597.89	3806.80	735.60
128	7591.06	5021.51	682.01
129	7570.41	4023.20	663.24
130	7561.67	5032.75	683.13
131	7498.71	5027.05	685.09
132	7349.00	5012.85	678.14
133	7338.74	4040.41	658.10
134	7276.06	5062.38	679.69
135	7179.18	5070.45	681.75

SUBGRADE PERIMETER DIKE COORDINATES			
Point #	Northing	Easting	Elevation (ft)
136	7127.70	4034.87	660.23
137	7083.24	3807.01	736.24
138	7043.49	5064.48	678.89
139	7042.16	3957.20	684.60
140	7039.03	5062.00	677.47
141	6983.25	3821.03	729.35
142	6687.01	3937.42	698.98
143	6636.63	3931.13	702.62
144	6437.61	5096.19	685.31

SUBGRADE PERIMETER DIKE COORDINATES			
Point #	Northing	Easting	Elevation (ft)
145	6425.37	3933.71	704.74
146	6383.17	5108.23	687.81
147	6352.10	5135.27	696.41
148	6316.02	3908.50	709.72
149	6308.86	4630.41	711.90
150	6304.89	4844.00	704.12
151	6304.21	4934.01	700.81
152	6295.30	4498.77	717.18
153	6290.14	4101.64	716.79

SUBGRADE PERIMETER DIKE COORDINATES			
Point #	Northing	Easting	Elevation (ft)
154	6278.55	4350.36	723.66
155	6270.50	4465.41	725.70
156	6270.26	4476.27	725.42
157	6254.80	4935.00	717.24
158	6237.41	3821.03	736.23
159	6235.06	4636.89	736.17
160	6228.94	4350.65	739.90
161	8265.78	3909.28	710.49
161	8265.78	3909.28	710.49

SUBGRADE PERIMETER DIKE COORDINATES			
Point #	Northing	Easting	Elevation (ft)
162	8258.95	3903.52	712.50
162	8258.95	3903.52	712.50
163	8248.62	3904.19	712.53
164	8104.44	3924.15	706.44
165	7991.56	3907.10	711.41

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
Novi, Michigan 48377
248.486.5100 (fax)248.486.5050
www.cticompanies.com

REVISIONS

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
B	9/23/11	PER MDEQ COMMENTS		DRL
A	6/10/11	PHASING DESIGNATIONS		DRL

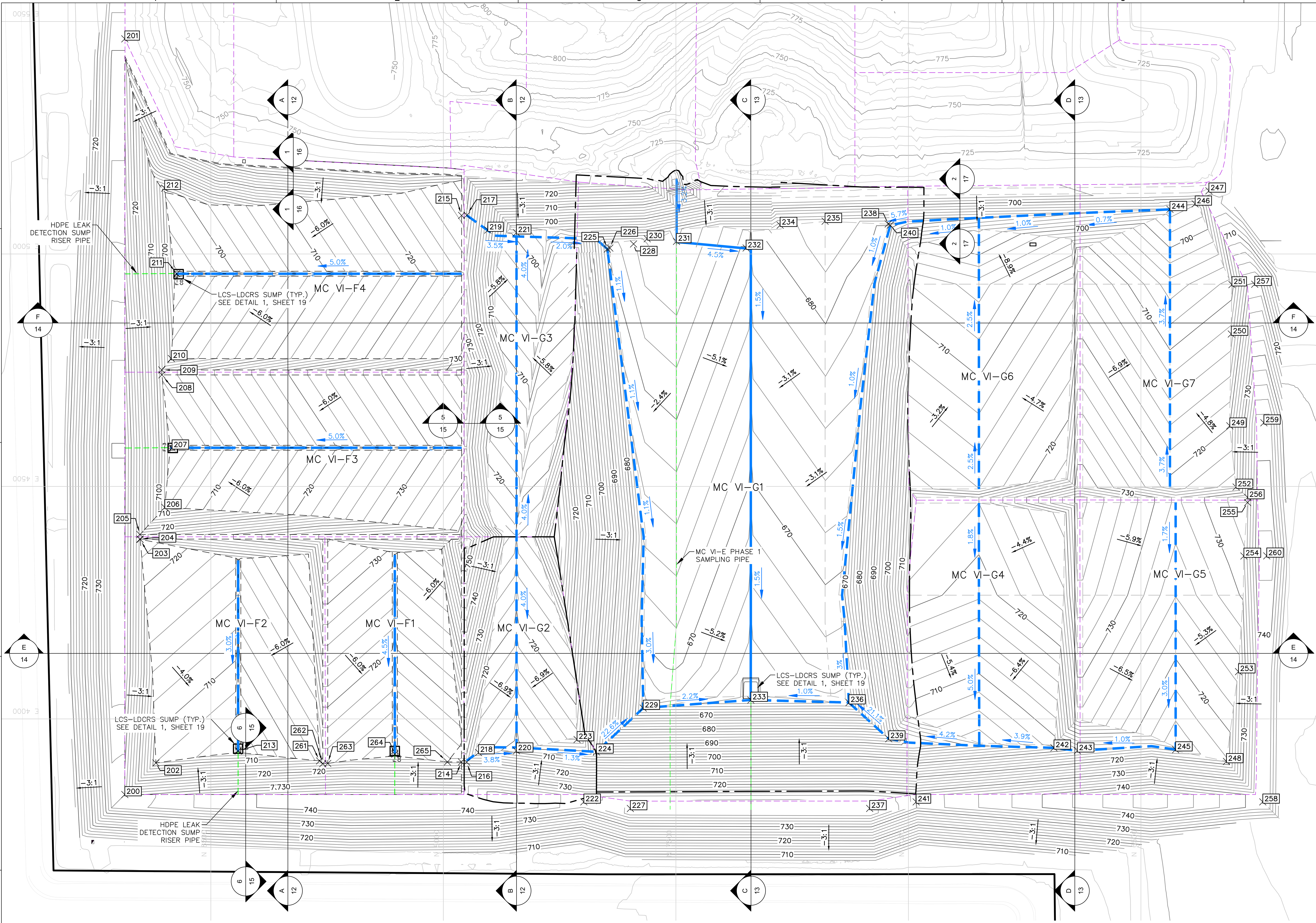
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
TOP OF SUBGRADE GRADING PLAN
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

TOP OF SUBGRADE GRADING PLAN

PROJECT NUMBER 1208070039

SCALE 1" = 100'

DRAWING NO 04



LEGEND

- 500 EXISTING MAJOR CONTOURS
- EXISTING MAJOR CONTOURS
- PROPERTY BOUNDARY
- 500 MASTER CELL VI-F & G MAJOR CONTOURS
- MASTER CELL VI-F & G MINOR CONTOURS
- GRADE BREAK
- GRADE BREAK(MAY 2018 PERMIT)
- 100 PROPOSED DIKE COORDINATE POINT NO.
- 3:1 PROPOSED SLOPE
- PROPOSED 2 EXTRA LAYERS OF GEONET 7.5' WIDE BENEATH GEOCOMPOSITE WITH FLOW DIRECTION
- PROPOSED 5 EXTRA LAYERS OF GEONET, 11.5' WIDE, BENEATH GEOCOMPOSITE WITH FLOW DIRECTION
- PROPOSED SOLID LEAK DETECTION SUMP RISER PIPE
- PROPOSED SECONDARY COLLECTION SUMP
- AS-BUILT BOUNDARY

NOTES:

1. THE BASE MAP WAS CREATED USING AN AERIAL SURVEY TAKEN IN 2020 BY WDI.
2. GRADES DEPICTED IN MC VI-G SUBCELLS G1-G2 REPRESENT AS-BUILT TOP OF SECONDARY LINER

SECONDARY DIKE COORDINATE POINTS

Point #	Northing	Easting	Elevation
200	8685.01	3837.32	728.96
201	8685.01	5462.64	722.82
202	8618.14	3905.24	707.94
203	8652.04	4386.21	723.27
204	8652.53	4386.75	723.43
205	8652.48	4396.57	723.43
206	8599.03	4454.94	705.72
207	8583.37	4583.16	701.11
208	8605.29	4739.88	706.35

SECONDARY DIKE COORDINATE POINTS

Point #	Northing	Easting	Elevation
209	8605.60	4750.54	706.33
210	8584.93	4775.12	699.17
211	8573.40	4957.47	692.57
212	8599.30	5141.46	698.57
213	8441.11	3930.91	702.92
214	7961.13	3907.36	713.33
215	7960.81	5082.91	709.33
216	7949.91	3907.03	713.51
217	7949.59	5083.40	709.66

SECONDARY DIKE COORDINATE POINTS

Point #	Northing	Easting	Elevation
218	7924.24	3927.69	706.53
219	7904.34	5051.40	697.89
220	7842.87	3931.37	703.56
221	7842.87	5045.71	695.60
222	7697.85	3821.52	733.74
223	7712.50	3955.68	716.00
224	7670.78	3929.03	697.65
225	7647.54	5010.47	681.80
226	7641.99	5012.71	683.24

SECONDARY DIKE COORDINATE POINTS

Point #	Northing	Easting	Elevation
227	7597.85	3807.29	738.60
228	7591.06	5021.51	685.01
229	7570.29	4023.33	666.36
230	7561.67	5032.75	686.20
231	7498.71	5027.05	688.09
232	7349.00	5012.85	681.14
233	7338.74	4040.54	661.22
234	7275.80	5061.92	682.69
235	7179.18	5070.45	684.75

SECONDARY DIKE COORDINATE POINTS

Point #	Northing	Easting	Elevation
236	7127.83	4034.99	663.35
237	7083.28	3807.50	739.24
238	7043.49	5064.48	681.99
239	7042.34	3957.36	687.71
240	7039.01	5061.89	680.59
241	6983.28	3821.52	732.35
242	6686.99	3937.74	702.15
243	6636.62	3931.46	705.79
244	6437.59	5096.06	688.43

SECONDARY DIKE COORDINATE POINTS

Point #	Northing	Easting	Elevation
245	6425.35	3933.83	707.86
246	6383.34	5107.71	690.84
247	6353.82	5135.70	699.60
248	6316.02	3908.50	712.72
249	6308.86	4630.41	714.90
250	6305.63	4827.81	707.70
251	6304.21	4934.01	703.81
252	6295.30	4498.77	720.18
253	6290.14	4101.64	719.79

SECONDARY DIKE COORDINATE POINTS

Point #	Northing	Easting	Elevation
254	6278.55	4350.36	726.66
255	6270.50	4465.41	728.70
256	6270.26	4476.27	728.59
257	6255.28	4934.88	720.24
258	6237.90	3821.52	739.23
259	6235.55	4636.87	739.17
260	6229.43	4350.65	742.90
261	8266.19	3909.62	712.48
261	8266.19	3909.62	712.48

SECONDARY DIKE COORDINATE POINTS

Point #	Northing	Easting	Elevation
262	8259.28	3903.79	714.52
262	8259.28	3903.79	714.52
263	8248.62	3904.19	714.53
264	8104.44	3924.29	708.51
265	7991.35	3907.36	713.43

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
Novi, Michigan 48377
248.486.5100 (fax)248.486.5050
www.cticompanies.com

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS	PAA	XZ
B	9/23/11	PER MDEQ COMMENTS	DRL	
A	6/10/11	PHASING DESIGNATIONS	DRL	

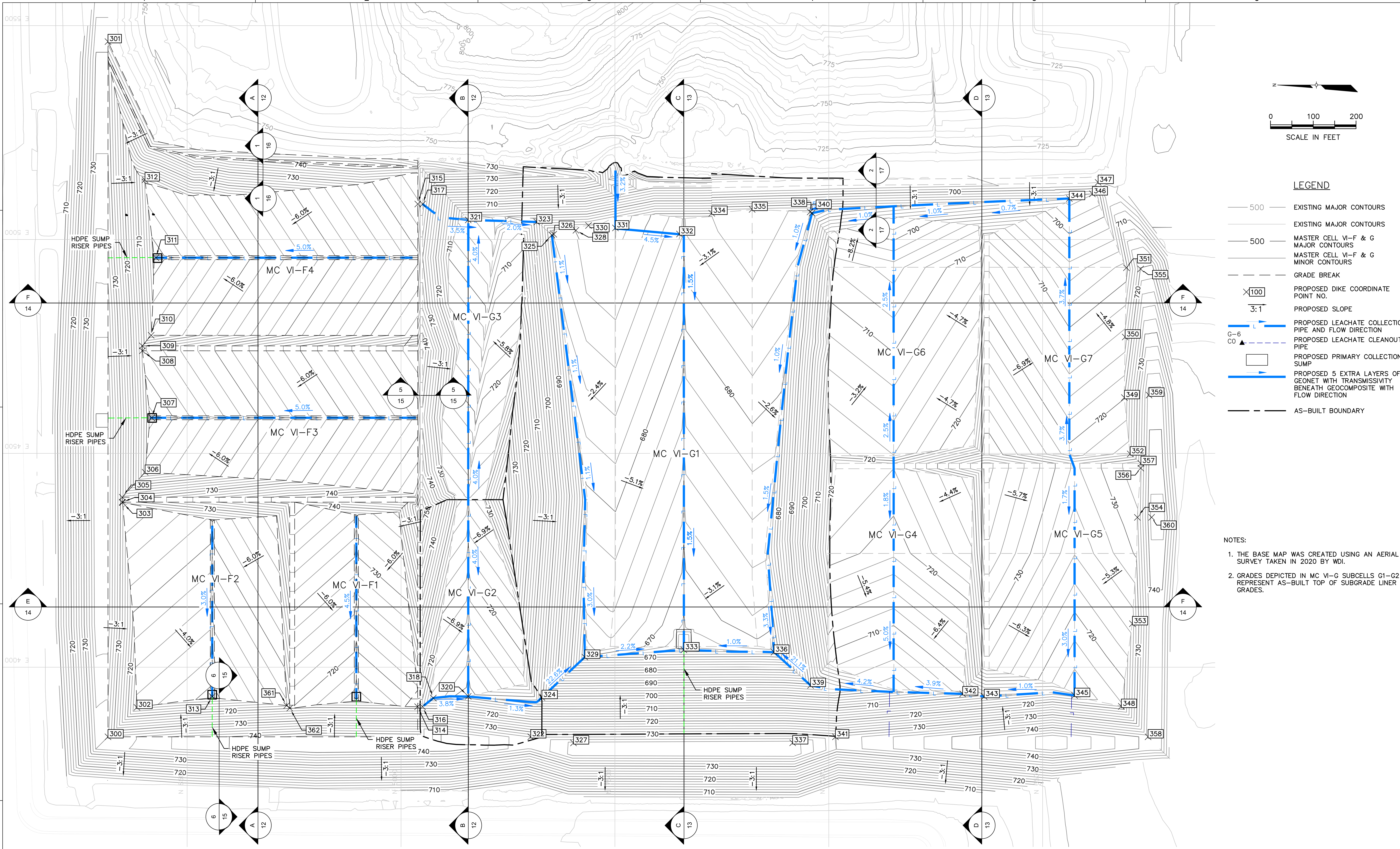
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
TOP OF SECONDARY LINER GRADING PLAN
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

TOP OF SECONDARY LINER GRADING PLAN

PROJECT NUMBER 1208070039

SCALE 1" = 100'

DRAWING NO 05



PRIMARY DIKE COORDINATE POINTS			
Point #	Northing	Easting	Elevation
300	8685.01	3837.32	734.39
301	8685.01	5462.64	728.25
302	8617.26	3906.14	713.09
303	8651.02	4385.09	728.36
304	8651.77	4385.91	728.60
305	8651.71	4397.41	728.61
306	8598.22	4455.83	710.88
307	8582.93	4583.16	706.44
308	8604.56	4739.88	711.53

PRIMARY DIKE COORDINATE POINTS			
Point #	Northing	Easting	Elevation
309	8604.89	4751.38	711.52
310	8584.15	4776.05	704.33
311	8572.95	4957.47	697.90
312	8598.52	5139.51	703.64
313	8441.35	3931.41	708.19
314	7961.13	3907.79	718.62
315	7960.81	5082.91	714.76
316	7949.75	3907.70	718.61
317	7949.43	5082.91	714.76

PRIMARY DIKE COORDINATE POINTS			
Point #	Northing	Easting	Elevation
318	7924.50	3928.02	711.75
319	7904.56	5051.05	703.11
320	7842.87	3931.97	708.82
321	7842.87	5045.77	700.84
322	7696.73	3837.32	733.74
323	7682.58	5040.91	697.50
324	7670.57	3929.29	702.88
325	7647.35	5010.49	687.00
326	7642.85	5012.25	688.18

PRIMARY DIKE COORDINATE POINTS			
Point #	Northing	Easting	Elevation
327	7596.74	3823.09	738.60
328	7591.06	5021.51	690.24
329	7570.10	4023.55	671.56
330	7561.67	5032.75	691.59
331	7498.71	5027.05	693.52
332	7349.00	5012.85	686.42
333	7338.74	4040.74	666.42
334	7273.49	5061.28	687.73
335	7179.18	5070.45	689.94

PRIMARY DIKE COORDINATE POINTS			
Point #	Northing	Easting	Elevation
336	7128.04	4035.19	668.55
337	7084.38	3823.30	739.24
338	7043.49	5064.48	687.10
339	7042.63	3957.62	692.90
340	7038.96	5061.69	685.79
341	6984.38	3837.32	732.35
342	6686.99	3937.74	0.00
343	6636.62	3931.46	0.00
344	6437.60	5095.87	693.63

PRIMARY DIKE COORDINATE POINTS			
Point #	Northing	Easting	Elevation
345	6425.32	3934.02	713.06
346	6383.71	5106.68	695.89
347	6370.28	5133.49	704.60
348	6316.02	3908.50	717.88
349	6308.86	4630.41	720.03
350	6307.07	4772.00	714.72
351	6304.21	4934.01	709.18
352	6295.30	4498.77	725.35
353	6290.14	4101.68	724.99

PRIMARY DIKE COORDINATE POINTS			
Point #	Northing	Easting	Elevation
354	6278.55	4350.36	731.79
355	6270.86	4931.07	720.24
356	6270.50	4465.41	733.79
357	6270.26	4476.27	733.80
358	6253.54	3837.32	739.23
359	6251.34	4636.24	739.17
360	6245.23	4350.52	742.90
361	8267.23	3910.50	717.60
361	8267.23	3910.50	717.60

PRIMARY DIKE COORDINATE POINTS			
Point #	Northing	Easting	Elevation
362	8260.12	3904.50	719.70
362	8260.12	3904.50	719.70
363	8248.62	3904.93	719.72
364	8104.44	3924.72	713.84
365	7990.81	3908.04	718.64

CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
Novi, Michigan 48377
248.486.5100 (fax)248.486.5050
www.cticompanies.com

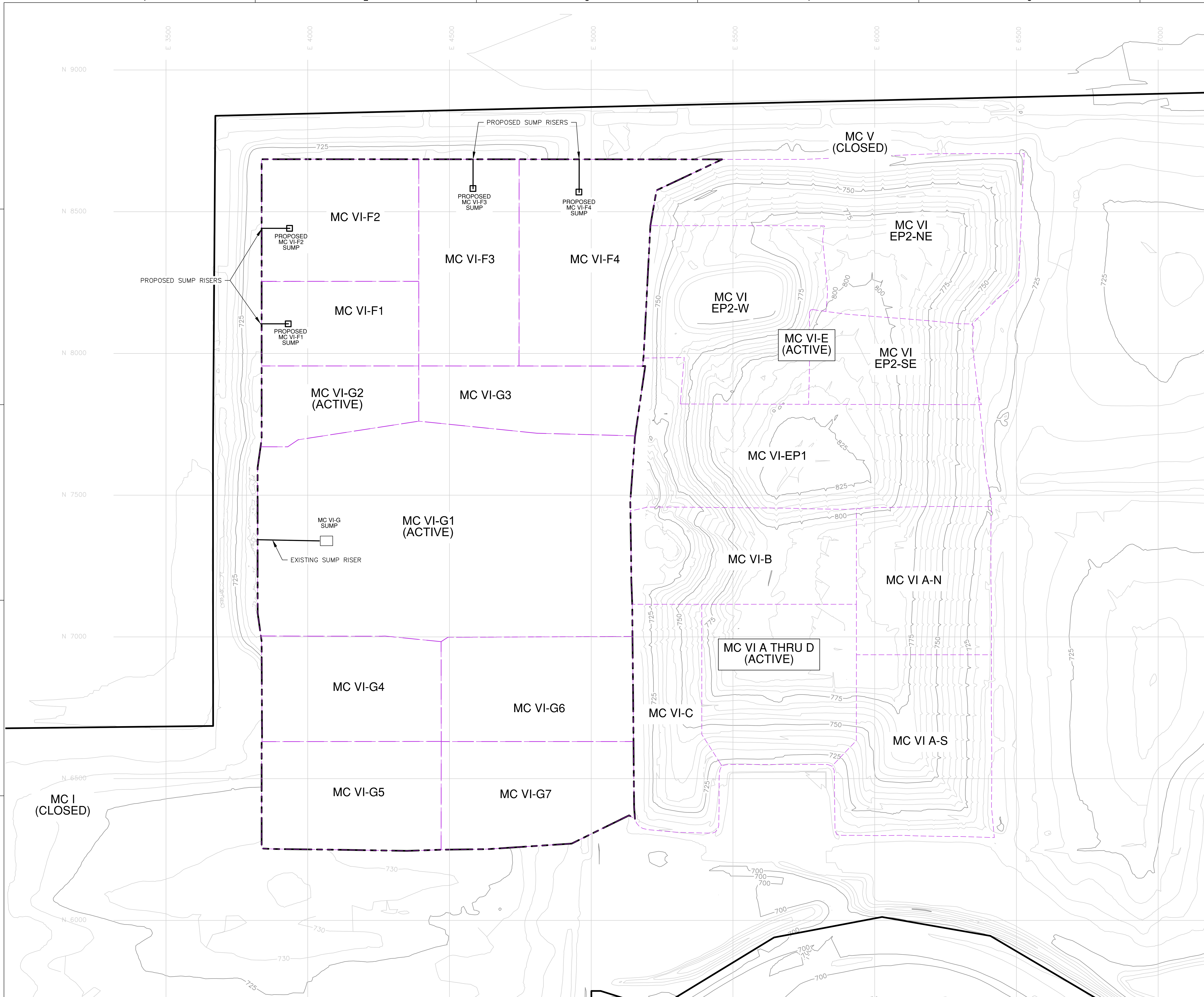
DATE: 01/20/21
DESIGNED BY: BA
DRAWN BY: WRG
CHECKED BY: CAB
APPROVED BY: XZ

REV	DATE	REVISION DESCRIPTION	DRN	APP
A	6/10/11	PHASING DESIGNATIONS		DRL
B	9/23/11	PER MDEQ COMMENTS		DRL
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS	PAA	XZ
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ

WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
TOP OF PRIMARY LINER GRADING PLAN
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

TOP OF PRIMARY LINER GRADING PLAN

PROJECT NUMBER 1208070039
SCALE 1" = 100'
DRAWING NO 06



0 150 300
SCALE IN FEET

LEGEND

500 EXISTING MAJOR CONTOURS
EXISTING MINOR CONTOURS
SUBCELL BOUNDARIES

NOTES:

1. THE BASE MAP WAS CREATED USING AN AERIAL SURVEY TAKEN IN 2020 BY WDI.

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
Novi, Michigan 48377
248.486.5100 (fax)248.486.5050
www.cticompanies.com

REVISIONS

REV	DATE	REVISION DESCRIPTION	DRN	DRL	APP
F	01/20/21	SUBCELLS F1–F4 REVISIONS	WRG		XZ
A	6/10/11	PHASING DESIGNATIONS			

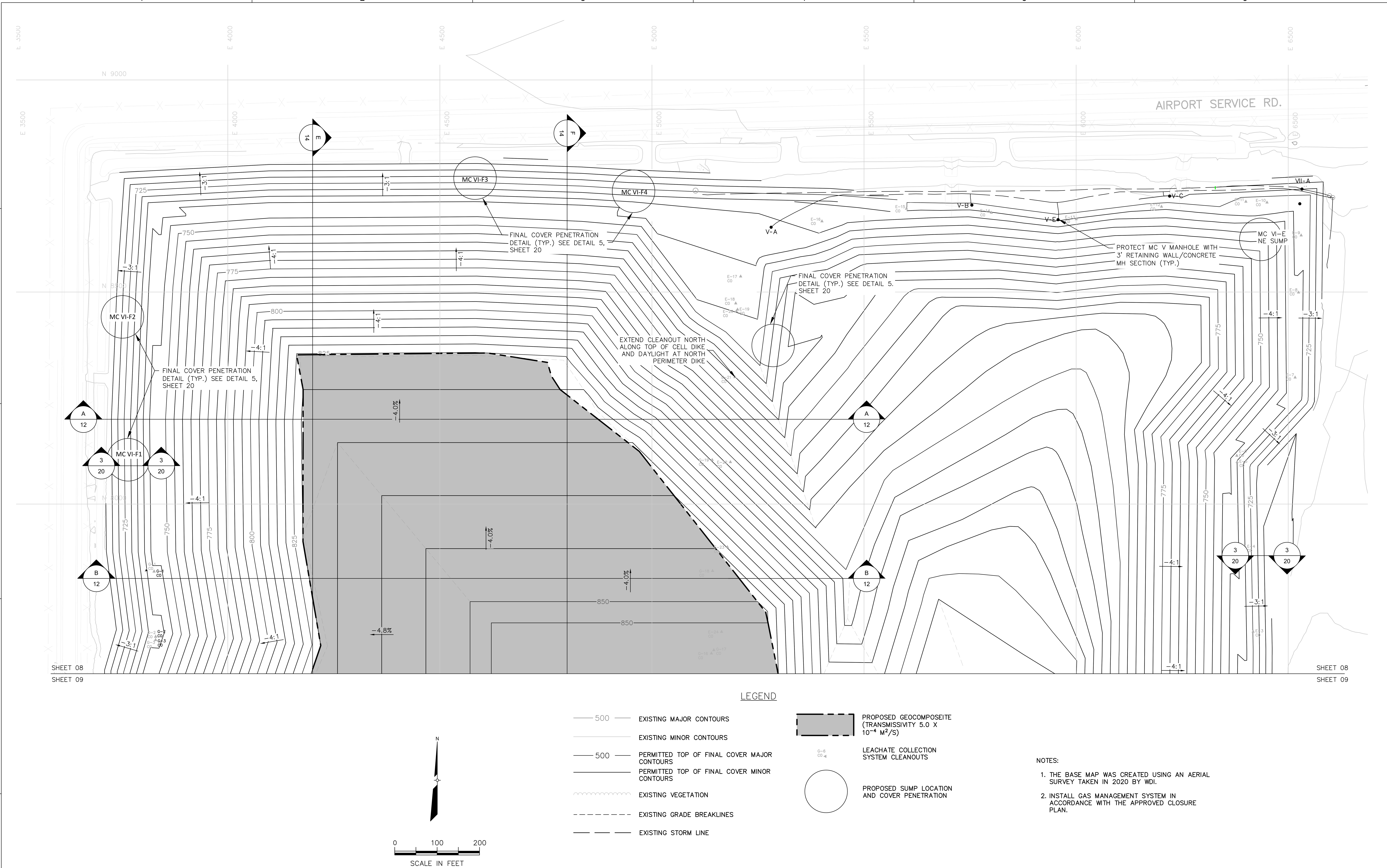
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
LEACHATE MANAGEMENT PLAN
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

LEACHATE MANAGEMENT PLAN

PROJECT NUMBER
1208070039

SCALE
1" = 150'

DRAWING NO
07



LEGEND

500	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
500	PERMITTED TOP OF FINAL COVER MAJOR CONTOURS
	PERMITTED TOP OF FINAL COVER MINOR CONTOURS
	EXISTING VEGETATION
	EXISTING GRADE BREAKLINES
	EXISTING STORM LINE
	PROPOSED GEOCOMPOSEITE (TRANSMISSIVITY 5.0 X 10^{-4} M^2/S)
	LEACHATE COLLECTION SYSTEM CLEANOUTS
	PROPOSED SUMP LOCATION AND COVER PENETRATION

NOTES:

1. THE BASE MAP WAS CREATED USING AN AERIAL SURVEY TAKEN IN 2020 BY WDI.
2. INSTALL GAS MANAGEMENT SYSTEM IN ACCORDANCE WITH THE APPROVED CLOSURE PLAN.

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
Novi, Michigan 48377
248.486.5100 (fax)248.486.5050
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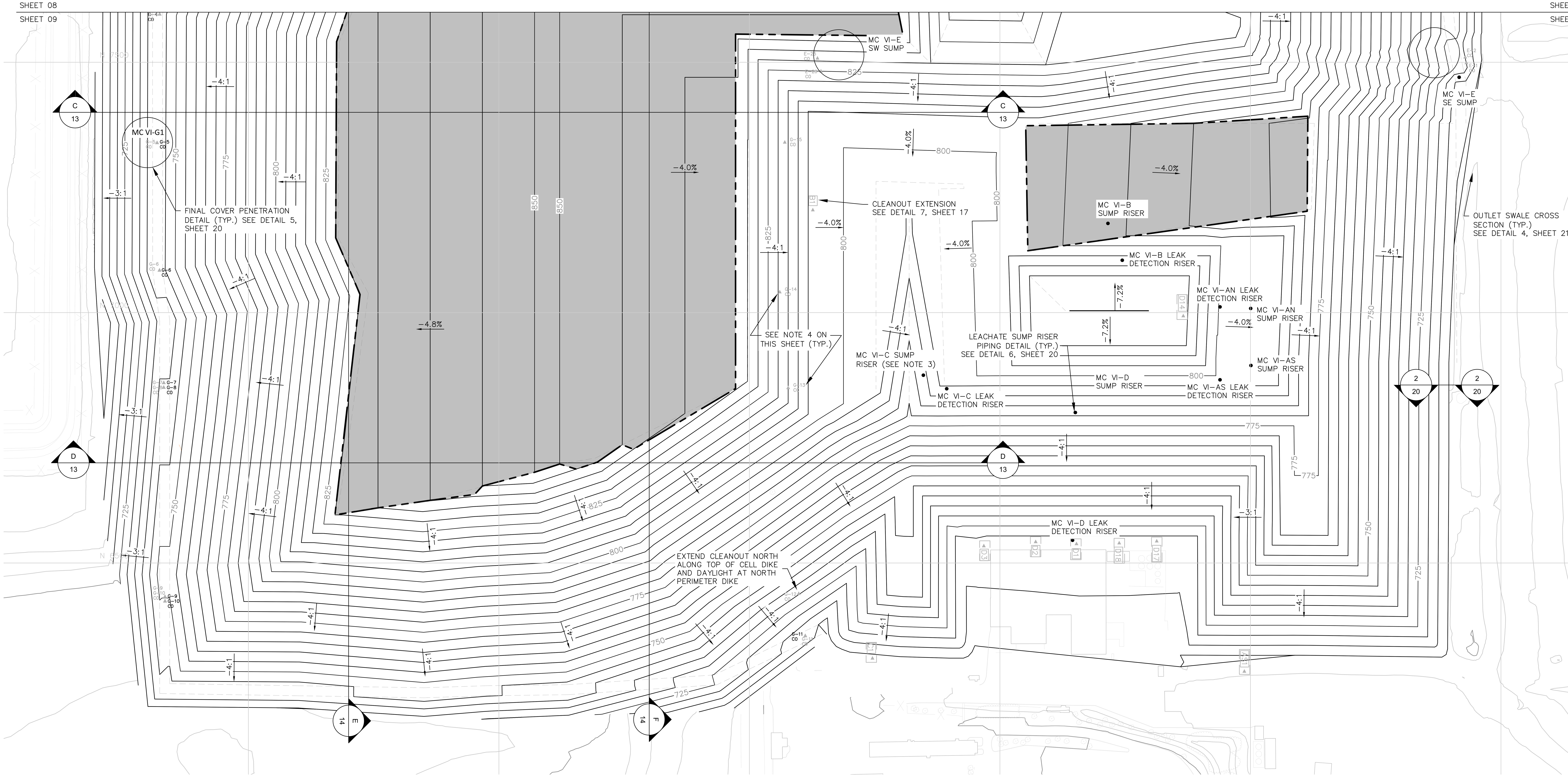
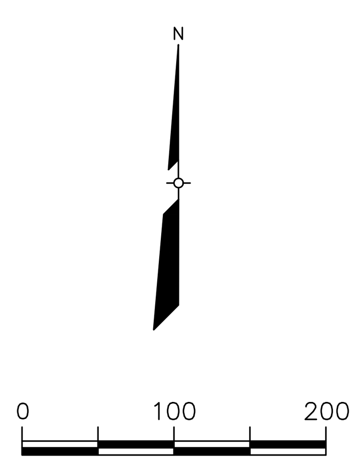
REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS	PAA	XZ

WAYNE DISPOSAL, INC. SITE NO. 2- MASTER CELL VI-F&G
FINAL COVER GRADING PLAN (1 OF 2)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

FINAL COVER GRADING PLAN (1 OF 2)

PROJECT NUMBER 1208070039
SCALE 1" = 100'
DRAWING NO 08





LEGEND

500	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
500	PERMITTED TOP OF FINAL COVER MAJOR CONTOURS
	PERMITTED TOP OF FINAL COVER MINOR CONTOURS
	EXISTING VEGETATION
	EXISTING GRADE BREAKLINES
	EXISTING STORM LINE
	PROPOSED GEOCOMPOSEITE (TRANSMISSIVITY 5.0 X 10^{-4} M^2/S)
	LEACHATE COLLECTION SYSTEM CLEANOUTS
	PROPOSED SUMP LOCATION AND COVER PENETRATION

NOTES:

1. THE BASE MAP WAS CREATED USING AN AERIAL SURVEY TAKEN IN 2020 BY WDI.
2. INSTALL GAS MANAGEMENT SYSTEM IN ACCORDANCE WITH THE APPROVED CLOSURE PLAN.
3. CLEANOUTS IN MC VI-AN, AS, B, C, AND D ARE TO BE ABANDONED EXCEPT B1, C1, D1 THROUGH D3, D14, D17, D18, AND AS1.
4. BEFORE PLACING WASTE AROUND MC VI-C SUMP RISER, A MONITORING PROGRAM SHOULD BE IMPLEMENTED TO MONITOR ITS FUNCTIONALITY.
5. PRIOR TO PLACING WASTE AROUND CLEANOUTS E-22 THROUGH E-26 AND CLEANOUTS G-13 THROUGH G-19, THE CLEANOUTS SHOULD BE EVALUATED TO DETERMINE IF THE LEACHATE COLLECTION LINE CAN BE CLEANED BY A SINGLE ACCESS POINT. IF NOT, THE CLEANOUT SHOULD BE EXTENDED IN ACCORDANCE WITH DETAIL 7 ON SHEET 22 OR ALONG INTERIOR DIKE TO PERIMETER DIKE.

DATE:	01/20/21		
DESIGNED BY:	BA		
DRAWN BY:	WRG		
CHECKED BY:	CAB		
APPROVED BY:	XZ		

CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
Novi, Michigan 48377
248.486.5100 (fax)248.486.5050
www.cticompanies.com

REVISIONS

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS	PAA	XZ

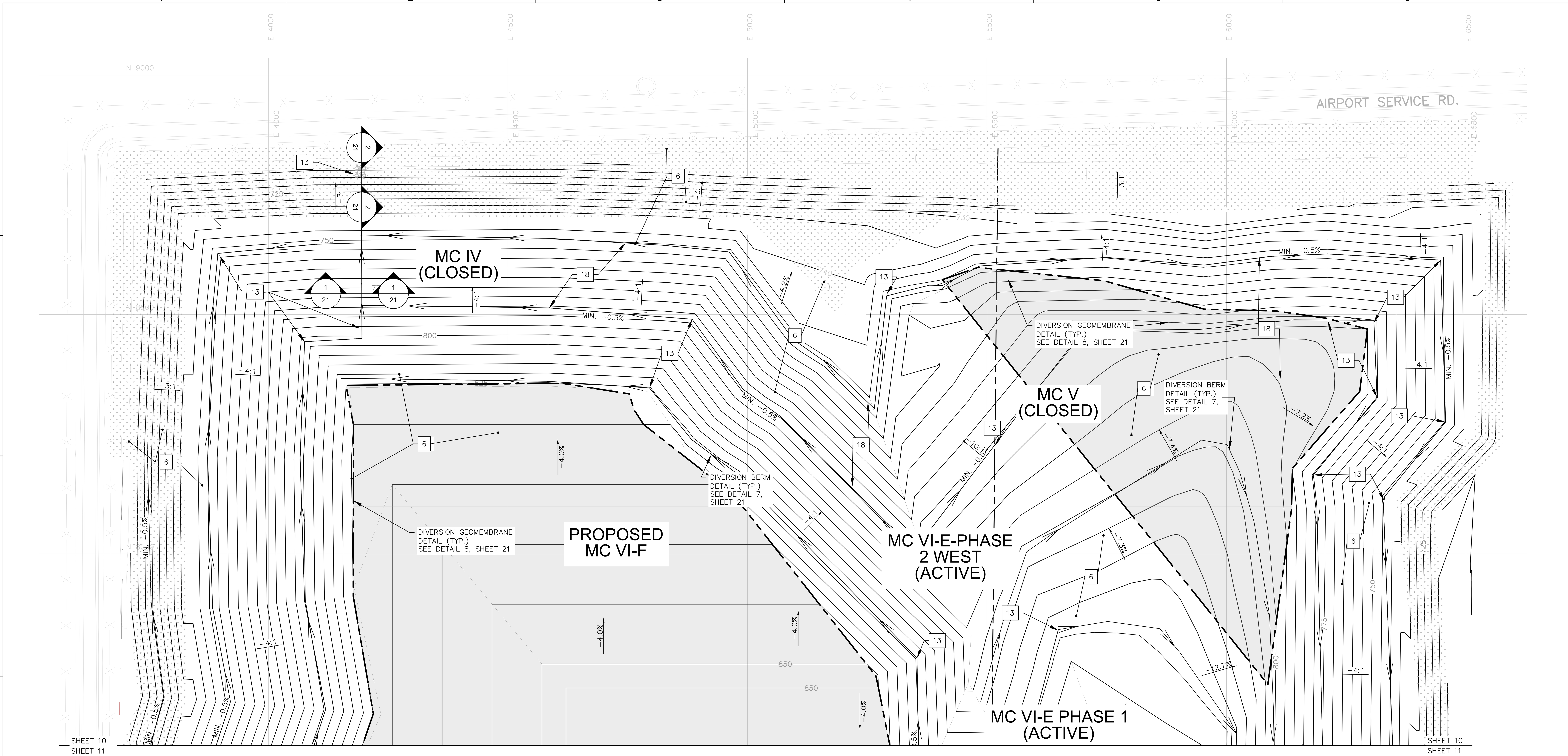
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
FINAL COVER GRADING PLAN (2 OF 2)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

FINAL COVER GRADING PLAN (2 OF 2)

PROJECT NUMBER 1208070039

SCALE 1" = 100'

DRAWING NO 09



LEGEND

500	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
500	PERMITTED TOP OF FINAL COVER MAJOR CONTOURS
	PERMITTED TOP OF FINAL COVER MINOR CONTOURS
	EXISTING VEGETATION
	PROPOSED GRADE BREAK
	EXISTING GRADE BREAK
	EXISTING STORM LINE
	PROPOSED DOWNSLOPE SPILLWAY
	PROPOSED OUTLET SWALE
	PROPOSED DIVERSION GEOMEMBRANE
	PROPOSED GEOCOMPOSEITE (TRANSMISSIVITY 5.0 X 10^{-4} M^2/S)
	PROPOSED RIP-RAP
	PROPOSED PERMANENT SEEDING-AT TIME OF DIKE CONSTRUCTION
	PROPOSED DIVERSION BERM

6 SEEDING WITH MULTCH AND/OR MATTING

13 RIPRAP, RUBBLE, GABIONS

18 DIVERSION BERM

N

0 100 200
SCALE IN FEET

NOTES:

1. THE BASE MAP WAS CREATED USING AN AERIAL SURVEY TAKEN IN 2020 BY WDI.

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

CTI and Associates, Inc.
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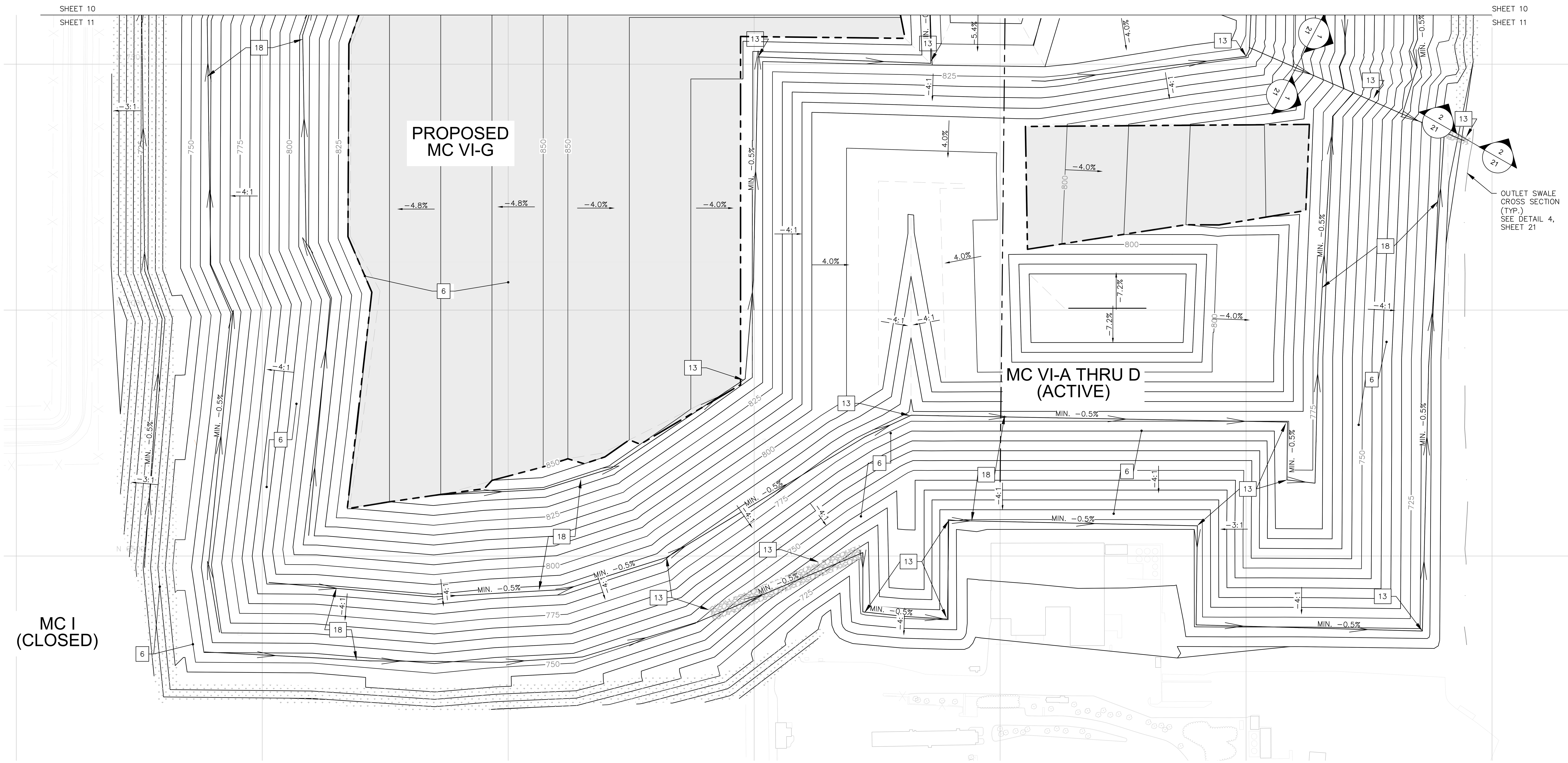
248.486.5100 (fax)248.486.5050
www.cticompanies.com

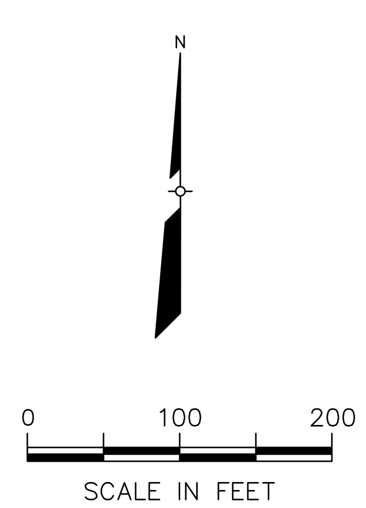
REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ

WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
STORMWATER MANAGEMENT AND SEDIMENTATION PLAN (1 OF 2)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

STORMWATER MANAGEMENT AND SEDIMENTATION PLAN (1 OF 2)

PROJECT NUMBER 1208070039
SCALE 1" = 100'
DRAWING NO 10

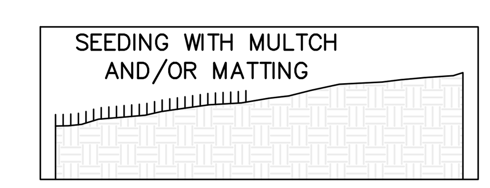




LEGEND

- 500 — EXISTING MAJOR CONTOURS
- EXISTING MINOR CONTOURS
- 500 — PERMITTED TOP OF FINAL COVER MAJOR CONTOURS
- PERMITTED TOP OF FINAL COVER MINOR CONTOURS
- EXISTING VEGETATION
- PROPOSED GRADE BREAK
- EXISTING GRADE BREAK
- EXISTING STORM LINE
- PROPOSED DOWNSLOPE SPILLWAY
- PROPOSED OUTLET SWALE
- PROPOSED DIVERSION GEOMEMBRANE
- PROPOSED GEOCOMPOSEITE (TRANSMISSIVITY 5.0 X 10^{-4} M^2/S)
- PROPOSED RIP-RAP
- PROPOSED PERMANENT SEEDING-AT TIME OF DIKE CONSTRUCTION
- PROPOSED DIVERSION BERM

6



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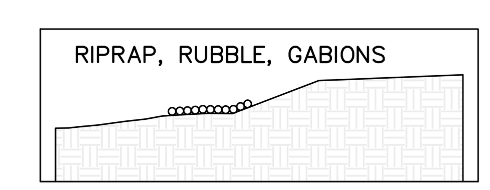

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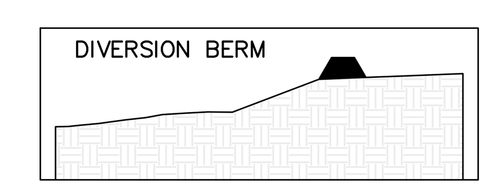

NOTES:

1. THE BASE MAP WAS CREATED USING AN AERIAL SURVEY TAKEN IN 2020 BY WDI.

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

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REVISIONS

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1–F4 REVISIONS	WRG	XZ

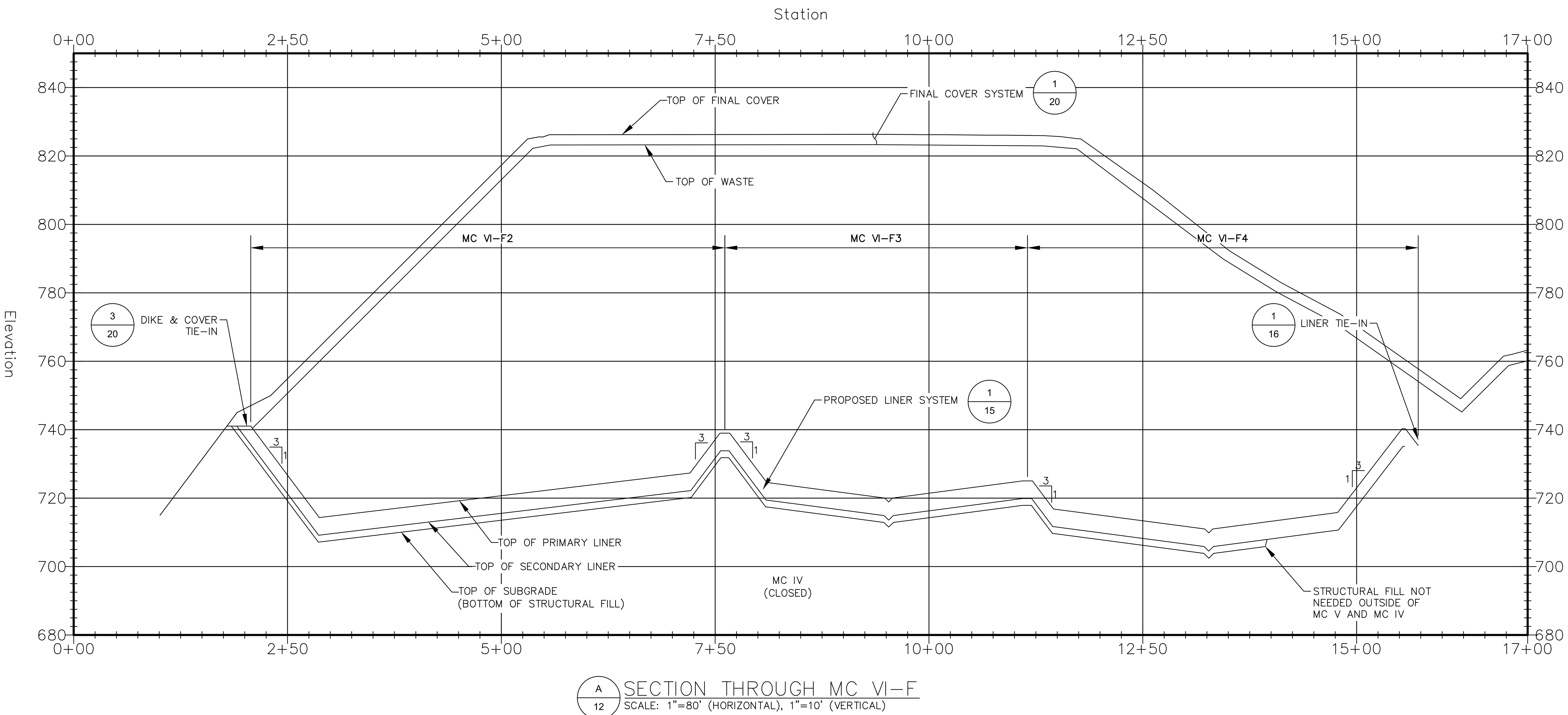
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
STORMWATER MANAGEMENT AND SEDIMENTATION PLAN (1 OF 2)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

STORMWATER MANAGEMENT AND SEDIMENTATION PLAN (2 OF 2)

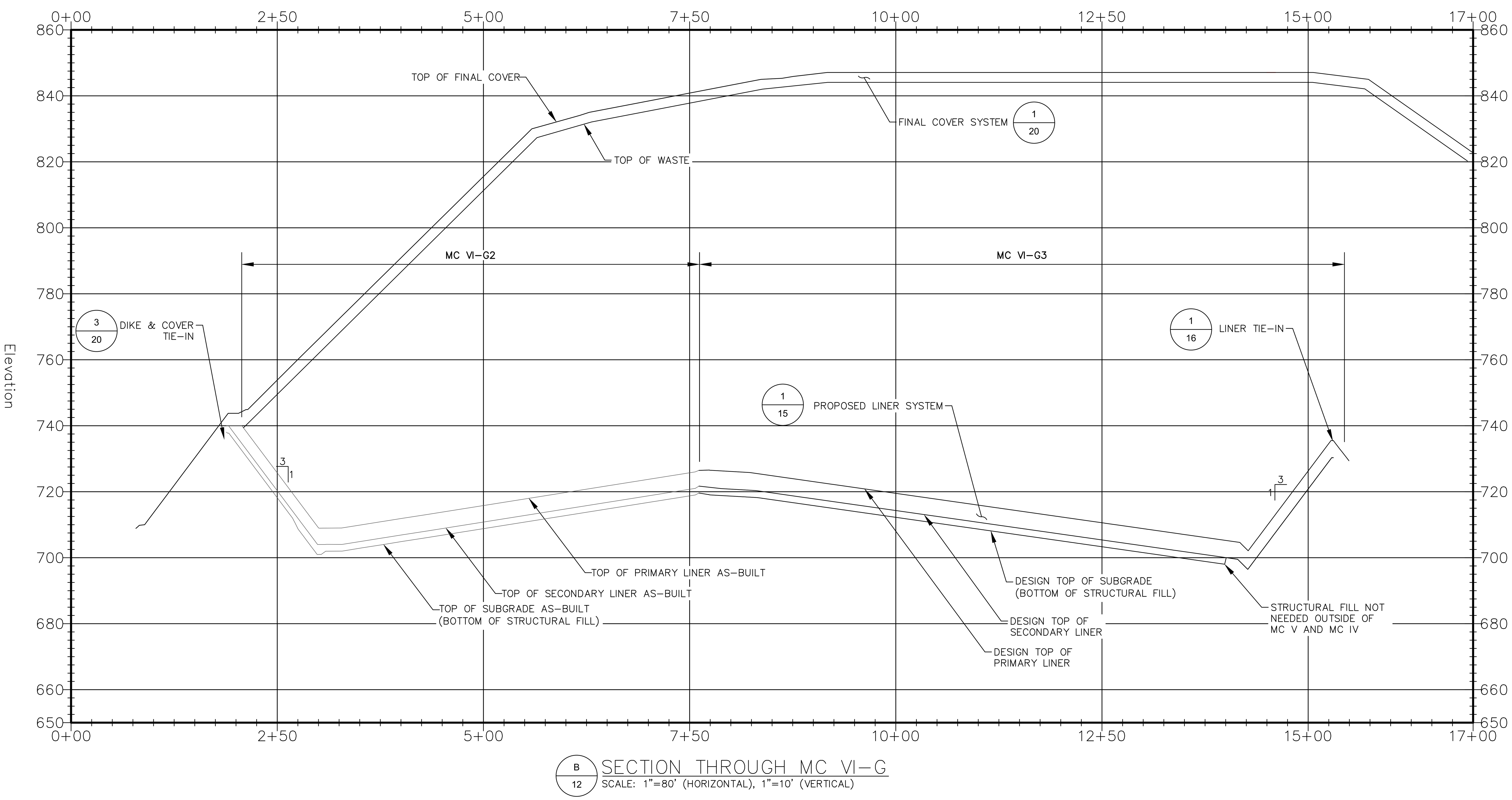
PROJECT NUMBER 1208070039

SCALE 1" = 100'

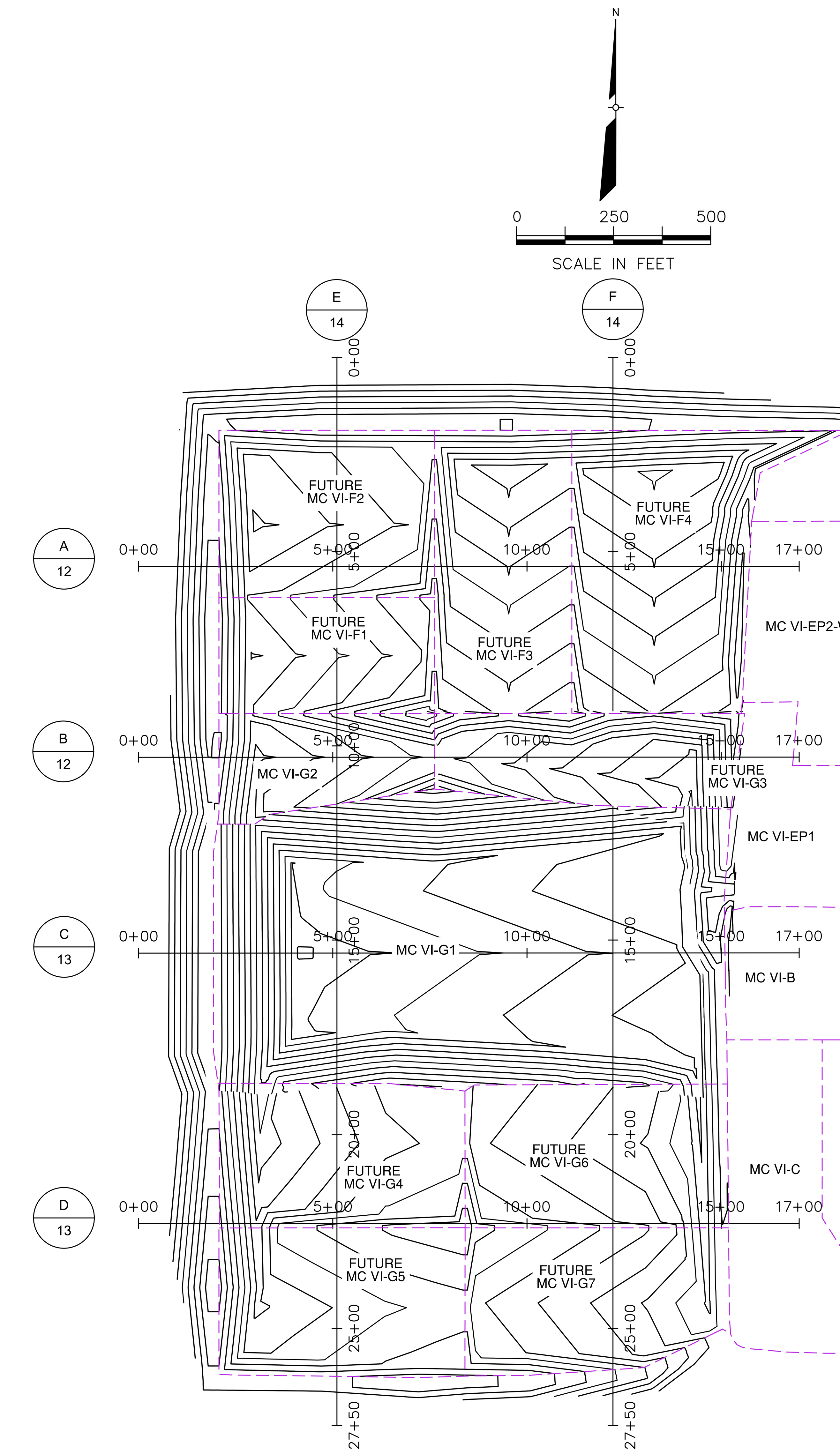
DRAWING NO 11



A/12 SECTION THROUGH MC VI-F
SCALE: 1"=80' (HORIZONTAL), 1"=10' (VERTICAL)



B/12 SECTION THROUGH MC VI-G
SCALE: 1"=80' (HORIZONTAL), 1"=10' (VERTICAL)



DATE: 01/20/21
DESIGNED BY: BA
DRAWN BY: WRG
CHECKED BY: CAB
APPROVED BY: XZ

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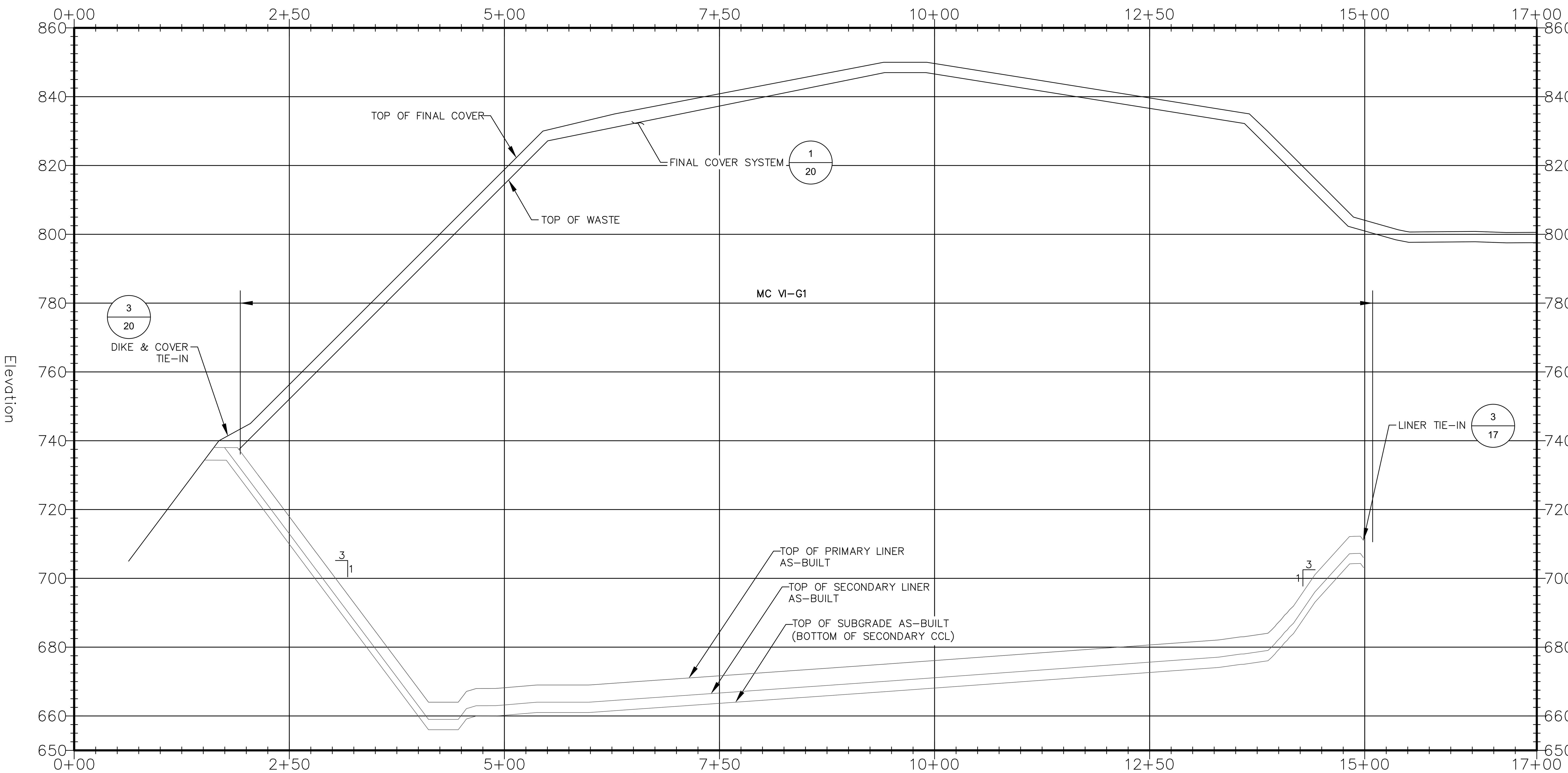
REVISIONS

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1–F4 REVISIONS	WRG	XZ
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS	PAA	XZ

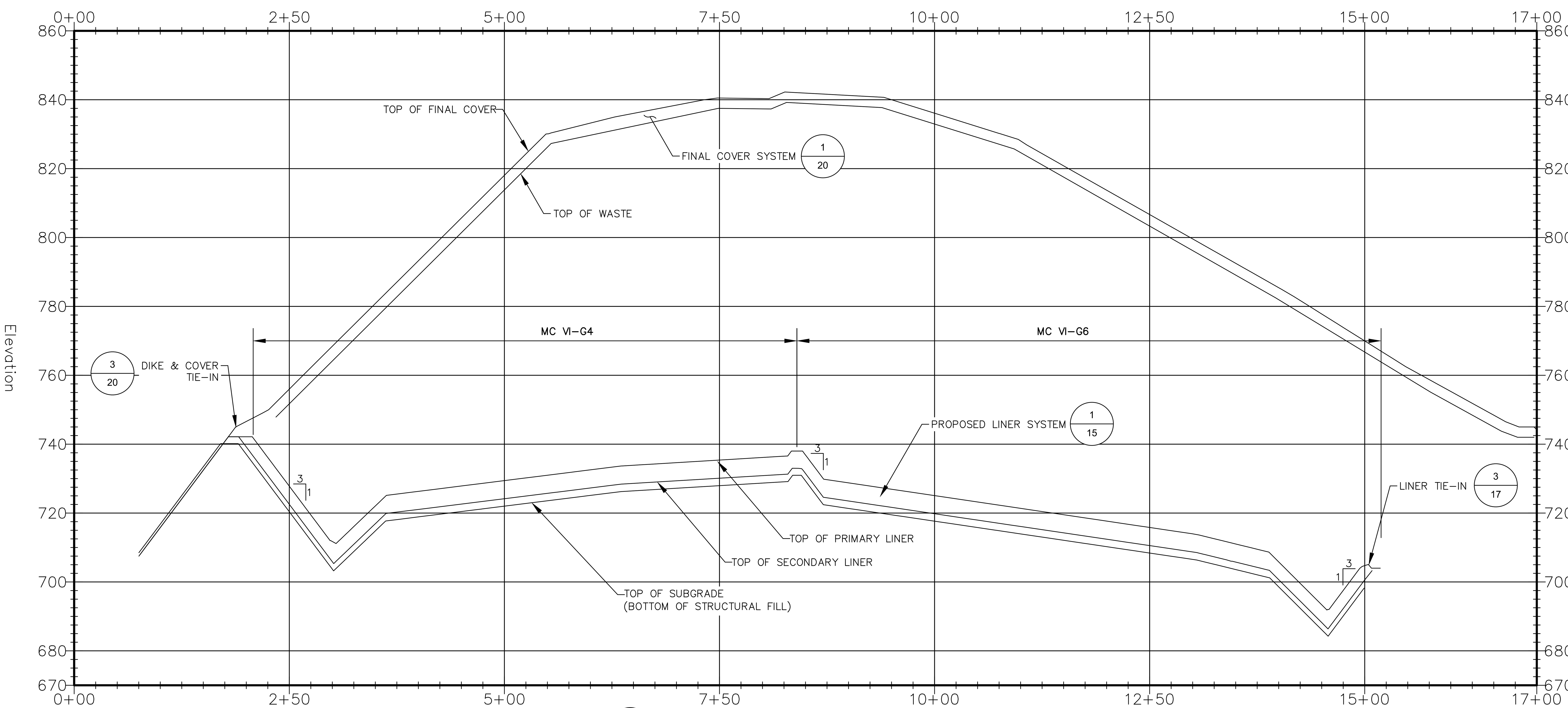
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
CROSS SECTIONS (1 OF 3)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

CROSS SECTIONS (1 OF 3)

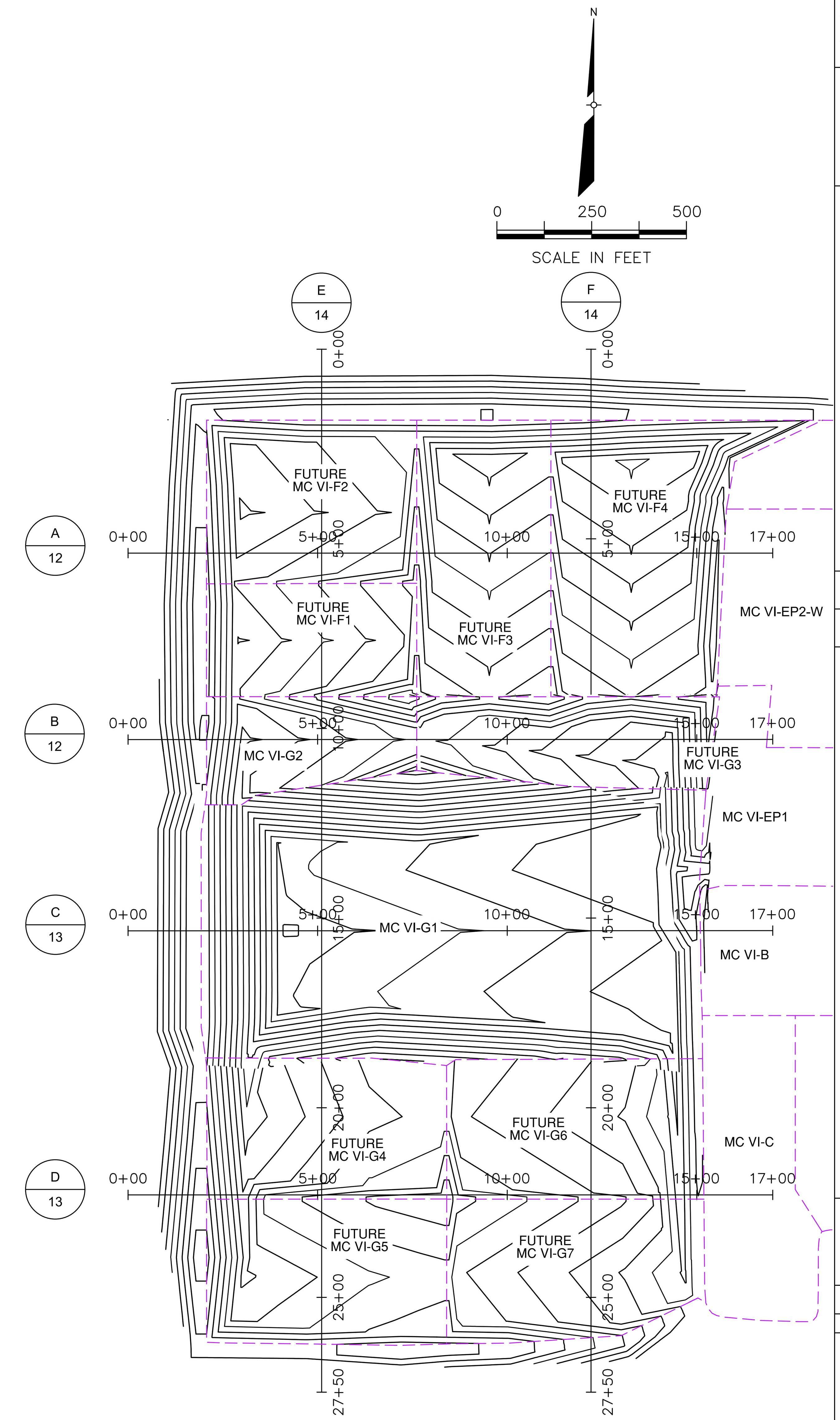
PROJECT NUMBER
1208070039
SCALE
AS SHOWN
DRAWING NO
12



C/13 SECTION THROUGH MC VI-G
SCALE: 1"=80' (HORIZONTAL), 1"=10' (VERTICAL)



D/13 SECTION THROUGH MC VI-G
SCALE: 1"=80' (HORIZONTAL), 1"=10' (VERTICAL)



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DATE:	01/20/21
DESIGNED BY:	BA
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APPROVED BY:	XZ

REVISIONS

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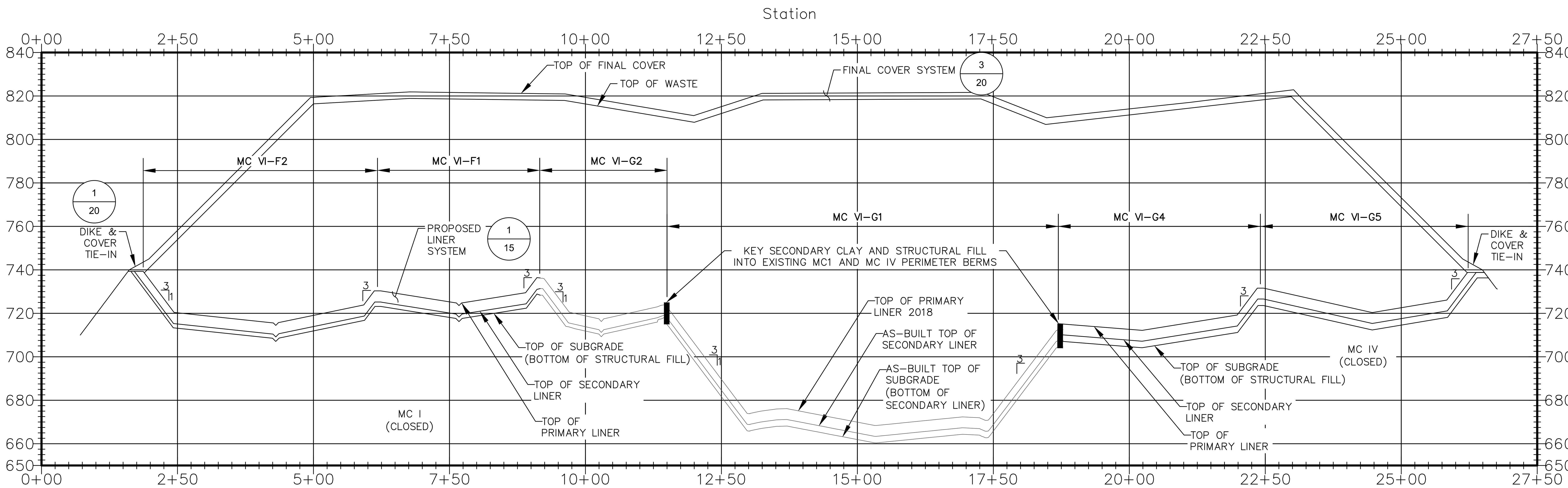
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS	PAA	XZ

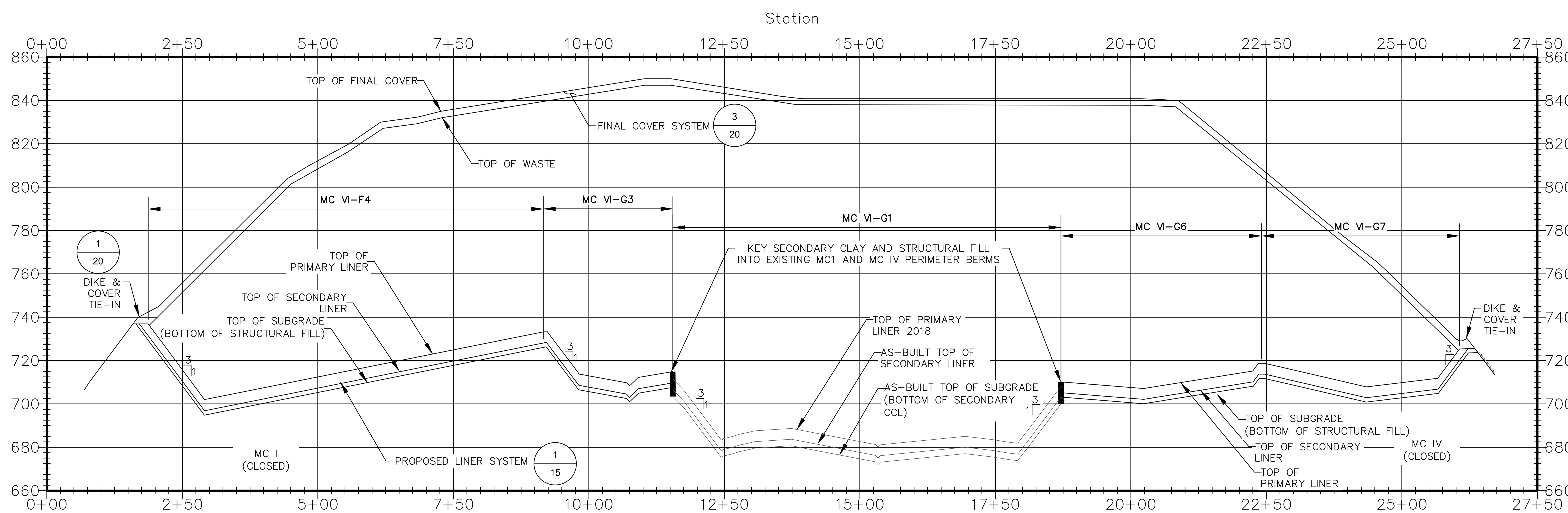
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
CROSS SECTIONS (2 OF 3)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

CROSS SECTIONS (2 OF 3)

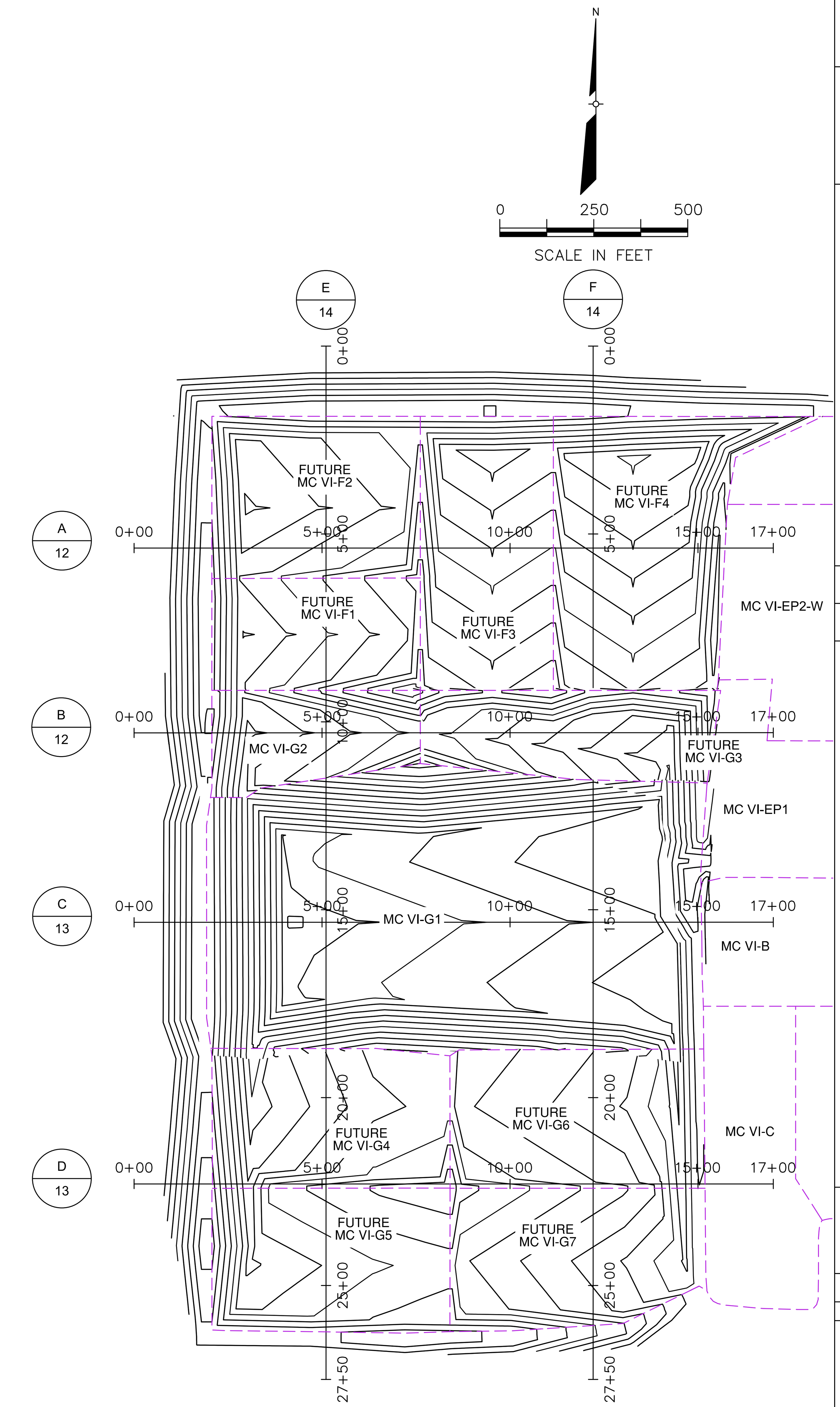
PROJECT NUMBER 1208070039
SCALE AS SHOWN
DRAWING NO 13



E
14
SECTION THROUGH PROPOSED LINER FLOOR GRADES I
SCALE: 1"=125' (HORIZONTAL), 1"=10' (VERTICAL)



F
14
SECTION THROUGH PROPOSED LINER FLOOR GRADES II
SCALE: 1"=125' (HORIZONTAL), 1"=10' (VERTICAL)



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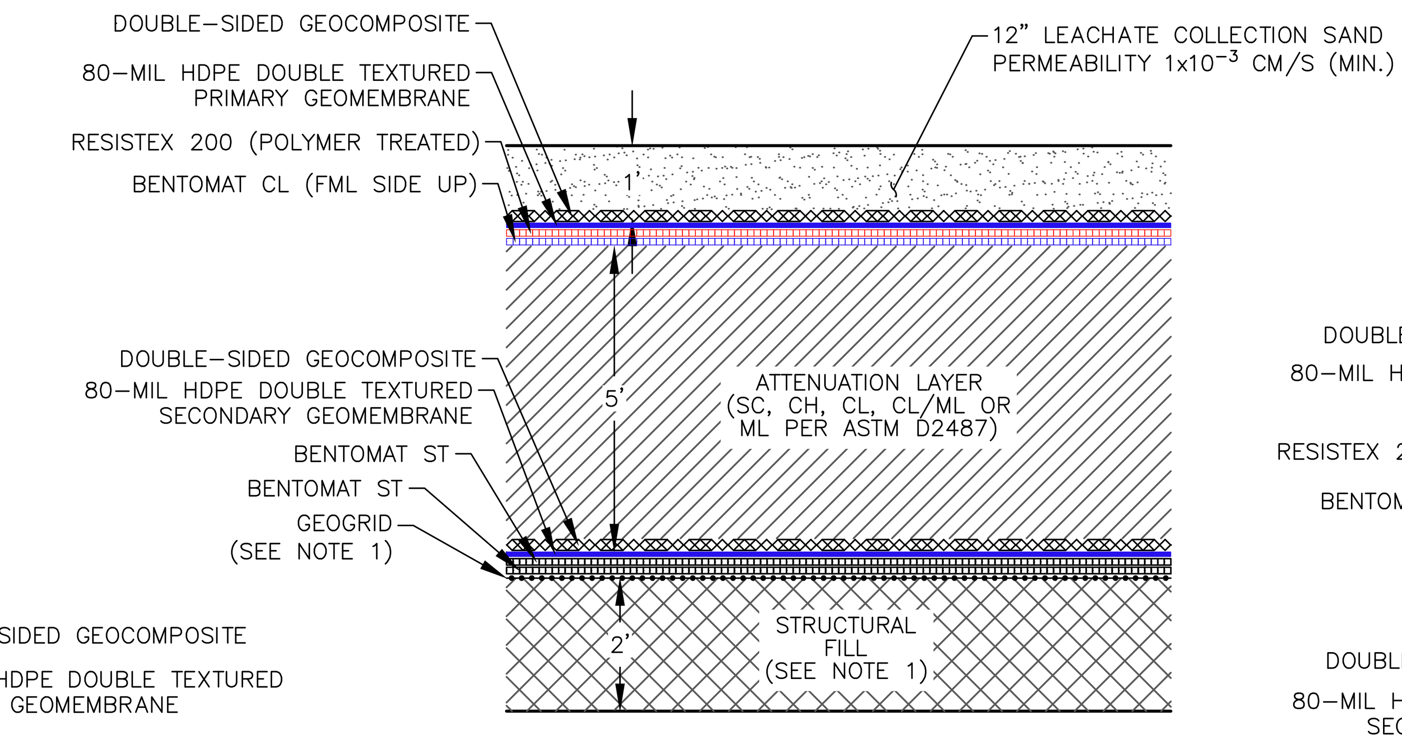
DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS	PAA	XZ
B	9/23/11	PER MDEQ COMMENTS		DRL
A	6/10/11	PHASING DESIGNATIONS		DRL

WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
CROSS SECTIONS (3 OF 3)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

CROSS SECTIONS (3 OF 3)

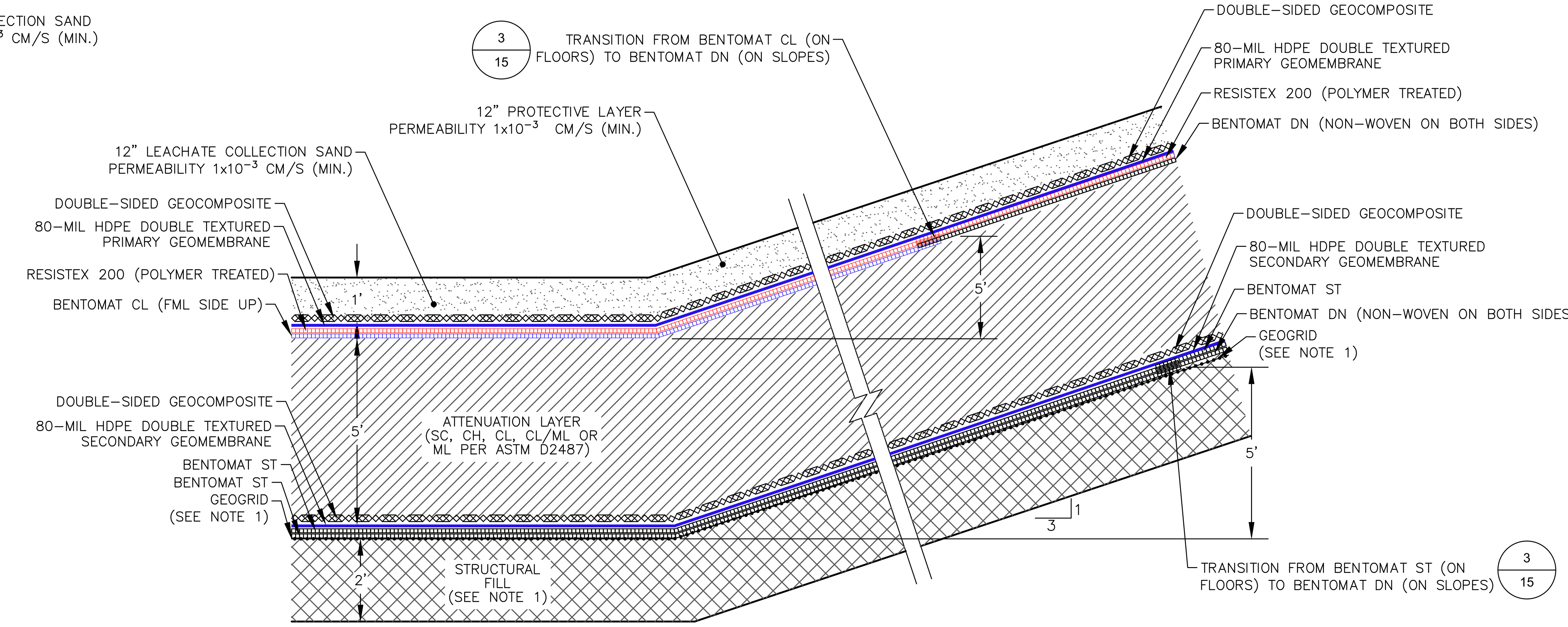
PROJECT NUMBER 1208070039
SCALE AS SHOWN
DRAWING NO 14



1/15 PROPOSED FLOOR LINER SYSTEM USING GCL
NOT TO SCALE

NOTE:

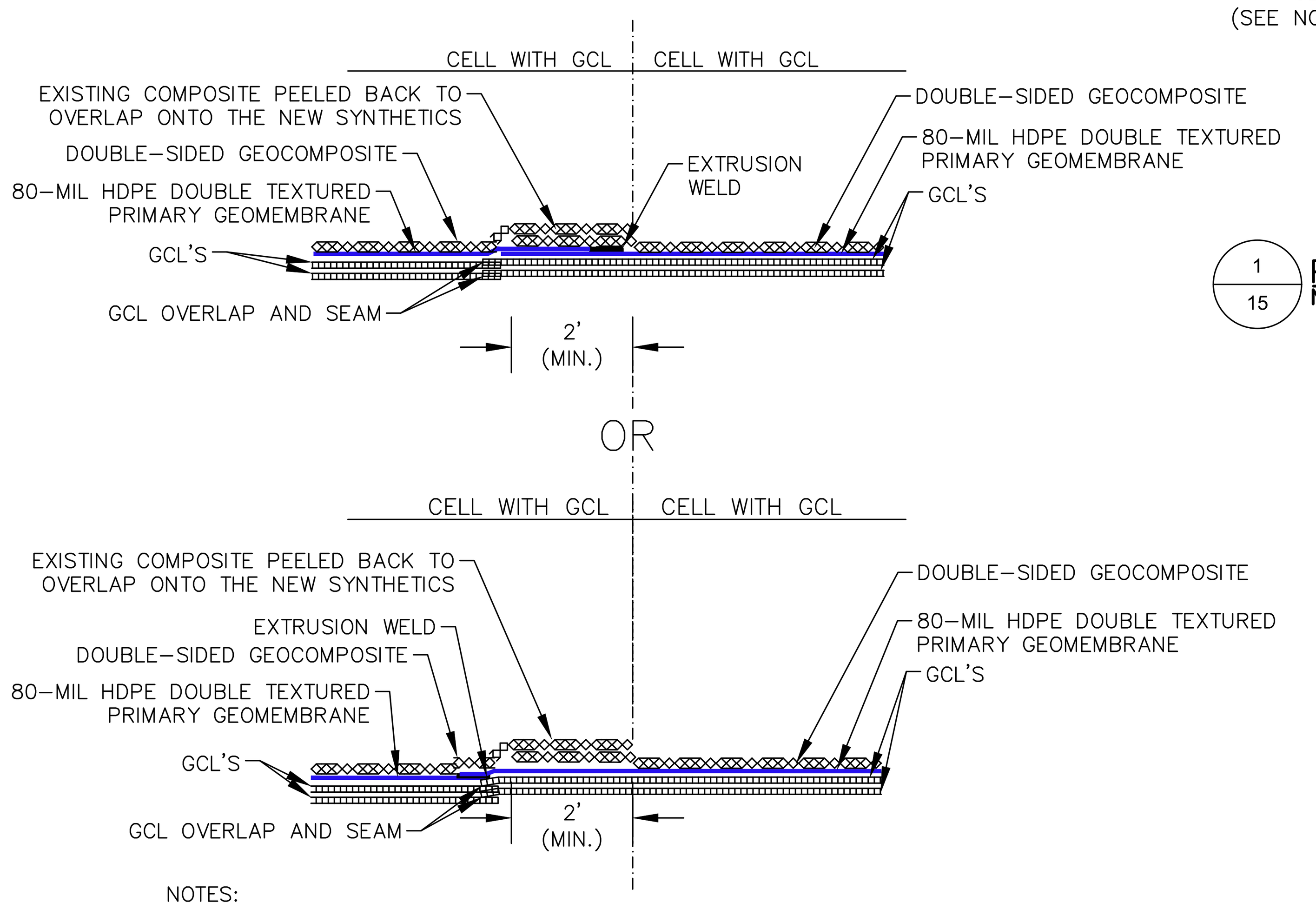
1. STRUCTURAL FILL AND GEOGRID NOT REQUIRED OUTSIDE OF MC VI-F4, MC VI-G6, AND MC VI-G7. SEE LIMITS ON SHEET 04



2/15 PROPOSED SIDESLOPE LINER SYSTEM USING GCL
NOT TO SCALE

NOTE:

1. STRUCTURAL FILL AND GEOGRID NOT REQUIRED OUTSIDE OF MC VI-F4, MC VI-G6, AND MC VI-G7. SEE LIMITS ON SHEET 04



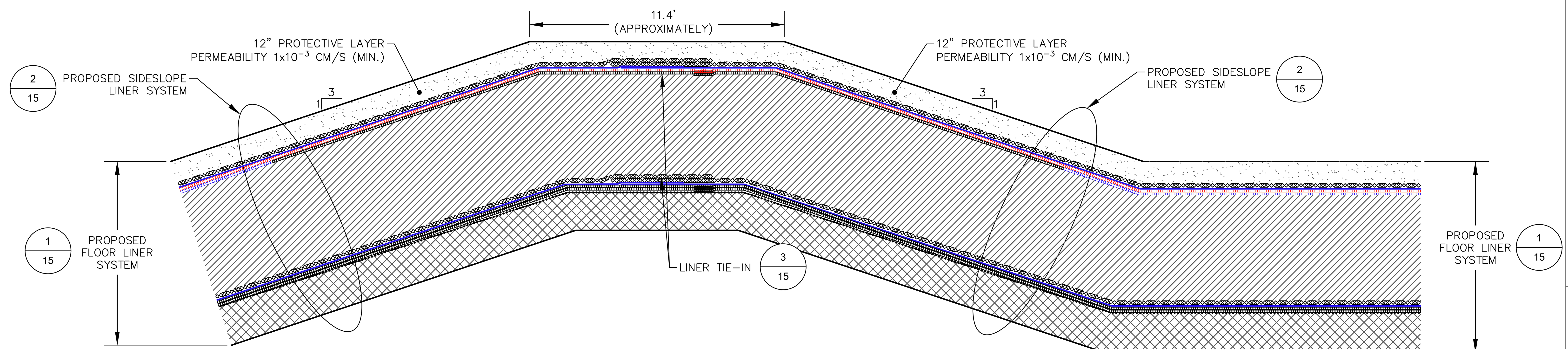
NOTES:

A. NEW AND EXISTING GEOCOMPOSITE LAYERS SHALL BE CONNECTED AS:
- GEONET CORES SHALL BE JOINED BY PLASTIC FASTENERS.
- TOP GEOTEXTILE SHALL BE SEWED TOGETHER OR COVERED WITH EXTRA NON-WOVEN GEOTEXTILE (MINIMUM 24" WIDE) HEAT BONDED TO THE EXISTING GEOTEXTILE.

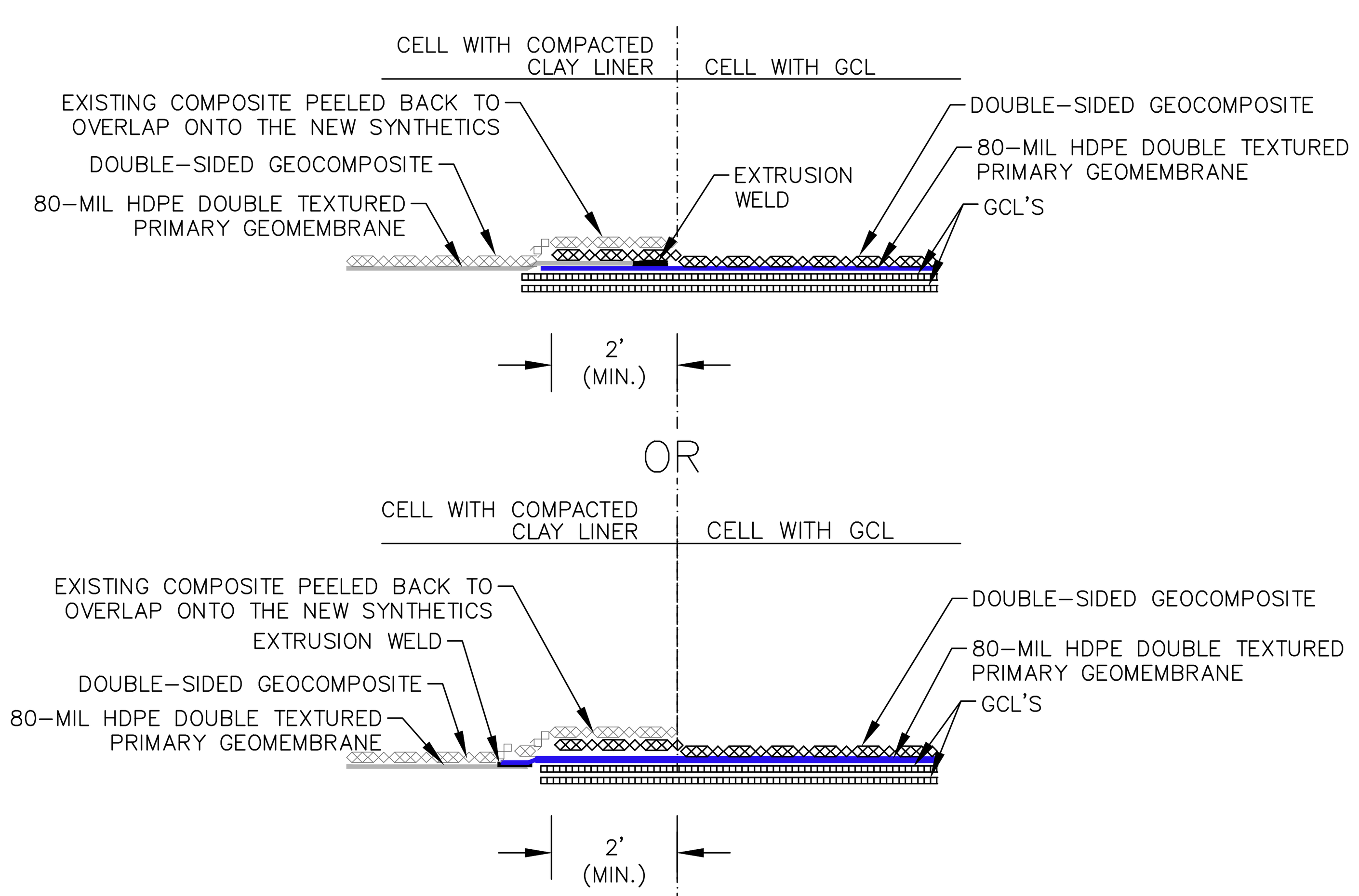
B. AT GCL SEAMS, DRY BENTONITE POWDER SHALL BE APPLIED IN A TWO-INCH WIDE STRIP AT A RATE OF ¼ POUND PER FOOT BETWEEN ALL OVERLAPPED SEAMS.

C. SEAMS SHOULD BE CONSTRUCTED SUCH THAT THEY ARE SHINGLED IN THE DIRECTION OF THE GRADE TO PREVENT FLOW FROM ENTERING THE OVERLAP ZONE.

3/15 LINER TIE-IN DETAIL I
NOT TO SCALE



5/15 MC VI-F & G TIE-IN DETAIL
NOT TO SCALE



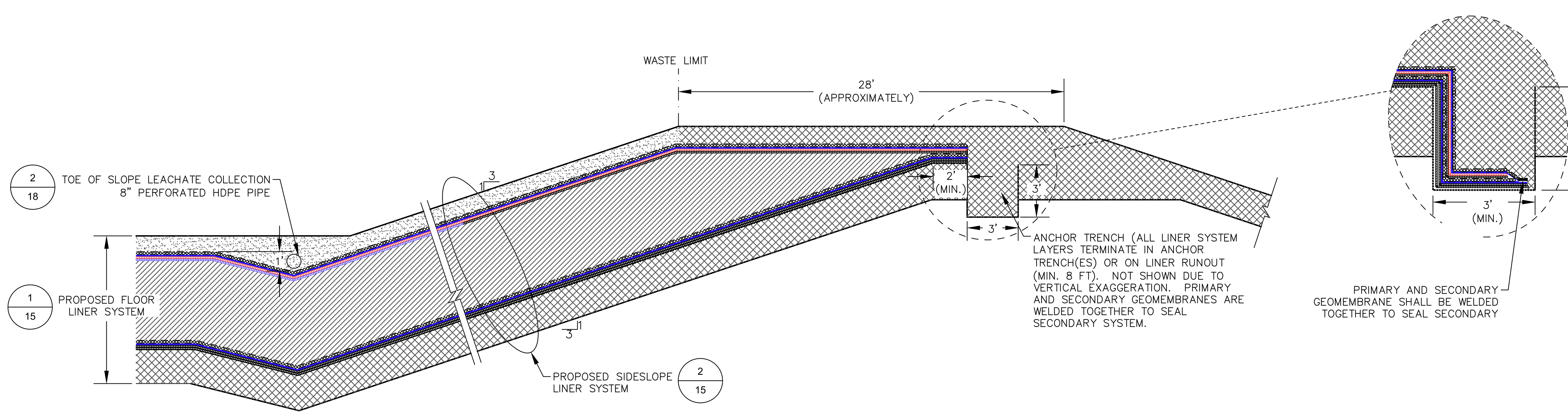
NOTES:

NEW AND EXISTING GEOCOMPOSITE LAYERS SHALL BE CONNECTED AS:

A. GEONET CORES SHALL BE JOINED BY PLASTIC FASTENERS.

B. TOP GEOTEXTILE SHALL BE SEWED TOGETHER OR COVERED WITH EXTRA NON-WOVEN GEOTEXTILE (MINIMUM 24" WIDE) HEAT BONDED TO THE EXISTING GEOTEXTILE.

4/15 LINER TIE-IN DETAIL II
NOT TO SCALE



6/15 G AND F CELLS WEST PERIMETER DIKE
NOT TO SCALE

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

CTI and Associates, Inc.
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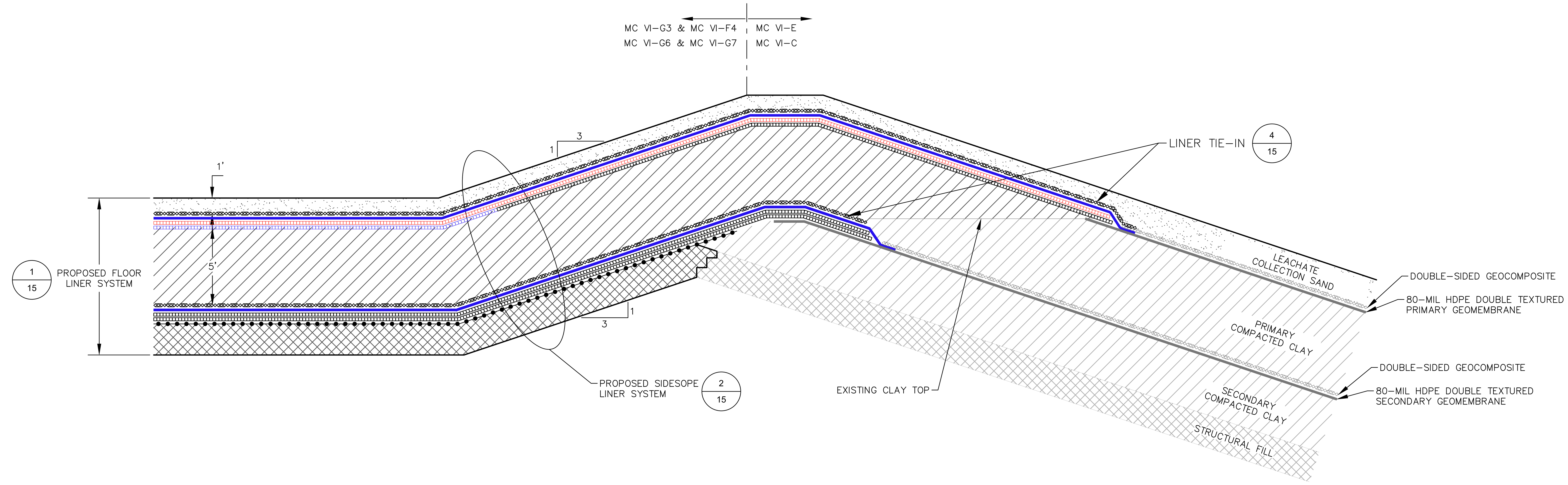
REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
E	5/29/18	ADDENDUM 1	PAA	XZ
D	5/08/18	REVISION BASED ON MDEQ'S COMMENTS	PAA	XZ
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS		

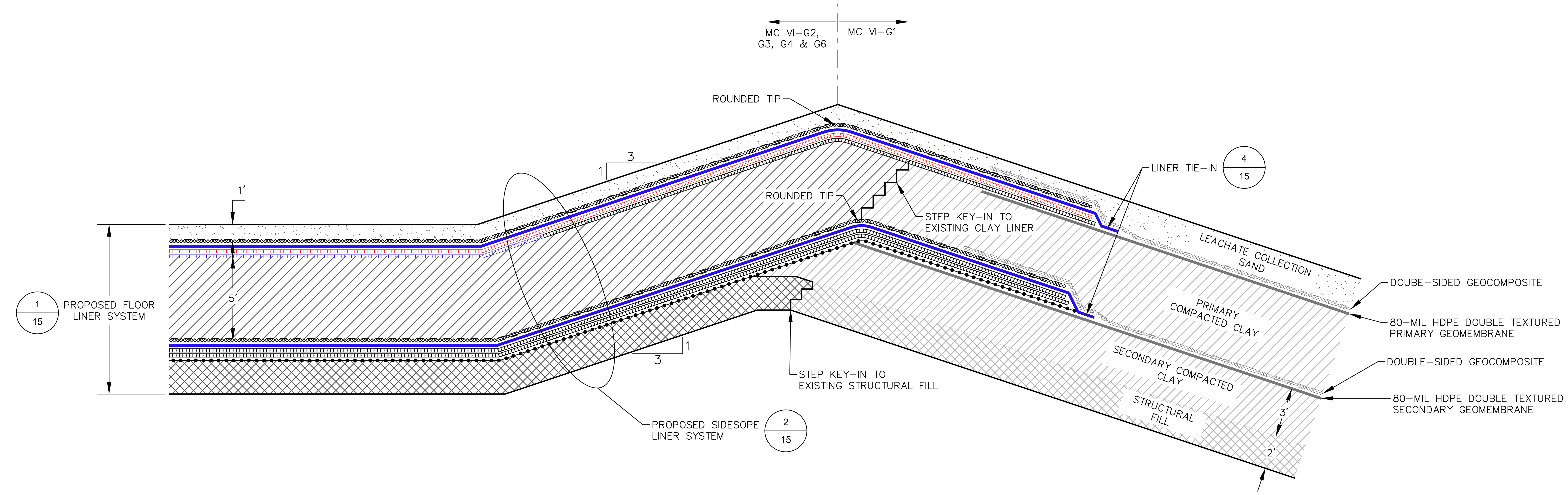
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
LINER SYSTEM DETAILS (1 OF 3)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

LINER SYSTEM DETAILS (1 OF 3)

PROJECT NUMBER 1208070039
SCALE AS SHOWN
DRAWING NO 15



1
16
MC VI-E TO MC VI-G3 & MC VI-F4 TIE-IN DETAIL
NOT TO SCALE



2
16
MC VI-G1, MC VI-G2, G3, G4, & G6 TIE-IN DETAIL
NOT TO SCALE

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DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

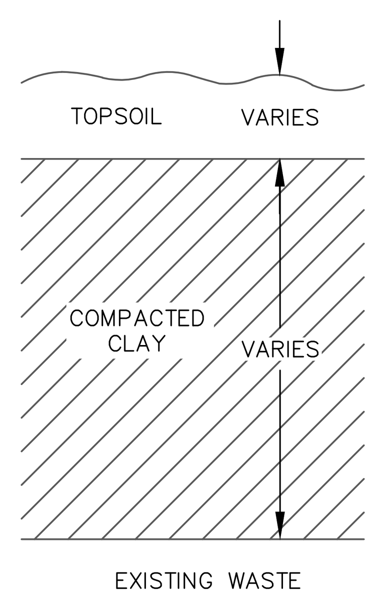
REVISIONS

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
D	5/08/18	REVISION BASED ON MDEQ'S COMMENTS		
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS	PAA	XZ

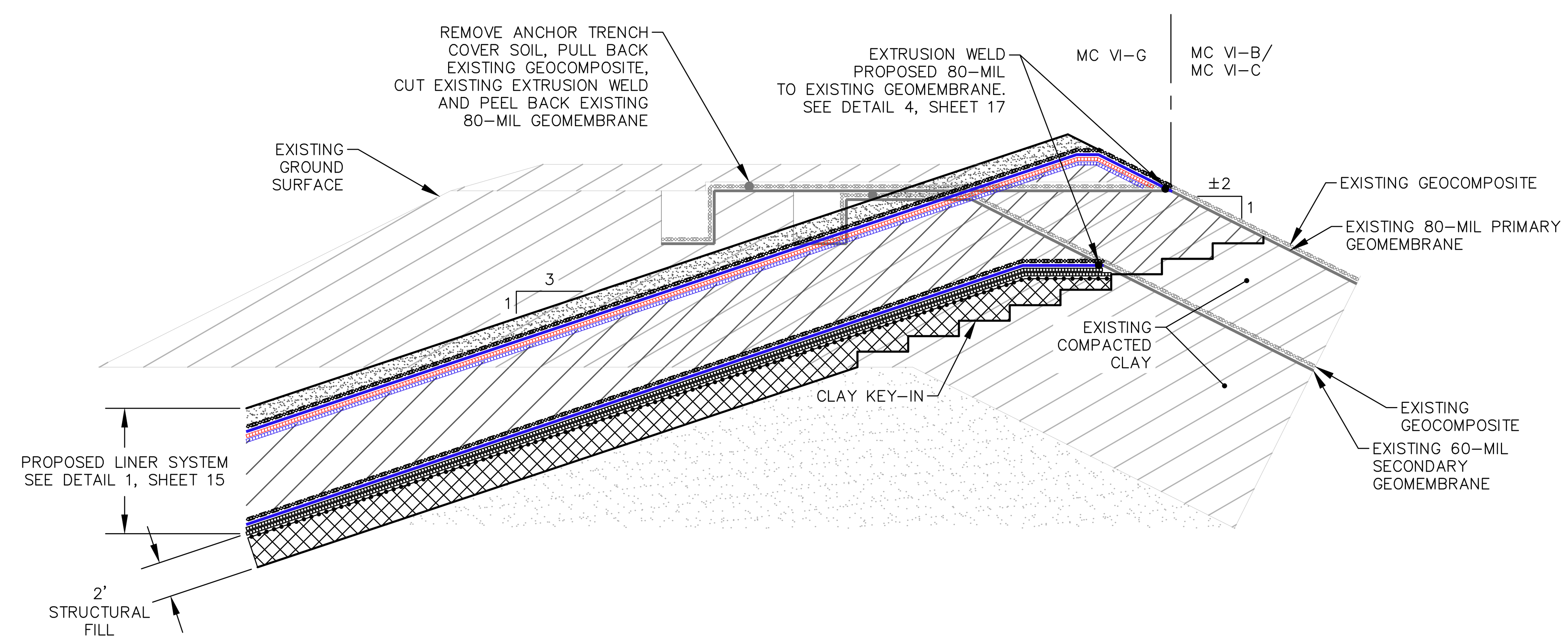
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
LINER SYSTEM DETAILS (2 OF 3)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

LINER SYSTEM DETAILS (2 OF 3)

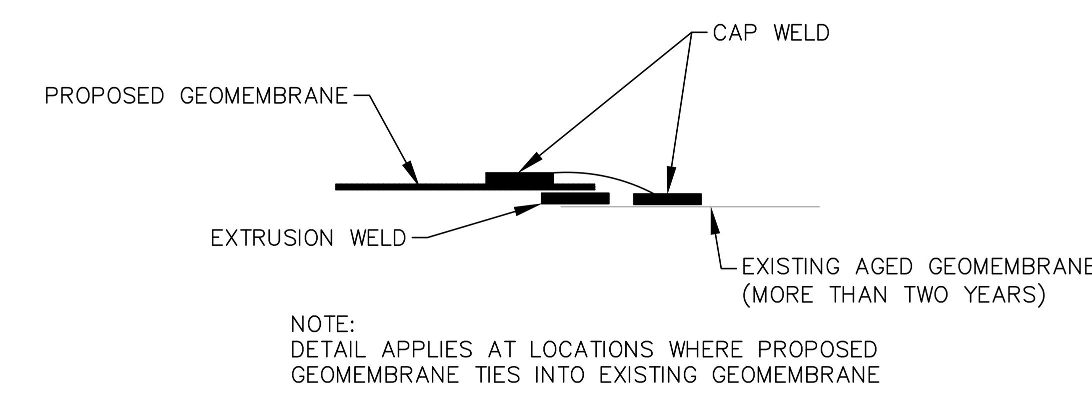
PROJECT NUMBER 1208070039
SCALE AS SHOWN
DRAWING NO 16



1/17 MC1 & MC4 COVER DETAIL
NOT TO SCALE

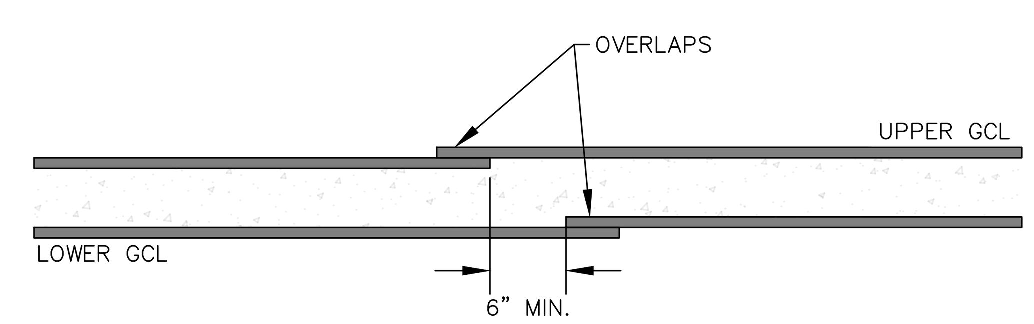


2/17 MC VI-G6, MC VI-G7, & MC VI-B OR MC VI-C TIE-IN DETAIL
NOT TO SCALE



NOTE:
DETAIL APPLIES AT LOCATIONS WHERE PROPOSED GEOMEMBRANE TIES INTO EXISTING GEOMEMBRANE

3/17 GEOMEMBRANE WELDING DETAIL
NOT TO SCALE



4/17 GCL OVERLAPS REQUIREMENT
NOT TO SCALE

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DATE:	01/20/21
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APPROVED BY:	XZ

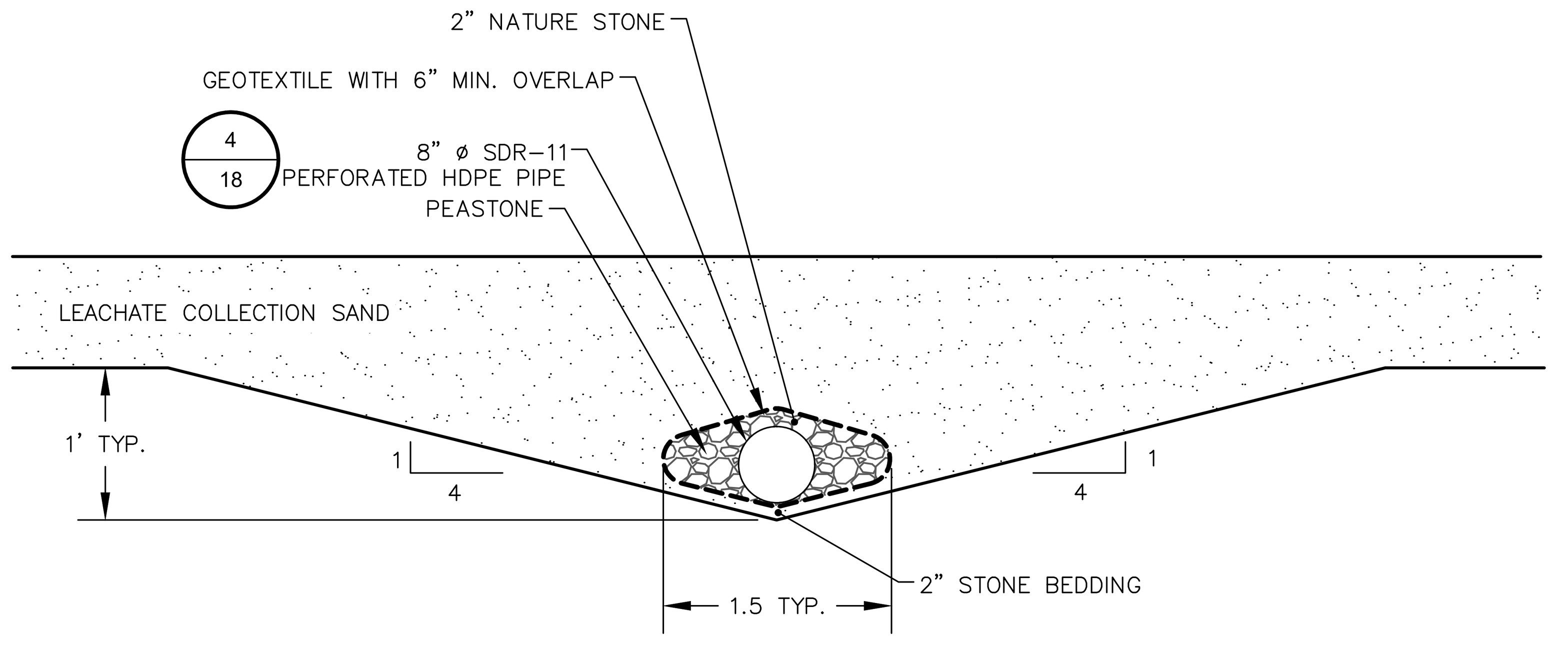
REVISIONS

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
B	9/23/11	PER MDEQ COMMENTS		DRL
A	6/10/11	PHASING DESIGNATIONS		DRL

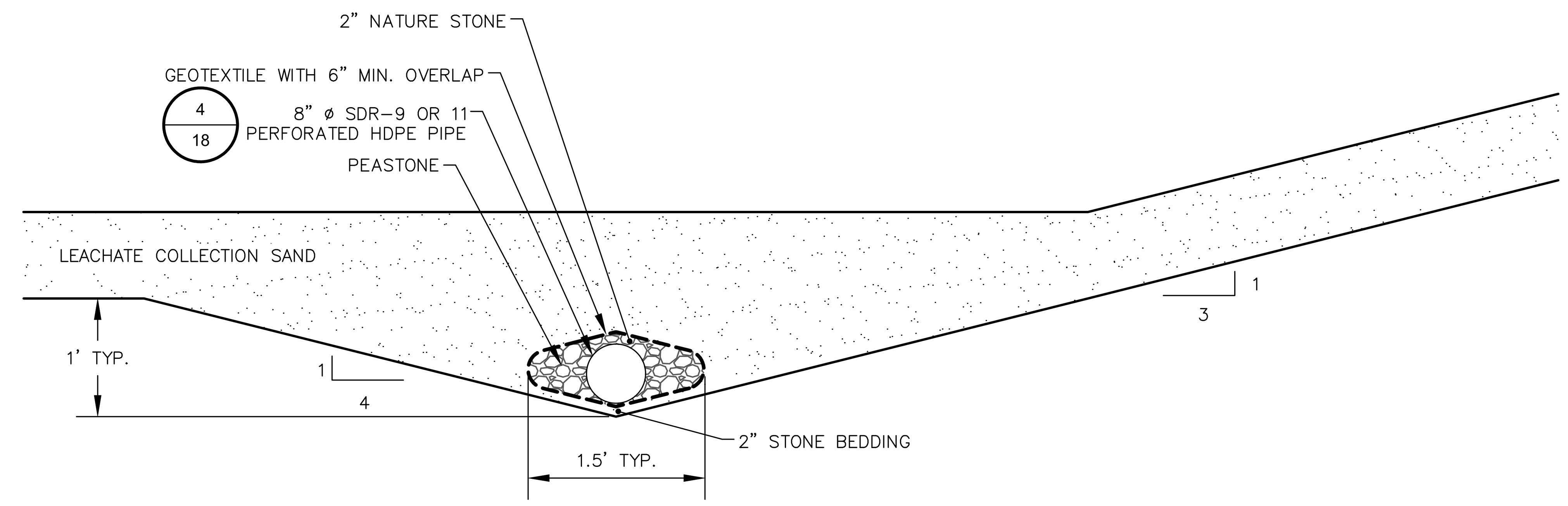
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
LINER SYSTEM DETAILS (3 OF 3)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

LINER SYSTEM DETAILS (3 OF 3)

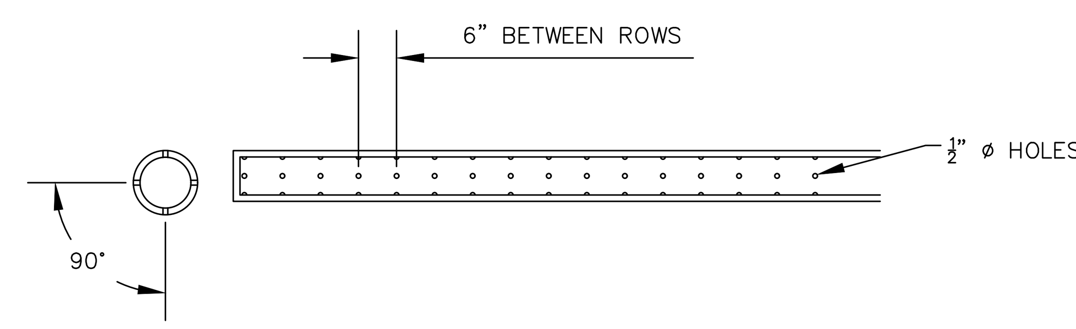
PROJECT NUMBER 1208070039
SCALE AS SHOWN
DRAWING NO 17



1/18 CELL FLOOR LEACHATE COLLECTION PIPE (TYP.)
NOT TO SCALE



2/18 TOE OF SLOPE LEACHATE COLLECTION PIPE (TYP.)
NOT TO SCALE



3/18 8" LEACHATE COLLECTION PIPE PERFORATION SPACING DETAIL
NOT TO SCALE

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

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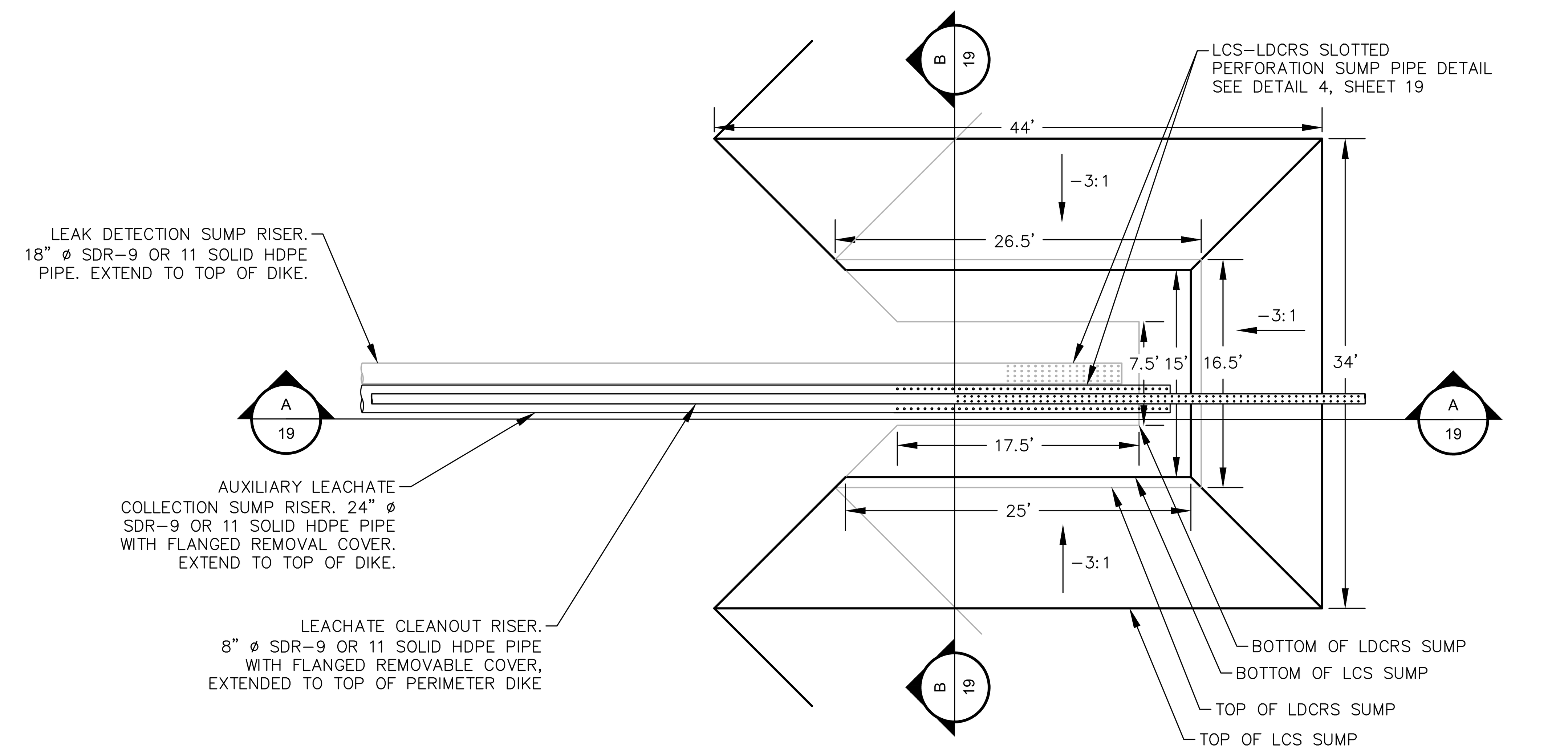
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
E	5/29/18	ADDENDUM 1		
D	5/08/18	REVISION BASED ON MDEQ'S COMMENTS		

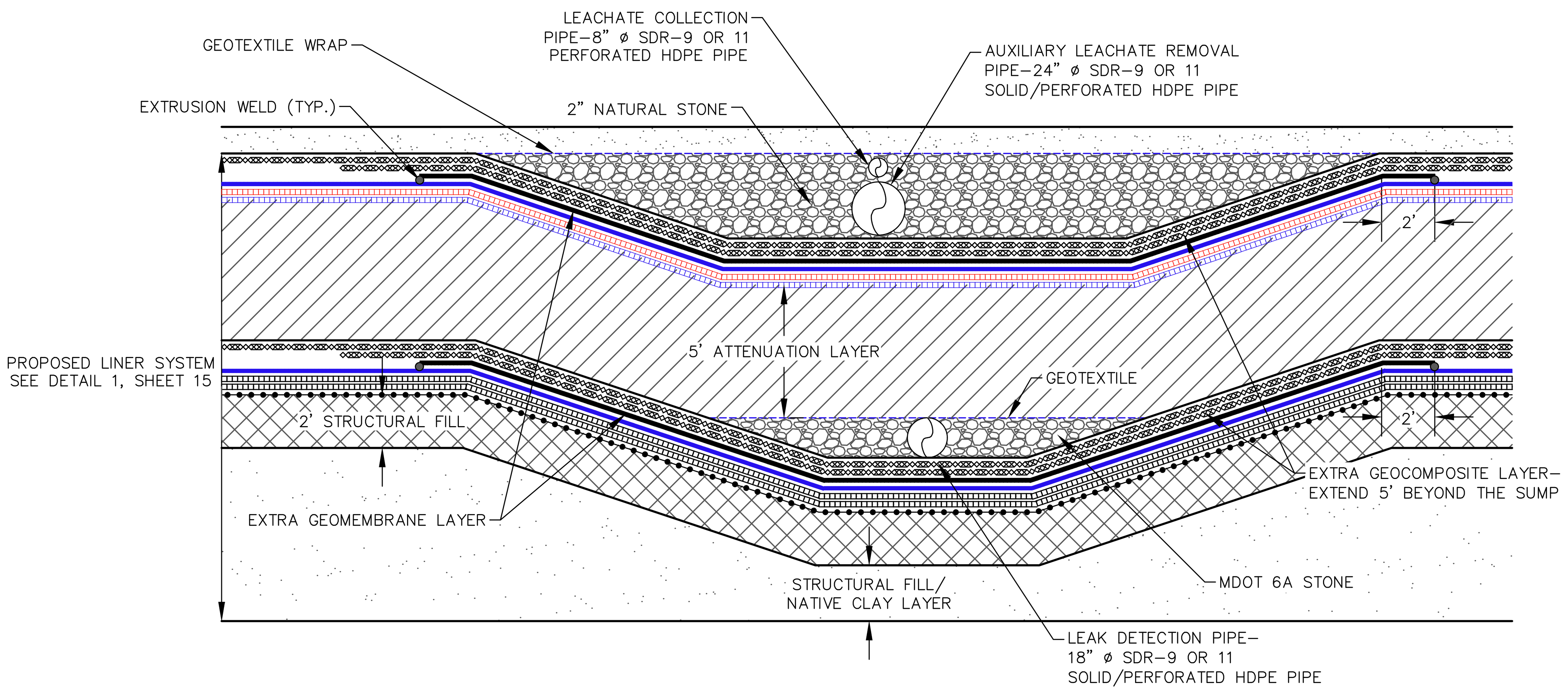
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
LEACHATE COLLECTION SYSTEM DETAILS (1 OF 2)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

LEACHATE COLLECTION SYSTEM DETAILS (1 OF 2)

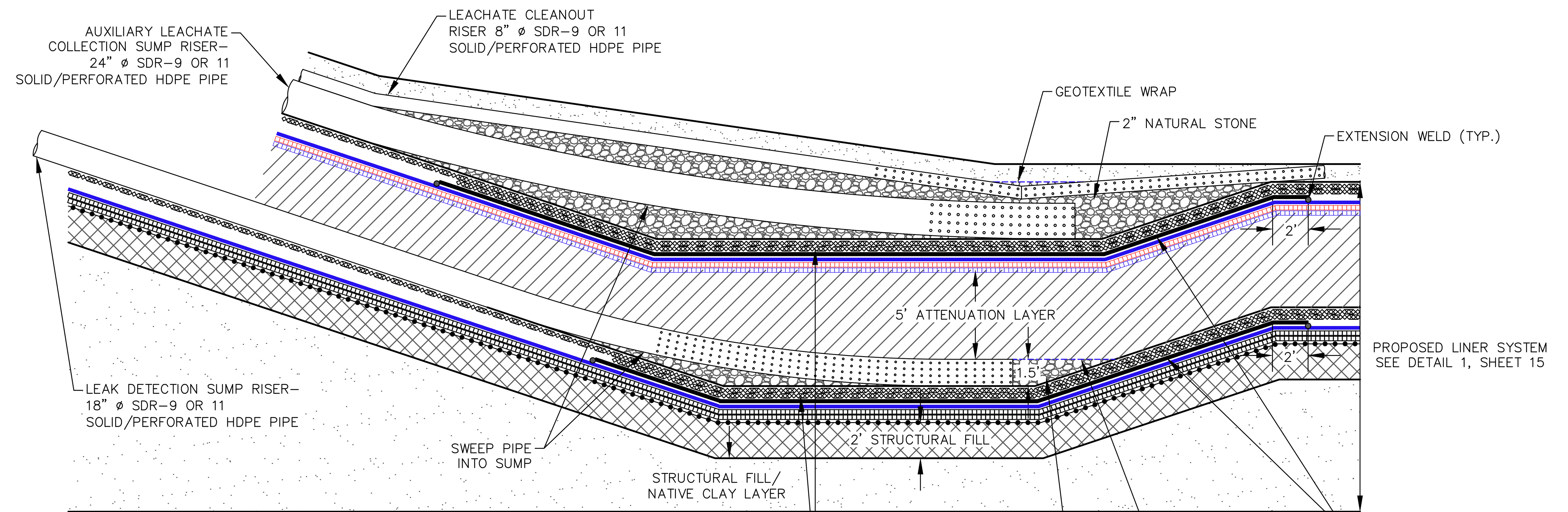
PROJECT NUMBER 1208070039
SCALE AS SHOWN
DRAWING NO 18



1/19 **LCS-LDCRS SUMP (TYP.)**
NOT TO SCALE



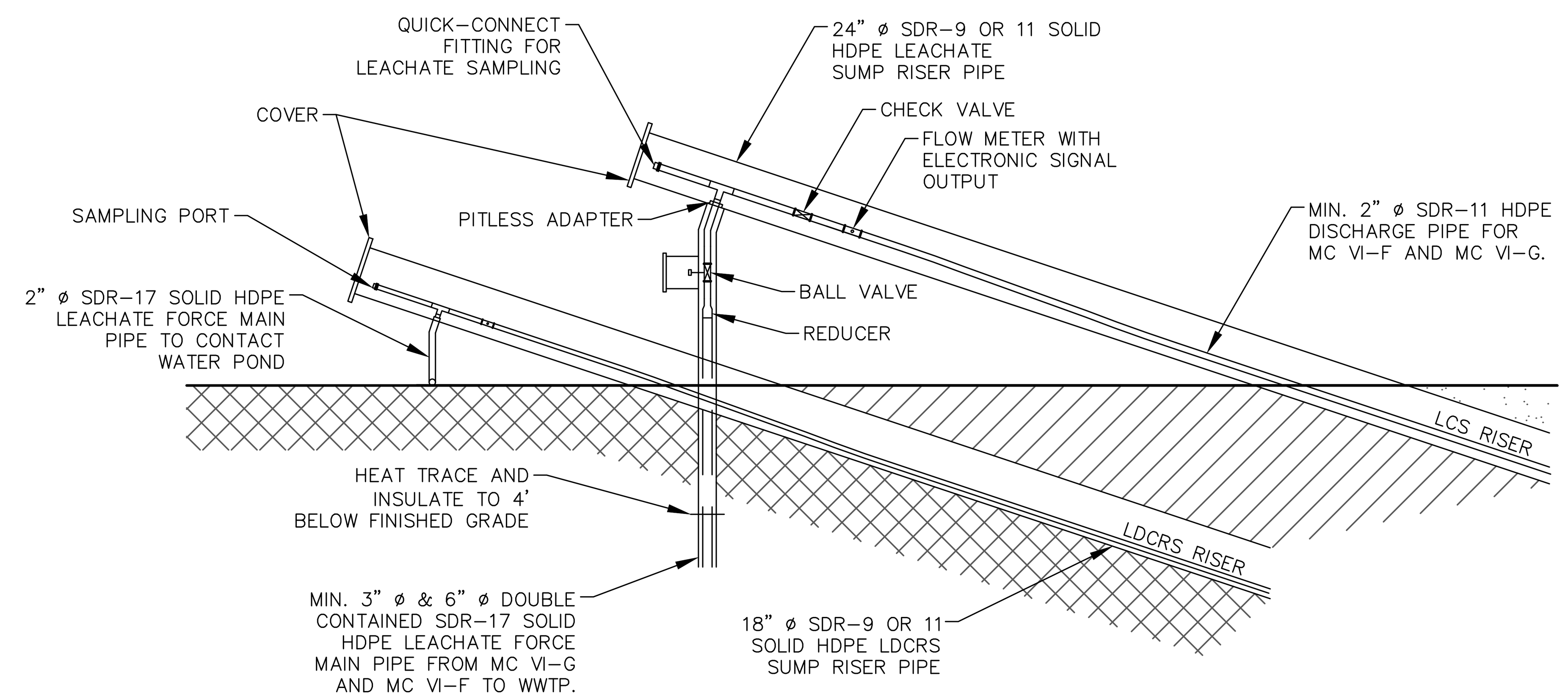
B/19 **SUMP CROSS-SECTION B**
NOT TO SCALE



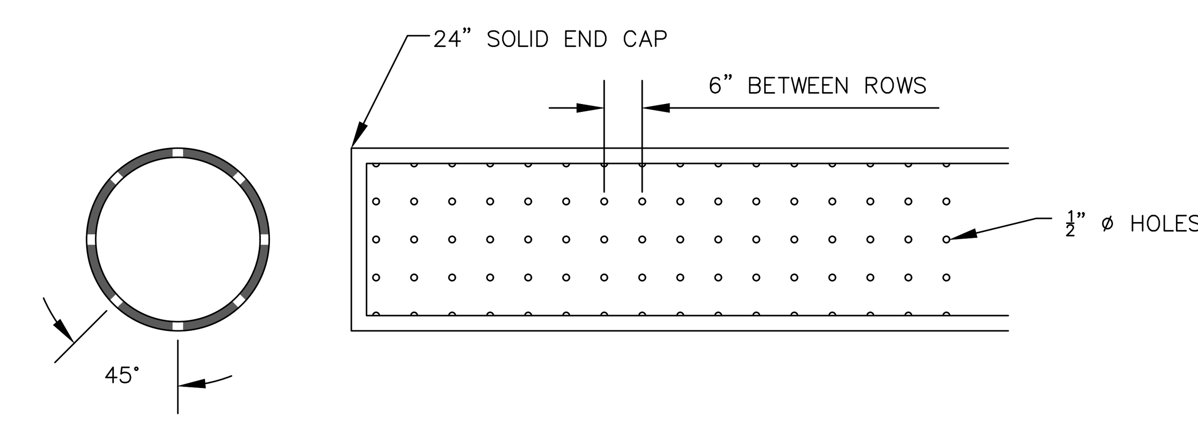
NOTES:

1. LDCRS "PUMP-ON" ELEV = TOP OF LDCRS SUMP
   LDCRS "PUMP-OFF" ELEV = 1 FOOT ABOVE LDCRS SUMP BOTTOM
   LCS "PUMP-ON" ELEV = LCS PIPE INVERT
   LCS "PUMP-OFF" ELEV = 1 FOOT ABOVE LCS SUMP BOTTOM
2. OTHER "PUMP-ON"/"PUMP-OFF" CONTROLS MAY BE USED PROVIDED LESS THAN 1 FOOT OF LEACHATE HEAD ON THE LINER IS MAINTAINED
3. THE AUXILIARY LEACHATE COLLECTION SUMP RISER IS REQUIRED FOR THE MC VI-G1 SUMP ONLY.

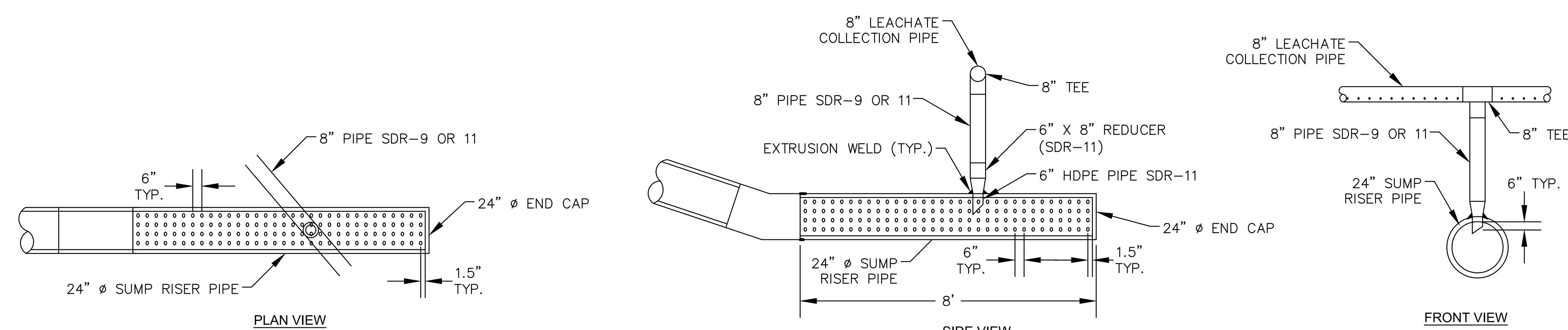
A/19 **SUMP CROSS-SECTION A**
NOT TO SCALE



2/19 **LCS AND LDCRS RISER DETAIL**
NOT TO SCALE



3/19 **SUMP PERFORATION SPACING DETAIL**
NOT TO SCALE



4/19 **LEACHATE COLLECTION PIPE AND SUMP RISER CONNECTION DETAIL**
NOT TO SCALE

Geosynthetic Materials

Material	Location	Description	Product	Additional Requirements
80-mil Geomembrane	Primary and secondary liners	80-mil HDPE, textured both sides	GSE HD textured, or equivalent	Interface friction requirements in CQA Plan
40-mil Geomembrane	Final cover	40-mil HDPE, textured both sides	GSE HD textured, or equivalent	Interface friction requirements in CQA Plan
Geosynthetic Clay Liner	Final cover and secondary liner	Sodium bentonite encapsulated between two geotextiles that are needle-punched or stitch-bonded together	CETCO Bentomat ST, or equivalent	Internal shear strength requirements in CQA Plan
Geosynthetic Clay Liner	Primary and secondary liners	Sodium bentonite encapsulated between two geotextiles that are needle-punched together	CETCO Bentomat DN, or equivalent	Internal shear strength requirements in CQA Plan
Geosynthetic Clay Liner	Primary liner	Sodium bentonite encapsulated between two geotextiles that are needle-punched and laminated to a geofilm	CETCO Bentomat CL, or equivalent	Internal shear strength requirements in CQA Plan
Geosynthetic Clay Liner	Primary Liner	Polymer-modified bentonite	CETCO Resistex 200 FLW9, or equivalent	Internal shear strength requirements in CQA Plan
Geocomposite	LCS and LDCRS	200-mil HDPE, bonded top and bottom to geotextile meeting requirements below	GSE FABRINET, or equivalent	Transmissivity and interface friction requirements in CQA Plan
Cover Geocomposite	Final cover	200-mil HDPE, bonded top and bottom to geotextile meeting requirements below	GSE FABRINET, or equivalent	Transmissivity and interface friction requirements in CQA Plan
Geonet	LCS and LDCRS sumps, and LDCRS collectors	200-mil HDPE	GSE HYPERNET, or equivalent	Transmissivity requirements in CQA Plan
Geotextile	All geocomposites, gravel/geotextile envelopes for LCS, and final cover perimeter drain	Nominal 8 oz/yd^2, needle-punched, non-woven polypropylene	Amoco 4508, Synthetic Industries Geotex 801, or equivalent	AASHTO M288-96 requirements for Drainage Geotextile (Class 2)
Geogrid	Above subgrade	Biaxial Polymeric Grid	Huesker Fortrac 80-80, or equivalent	None

LCS denotes leachate collection system
LDCRS denotes leak detection, collection, and removal system

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
B	9/23/11	PER MDEQ COMMENTS		

DATE: 01/20/21
DESIGNED BY: BA
DRAWN BY: WRG
CHECKED BY: CAB
APPROVED BY: XZ

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Novi, Michigan 48377
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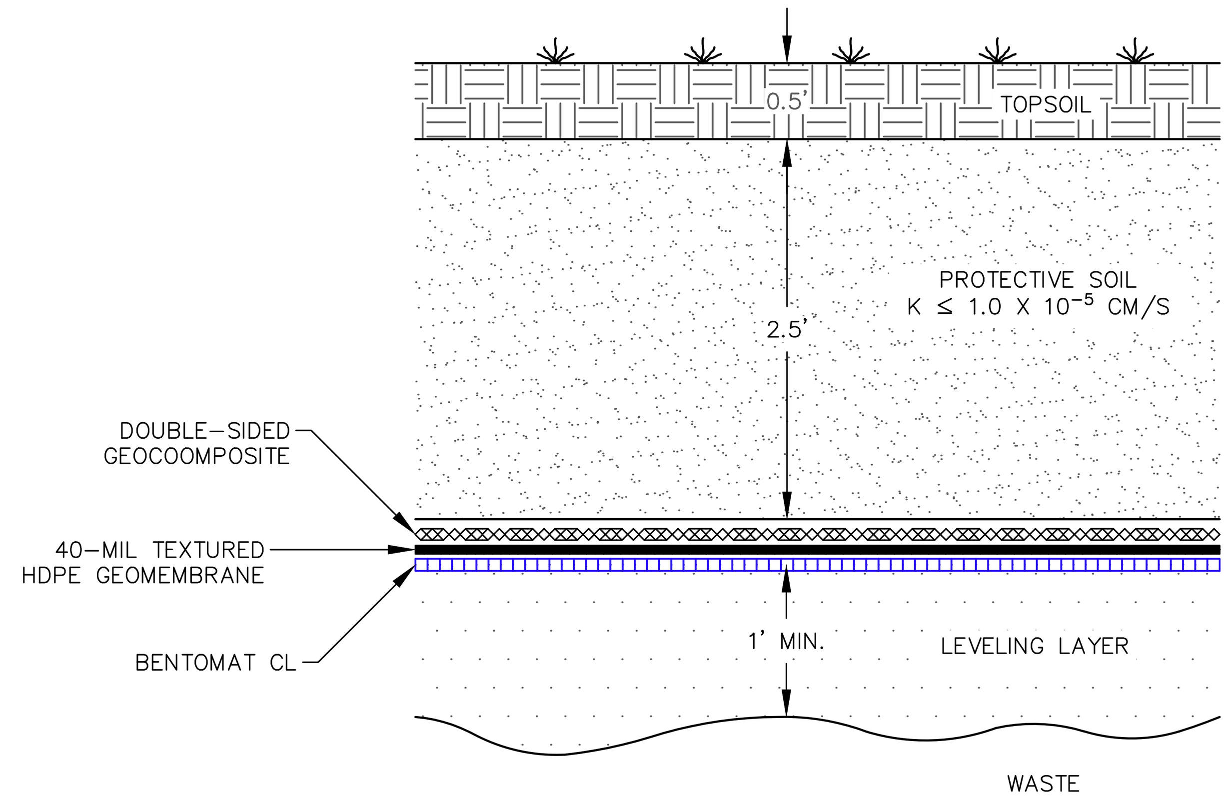
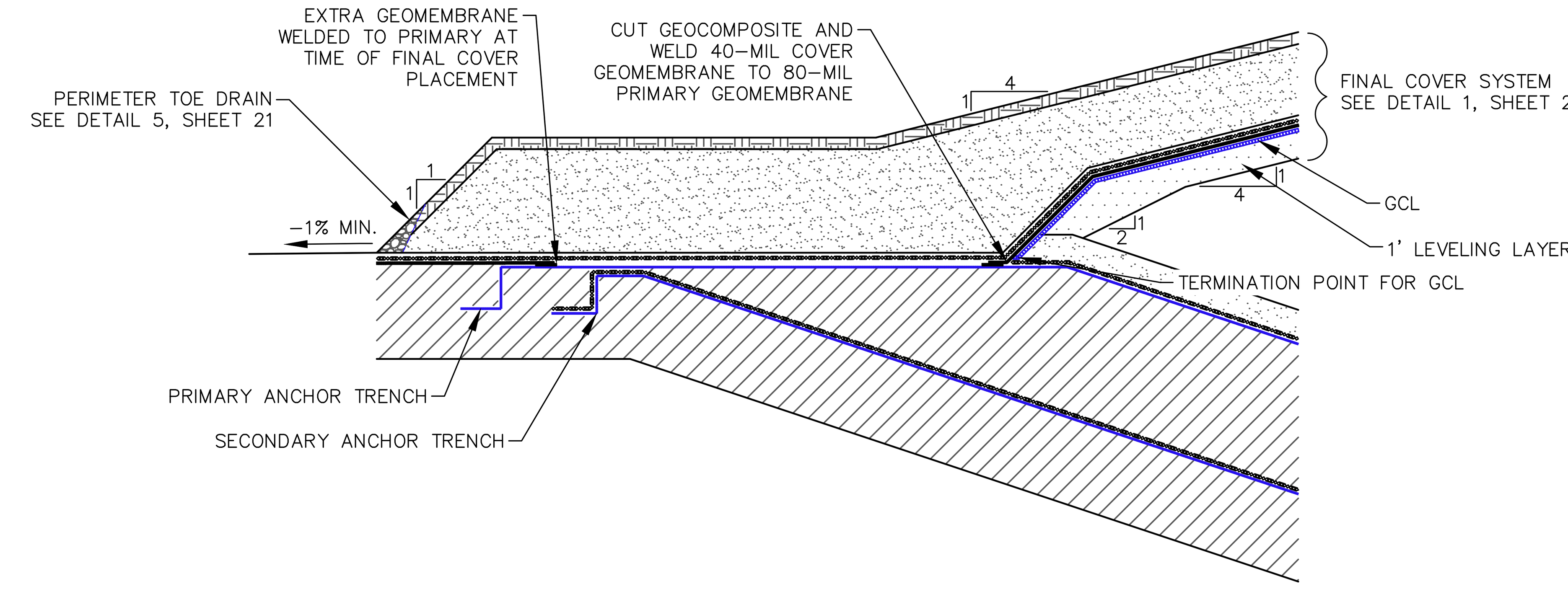
WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
LEACHATE COLLECTION SYSTEM DETAILS (2 OF 2)
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

LEACHATE COLLECTION SYSTEM DETAILS (2 OF 2)

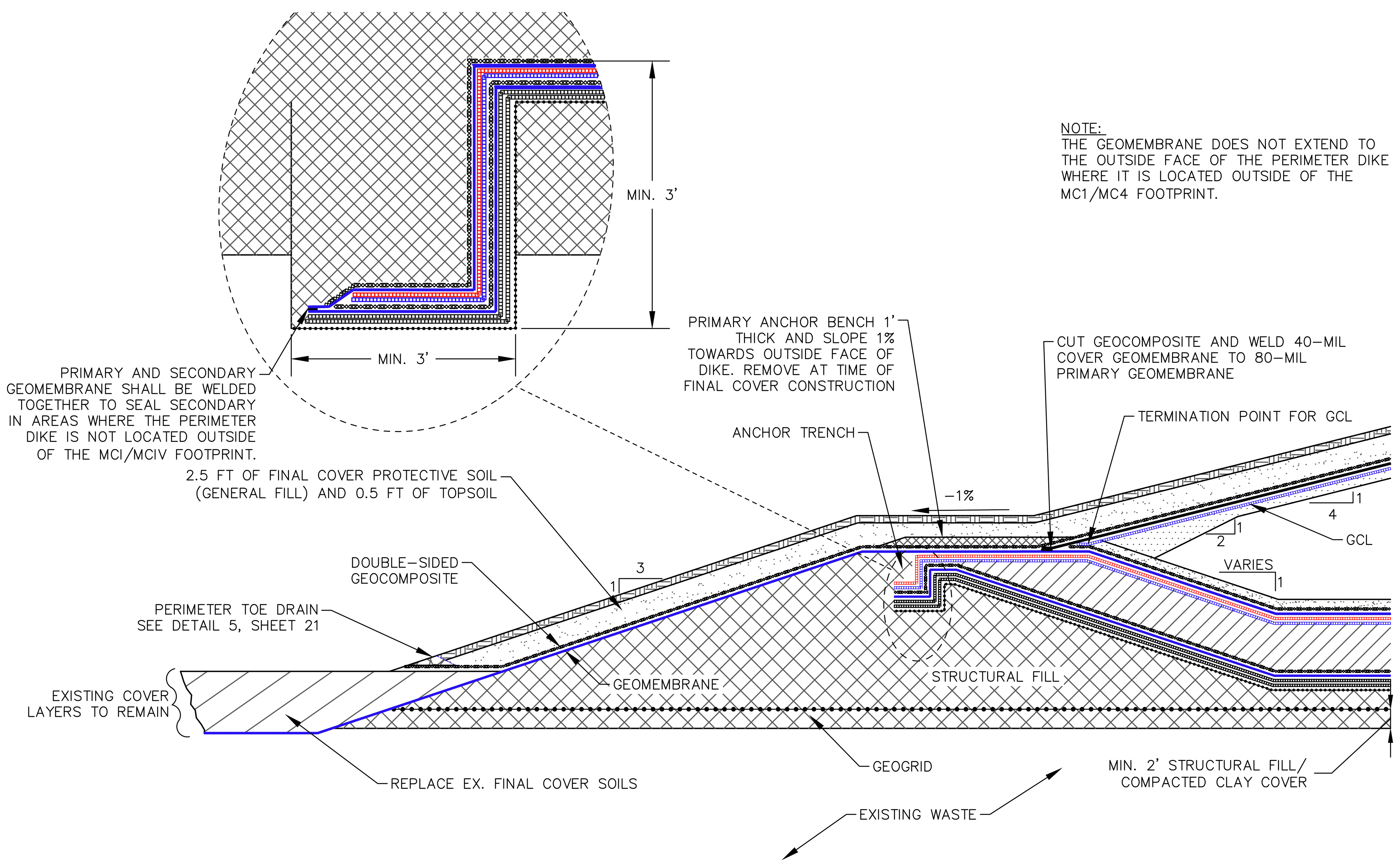
PROJECT NUMBER 1208070039
SCALE AS SHOWN
DRAWING NO 19



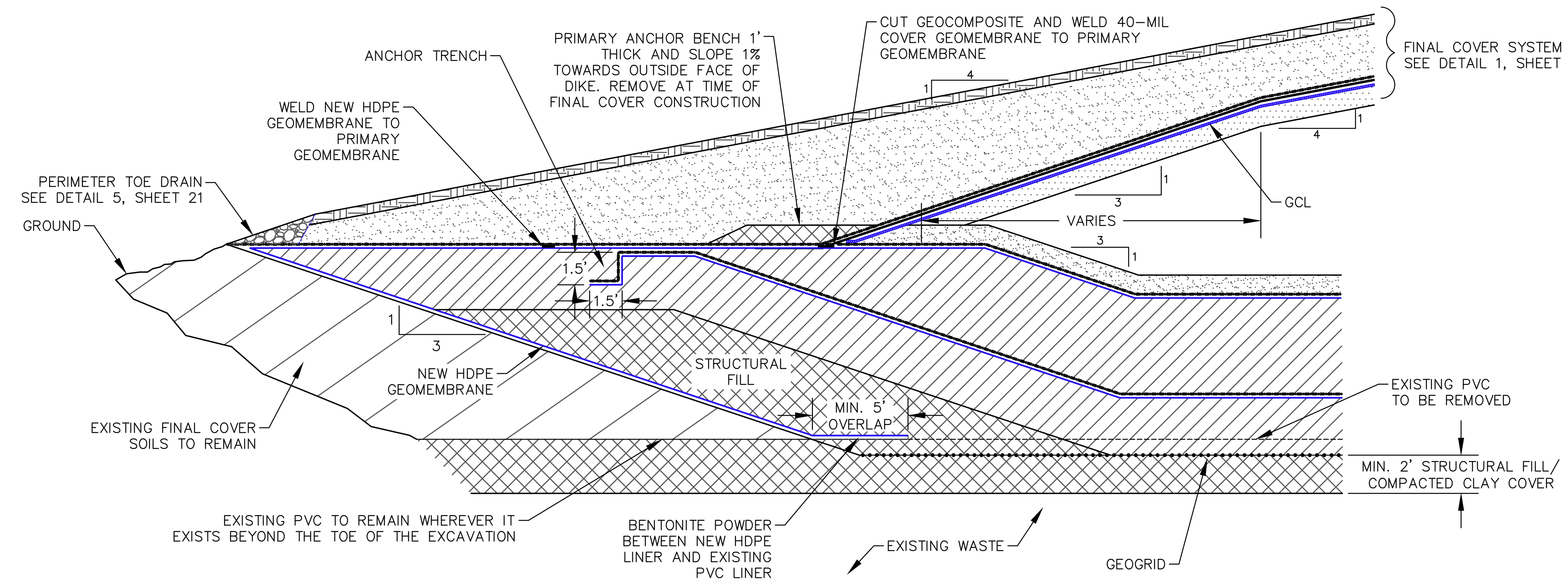
1/20 FINAL COVER SYSTEM
1"=2'



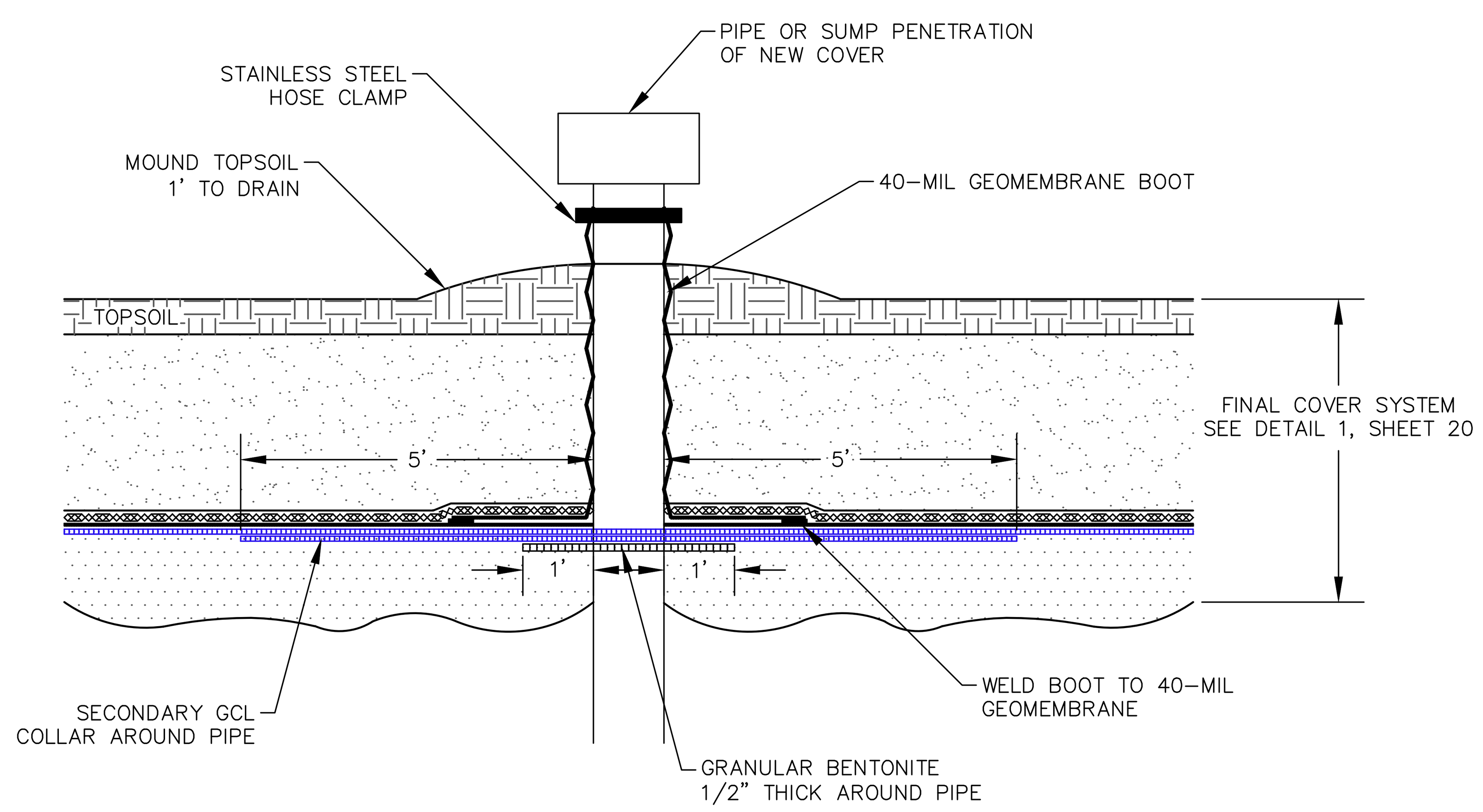
2/20 FINAL COVER TIE-IN DETAIL
MC VI-AN, AS, C & D
NOT TO SCALE



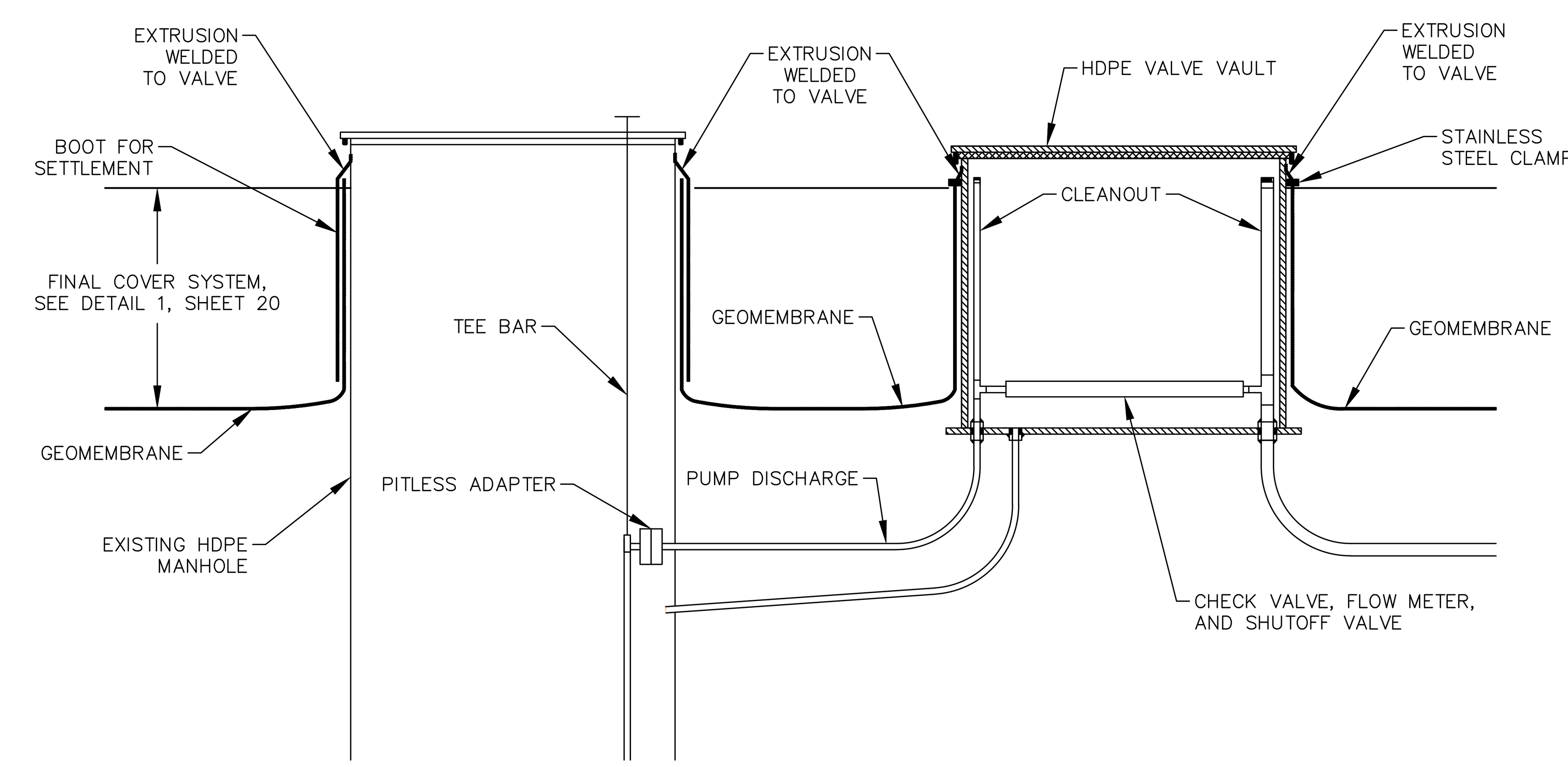
3/20 DIKE AND COVER TIE-IN DETAIL (TYP.)
MC VI-F, MC VI-G, & EAST SIDE OF MC VI-E
NOT TO SCALE



4/20 DIKE AND COVER TIE-IN DETAIL
NORTH SIDE OF MC VI-E
NOT TO SCALE



5/20 FINAL COVER PENETRATION DETAIL (TYP.)
NOT TO SCALE



6/20 LEACHATE SUMP RISER PIPING DETAIL
(MC VI-AN,AS, B, C, & D RISERS) F
NOT TO SCALE

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

CTI and Associates, Inc.
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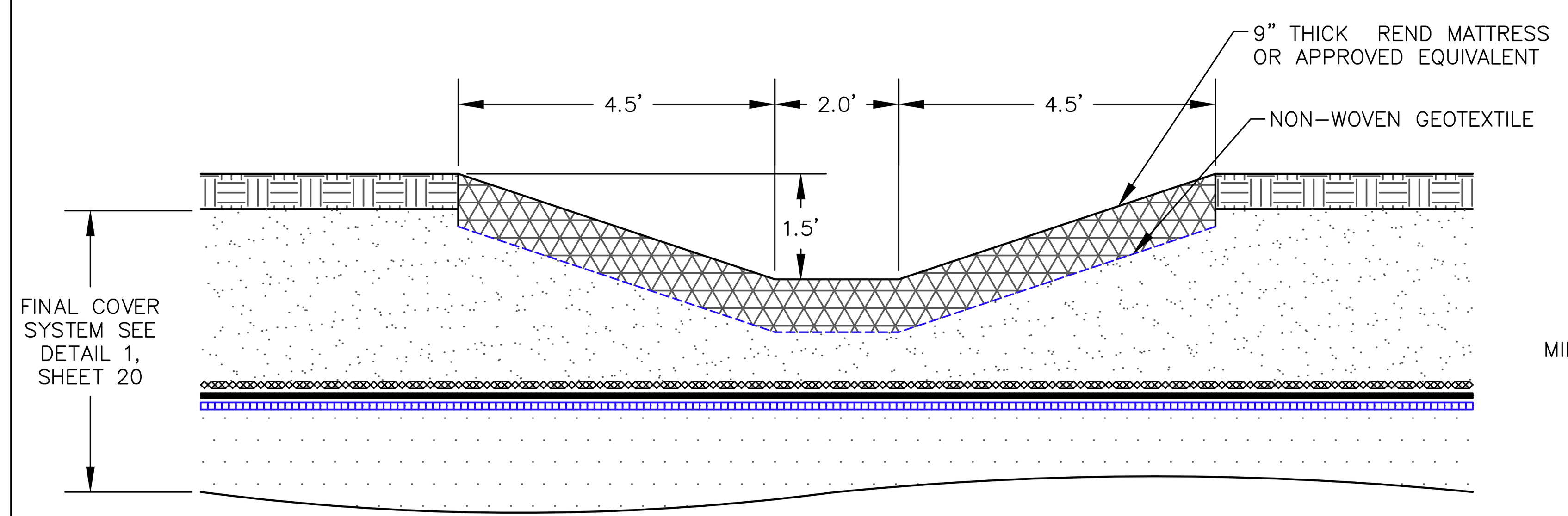
REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ

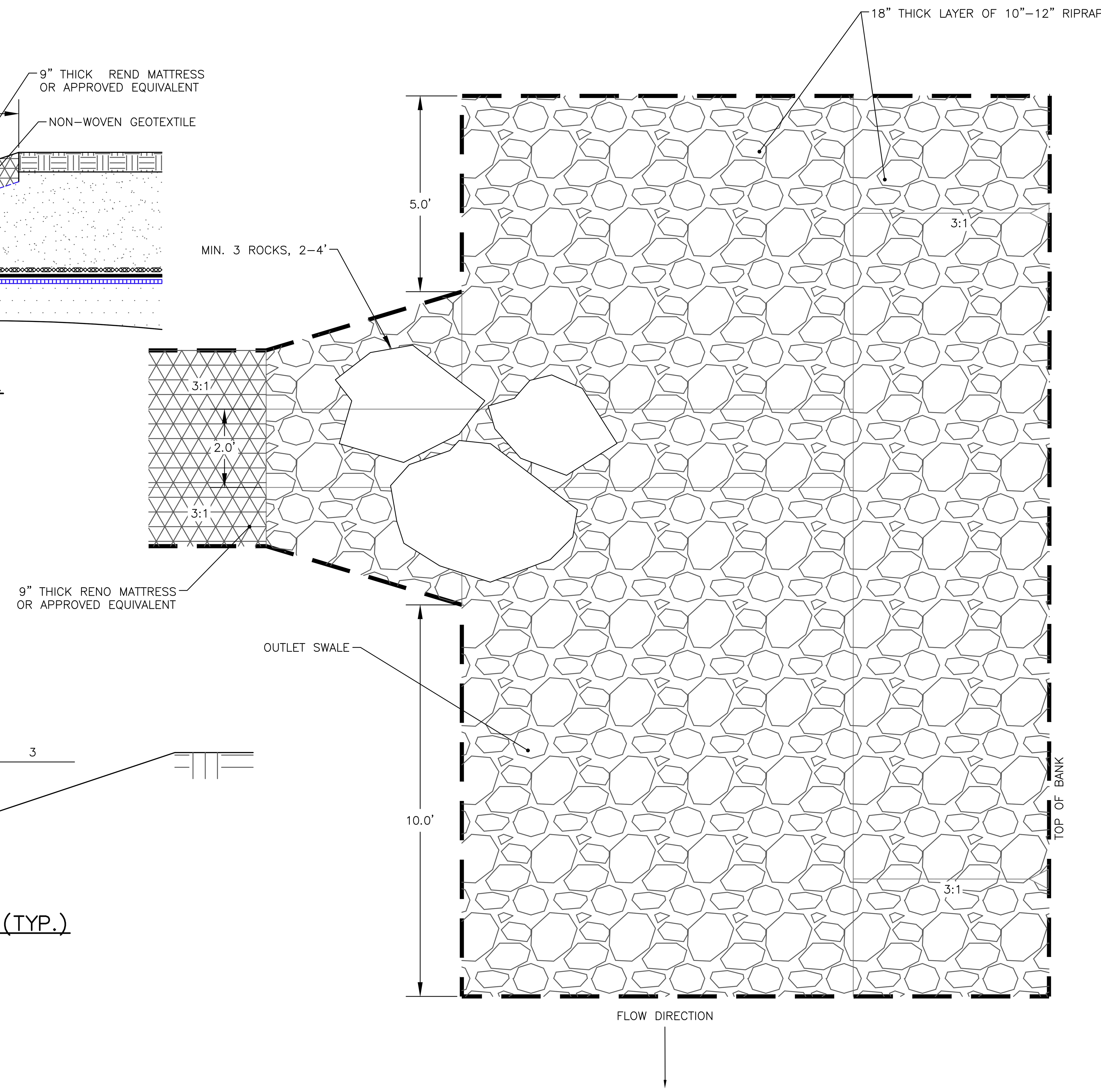
WAYNE DISPOSAL, INC. SITE NO. 2- MASTER CELL VI-F&G
FINAL COVER DETAILS
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

FINAL COVER DETAILS

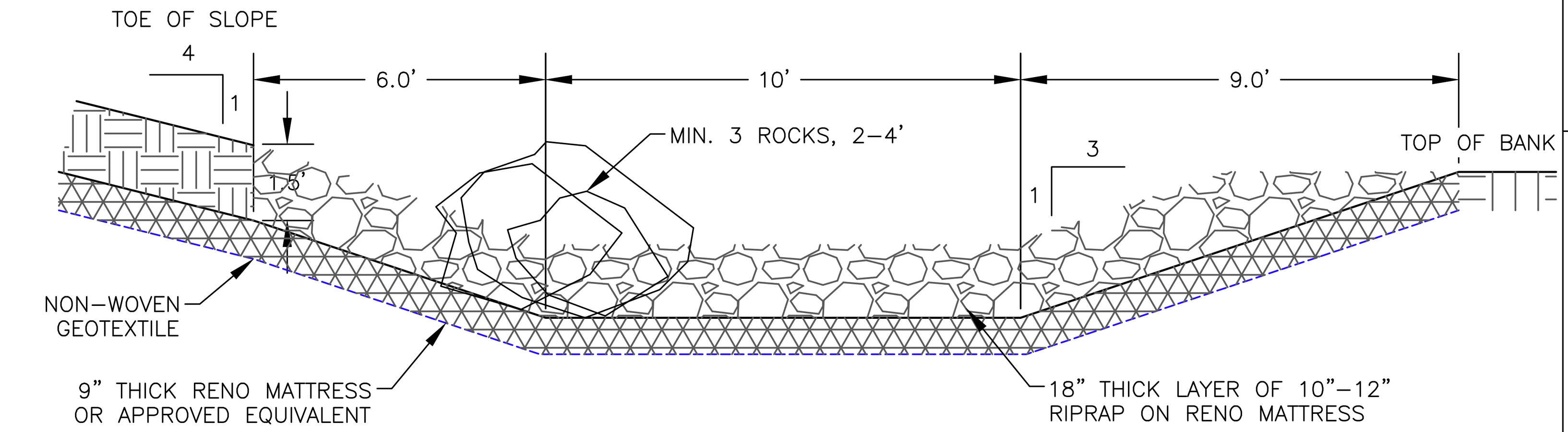
PROJECT NUMBER 1208070039
SCALE AS SHOWN
DRAWING NO 20



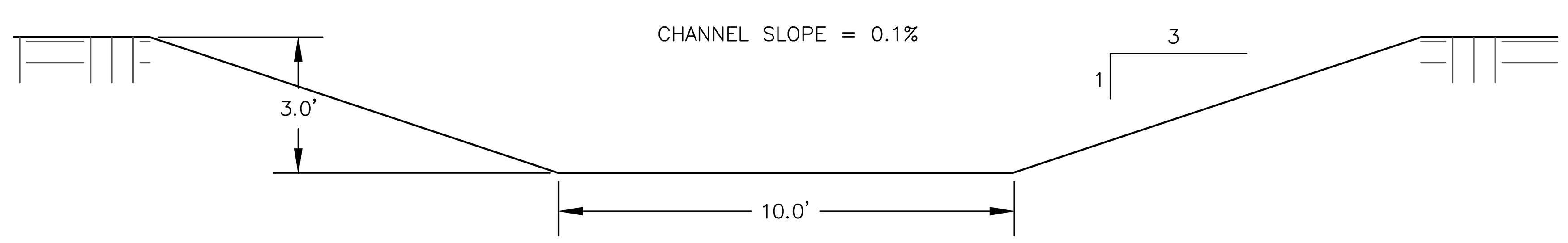
1/21 TYPICAL PAVEMENT DETAIL
SCALE: 1"=2'



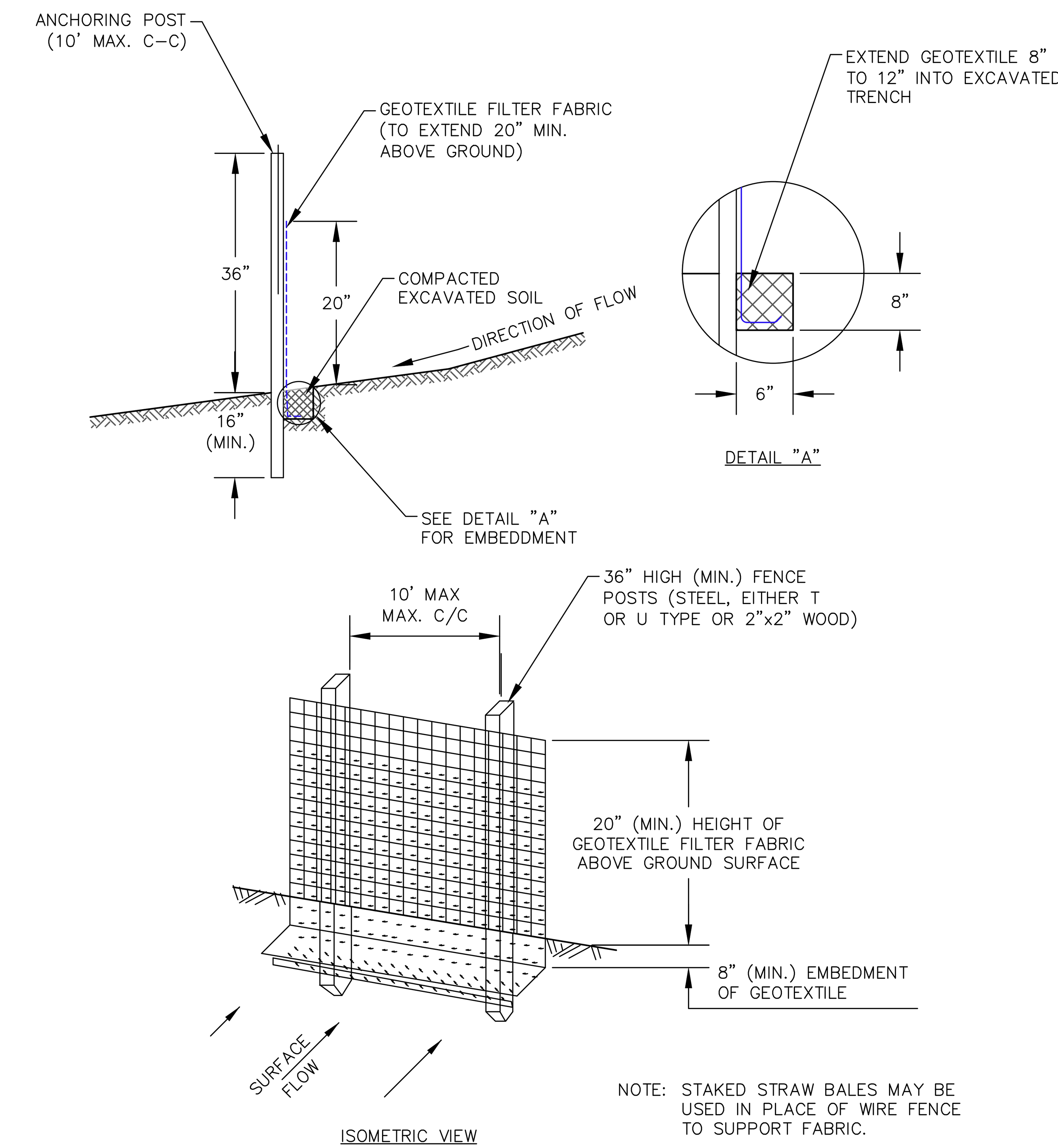
2/21 TOE OF SPILLWAY DOWNSLOPE CHANNEL
SCALE: 1"=2'



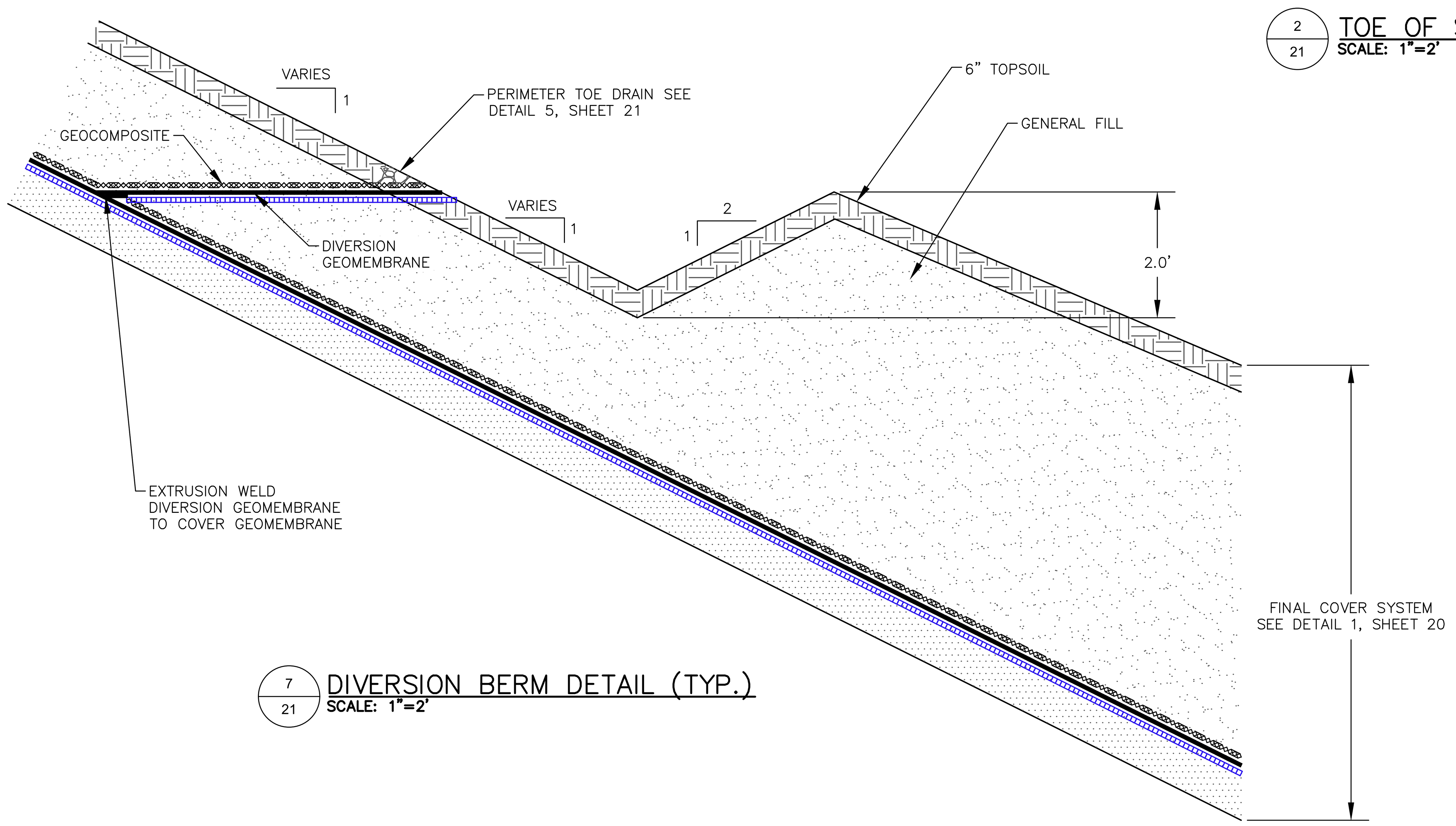
3/21 TOE OF SPILLWAY PROFILE
SCALE: 1"=3'



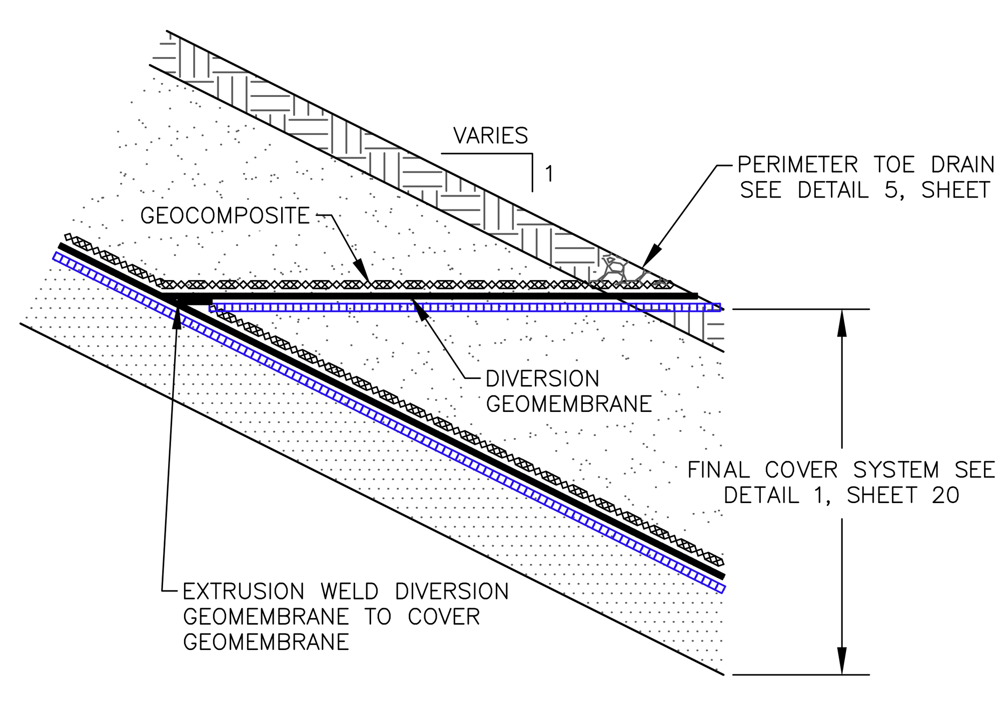
4/21 OUTLET SWALE CROSS SECTION (TYP.)
SCALE: 1"=3'



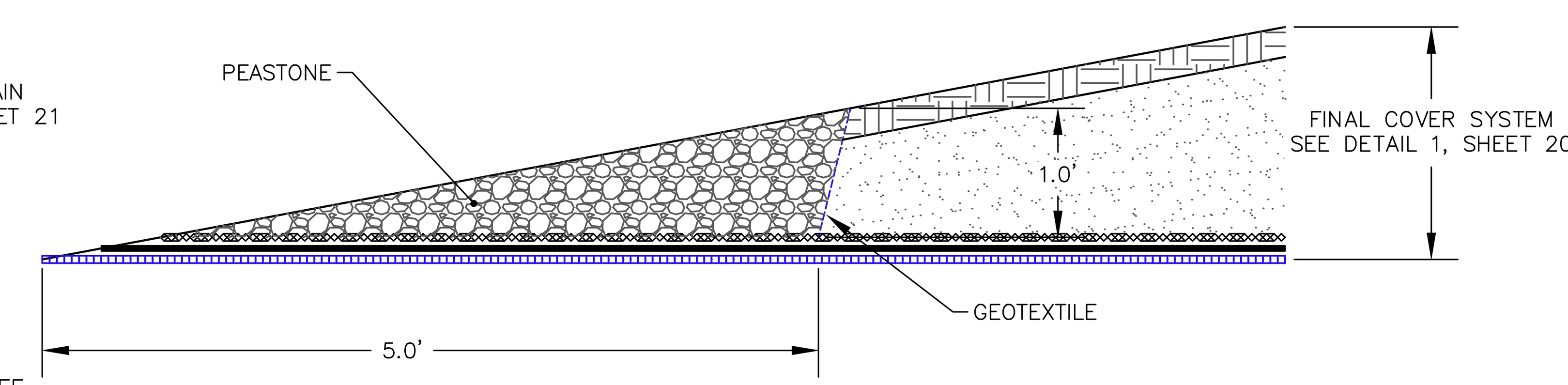
6/21 SILT FENCE DETAIL (TYP.)
SCALE: 1"=1'



7/21 DIVERSION BERM DETAIL (TYP.)
SCALE: 1"=2'



8/21 DIVERSION GEOMEMBRANE DETAIL (TYP.)
SCALE: 1"=2'



5/21 PERIMETER TOE DRAIN
SCALE: 1"=1'

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

CTI and Associates, Inc.
28001 Cabot Drive, Ste. 250
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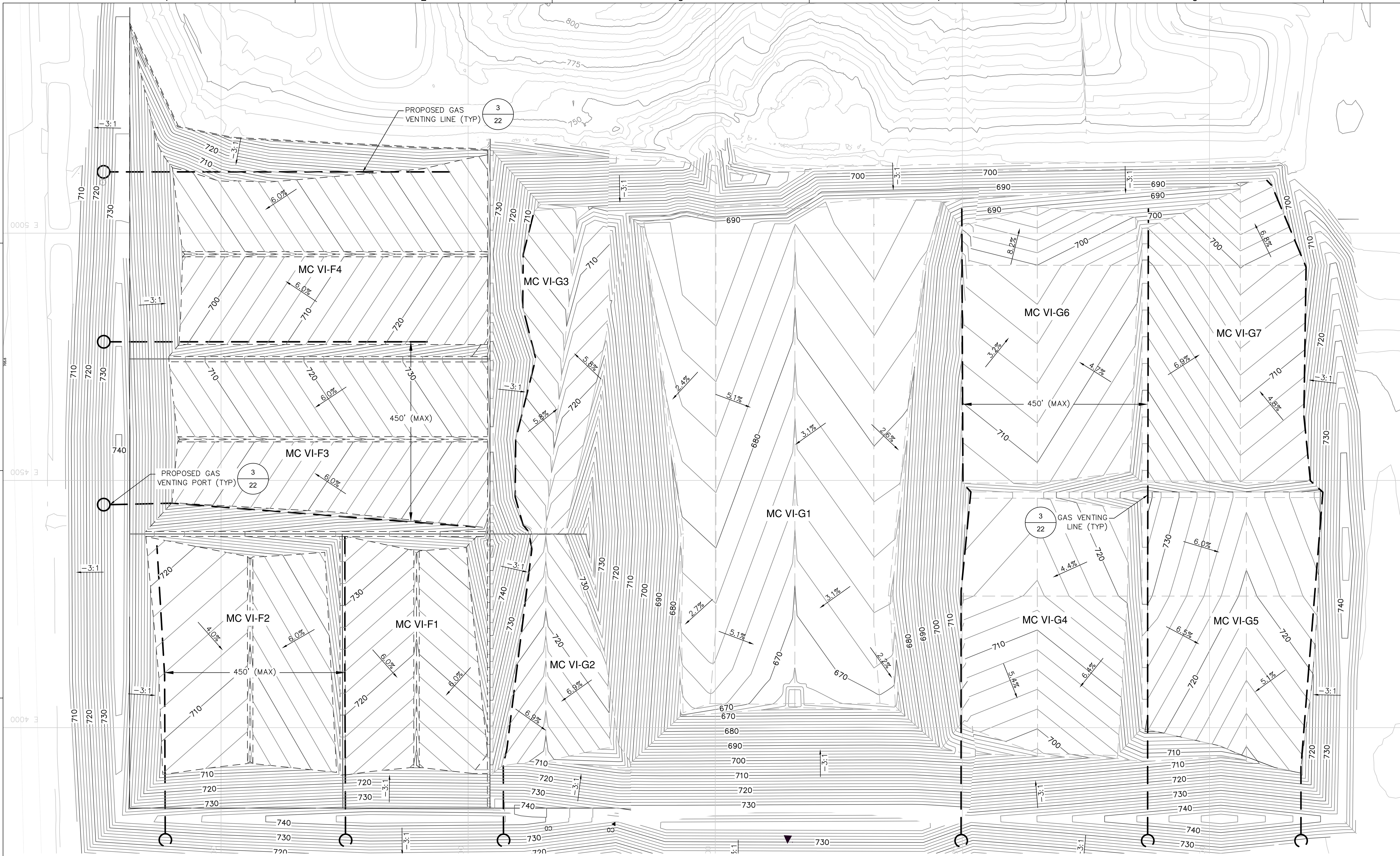
www.cticompanies.com

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ

WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
STORMWATER MANAGEMENT SYSTEM DETAILS
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

STORMWATER MANAGEMENT SYSTEM DETAILS

PROJECT NUMBER 1208070039
SCALE AS SHOWN
DRAWING NO 21

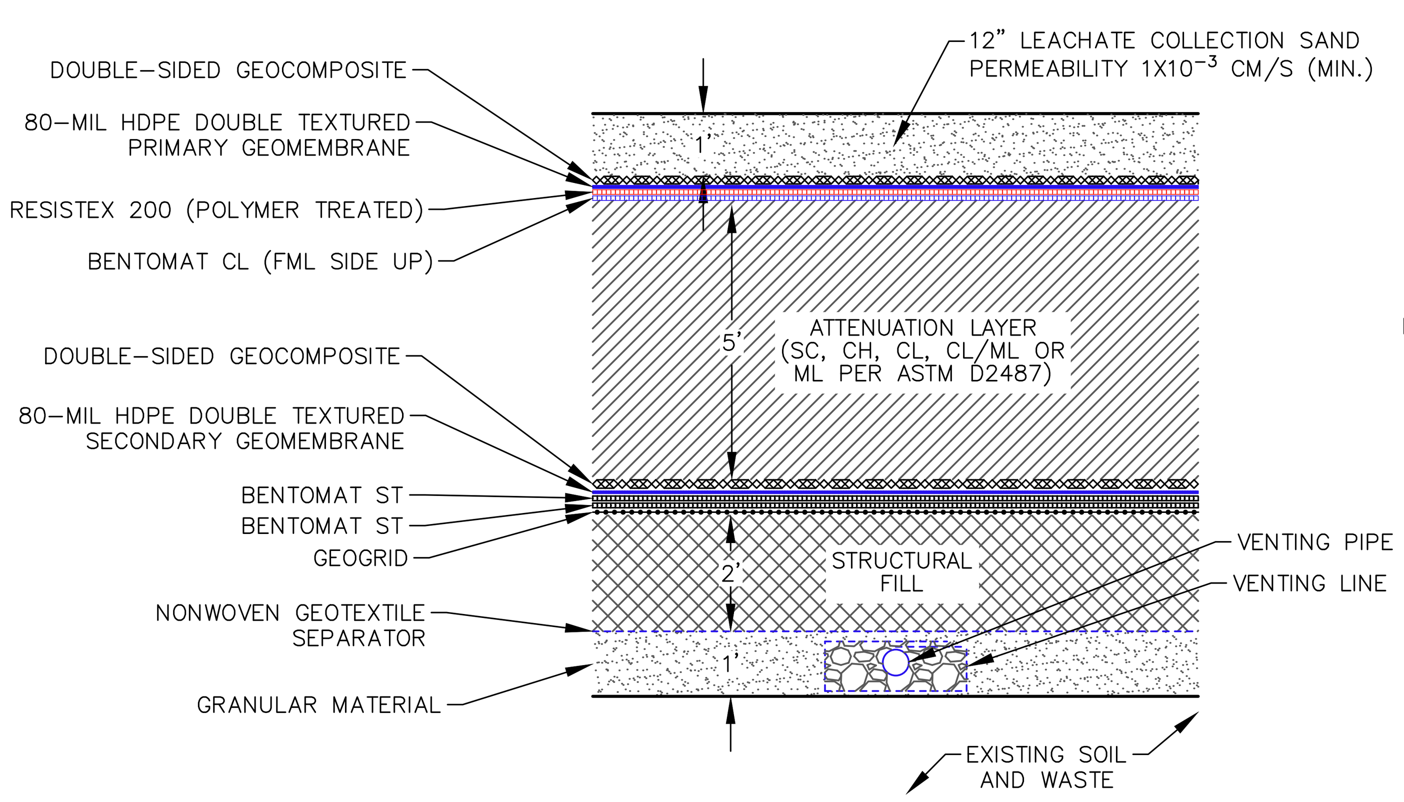


LEGEND

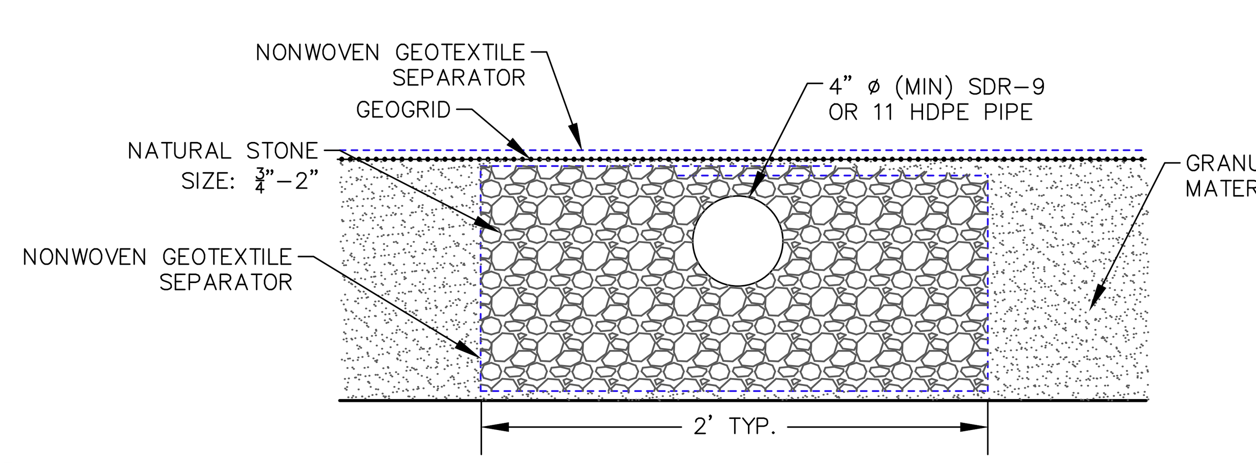
500	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
500	MASTER CELL VI-F & G MAJOR CONTOURS
	MASTER CELL VI-F &G MINOR CONTOURS
	GRADE BREAKS
	GRADE BREAKS(MAY 2018 PERMIT)
	PROPOSED GAS VENT LINE

NOTES:

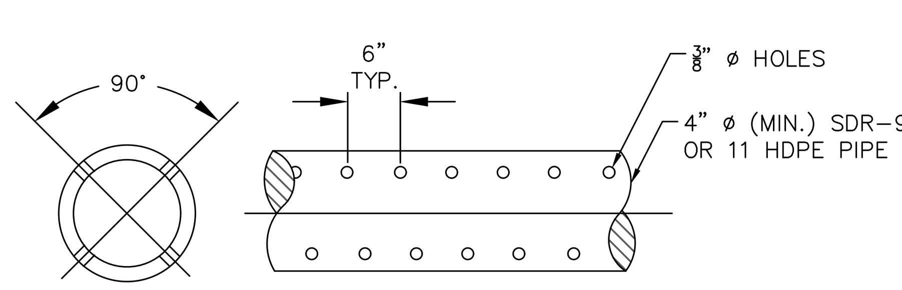
1. THE BASE MAP WAS CREATED USING AN AERIAL SURVEY TAKEN IN 2020 BY WDI.
2. GRADES DEPICTED IN MC VI-F SUBCELLS F1-F4 REPRESENT REDESIGN TOP OF GAS VENTING SYSTEM GRADES. GRADES DEPICTED IN MC VI-G SUBCELLS G1-G2 REPRESENT AS-BUILT TOP OF PRIMARY LINER GRADES. GRADES DEPICTED IN MC VI-G SUBCELL G3-G7 REPRESENT 2018 PERMITTED TOP OF PRIMARY LINER GRADES.



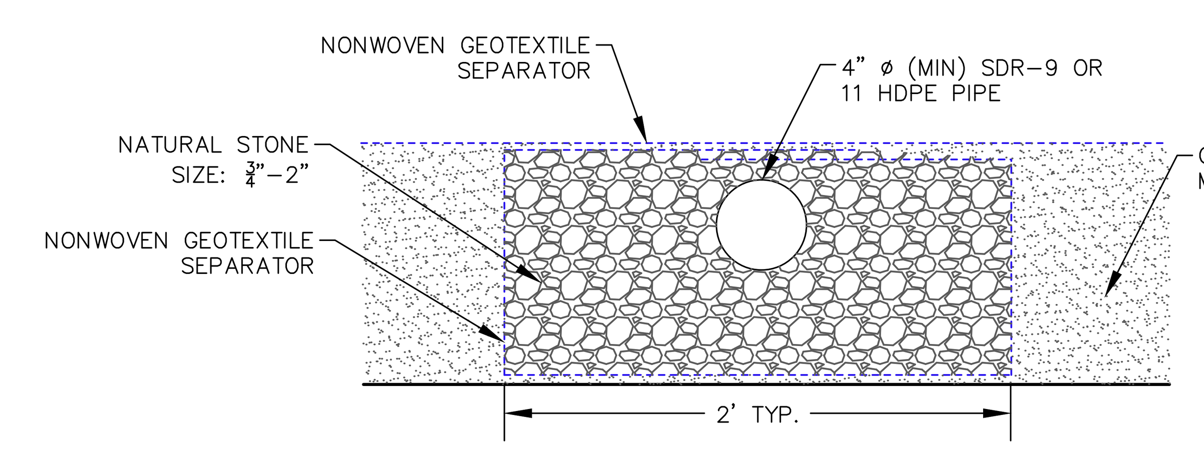
1/22 PROPOSED VENTING SYSTEM FOR SUBCELLS F1-4 AND G3-7
NOT TO SCALE



2A/22 PROPOSED FLOOR LINER SYSTEM
NOT TO SCALE



3/22 VENTING PIPE DETAIL
NOT TO SCALE



2B/22 VENTING LINE DETAIL FOR SUBCELLS F1-4 AND G3-7
NOT TO SCALE

DATE:	01/20/21
DESIGNED BY:	BA
DRAWN BY:	WRG
CHECKED BY:	CAB
APPROVED BY:	XZ

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248.486.5100 (fax)248.486.5050
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REVISIONS

REV	DATE	REVISION DESCRIPTION	DRN	APP
F	01/20/21	SUBCELLS F1-F4 REVISIONS	WRG	XZ
E	5/29/18	ADDENDUM 1	PAA	XZ
C	5/02/18	SUBCELLS G2 AND G3 REVISIONS	PAA	XZ

WAYNE DISPOSAL, INC. SITE NO. 2 - MASTER CELL VI-F&G
CONCEPTUAL GAS VENTING SYSTEM
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

CONCEPTUAL GAS VENTING SYSTEM

PROJECT NUMBER 1208070039
SCALE AS SHOWN
DRAWING NO 22

Attachment D

GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines

RESISTEX® 200 FLW9 CERTIFIED PROPERTIES

CETCO® Resistex® geosynthetic clay liners are engineered to provide the highest level of chemical compatibility in extremely aggressive leachate environments such as some coal combustion product storage facilities, mining operations, and industrial waste storage facilities. Site-specific compatibility testing is strongly recommended.[7]

MATERIAL PROPERTY	TEST METHOD	TEST FREQUENCY	CERTIFIED VALUES
Scrim-reinforced Nonwoven Base Geotextile Mass/Area[1]	ASTM D5261	200,000 ft^2 (20,000 m^2)	6.0 oz/yd^2 (200 g/m^2) min.
Nonwoven Cap Geotextile Mass/Area[1]	ASTM D5261	200,000 ft^2 (20,000 m^2)	9.0 oz/yd^2 (300 g/m^2) min.
Bentonite Moisture Content[2]	ASTM D2216	1 per 50 tonnes	12% max.
Bentonite Swell Index[2]	ASTM D5890	1 per 50 tonnes	24 mL/2g min.
Bentonite Fluid Loss[2]	ASTM D5891	1 per 50 tonnes	18 mL max.
Bentonite Mass/Area[3]	ASTM D5993	40,000 ft^2 (4,000 m^2)	0.75 lb/ft^2 (3.7 kg/m^2) min.
Total Mass/Area[3]	ASTM D5993	40,000 ft^2 (4,000 m^2)	0.85 lb/ft^2 (4.2 kg/m^2) min.
GCL Moisture Content	ASTM D5993	40,000 ft^2 (4,000 m^2)	35% max.
GCL Grab Strength[4]	ASTM D6768	200,000 ft^2 (20,000 m^2)	50 lbs/in (8.8 kN/m) min.
GCL Peel Strength	ASTM D6496	40,000 ft^2 (4,000 m^2)	3.5 lbs/in (610 N/m) min.
GCL Hydraulic Conductivity[5]	ASTM D5887	250,000 ft^2 (25,000 m^2)	3 x 10^{-11} m/s max.
GCL Hydrated Internal Shear Strength[6]	ASTM D6243	1,000,000 ft^2 (100,000 m^2)	500 psf (24 kPa) typ.@ 200 psf (9.6 kPa)

Notes:
[1] Geotextile property tests performed on the geotextile components before they are incorporated into the finished GCL product.
[2] Bentonite property tests performed before the bentonite is incorporated into the finished GCL product.
[3] Reported at 0 percent moisture content.
[4] All tensile strength testing is performed in the machine direction using ASTM D6768.
[5] Index flux and hydraulic conductivity testing with deaired distilled/deionized water at 80 psi (550 kPa) cell pressure, 77 psi (530 kPa) headwater pressure and 75 psi (515 kPa) tailwater pressure.
[6] Peak values measured at 200 psf (9.6 kPa) normal stress for a specimen hydrated for 48 hours. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength of the proposed design.

MINERALS TECHNOLOGIES CETCO®

BENTOMAT® CL CERTIFIED PROPERTIES

CETCO® Bentomat® CL is a reinforced geosynthetic clay liner (GCL) consisting of a layer of sodium bentonite between a polypropylene woven geotextile and a polypropylene nonwoven geotextile, which are needle-punched together and laminated to a polyethylene geofilm.

MATERIAL PROPERTY	TEST METHOD	TEST FREQUENCY	CERTIFIED VALUES
Bentonite Moisture Content[2]	ASTM D2216	1 per 50 tonnes	12% max.
Bentonite Swell Index[2]	ASTM D5890	1 per 50 tonnes	24 mL/2g min.
Bentonite Fluid Loss[2]	ASTM D5891	1 per 50 tonnes	18 mL max.
Bentonite Mass/Area[3]	ASTM D5993	40,000 ft^2 (4,000 m^2)	0.75 lb/ft^2 (3.7 kg/m^2) min.
Geofilm Density[1]	ASTM D1505	200,000 ft^2 (20,000 m^2)	0.92 g/cm^3
Geofilm Thickness[1]	ASTM D5199	200,000 ft^2 (20,000 m^2)	5 mil (0.12 mm) min.
Geofilm Break Strength[1,4]	ASTM D882	200,000 ft^2 (20,000 m^2)	14 lbs/in (2.5 kN/m) min.
Total Mass/Area[3]	ASTM D5993	40,000 ft^2 (4,000 m^2)	0.84 lb/ft^2 (4.1 kg/m^2) min.
GCL Moisture Content	ASTM D5993	40,000 ft^2 (4,000 m^2)	35% max.
GCL Grab Strength[5]	ASTM D6768	200,000 ft^2 (20,000 m^2)	30 lbs/in (5.3 kN/m) min.
GCL Peel Strength	ASTM D6496	40,000 ft^2 (4,000 m^2)	3.5 lbs/in (610 N/m) min.
GCL Hydraulic Conductivity[6]	ASTM D5887	250,000 ft^2 (25,000 m^2)	5×10^{-12} m/s max.
GCL Index Flux[6]	ASTM D5887	250,000 ft^2 (25,000 m^2)	1×10^{-9} $m^3/m^2/s$ max.
GCL Hydrated Internal Shear Strength[7]	ASTM D6243	1,000,000 ft^2 (100,000 m^2)	500 psf (24 kPa) typ.@ 200 psf (9.6 kPa)

Notes:

1 Geosynthetic property tests performed on the geosynthetic components before they are incorporated into the finished GCL product.

2 Bentonite property tests performed before the bentonite is incorporated into the finished GCL product.

3 Reported at 0 percent moisture content.

4 Geofilm tensile break strength performed in the machine and cross-machine directions using ASTM D882.

5 GCL tensile strength testing is performed in the machine direction using ASTM D6768.

6 ASTM D5887 is modified to include the laminated thin flexible membrane on the test specimen. Index flux and hydraulic conductivity testing with deaired distilled/deionized water at 80 psi (550 kPa) cell pressure, 77 psi (530 kPa) headwater pressure and 75 psi (515 kPa) tailwater pressure. ASTM D5887 (modified) testing is performed only on a periodic basis because the thin flexible membrane is essentially impermeable. The Bentomat® GCL core (without the flexible membrane) has a maximum hydraulic conductivity of 5×10^{-11} m/s with deaired distilled/deionized water. For more information, see CETCO® Technical Reference (TR) Nos. 111 and 112.

7 Peak values measured at 200 psf (9.6 kPa) normal stress for a specimen hydrated for 48 hours. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength of the proposed design.

www.CETCO.com | contact@cetco.com

BENTOMAT® DN CERTIFIED PROPERTIES

CETCO® Bentomat® DN is a reinforced geosynthetic clay liner (GCL) consisting of a layer of sodium bentonite between two polypropylene nonwoven geotextiles, which are needle-punched together.

MATERIAL PROPERTY	TEST METHOD	TEST FREQUENCY	CERTIFIED VALUES
Bentonite Moisture Content[1]	ASTM D2216	1 per 50 tonnes	12% max.
Bentonite Swell Index[1]	ASTM D5890	1 per 50 tonnes	24 mL/2g min.
Bentonite Fluid Loss[1]	ASTM D5891	1 per 50 tonnes	18 mL max.
Bentonite Mass/Area[2]	ASTM D5993	40,000 ft^2 (4,000 m^2)	0.75 lb/ft^2 (3.7 kg/m^2) min.
Total Mass/Area[2]	ASTM D5993	40,000 ft^2 (4,000 m^2)	0.83 lb/ft^2 (4.1 kg/m^2) min.
GCL Moisture Content	ASTM D5993	40,000 ft^2 (4,000 m^2)	35% max.
GCL Grab Strength[3]	ASTM D6768	200,000 ft^2 (20,000 m^2)	50 lbs/in (8.8 kN/m) min.
GCL Peel Strength	ASTM D6496	40,000 ft^2 (4,000 m^2)	3.5 lbs/in (610 N/m) min.
GCL Hydraulic Conductivity[4]	ASTM D5887	250,000 ft^2 (25,000 m^2)	5 x 10^{-11} m/s max.
GCL Index Flux[4]	ASTM D5887	250,000 ft^2 (25,000 m^2)	1 x 10^{-8} $m^3/m^2/s$ max.
GCL Hydrated Internal Shear Strength[5]	ASTM D6243	1,000,000 ft^2 (100,000 m^2)	500 psf (24 kPa) typ.@ 200 psf (9.6 kPa)

Notes:

1 Bentonite property tests performed before the bentonite is incorporated into the finished GCL product.

2 Reported at 0 percent moisture content.

3 All tensile strength testing is performed in the machine direction using ASTM D6768.

4 Index flux and hydraulic conductivity testing with deaired distilled/deionized water at 80 psi (550 kPa) cell pressure, 77 psi (530 kPa) headwater pressure and 75 psi (515 kPa) tailwater pressure.

5 Peak values measured at 200 psf (9.6 kPa) normal stress for a specimen hydrated for 48 hours. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength of the proposed design.

TR 401-BDN-3.5lb/in- D5889/GRI-GCL3
02/2017

BENTOMAT® ST CERTIFIED PROPERTIES

CETCO® Bentomat® ST is a reinforced geosynthetic clay liner (GCL) consisting of a layer of sodium bentonite between a polypropylene woven geotextile and a polypropylene nonwoven geotextile, which are needle-punched together.

MATERIAL PROPERTY	TEST METHOD	TEST FREQUENCY	CERTIFIED VALUES
Bentonite Moisture Content[1]	ASTM D2216	1 per 50 tonnes	12% max.
Bentonite Swell Index[1]	ASTM D5890	1 per 50 tonnes	24 mL/2g min.
Bentonite Fluid Loss[1]	ASTM D5891	1 per 50 tonnes	18 mL max.
Bentonite Mass/Area[2]	ASTM D5993	40,000 ft^2 (4,000 m^2)	0.75 lb/ft^2 (3.7 kg/m^2) min.
Total Mass/Area[2]	ASTM D5993	40,000 ft^2 (4,000 m^2)	0.81 lb/ft^2 (4.0 kg/m^2) min.
GCL Moisture Content	ASTM D5993	40,000 ft^2 (4,000 m^2)	35% max.
GCL Grab Strength[3]	ASTM D6768	200,000 ft^2 (20,000 m^2)	30 lbs/in (5.3 kN/m) min.
GCL Peel Strength	ASTM D6496	40,000 ft^2 (4,000 m^2)	3.5 lbs/in (610 N/m) min.
GCL Hydraulic Conductivity[4]	ASTM D5887	250,000 ft^2 (25,000 m^2)	5 x 10^{-11} m/s max.
GCL Index Flux[4]	ASTM D5887	250,000 ft^2 (25,000 m^2)	1 x 10^{-8} $m^3/m^2/s$ max.
GCL Hydrated Internal Shear Strength[5]	ASTM D6243	1,000,000 ft^2 (100,000 m^2)	500 psf (24 kPa) typ.@ 200 psf (9.6 kPa)

Notes:

1 Bentonite property tests performed before the bentonite is incorporated into the finished GCL product.

2 Reported at 0 percent moisture content.

3 All tensile strength testing is performed in the machine direction using ASTM D6768.

4 Index flux and hydraulic conductivity testing with deaired distilled/deionized water at 80 psi (550 kPa) cell pressure, 77 psi (530 kPa) headwater pressure and 75 psi (515 kPa) tailwater pressure.

5 Peak values measured at 200 psf (9.6 kPa) normal stress for a specimen hydrated for 48 hours. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength of the proposed design.

MINERALS TECHNOLOGIES CETCO®

CETCO GCL

CONSTRUCTION QUALITY ASSURANCE (CQA) MANUAL

Version 6.0, August 2008

800.527.9948 Fax 847.577.5566

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LIST OF APPENDICES

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SECTION 1
INTRODUCTION

1.1 Definitions

Construction Quality Assurance. For the purposes of this manual, construction quality assurance (CQA) is defined as a planned system of activities that provides assurance that *installation* of the geosynthetic clay liner (GCL) proceeds in accordance with the project design drawings and specifications. In general, these activities include continuous inspection of the installation, testing of materials and procedures, and overall documentation.

Construction Quality Control. Again, for the purposes of this manual, construction quality control (CQC) is defined as a planned system of activities that provides assurance that the properties of the GCL *materials* meet the requirements of the project specifications. These activities primarily include materials testing and documentation.

There is a great deal of overlap in the nature of CQA and CQC, and from a practical standpoint, CQA and CQC activities are often performed by the same party. For this reason, we will use the term CQA to describe *all* of the quality-oriented tasks relating to the GCL and its installation.

1.2 Scope and Purpose of the CQA Manual

This manual is written to address third-party CQA activities and is *not* intended as a guide for GCL installation. Installation guidelines are available separately from CETCO (see Technical References TR-402). This manual is also not intended to describe the various *manufacturing* quality assurance and quality control (MQA/MQC) activities performed by CETCO at the GCL manufacturing facilities (see Technical Reference No. TR-403).

The purpose of the CQA Manual is provide the project CQA personnel with a general format for assuring that the GCL delivered to the job meets the requirements of the specifications and that this material is installed in accordance with the design drawings and specifications. This manual should be modified as necessary by the design or CQA engineer in order to account for site-specific or project-specific concerns and conditions. Any such changes, however, should be discussed with CETCO before they are introduced into the final version of the project CQA plan.

For the convenience of the CQA personnel, an overall CQA Checklist is provided in Appendix A. This checklist or a similar version thereof is designed to be used on a daily basis to document that all CQA activities are consistently executed throughout the project. The checklists should be maintained at the job site and should be included chronologically in the final CQA documentation package (Section 7).

SECTION 2
PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

It is vital that all parties involved in the installation of the GCL are in close communication with each other throughout the project, and that they fully understand the requirements of the project CQA plan. For the purposes of this manual, the qualifications and responsibilities of the various parties are delineated as follows:

Installing Contractor

Responsible for installing the GCL. The contractor should appoint an on-site Construction Supervisor to coordinate the installation effort and to interact with the other parties on the job site. The installing contractor should have prior experience in GCL installation and should staff the project with qualified technicians.

On-Site Engineer

Usually the design engineer or designee, this person is responsible for general oversight of the installation. Provides assurance that construction is performed as designed, although not formally responsible for CQA. Primary contact when the installing contractor is in need of clarification of design issues. Primary contact for dispute/problem resolution. This person should be a registered professional engineer.

CQA Engineer

Charged with CQA for Bentomat installation as well as for any other liner system components. Oversees all CQA inspection, testing, and documentation. This person should be a registered professional engineer or a certified geosynthetics installation technician. This person must also be independent of the other parties on site.

Manufacturer's Representative

CETCO may provide on-site start-up assistance, especially those in which the installer has little or no prior experience or where unusual site conditions exist. The on-site engineer or installer is responsible for notifying CETCO of the intended installation schedule such that CETCO may provide timely guidance during the start-up process. CETCO’s GCL installation experience may provide valuable insights to the uninitiated engineer and/or installer.

CETCO also acts as the liaison between the manufacturing plant and the installer and coordinates the release of GCL from the plant in accordance with the installer’s schedule. CETCO’s *on-site* involvement is typically lessened when it is determined that the installer is sufficiently capable of installing GCL without CETCO’s continuous assistance. CETCO remains available throughout the project should questions or problems arise.

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CQA Laboratory

The GCL conformance tests in this manual are designed to be performed at the job site to facilitate real-time response as test results are generated. In some projects where additional testing is required, however, it may be necessary to utilize the services of an off-site laboratory. The on-site engineer should verify that the selected laboratory has ample experience in the testing of GCLs and is aware of the general content of the project CQA plan as well as its specific testing requirements. The CQA engineer should establish a key contact at the laboratory to coordinate sample delivery procedures, confirm testing parameters and methods, and arrange the timely reporting of test results.

It is recommended that a preconstruction meeting be held between the above parties in order to establish working relationships with one another and to review the design drawings and specifications prior to deployment of the GCL. Thereafter, regular meetings on a daily or weekly basis are recommended as the project continues.

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SECTION 3
ON-SITE HANDLING

This section describes the procedures and equipment to be used in handling the GCL when it arrives at the job site. Proper execution of these procedures will ensure that the GCL is not damaged prior to installation. It should be noted that ASTM D 5888 also provides guidelines for GCL handling. The recommendations included herein are consistent with all ASTM guidelines.

CETCO's GCLs are produced in slightly different sizes depending upon the product selected. Weights and dimensions of these products and their corresponding core pipe sizes required for safe handling are provided in Table 1 below.

Product	Panel Size (m)	Roll Diam. (mm)	Typ. Roll Weight (kg)	Core Diam. (mm)	Core Pipe Diameter (mm)	Core Pipe Length (m)	Minimum Core Pipe Strength
Bentomat	4.57 x 45.7	610	1,200	100	89	6.1	XXH
Claymax	4.57 x 45.7	510	1,250	100	89	6.1	XXH

Table 1. GCL panel sizes and corresponding core pipe requirements.

It should be recognized that the weight of the GCL rolls will dictate what type of core pipe will be sufficiently strong for unloading and handling activities. Experience has shown that the type of steel from which the pipe was produced will influence its ability to sustain the weight of the roll. The strongest steel available should be used to prevent pipe bending. A core pipe that deflects more than 75 mm as measured from end to midpoint when the roll is lifted can cause damage to the GCL and is *not acceptable.* The pipes used to unload or deploy the GCL *must not bend* at any time.

3.1 Unloading Procedures

The GCL may be delivered to the job site in one of two ways: by flatbed truck or by closed trailer/container. Regardless of the delivery method, all unloading activities should take place away from main roadways and high-traffic areas at the site. The designated unloading area should be flat, dry, and stable, and should provide adequate peripheral access for the unloading equipment. Different techniques for unloading the GCL are used accordingly. Using the procedures and equipment described below will minimize unloading time.

3.1.1 Flatbed Truck Delivery

A front-end loader or backhoe is typically used to remove the rolls from the flatbed truck. Starting from the top rolls on the truck, the core pipe is inserted through the roll core. The core has an inside diameter of 100 mm but may be slightly bowed upon arrival to the job site. In this case, it may be necessary to assist the core pipe insertion process by using the back of the loader bucket to carefully

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push the pipe through the core.

After the core pipe has been inserted, straps or chains are looped around each end of the pipe protruding from the roll. The other ends of the chains should be connected to a spreader bar (typically an I-beam) of equal length to the core pipe. The spreader bar itself is suspended from the loader bucket. The purpose of the spreader bar is to prevent the chains from chafing the ends of the roll as it is lifted. It is recommended that the chains or straps be secured by the placing a pin through each end of the pipe. The GCL roll should then be lifted and slowly carried from the flatbed to the temporary storage area.

GCL rolls can also be provided with a pair of slings to facilitate lifting and handling.

3.1.2 Trailer or Container Delivery

The GCL may also be delivered in closed trailers or shipping containers. In these cases, different unloading equipment and techniques must be employed. Because of limited access to the GCL rolls, it is usually necessary to utilize an extendable-boom forklift with a "stinger" attachment. The forklift dealer or manufacturer can provide details on selecting the proper stinger for the type of forklift used at the job site.

The rolls are placed inside the trailer or container in the same way that they are positioned on a flatbed truck. The rolls are removed by inserting the stinger through the roll cores and lifting/pulling the rolls from the trailer/container.

3.2 Materials Handling

The equipment used to unload the GCL from the delivery vehicle may also be used to handle the material on site and to convey it to work areas. All unloading and handling activities must be undertaken with great care to avoid damage to the GCL. The GCL should never be handled in ways that could affect its performance. Some activities to avoid:

- Dropping the rolls from the edge of the delivery truck or container.
- Pushing or pulling the rolls on the ground surface.
- Lifting the roll without a core pipe.
- Bending the rolls by using a core pipe that cannot bear the weight of the roll.
- Forcing a bent core pipe through the core.
- Carrying the GCL over excessively rutted, bumpy terrain, causing the roll to bend and bounce in transit.

Adherence to these common-sense precautions will prevent handling-related damage to the Bentomat.

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The CQA engineer or designee should supervise the unloading and storage operations. It is the duty of the CQA engineer to maintain records of the shipments and to verify that the roll numbers on the labels match the roll numbers on the bills of lading. Any apparent discrepancies should be noted and reported to CETCO.

At this time, all of the rolls should also be visually inspected for damage. Damaged rolls should be clearly marked and set aside where they will not be immediately used. Major damage suspected to have occurred during shipment should *immediately* be reported to the carrier and to CETCO (see Section 4.8.1).

3.3 On-Site Storage

The GCL may be stored at a project site indefinitely, provided that proper storage procedures are followed. First, a dedicated storage area should be identified. This area should be level, dry, well drained, and located away from high-traffic areas of the job site.

For reasons of safety and material integrity, GCL rolls must never be stored on end. Rolls should be stored horizontally, in small stacks not to exceed four rolls in height. It is preferred that the bottom rolls be placed on plywood, on an arrangement of pallets, or on some other man-made surface, to promote drainage and to prevent damage by contact with the ground surface. If the rolls are to be placed directly on the ground, the local ground surface should be carefully prepared and proof-rolled to minimize the potential for damage. It is good practice to cover the stored rolls with a tarpaulin or plastic sheeting for supplemental protection from the elements.

The polyethylene sleeves of the GCL rolls should be examined for any obvious rips or tears. Sleeve damage should be repaired immediately with adhesive tape or additional plastic sheeting. At this time it is also recommended that the labels be examined and taped to the roll if they were displaced in transit.

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SECTION 4
INSTALLATION

This section of the CETCO GCL CQA Manual covers the techniques and procedures to be used for ensuring the quality of a GCL installation. Although some installation techniques are described, this section is *not* an installation guide. Refer instead to CETCO GCL Technical Reference TR-402 for specific GCL installation guidelines. ASTM D 6102 also contains sound GCL installation guidelines.

4.1 Start-Up Assistance

CETCO or its representatives can provide on-site start-up assistance, especially where the installer has no prior GCL installation experience or in which the application is relatively unique. CETCO will work with the on-site engineer and CQA engineer in order to verify that the proper unloading, installation and conformance testing procedures are utilized. CETCO's input is based on extensive experience with GCL installation and on intimate knowledge of the physical characteristics of GCLs. It should be recognized, however, that it is the site engineer's responsibility to implement CETCO's recommendations.

4.2 Equipment

In many projects, the equipment used for unloading the GCL can also be used to install it. Most applications require a vehicle to lift and suspend the roll as it is deployed. Front-end loaders, bulldozers, boom cranes, forklifts, and tracked excavators all have been successfully used for this task. Other, more specialized equipment exists for these operations and may also be used. The equipment for unrolling the GCL should be able to lift the roll and suspend it *freely* such that it does not chafe against the vehicle or the ground. The vehicle must also have the ability to accommodate a spreader bar above the roll of GCL.

The spreader bar should be sufficiently strong to bear the full weight of the GCL roll without bending. Readily available I-beams or T-beams made of structural steel are typically used for this purpose, although steel pipes have also been successfully used. The chains or straps should be checked for their strength before the installation begins and should continually be inspected for wear as the installation continues.

The core pipe should be of the dimensions and strength indicated in Table 1. It has been CETCO's experience that the schedule of the core pipe is not always an accurate indicator of its strength. The type of steel from which the pipe is made, the presence of a longitudinal weld, and the overall length of the pipe all have an influence on its ability to sustain the weight of the GCL. It is essential that the core pipe *does not bend* when the full roll of GCL is suspended from it. Lastly, it is recommended that the core pipe have a means to prevent the chains or straps from slipping off the ends of the pipe. This can be accomplished by using pins or clamps.

It will often be necessary to cut the GCL before the end of the roll or to cut it to fit in certain confined areas. Cutting the GCL requires a *sharp* utility knife. It is very important to maintain the sharpness of the knife blades used for cutting the GCL, in order to prevent tearing its geosynthetic components and damaging the GCL where the cut is made. Frequent blade changes for the utility knives are strongly recommended.

For construction of the bentonite enhanced overlapped seams of the Bentomat products, an acceptable fillet of bentonite can be poured directly from the bags of granular bentonite supplied with each roll of Bentomat, but a watering can (without a sprinkler head) is easier to use and produces a more controlled seam enhancement. A line chalker, such as those used for marking athletic fields, may also be used.

4.3 Field Conditions

At the beginning of each working day, the CQA engineer should confirm that there are no ambient site conditions which could affect the quality of the installation. Specifically, the presence at the job site of excessively high winds, rain, standing water, or snow may be construed as unsuitable weather for GCL installation. There are no temperature restrictions for installing the GCL, however.

Bentomat is not as susceptible as Claymax to damage due to "premature hydration" (i.e., hydration before a confining stress is applied). Although Bentomat will not delaminate when wetted, CETCO nevertheless recommends that it be installed in dry weather as with Claymax. This lessens the potential for damage to the material and ensures that its integrity is not compromised by the swelling of the bentonite. Should the GCL become prematurely hydrated, it urged that CETCO be contacted in order to recommend a project-specific and product-specific recommendation as to whether the GCL must be removed and replaced. CETCO's Technical Reference TR-312 provides a checklist for evaluating GCL that has been hydrated when no confining pressure is present.

4.4 Site Inspection

Prior to each day's installation activities, the site engineer and/or CQA engineer should inspect the work area to ensure that it has been prepared in accordance with the specification and design drawings. Specifically, the design grades should be verified, the slope length and steepness should be checked, the anchor trench dimensions should be measured, and the subgrade should be inspected and approved. Any deviations from the specifications or design drawings should be noted and rectified before the GCL is installed.

The anchor trench is especially important in applications where slopes are present. The anchor trench must meet or exceed the design dimensions but must also be free of any sharp corners or protrusions which could put excessive stress on the GCL. The CQA engineer must ensure that the anchor trench is as carefully prepared as the rest of the subgrade.

4.5 Panel Placement

The unrolling and placement of the GCL should be performed in such a way that the GCL is not damaged or unduly stretched, folded, or creased. The GCL rolls are typically suspended from the front of the vehicle while it travels backwards along the intended path of placement. During this activity, the roll should be able to rotate freely around the core pipe. Excessive friction due to a bent or large-diameter core pipe, or due to contact between the roll and the deployment equipment, may cause undesirable levels of tension to develop. It is necessary that the GCL be deployed in a fully relaxed (but not wrinkled) state.

A common deployment technique when the GCL is placed on slopes is to suspend the roll at the top of the slope while several laborers unroll it as they walk downslope. This is an acceptable technique, but the CQA engineer should verify that excessive tension does not develop on the material and that the underside of the panel is not damaged by friction with the subgrade. Unless the subgrade is acceptably smooth, the GCL should be unrolled over an already-placed panel and then moved laterally into its correct position. Flat-bladed vise grips are very useful for handling and moving unrolled panels.

It is important to ensure that, at the top of a slope, the GCL is properly placed in the anchor trench. After confirming that the trench has been constructed according to the specifications, the GCL should be placed in the trench such that it extends across the trench floor but not up the rear wall of the trench. Excess material if any, should be cut off, *not* folded over on top of the existing material. Proper anchorage will be achieved if and only if the GCL is placed within the trench in this manner.

The orientation of the GCL panels is important. When working in sloping areas, the panels should be positioned such that their long dimension is parallel to the direction of the slope. Panels may only be placed across the slope when the slope is less steep than 4H:1V or when the slope length is very short (less than or equal to 3 m).

4.6 Seaming

Proper field seaming is vital for the liner to function to its maximum abilities. There are three elements of CQA for this important task:

- Verification of the minimum acceptable overlap.
- Verification of the continuity of the accessory bentonite (Bentomat only).
- Verification that there is no dirt in the overlap zone or on the bottom geotextile of the overlying GCL panel.

These elements for field seam CQA are straightforward and require only visual inspection by the CQA engineer. The upper surface of the GCL has two heavy dashed lines on both sides of the panel. The lap lines are 150 mm from the edges of the panel, and the match lines are 250 mm from the edges of the panel. The minimum acceptable overlap is 150 mm. Thus, the installer's objective is to place the overlying panel *between* the two lines of the underlying panel. The CQA engineer needs only to visually verify that the 150-mm lap line of the underlying panel is not visible. A properly executed seam, therefore, is verified when three dashed lines (not four) are visible at the overlap, as shown in Figure 1.

The hydraulic performance of Bentomat is maximized when the accessory bentonite is placed *continuously* within the overlap zone. Continuity is best achieved when a watering can or other similar device is used. Pouring the bentonite directly from the bag is less effective in this regard. Verification of continuity should be performed visually by the CQA engineer. The CQA engineer should observe the accessory bentonite as it is being placed within the overlap zone and should give verbal approval of the seam before the overlap is flipped back into place.

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Bentomat ST, DN, and SDN with Supergroove® have self-seaming capabilities in their longitudinal overlaps (Figure 2) and do not require supplemental bentonite. For these Bentomat products, supplemental bentonite is required for the end-of-panel overlapped seams. For pond applications, supplemental bentonite must be used in longitudinal seams regardless of the CETCO GCL used.

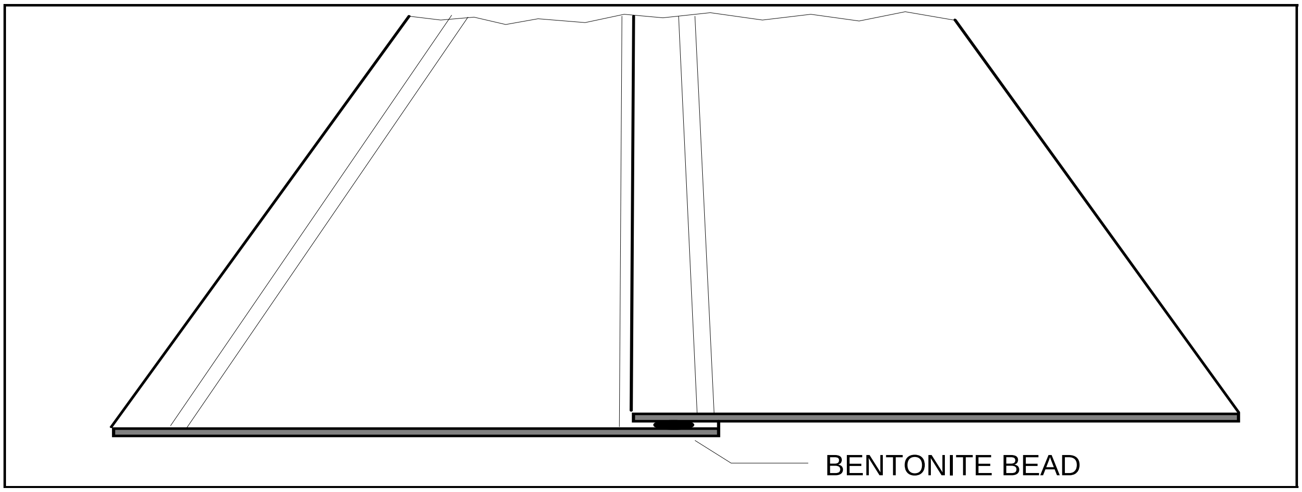

Figure 1. Schematic representation of a properly executed Bentomat field seam.

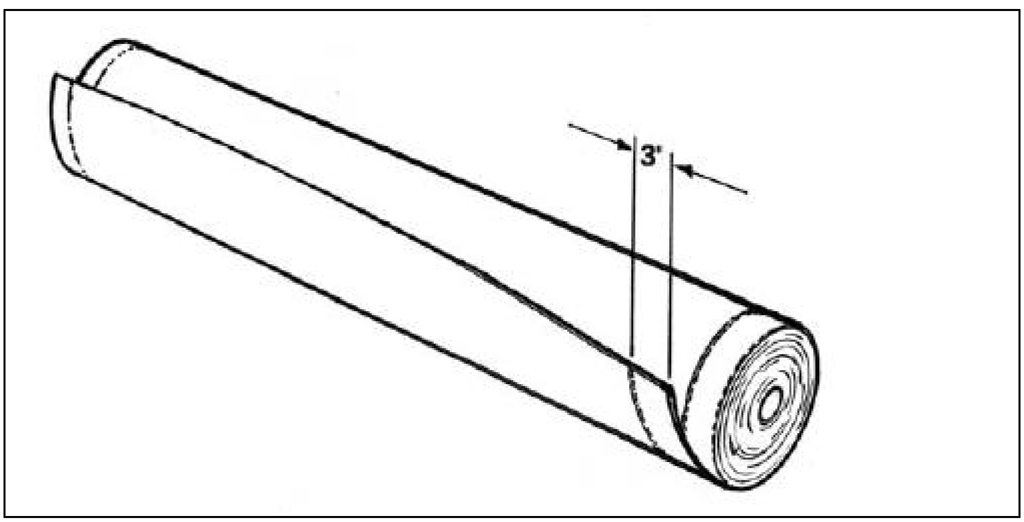

Figure 2. Supergroove Bentomat field seam.

Verification of the cleanliness of the overlap is also required, because dirt can enter the overlap and create a conduit for excessive lateral leakage. This is one reason CETCO recommends that the overlying panel is placed and then its edge flipped back to reveal the overlap zone. Exposing the overlap in this manner forces extra attention on the seam and reveals the presence of loose dirt that may have inadvertently entered the overlap zone or may have become adhered to the bottom geotextile of the overlying panel. The CQA engineer should either verify that no dirt is present or ensure that the dirt is swept out of the overlap.

Verification of the *amount* of bentonite placed at the seam may be achieved by ensuring that one full 22.5 kg bag of granular bentonite is used for the lateral and longitudinal seaming of each roll of GCL. CETCO recommends that a minimum of 375 grams of granular bentonite be applied per lineal meter of seam. If the installer places bentonite at the rate of one bag per roll, this target application rate will be achieved.

The longitudinal overlap for the GCL should be at least 150 mm (Bentomat) and 300 mm (Claymax). Overlaps at the *ends* of the rolls, however, ("transverse" overlaps) should be at least 300 mm (Bentomat) and 600 mm (Claymax) to account for any incidental loss of bentonite that could occur due to excessive handling of this portion of the roll or to stress relaxation after placement. Overlap distances can be increased if unusual site conditions (such as a soft subgrade, or GCL covered only with geomembrane) exist.

4.7 Detail Work

The term "detail work" refers to the placement of GCL around structures such as vertical walls, gas vents, drainage basins, and pipe penetrations. In all of these cases, it is necessary to utilize granular bentonite or a bentonite mastic to create a seal between the GCL and the structure. CQA of these areas involves a visual inspection of the methods used to make the seal. Specific items requiring inspection include:

- Dimensions of the "notch" excavated around the structure.
- Amount of bentonite applied to the detail
- Condition of the GCL at its cut edge (the cut should be clean, not frayed, with little or no bentonite edge loss from the GCL)
- Integrity of the detail as cover material is placed over and around it.

When cutting the GCL, it is important to ensure that the cut is made where the GCL hangs from the roll or where it rests on the subgrade . The GCL cut should *never* be made on the roll itself or when it rests on any other liner system component.

4.8 Damage and Damage Repair

Even when all reasonable protective measures are taken, the GCL may still become damaged during shipping and handling or during installation. This section provides instructions on assessing and managing the damaged materials.

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4.8.1 Damage From Shipping and Handling

Occasionally, a GCL roll will arrive at a job site with its protective plastic sleeve torn due to movement during transit. This roll should be inspected for damage in the area where the sleeve was torn. If the geotextile under the torn sleeve is also torn, The outermost wrap of GCL on the roll should be unwound and discarded when the roll is installed. It is not necessary to consider the entire roll unusable. It is important, however, to mark the roll in order to alert the installer that the initial wrap should be cut away and discarded, because the damaged geotextile may be hidden from view when the GCL is unrolled. It is remotely possible that further layers of GCL on the roll could be similarly damaged. If this happens, additional wraps may be unrolled and discarded prior to placement.

Damage due to poor handling may occur as a result of accidentally dropping a suspended roll onto the ground or using weak core pipes that bend when the GCL is lifted. These activities can cause damage not just to the outer wrap of GCL but to the entire roll. If such damage occurs, the rolls should be clearly marked and moved away from the storage area. The CQA engineer should ensure that procedures are immediately implemented in order to prevent the recurrence of this problem. The CQA engineer should also contact CETCO to help make a determination as to whether the mis-handled GCL is acceptable for use on the project.

4.8.2 Damage From Installation Activities

The more commonly observed incidents of damage occur during installation, as a result of inadvertent contact by heavy equipment. Because this type of damage will potentially have the largest overall effect on the integrity of the liner system, CETCO strongly recommends that equipment operating on or near the GCL *be monitored continuously.*

Equipment operators should be made fully aware of the importance of their actions and should be encouraged to notify the CQA engineer directly if they suspect at any time that the liner may have become damaged by their equipment. Close communication among everyone involved in the installation will help to ensure that this type of damage is reported and repaired.

Repeated passes by loaded dump trucks over GCL, which has minimal cover, can cause damage. It is therefore preferred to prevent potential for such damage by placing the GCL over these high-traffic areas *after* cover material delivery is largely completed. If this is not possible, then extra cover should be placed over high-traffic areas. At least 600-900 mm of screened, cohesive soil is recommended.

Should damage occur to the already-installed GCL, the following procedures should be followed:

1. Remove equipment from the damaged area and notify the CQA engineer.
2. *Manually* clean away all cover material within a 600-mm radius of the damaged area. Use a broom to sweep away the remaining dirt in order to make the area as clean as possible.
3. If necessary, repair the subgrade to its original conditions. Replace the torn/damaged GCL as closely as possible to its original position.
4. Place a bead of granular bentonite or bentonite paste at the minimum rate of 500 g per lineal meter around the damaged area.
5. Cut a patch of new GCL to fit over the damaged area and extending 600 mm beyond it.

6. Place the patch over the damaged area and carefully backfill over the patch.

Note that it is necessary only to repair the damaged portion of the GCL. It is usually not necessary to remove and replace the entire panel, unless the damage has occurred on a slope. In this case, slope stability may be compromised and the site engineer should be contacted to help determine whether a repair is acceptable.

SECTION 5
PLACEMENT OF COVER MATERIALS

As mentioned previously, the proper placement of cover on the GCL is crucial to the overall success of the installation. This section of the Bentomat CQA manual includes recommended materials and procedures, which will help to ensure that the integrity of the GCL is not compromised when it is covered.

Regardless of the nature of the cover material used, it should be placed as soon as possible after the GCL has been deployed. The efforts of placing the GCL and placing the final cover should be coordinated to the extent that only as much GCL as can be covered should be deployed in one working day. This will prevent premature hydration and will greatly reduce the chances for incidental damage to the GCL during other activities.

5.1 Soil/Stone Cover

When a GCL is the sole liner system component, soil or stone cover *must* be placed over it to provide protection from physical damage, erosional forces, and degradation by UV light. The presence of cover also provides a confining stress, which allows the overlapped seam to perform properly and enhances the long-term physical integrity of the material. Lastly, the cover may provide a base for vehicular traffic. Because it serves so many functions, proper placement and CQA of the soil/stone cover is essential.

Frequently used cover materials include sand, gravel, crushed stone, and common earth fill. Regardless of the type of material selected for the cover, it should be free of large stones (greater than 50 mm in diameter), sticks, and any other materials, which could cause puncture or tearing. The source of all cover material should be identified in order to ascertain its suitability well in advance of the installation.

In addition to particle size, the *angularity* of a crushed stone or gravel will impact the construction survivability of the GCL. It is preferred that relatively rounded materials be utilized. If these materials are not available, then extra caution must be taken during cover placement. Dumping the cover from a loader bucket positioned high above the GCL is unacceptable. The cover should be gently placed from as low a height as possible. Vehicular traffic should also be restricted if particularly angular or abrasive material is used. If there is some doubt as to the suitability of a potential cover material, a representative sample should be submitted to CETCO for analysis.

With respect to the equipment used to place the protective cover, it is strongly recommended that no heavy equipment come in direct contact with the GCL. Obviously, tracked equipment will damage the liner. In some cases, however it is necessary to drive equipment directly on the GCL. This can be accomplished with low-pressure, *rubber-tired* equipment. Permission to do so will be granted by CETCO through the CQA engineer on a case-by-case basis *only* and will include restrictions on the equipment itself and on the type of movements the vehicle may make on the GCL.

The chemical nature of the cover soil must also be considered. The use of fine-grained, calcareous soil or stone is strongly discouraged due to the potential for an adverse reaction with the sodium

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bentonite contained in the GCL.

The cover material placed as backfill in the anchor trench should be of the same quality as the rest of the backfill. It is especially important that the anchor trench backfill be compacted either by hand tamping or by the use of a small walk-behind compactor. Compaction should be performed over each 150-mm lift of backfill placed in the anchor trench.

5.2 Geosynthetic Cover

A geomembrane or other geosynthetic liner system component is often placed over the GCL. Caution must be used during this activity to prevent GCL damage. Again, it is strongly recommended that no heavy equipment directly contact the GCL, but exceptions can be made on a project-specific basis.

A special precaution should be taken when textured geomembrane is installed directly over the GCL in a composite liner system. Because considerable friction may develop between the geomembrane and the GCL, it is difficult to pull the geomembrane into position for welding to adjacent sheets. A smooth "slip sheet" can be used to provide a low-friction sliding surface for the geomembrane until it is in position for welding.

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SECTION 6
CONFORMANCE TESTING

Conformance testing is necessary in order to verify that the materials installed meet the requirements set forth in the specification. Although CETCO performs regular testing on its GCLs as part of its manufacturing QA/QC program, the engineer may require additional testing at the job site. This section lists several tests, which may be utilized to verify the quality of the delivered materials and the quality of the installation of those materials.

6.1 Bentonite Mass Per Unit Area

A relatively simple test to verify that the specified amount of bentonite has been encapsulated in the GCL is to measure the bentonite mass per unit area of representative samples cut from delivered rolls. The results of this test may be used in conjunction with the results of the bentonite swell test described in Section 6.2 to arrive at an indirect verification of the hydraulic performance of the GCL.

ASTM D 5993 provides procedures for performing the mass per unit area test. After the correction for geotextile mass is made, there should be at least 3,600 g of bentonite contained within the GCL per square meter. This is CETCO's minimum average roll value (MARV) for bentonite content of all of its GCLs. These values are always subject to change, so please refer to GCL Technical Reference No. TR-404 for the most recent list of certified physical GCL properties.

If for any reason the resulting mass per unit area values do not meet the required MARVs, the corresponding rolls should be set-aside for additional inspection and testing. CETCO should be notified to assist in resolving the problem if it persists.

6.2 Bentonite Swell Index and Fluid Loss

The swell index and fluid loss of the bentonite are two of the most important indicators of its ability to function as a barrier material. ASTM D 5890 provides a detailed free swell testing procedure used by CETCO. CETCO's MARV requirement for the bentonite is 24 mL/2g. ASTM D5891 provides a detailed fluid loss testing procedure. CETCO's maximum requirement for fluid loss of the bentonite is 18 ml. As with the mass per unit area test described in Section 6.1, if these values are not achieved in conformance testing, the corresponding rolls should be set aside for additional inspection and testing. CETCO should be notified to assist in resolving the problem if it persists.

6.3 Other Conformance Tests

Other conformance tests may be conducted at the request of the on-site engineer or the CQA engineer on a project specific basis. ASTM D6495 suggests grab tensile strength and index flux/permeability (as per ASTM D 5887), although it should be cautioned that rapid "real-time" results of index flux/permeability are not possible due to the time required to achieve steady-state permeability values. Thus, it is difficult to use permeability testing as a pass/fail criterion for GCL acceptance at the job site.

Also, the laminated GCLs are not easily tested for index flux/permeability due to potential sidewall leakage around the membrane. CETCO has a special setup procedure for its laminated GCLs in TR-302.

Lastly, it should be recognized that field-scale test pads and infiltrometer tests are typically *not* performed in GCL projects. This contrasts with compacted clay liner (CCL) projects, in which, for two reasons, field-scale data is almost always required. First, field data for CCL projects is necessary because there are many variables involved in their construction (compactor weight, speed, number of passes; soil type; moisture content; lift thickness; etc.). It is therefore necessary to build a test pad to ensure that the construction materials and methods intended for the project will provide the required level of performance. Second, laboratory test results and field test results may vary significantly with CCLs due to the difficulties in retrieving representative, undisturbed samples. This factor also warrants that field data be obtained for CCL projects.

With GCL installations, however, there are very few construction-related variables. Additionally, the GCL that is tested for permeability in the laboratory is the *same* material deployed in the field. For this reason, a GCL such as Bentomat or Claymax does not require a field permeability test.

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SECTION 7
DOCUMENTATION

Thorough documentation of all CQA activities and tests is necessary in order to provide a written record that the GCL has been properly installed. The CQA documentation package for a GCL installation should include the following items:

- Bills of lading and corresponding packing list confirming receipt of all GCL installed at the site.
- A panel layout drawing in which the GCL roll numbers are keyed to their location in the field. Locations where damage was encountered and repaired should also be marked.
- The roll numbers from which samples were taken for conformance tests, along with the results of those tests.
- A daily report or diary of the activities undertaken at the site during construction.
- Certification that the requirements for the subgrade and for the cover material were achieved.
- A compilation of all CQA checklists completed during the installation.
- The manufacturing quality control (MQC) certification and accompanying test data.
- A description of deviations, if any, made to the original CQA plan during the installation.
- Photographs of the GCL during installation.

CETCO provides the MQC certification. All other items on the above list are the responsibility of the CQA engineer.

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APPENDIX A
List of Applicable ASTM Standards

ASTM D 5887, "Standard Test Method for Measurement of the Index Flux Through Saturated Geosynthetic Clay Liner Specimens Using a Flexible Wall Permeameter," *Annual Book of ASTM Standards, Vol. 4.09,* American Society for Testing and Materials, W. Conshohocken, PA.

This method describes the specimen preparation, stress and gradient conditions, and testing procedures to be used for determining the flux (flow per unit area) through GCLs. Adherence to the specimen preparation procedures presented will help to minimize sidewall leakage, a common problem when testing thin barriers. This is an index test designed to determine product acceptability and uses a maximum confining stress of 35 kPa (5 psi) and a hydraulic gradient of 14 kPa (2 psi).

ASTM D 5888, "Standard Guide for Storage and Handling of Geosynthetic Clay Liners," *Annual Book of ASTM Standards, Vol. 4.09,* American Society for Testing and Materials, W. Conshohocken, PA.

This is a guide for the safe handling of GCL rolls at a job site, identifying the equipment and techniques typically employed to unload the material from delivery trucks and to place it in a dedicated storage area. Procedures are also presented for proper storage of the GCL in order to minimize the potential for product damage while in storage.

ASTM D 5889, "Standard Practice for Quality Control of Geosynthetic Clay Liners," *Annual Book of ASTM Standards, Vol. 4.09,* American Society for Testing and Materials, W. Conshohocken, PA.

Test methods and testing frequencies are presented for manufacturing quality control (MQC) of GCLs. This standard practice includes conformance tests to be performed on the GCL components (bentonite and geotextiles and/or geomembranes) as well as tests to be performed on the finished GCL product. Special procedures for GCL permeability/flux testing require the manufacturer to provide an historical database to demonstrate the consistency of the hydraulic performance of the finished product and to justify the reduced need for frequent MQA permeability testing.

ASTM D 5890, "Standard Test Method for Swell Index Measurement of Clay Mineral Component of Geosynthetic Clay Liners," *Annual Book of ASTM Standards, Vol. 4.09,* American Society for Testing and Materials, W. Conshohocken, PA.

This test method was adapted from the basic elements of a swell test presented in the USP/NF (United States Pharmacopeia/National Formulary). Two grams of dried and powdered bentonite are slowly dropped into a graduate cylinder containing 100 mL of distilled water. The swell value in mL is recorded after 24 hours, by reading the value on the graduate cylinder at the clay/water interface.

APPENDIX A (continued)
List of Applicable ASTM Standards

ASTM D 5891, "Standard Test Method for Measurement of Fluid Loss of Clay Mineral Component of Geosynthetic Clay Liners."

This test method was adapted from the API (American Petroleum Institute) Procedure 13A/13B for bentonite. A bentonite slurry is created, aged, and then filtered in a pressurized cell. The amount of water passing through the filter cake in a specified time interval is recorded as the filtrate loss or fluid loss. The test indicates the clay's general ability to function as a barrier to liquids.

ASTM D 5993, "Standard Test Method for Measuring the Mass per Unit Area of Geosynthetic Clay Liners."

This test method describes how to measure the bentonite mass per unit area of a GCL sample. A GCL specimen of a certain minimum area is weighed, oven-dried, and weighed again. The dry weight of the specimen, minus the nominal weight of the geosynthetic component(s), is then divided by the area of the specimen. The moisture content of the specimen is determined by subtracting the dry weight from the wet weight.

ASTM D 6072, "Standard Guide for Obtaining Samples of Geosynthetic Clay Liners."

Presents procedures for obtaining representative samples of GCL material for laboratory testing purposes. These samples may be obtained either at the factory or in the field. Procedures for packaging and protecting the sample are also included to prevent the possibility of damage in transit to the laboratory.

ASTM D 6102, "Standard Guide for Installation of Geosynthetic Clay Liners."

Provides detailed recommendations for the proper installation of GCLs. Discusses the necessary site conditions, equipment, and techniques for installing GCLs without damaging them. Includes recommendations on panel placement, overlaps, and special considerations for slopes. Also discusses the preferred types of soil cover and equipment used to apply this cover.

ASTM D 6243, "Standard Test Method for Determining the Internal and Interface Shear Resistance of Geosynthetic Clay Liner by the Direct Shear Method."

This test method covers a procedure for determining the internal shear resistance of a GCL or the interface shear resistance between the GCL and an adjacent material under a constant rate of displacement or constant stress.

ASTM D 6496, "Standard Test Method for Determining Average Bonding Peel Strength Between Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners."

This test method was adapted from ASTM D 4632 for grab strength testing of geotextiles. The method covers the laboratory determination of the average bonding strength between the top and bottom layers of a sample of a GCL. These results provide an indication of a GCL's internal reinforcement and internal shear strength.

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APPENDIX A (continued)
List of Applicable ASTM Standards

ASTM D 6768, "Standard Test Method for Tensile Strength of Geosynthetic Clay Liners."

This test method was adapted from ASTM D 4632 for grab strength testing of geotextiles. The test method establishes the procedures for the measurement of tensile strength of a GCL. This test method is strictly an index test method to be used to verify the tensile strength of GCLs. Results from this test method should not be considered as an indication of actual or long-term performance of the geosynthetic in field applications.

ASTM D 6495, "Standard Guide for Acceptance Testing Requirements for Geosynthetic Clay Liners".

Provides guidelines for acceptance testing requirements for GCLs, including test methods and verifications.

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APPENDIX B
CETCO GCL Construction Quality Assurance Checklist

Project Name/Number:____

CQA Inspector:____

Date:___________________Weather:_________________________________

STORAGE AREA

_______ Rolls covered/tarped
_______ Rolls labeled
_______ No standing water present
_______ Packaging intact/repaired
_______ Accessory bentonite protected

MATERIALS RECEIVED TODAY

_______ Packaging intact
_______ Rolls inspected for damage-- none found
_______ Damage suspected (indicate roll numbers and nature of damage ___________________________
____
____

SITE INSPECTION

_______ Subgrade surface acceptable
_______ Installation area dry
_______ Anchor trenches acceptable
_______ Design grades achieved
_______ Cover soil acceptable (as applicable)

INSTALLATION

_______ Number of rolls deployed today (attach list of roll numbers)
_______ Anchor trench fill compacted
_______ Min. seam overlap achieved
_______ All seams visually inspected
_______ Seam bentonite added (as applicable)
_______ All detail work inspected
_______ Downslope panel orientation
_______ All mat covered at end of day
_______ Storage area maintained

INSTALLATION EQUIPMENT

_______ Core pipe straight
_______ Spreader bar straight
_______ Chains/Straps inspected
_______ Knife blades replaced
_______ Seaming clay supply available

CONFORMANCE TESTING

Bentonite Mass/Area:

Bentomat Roll No.	Bentonite (g/sm)	Pass/ Fail?

Bentonite Swell:

Bentomat Roll No.	Final Swell Value (mL/2g)	Pass/ Fail?

NOTES/OBSERVATIONS

____
____
____

NOTE:

This checklist is intended to serve as a *guideline* for the CQA engineer to use in the development of a project-specific or company-specific CQA plan. The checklist is not all-inclusive. The items presented in this list are those that CETCO feels are the most important for the proper installation of Bentomat.

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BENTOMAT® INSTALLATION GUIDELINES

GEOSYNTHETIC CLAY LINERS

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CONTENTS

NOTICE: THIS DOCUMENT IS INTENDED FOR USE AS A GENERAL GUIDELINE FOR THE INSTALLATION OF CETCO GCLS. THE INFORMATION AND DATA CONTAINED HEREIN ARE BELIEVED TO BE ACCURATE AND RELIABLE. CETCO MAKES NO WARRANTY OF ANY KIND AND ACCEPTS NO RESPONSIBILITY FOR THE RESULTS OBTAINED THROUGH APPLICATION OF THIS INFORMATION. INSTALLATION GUIDELINES ARE SUBJECT TO PERIODIC CHANGES. PLEASE CONSULT OUR WEBSITE @ WWW.CETCO.COM/LT FOR THE MOST RECENT VERSION.

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SECTION 1
INTRODUCTION

1.1
This document provides procedures for the installation of CETCO GCLs in a manner that maximizes safety, efficiency, and the physical integrity of the GCL.

1.2
These guidelines are based upon many years of experience at a variety of sites and should be generally applicable to any type of lining project using CETCO GCLs. Variance from these guidelines is at the engineer's discretion.

1.3
The performance of the GCL is wholly dependent on the quality of its installation. It is the installer's responsibility to adhere to these guidelines, and to the project specifications and drawings as closely as possible. It is the engineer's and owner's responsibility to provide construction quality assurance (CQA) for the installation. This will ensure that the installation has been executed properly. This document covers only installation procedures.

1.4
For additional guidance, refer to ASTM D5888 (Standard Guide For Storage and Handling of Geosynthetic Clay Liners) and ASTM D 6102 (Standard Guide For Installation of Geosynthetic Clay Liners).

SECTION 2
EQUIPMENT REQUIREMENTS

2.1
CETCO GCLs are delivered in rolls typically 2,600-2,950 lbs (1180-1340 kg). Roll dimensions and weights will vary with the dimensions of the product ordered. It is necessary to support this weight using an appropriate core pipe, as indicated in Table 1. For any installation, the core pipe must not deflect more than 3 inches (75 mm), as measured from end to midpoint when a full GCL roll is lifted.

2.2
Lifting chains or straps appropriately rated should be used in combination with a spreader bar made from an I-beam, as shown in Figure 1.

2.3
The spreader bar ensures that lifting chains or straps do not chafe against the ends of the GCL roll, allowing it to rotate freely during installation. Spreader bar and core pipe kits are available through CETCO.

2.4
A front end loader, backhoe, dozer, or other equipment can be utilized with the spreader bar and core pipe or slings. Alternatively, a forklift with a "stinger" attachment may be used for on-site handling. A forklift without a stinger attachment should not be used to lift or handle the GCL rolls. Stinger attachments (Figures 2-4) are specially fabricated to fit various forklift makes and models.

Table 1: Core Requirements

Product	Nominal GCL Roll Size Lenth X Diameter	Typical GCL Roll Weight	Interior Core Size	Core Pipe Length x Diameter	Minimum Core Pipe Strength
BENTOMAT DN, SDN	16' x 24" (4.9 m x 610 mm)	2,650 lbs. (1204 kg)	3 3/4" (100 mm)	20' x 3.5" O.D. (6.1 m x 89 mm)	XXH
BENTOMAT ST	16' x 24" (4.9 m x 610 mm)	2,650 lbs. (1204 kg)	3 3/4" (100 mm)	20' x 3.5" O.D. (6.1 m x 89 mm)	XXH
BENTOMAT STM	16' x 32" (4.9 m x 814 mm)	2,500 lbs. (1130 kg)	3 3/4" (100 mm)	20' x 3.5" O.D. (6.1 m x 89 mm)	XXH
BENTOMAT 200R	16' x 24" (4.9 m x 610 mm)	2,650 lbs. (1204 kg)	3 3/4" (100 mm)	20' x 3.5" O.D. (6.1 m x 89 mm)	XXH
BENTOMAT CLT	16' x 26" (4.9 m x 660 mm)	2,650 lbs. (1204 kg)	3 3/4" (100 mm)	20' x 3.5" O.D. (6.1 m x 89 mm)	XXH
BENTOMAT CL	16' x 25" (4.9 m x 635 mm)	2,650 lbs. (1204 kg)	3 3/4" (100 mm)	20' x 3.5" O.D. (6.1 m x 89 mm)	XXH
BENTOMAT 600 CL	16' x 25" (4.9 m x 635 mm)	2,700 lbs. (1227 kg)	3 3/4" (100 mm)	20' x 3.5" O.D. (6.1 m x 89 mm)	XXH

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FIGURE 1 -SPREADER BAR ASSEMBLY

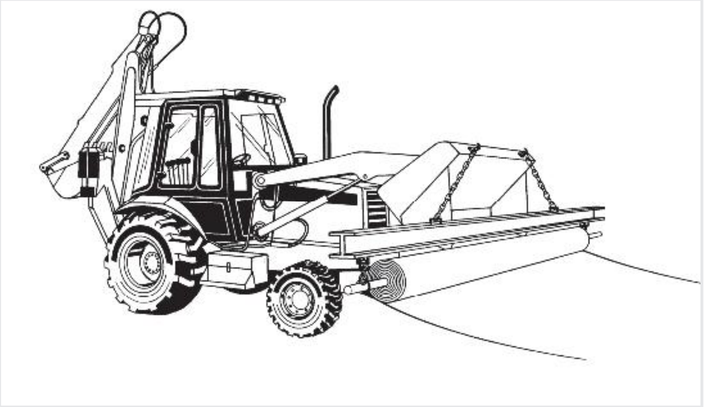


FIGURE 2 - HOOK MOUNT

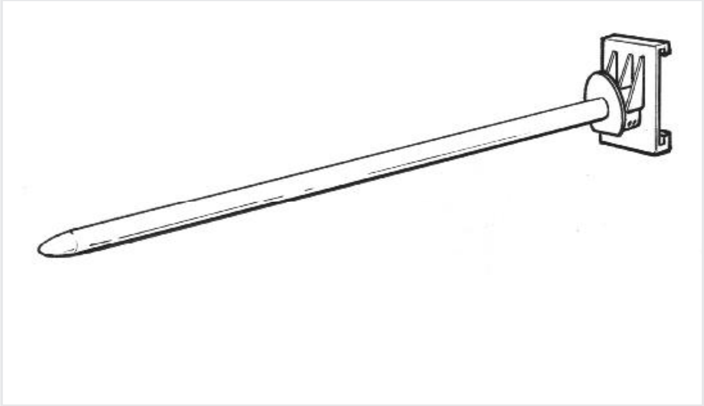


FIGURE 3 - FORK MOUNT (WITH FORK POCKETS)

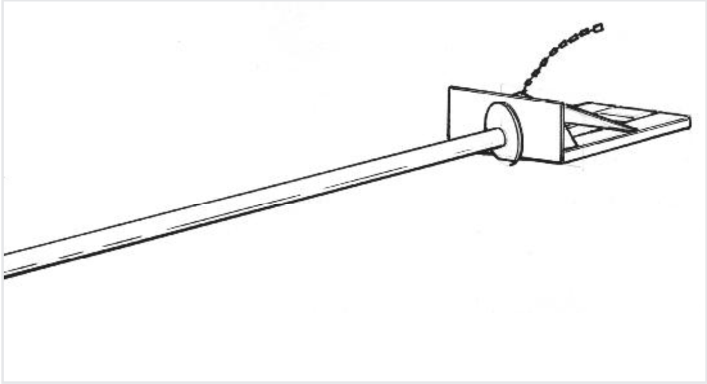
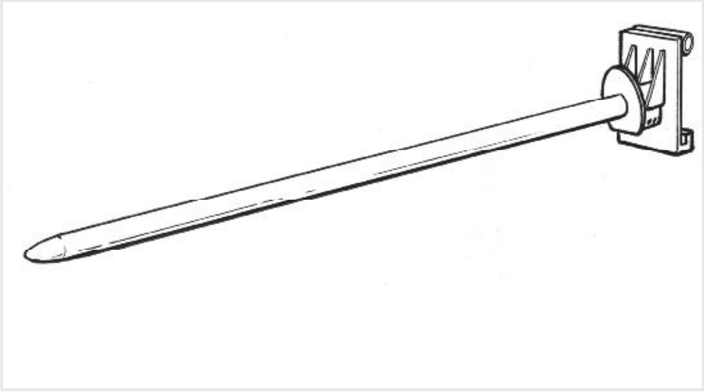


FIGURE 4 - PIN MOUNT



2.5

When installing over certain geosynthetic materials, a 4 wheel, all-terrain vehicle (ATV) can be used to deploy the GCL. An ATV can be driven directly on the GCL provided that no sudden stops, starts, or turns are made.

2.6

Additional equipment needed for installation of CETCO GCLs includes:

- ► Utility knife and spare blades (for cutting the GCL)
- ► Granular bentonite for end-of-roll GCL seams and for sealing around structures and details
- ► Waterproof tarpaulins (for temporary cover on installed material as well as for stockpiled rolls)
- ► Optional flat-bladed vise grips (for positioning the GCL panel by hand)

2.7

The CETCO EASY ROLLER™ GCL Deployment System is a preferred method of installing geosynthetic clay liners. Use of the EASY ROLLER system eliminates the need for spreader bars and heavy core pipes. Installation speed and worker safety are also significantly increased. For further details, contact CETCO.

SECTION 3
SHIPPING, UNLOADING, & STORAGE

3.1
All lot and roll numbers should be recorded and compared to the packing list. Each roll of GCL should also be visually inspected during unloading to determine if any packaging has been damaged. Damage, whether obvious or suspected, should be recorded and the affected rolls marked.

3.2
Major damage suspected to have occurred during transit should be reported to the carrier and to CETCO immediately. The nature of the damage should also be indicated on the bill of lading, with specific lot and roll numbers noted. Accumulation of some moisture within roll packaging is normal and does not damage the product.

3.3
The party directly responsible for unloading the GCL should refer to this manual prior to shipment to ascertain the appropriateness of their unloading equipment and procedures. Unloading and on-site handling of the GCL should be supervised.

3.4
In most cases, CETCO GCLs are delivered on flatbed trucks. There are three methods of unloading: core pipe and spreader bar, slings, or stinger bar. To unload the rolls from the flat-bed using a core pipe and spreader bar, first insert the core pipe through the core tube. Secure the lifting chains or straps to each end of the core pipe and to the spreader bar mounted on the lifting equipment. Hoist the roll straight up and make sure its weight is evenly distributed so that it does not tilt or sway when lifted.

3.5
All CETCO GCLs are delivered with two 2'x 12' (50 mm x 3.65 mm) Type V polyester endless slings on each roll. Before lifting, check the position of the slings. Each sling should be tied off in the choke position, approximately one third (1/3) from the end of the roll. Hoist the roll straight up so that it does not tilt or sway when lifted.

3.6
In some cases, GCL rolls will be stacked in three pyramids on flatbed trucks. If slings are not used, rolls will require unloading with a stinger bar and extendible boom fork lift. Spreader bars will not work in this situation because of the limited access between the stacks of GCL. Three types of stingers are available from CETCO, a hook mount, fork mount and pin mount (Figures 2-4). To unload, guide the stinger through the core tube before lifting the GCL roll and removing the truck.

3.7
An extendable boom fork lift with a stinger bar is required for unloading vans. Rolls in the nose and center of the van should first be carefully pulled toward the door using the slings provided on the rolls.

3.8
Rolls should be stored at the job site away from high-traffic areas but sufficiently close to the active work area to minimize handling. The designated storage area should be flat, dry, and stable. Moisture protection of the GCL is provided by its packaging; however, based on expected weather conditions, an additional tarpaulin or plastic sheet may be required for added protection during prolonged outdoor storage.

3.9
Rolls should be stacked in a manner that prevents them from sliding or rolling. This can be accomplished by chocking the bottom layer of rolls. Rolls should be stacked no higher than the height at which they can be safely handled by laborers (typically no higher than four layers of rolls). Rolls should never be stacked on end.

SECTION 4
SUBGRADE PREPARATION

4.1
Subgrade surfaces consisting of granular soils or gravels are not acceptable due to their large void fraction and puncture potential. In applications where the GCL is the only barrier, subgrade soils should have a particle-size distribution of at least 80 percent finer than the #60 sieve (0.25 mm). In other applications, subgrade soils should range between fines and 1 inch (25 mm). In high-head applications (greater than 1 foot or 30.48 cm), CETCO recommends a membrane-laminated GCL (BENTOMAT CLT, BENTOMAT CL, or BENTOMAT 600 CL).

4.2
When the GCL is placed over an earthen subgrade, the subgrade surface must be prepared in accordance with the project specifications. The engineer's approval of the subgrade must be obtained prior to installation. The finished surface should be firm and unyielding, without abrupt elevation changes, voids, cracks, ice, or standing water.

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4.3

The subgrade surface must be smooth and free of vegetation, sharp-edged rocks, stones, sticks, construction debris, and other foreign matter that could contact the GCL. The subgrade should be rolled with a smooth-drum compactor to remove any wheel ruts greater than 1 inch in depth, footprints, or other abrupt grade changes. Furthermore, all protrusions extending more than 0.5 inch (12 mm) from the subgrade surface shall be removed, crushed, or pushed into the surface with a smooth-drum compactor. The GCL may be installed on a frozen subgrade, but the subgrade soil in the unfrozen state should meet the above requirements.

SECTION 5 INSTALLATION

5.1

GCL rolls should be taken to the work area of the site in their original packaging. The orientation of the GCL (i.e., which side faces up) may be important if the GCL has two different types of geosynthetics. Check with the project engineer to determine if there is a preferred installation orientation for the GCL. If no specific orientation is required, allow the roll to unwind from the bottom rather than pulling from the top (Figure 5A). The arrow sticker on the plastic sleeve indicates the direction that the GCL will naturally unroll when placed on the ground (Figure 6). Prior to deployment, the packaging should be carefully removed without damaging the GCL.

5.2

Equipment which could damage the GCL should not be allowed to travel directly on it. Therefore, acceptable installation may be accomplished whereby the GCL is unrolled in front of backwards-moving equipment (Figure 7). If the installation equipment causes rutting of the subgrade, the subgrade must be restored to its originally accepted condition before placement continues.

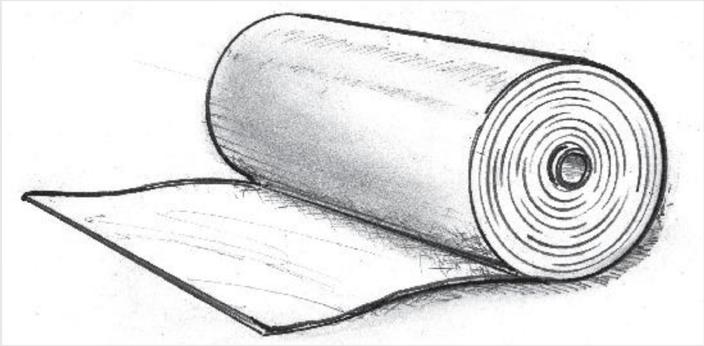
5.3

If sufficient access is available, GCL may be deployed by suspending the roll at the top of the slope, with a group of laborers pulling the material off of the roll, and down the slope (Figure 8).

5.4

GCL rolls should not be released on the slope and allowed to unroll freely by gravity.

FIGURE 5 A & B
“NATURAL’ ORIENTATION (5A)



TOP OF THE ROLL (5B)

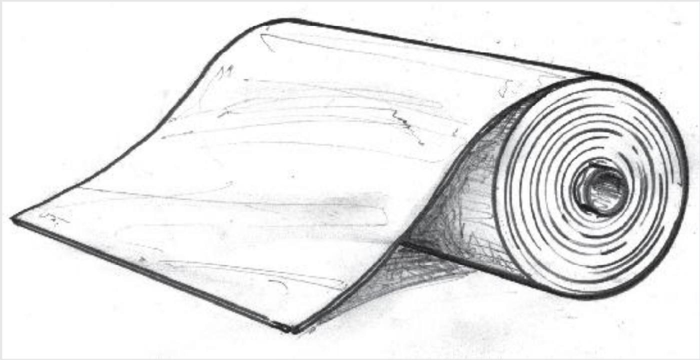


FIGURE 6 - DIRECTION TO UNROLL GCL ON GROUND PER FIGURE 5A

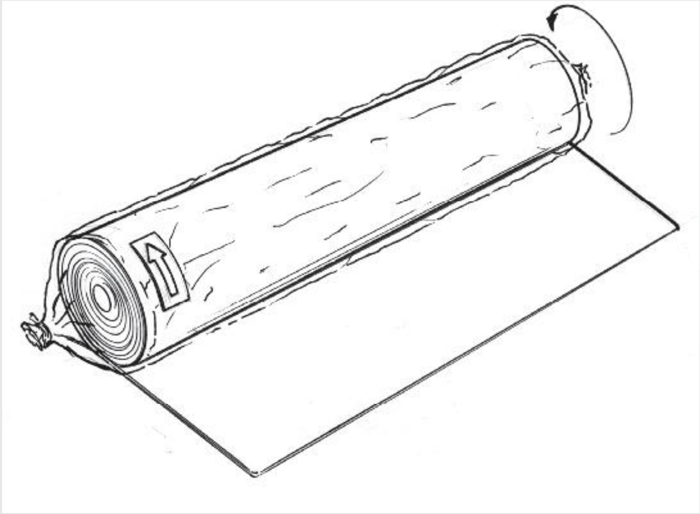


FIGURE 7 - TYPICAL BENTOMAT® INSTALLATION TECHNIQUE

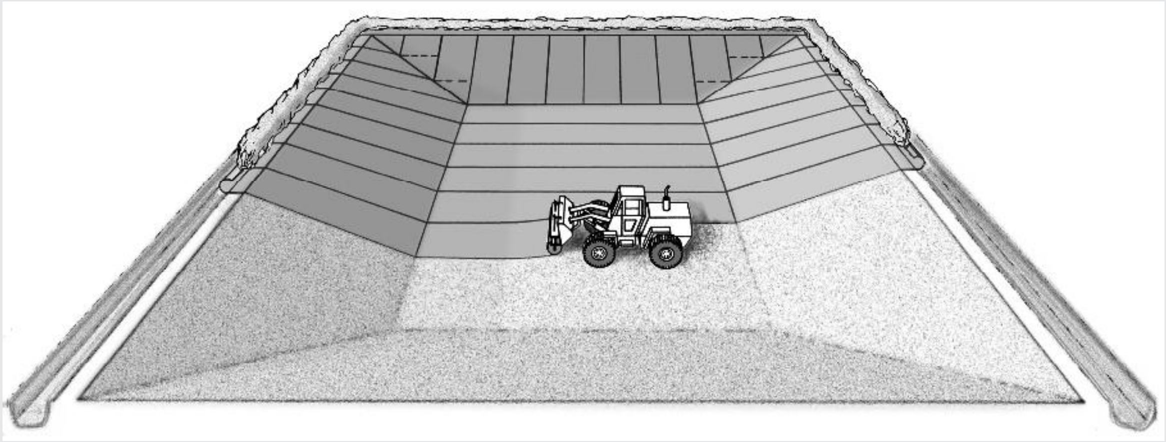
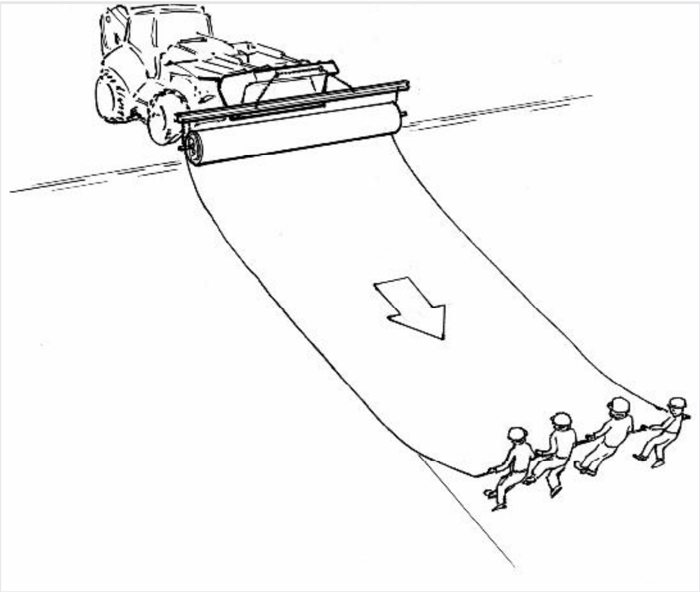


FIGURE 8 - UNROLLING BENTOMAT



5.5

Care must be taken to minimize the extent to which the GCL is dragged across the subgrade to avoid damage to the bottom surface of the GCL. Care must also be taken when adjusting BENTOMAT CLT panels to avoid damage to the geotextile surface of one panel of GCL by the textured sheet of another panel of GCL. A temporary geosynthetic subgrade cover commonly known as a slip sheet or rub sheet may be used to reduce friction damage during placement.

5.6

The GCL should be placed so that seams are parallel to the direction of the slope. End-of-panel seams should also be located at least 3 ft (1 m) from the toe and crest of slopes steeper than 4H:1V. End-of-roll seams on slopes should be used only if the liner is <u>not</u> expected to be in tension.

5.7

All GCL panels should lie flat, with no wrinkles or folds, especially at the exposed edges of the panels. When BENTOMAT geosynthetic clay liners with SUPERGROOVE® is repositioned, it should be gripped inside the SUPERGROOVE by folding the edge.

5.8

The GCL should not be installed in standing water or during rainy weather. Only as much GCL shall be deployed as can be covered at the end of the working day with soil, geomembrane, or a temporary waterproof tarpaulin. The GCL shall not be left uncovered overnight. If the GCL is hydrated when no confining stress is present, it may be necessary to remove and replace the hydrated material. CETCO recommends that premature hydration be evaluated on a case-by-case basis. The project engineer, CQA inspector, and CETCO TR-312 should be consulted for specific guidance if premature hydration occurs. The type of GCL, duration of exposure, degree of hydration, location in the liner system, and expected bearing loads should all be considered.

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In many instances, a needlepunch reinforced GCL may not require removal/replacement if the following are true:

- ► The geotextiles have not been separated, torn, or otherwise damaged
- ► There is no evidence that the needlepunching between the two geotextiles has been compromised
- ► The GCL does not leave deep indentations when stepped upon
- ► Overlapped seams with bentonite enhancement (see Section 7) are intact

5.9

For the convenience of the installer, hash marks are placed on BENTOMAT goesynthetic clay liners every 5' (1.5 m) of length.

SECTION 6 ANCHORAGE

6.1

If required by the project drawings, the end of the GCL roll should be placed in an anchor trench at the top of a slope. The front edge of the trench should be rounded to eliminate any sharp corners that could cause excessive stress on the GCL. Loose soil should be removed or compacted into the floor of the trench.

6.2

If a trench is used for anchoring the end of the GCL, soil backfill should be placed in the trench to provide resistance against pullout. The size and shape of the trench, as well as the appropriate backfill procedures should be in accordance with the project drawings and specifications. Typical dimensions are shown in Figure 9.

6.3

The GCL should be placed in the anchor trench such that it covers the entire trench floor but does not extend up the rear trench wall.

6.4

Sufficient anchorage may alternately be obtained by extending the end of the GCL roll back from the crest of the slope, and placing cover soil. The length of this "runout" anchor should be prepared in accordance with project drawings and specifications.

SECTION 7 SEAMING

7.1

GCL seams are constructed by overlapping adjacent panel edges and ends. Care should be taken to ensure that the overlap zone is not contaminated with loose soil or other debris. BENTOMAT 200R, BENTOMAT ST, BENTOMAT DN, and BENTOMAT SDN have SUPERGROOVE® which provides self-seaming capabilities in their longitudinal overlaps, and therefore do not require supplemental bentonite. However, for pond applications, supplemental bentonite must be used in longitudinal seams, regardless of the CETCO GCL.

FIGURE 9 - TYPICAL ANCHOR TRENCH DESIGN

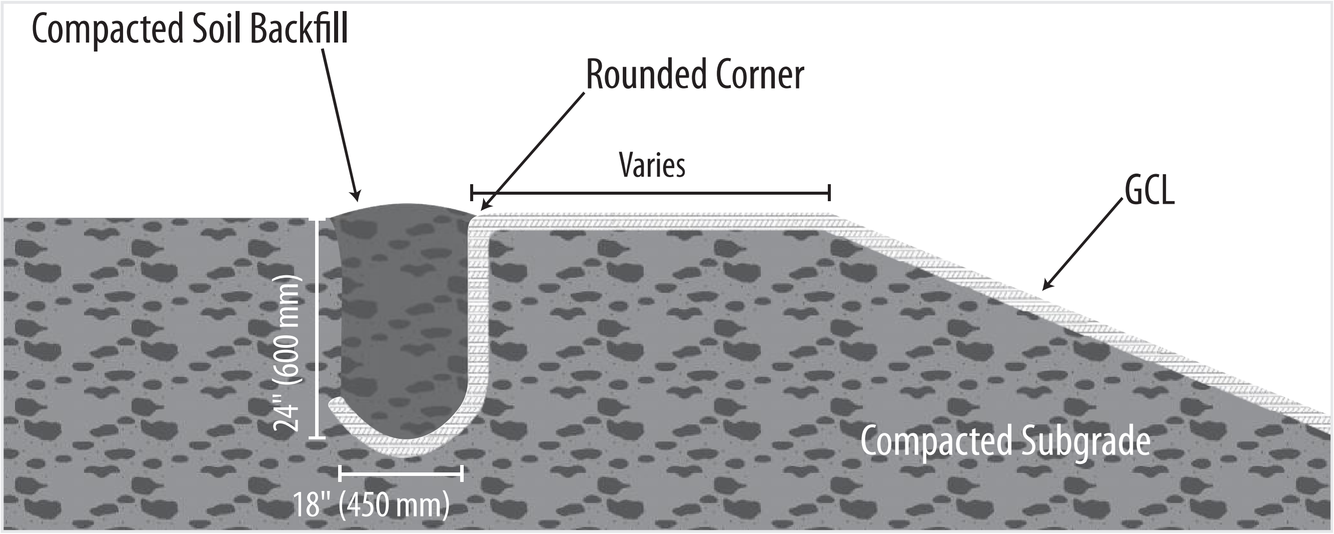
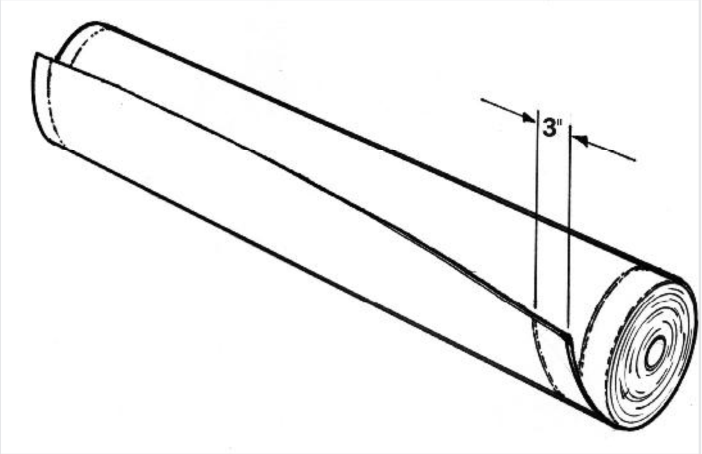


FIGURE 10 - SUPERGROOVE®



7.2
Longitudinal seams should be overlapped a minimum of 6 inches (150 mm) for BENTOMAT geosynthetic clay liners. For high-head applications (greater than 1 foot or 20.48 cm) involving BENTOMAT CL, BENTOMAT CLT, or BENTOMAT 600 CL, a minimum longitudinal seam overlap of 12 inches (300 mm) and supplemental bentonite (per Section 7.6) is recommended.

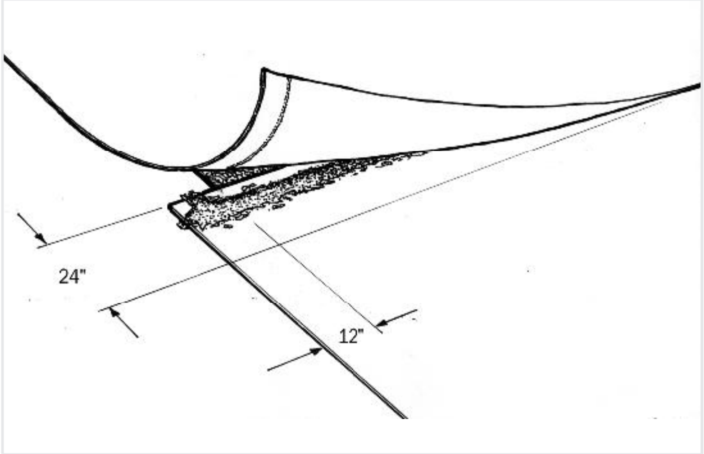
7.3
End-of-panel overlapped seams should be overlapped 24 inches (600 mm) for BENTOMAT geosynthetic clay liners.

7.4
End-of-panel overlapped seams are constructed such that they are shingled in the direction of the grade to prevent runoff from entering the overlap zone. End-of-panel seams on slopes are permissible, provided adequate slope stability analysis has been conducted (i.e., the GCL is not expected to be in tension). Bentonite-enhanced seams are required for all BENTOMAT end-of-panel overlapped seams.

7.5
BENTOMAT end-of-panel, bentonite-enhanced, overlapped seams are constructed first by overlapping the adjacent panels, exposing the underlying panel, and then applying a continuous bead or fillet of granular sodium bentonite 12" from the edge of the underlying panel (Figure 11). The minimum application rate at which the bentonite is applied is one-quarter pound per linear foot (0.4 kg/m).

7.6
If longitudinal bentonite enhanced seams are required for BENTOMAT 200R, BENTOMAT ST, BENTOMAT DN, or BENTOMAT SDN, they are constructed by overlapping the adjacent panels a minimum 6 inches (150 mm), exposing the underlying edge, and applying a continuous bead of granular bentonite approximately 3 inches (75 mm) from the edge. For pond applications involving BENTOMAT CL or BENTOMAT CLT, longitudinal seams are constructed by overlapping adjacent panels by 12 inches (300 mm), exposing the underlying edge, and applying a continuous bead of bentonite approximately 6 inches (150 mm) from the edge. The minimum application rate for the granular bentonite is one quarter pound per linear foot (0.4 kg/m).

FIGURE 11
BENTOMAT END-OF-PANEL OVERLAPPED SEAM



SECTION 8
SEALING AROUND PENETRATIONS AND STRUCTURES

8.1
Cutting the GCL should be performed using a sharp utility knife. Frequent blade changes are recommended to avoid irregular tearing of the geotextile components of the GCL during the cutting process.

8.2
The GCL should be sealed around penetrations and structures embedded in the subgrade in accordance with Figures 12 through 14. Granular bentonite shall be used liberally (approximately 0.25 lbs/ln. ft. or 0.4 kg/m) to seal the GCL to these structures.

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FIGURE 12 A CROSS-SECTION OF A HORIZONTAL PIPE PENETRATION

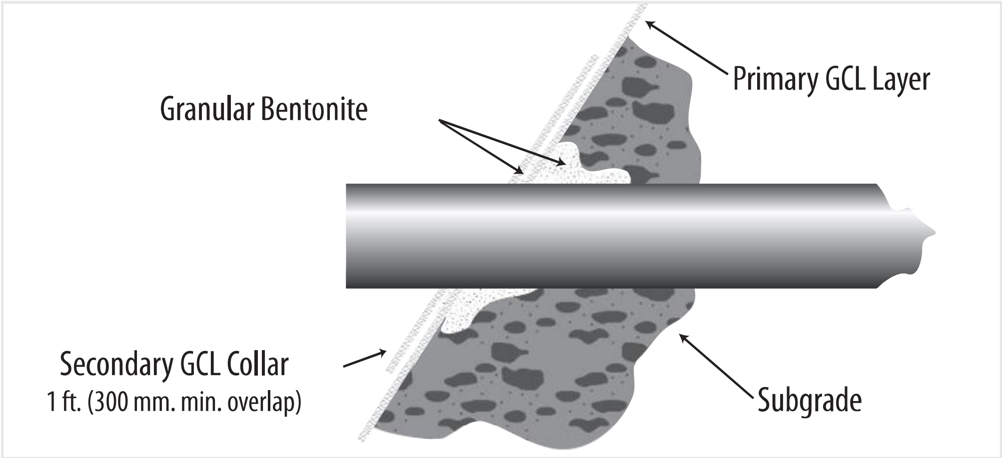


FIGURE 12 B ISOMETRIC VIEW OF A COMPLETED HORIZONTAL PIPE PENETRATION

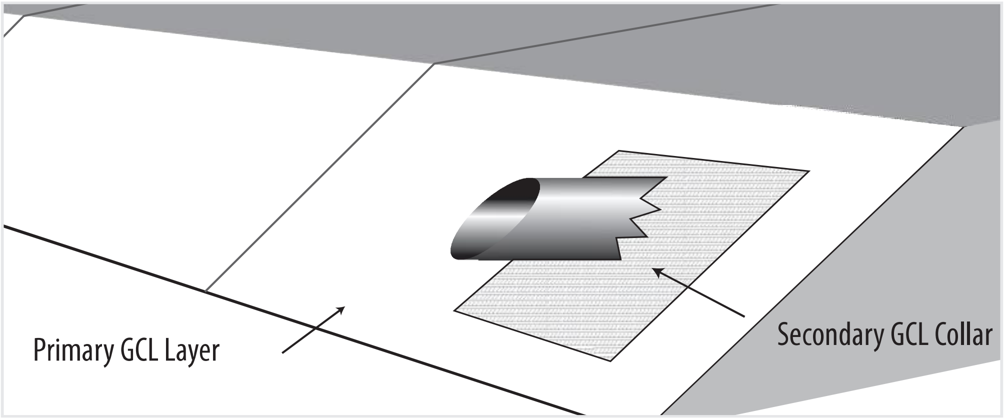


FIGURE 13 A CROSS-SECTION OF A VERTICAL PENETRATION

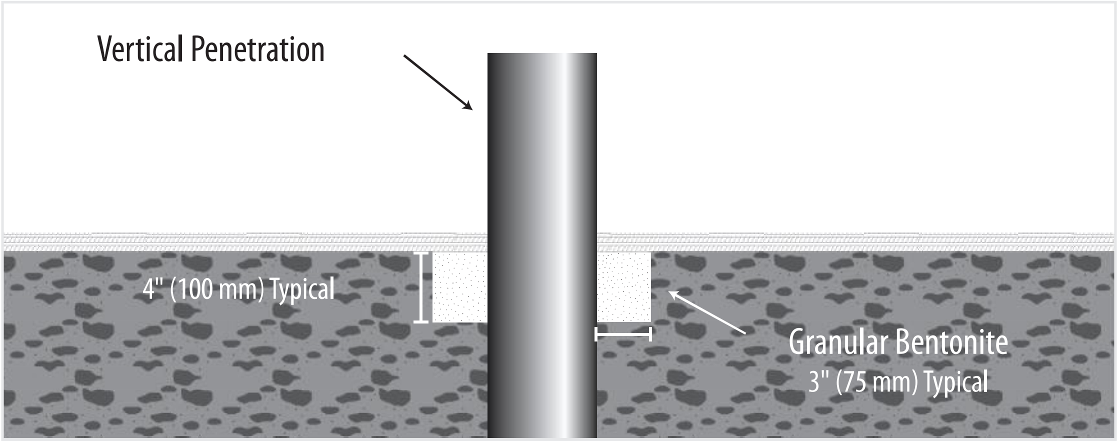


FIGURE 13B ISOMETRIC VIEW OF THE COMPLETED VERTICAL PENETRATION

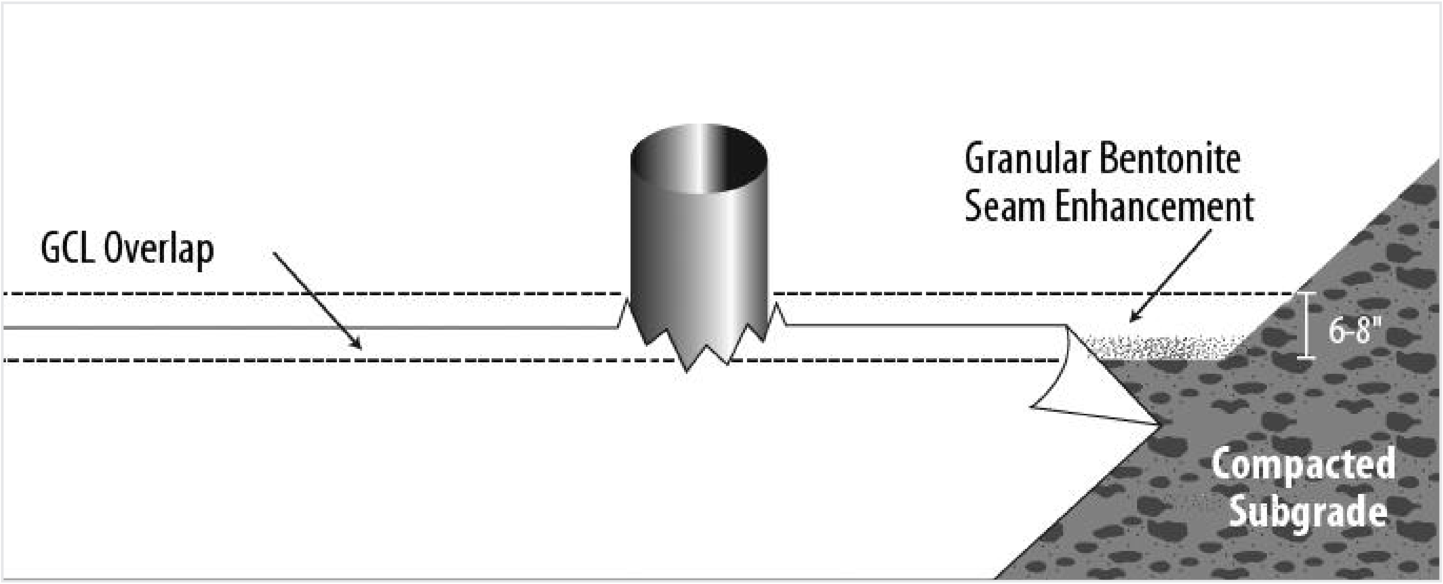
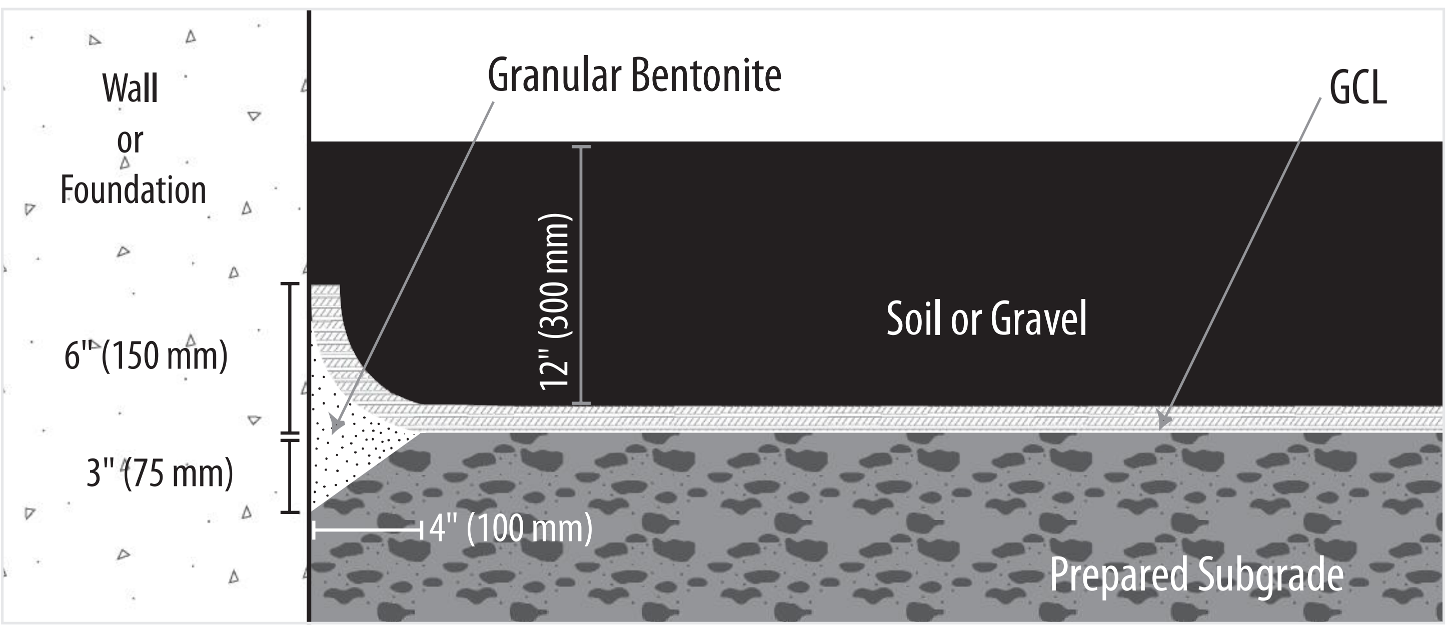


FIGURE 14 CROSS-SECTION OF GCL SEAL AGAINST AN EMBEDDED STRUCTURE OR WALL



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8.3
When the GCL is placed over a horizontal pipe penetration, a “notch” should be excavated into the subgrade around the penetration (Figure 12a). The notch should then be backfilled with granular bentonite. A secondary collar of GCL should be placed around the penetration, as shown in Figure 12b. It is helpful to first trace an outline of the penetration on the GCL and then cut a “star” pattern in the collar to enhance the collar’s fit to the penetration. Granular bentonite should be applied between the primary GCL layer and the secondary GCL collar.

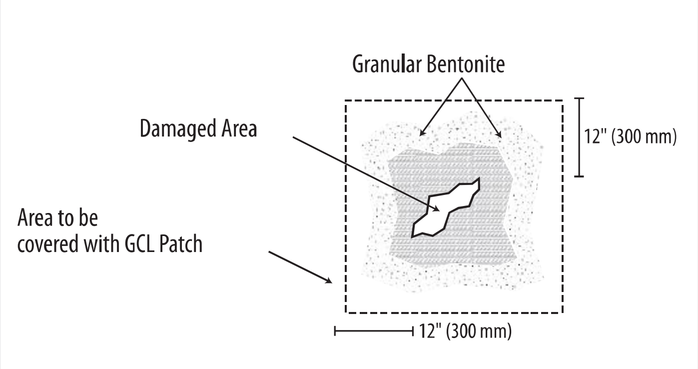
8.4
Vertical penetrations are prepared by notching into the subgrade as shown in Figure 13a. The penetration can be completed with two separate pieces of GCL as shown in Figure 13b. Alternatively, a secondary collar can be placed as shown in Figure 12a or 12b.

8.5
When the GCL is terminated at a structure or wall that is embedded into the subgrade on the floor of the containment area, the subgrade should be notched, as described in Sections 8.3 and 8.4. The notch is filled with granular bentonite; the GCL should be placed over the notch and up against the structure (Figure 14). Connection to the structure can be accomplished by placement of soil or stone backfill in this area. When structures or walls are at the top of a slope, additional detailing may be required. Contact CETCO for specific guidance.

SECTION 9
DAMAGE REPAIR

9.1
If the GCL is damaged (torn, punctured, perforated, etc.) during installation, it may be possible to repair it by cutting a patch to fit over the damaged area (Figure 15). The patch should be cut to size such that a minimum overlap of 12 inches (300 mm) is achieved around all parts of the damaged area. Granular bentonite should be applied around the damaged area prior to placement of the patch. It may be necessary to use an adhesive such as wood glue to affix the patch in place so that it is not displaced during cover placement. Smaller patches may be tucked under the damaged area to prevent patch movement.

FIGURE 15 DAMAGE REPAIR BY PATCHING



SECTION 10
COVER PLACEMENT

10.1
The final thickness of soil cover on the GCL varies with the application. A minimum cover layer must be at least 1 foot (300 mm) thick to provide confining stress to the GCL, eliminate the potential for seam separation and prevent damage by equipment, erosion, etc.

10.2
Cover soils should be free of angular stones or other foreign matter that could damage the GCL. Cover soils should be approved by the engineer with respect to particle size, uniformity, and chemical compatibility. Consult CETCO if cover soils have high concentrations of calcium (e.g. limestone, dolomite, gypsum, seashell fragments).

10.3
Recommended cover soils should have a particle size distribution ranging between fines and 1 inch (25 mm), unless a cushioning geotextile is specified.

10.4
Soil cover shall be placed over the GCL using construction equipment that minimizes stresses on the GCL. A minimum thickness of 1 foot (300 mm) of cover soil should be maintained between the equipment tires/tracks and the GCL at all times during the covering process. In high-traffic areas such as on roadways, a minimum thickness of 2 feet (600 mm) is required.

10.5
Soil cover should be placed in a manner that prevents the soil from entering the GCL overlap zones. Soil cover should be pushed up on slopes, not down slopes, to minimize tensile forces on the GCL.

10.6
When a textured geomembrane is installed over the GCL, a temporary geosynthetic covering known as a slip sheet or rub sheet should be used to minimize friction during placement and to allow the textured geomembranes to be more easily moved into its final position.

10.7
Cyclical wetting and drying of GCL covered only with geomembrane can cause overlap separation. Soil cover should be placed promptly whenever possible. Geomembranes should be covered with a white geotextile and/or operations layer without delay to minimize the intensity of wet-dry cycling. If there is the potential for unconfined cyclic wetting and drying over an extended period of time, the longitudinal seam overlaps should be increased based on the project engineer's recommendation.

10.8
To avoid seam separation, the GCL should not be put in excessive tension by the weight or movement of textured geomembrane on steep slopes. If there is the potential for unconfined geomembrane expansion and contraction over an extended period of time, the longitudinal seam overlaps should be increased based upon the project engineer's recommendation.

SECTION 11
HYDRATION

11.1
Hydration is usually accomplished by natural rainfall and/or absorption of moisture from soil. However, in cases where the containment of non-aqueous liquid is required, it may be necessary to hydrate the covered GCL with water prior to use.

11.2
If manual hydration is necessary, water can be introduced by flooding the covered lined area or using a sprinkler system. If flooding, care must be taken to diffuse the energy of the water discharge so that the cover material is not displaced.

11.3
If the GCL is hydrated when no confining stress is present, it may be necessary to remove and replace the hydrated material.

As discussed in Section 5.8, in many instances a needlepunch reinforced GCL may not require removal/replacement if the following are true:

- ► The geotextiles have not been separated, torn or otherwise damaged
- ► There is no evidence that the needlepunching between the two geotextiles has been compromised
- ► The GCL does not leave deep indentations when stepped upon
- ► Any overlapped seams with bentonite enhancement (see Section 7) are intact

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AMCOL® INTERNATIONAL HEADQUARTERS

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Attachment E

Responses to MDEQ / US EPA Region 5 Questions on 2018 WDI Permit Modification

Responses to MDEQ / US EPA Region 5 Questions on 2018 WDI Permit Modification			
Question Date	**Question**	**Response provided in the 2018 Permit Modification**	**Answers for Current Submittal "2021 Permit Modfication"**
4/5/2018	How will the different liners for different landfill cells be tied together or combined?	Liner tie-ins are detailed in the Permit Engineering Drawings	Attachment C, Permit Engineering Drawings
4/5/2018	What is the thickness of the HDPE plastic liner under the leachate collection system? At on-site meeting, Jim thought he heard that something less than 80 mil HDPE was going to be used.	The thickness for both primary and secondary geomembrane will be 80-mil HDPE geomembrane.	No change to 2018 response
4/5/2018	Attenuation layer at 1.0×10^{-5} permeability. When combined with the two GCL layers, how long will it take waste to travel through liner?	This is a complicated question that does not have a definitive answer. As shown in this submittal, when "comparing apples to apples", the proposed liner system will be at least equivalent to (if not superior than) the current liner system in this regard.	No change to 2018 response
4/5/2018	Steady state solute flux table from presentation shows a "composite permeability" number. Uncertain how this was arrived at or how valid it is for answering the question in third bullet. Also, did MDEQ have some questions about this table?	Composite permeability (or "equivalent" permeability") is a weighted average of permeability of a system consisting of a number of horizontal layers having different permeabilities and thicknesses. CTI will use the equivalent permeability of the two GCL layers (excluding the flow retardation provided by the attenuation layer for conservatism) to demonstrate that the steady-state solute flux of the proposed liner system is equivalent to (if not superior than) the current liner system in this regard.	No change to 2018 response
4/5/2018	Is geogrid sufficient to prevent damage to landfill structure?	There are no proposed changes to the geogrid already approved by the EPA and MDEQ.	No change to 2018 response
4/5/2018	Need Cross-Sections in design package that not only show the new proposed design but that also show the old design and landfill design below the new cells. We think there should be at least three cross-sections as follows: -General cross-section showing liner below old landfill cell all the way up to the cap of the new proposed design. - Detailed cross-section of previously approved design for new landfill cell. -Detailed cross-section of design modification for new landfill cell.	The revised Permit Engineering Drawings include cross-sectional views of both the old design and the new design.	Attachment C, Permit Engineering Drawings
4/5/2018	Comparison of leachate collection system between design modification and previously approved design.	The leachate collection system in this proposed permit modification has not changed from the currently permitted system. This proposed permit modification includes the addition of GCL in the baseliner of Master Cell VI-G Phase 2 but does not modify other components of the leachate collection system.	Attachment C, Permit Engineering Drawings
4/5/2018	In summary, the landfill design modification should be at least comparable to the old design modification regarding protectiveness.	The 2018 Permit Modification Letter Report discusses the equivalency of the permit modification.	No change to 2018 response; 2021 Permit Modification Letter Report section titled "Equivalency Demonstration"
4/13/2018	We're assuming that the Engineering design will also include the specifications, not just the drawings (schematics). We would like to see what materials/vendors they specify if possible.	This proposed permit modification includes the addition of Geosynthetic Clay Liner (GCL) in the base liner of Master Cell VI-G Phase 2. Distinct GCL products from the manufacturer, CETCO, have been specified in this request and are detailed in the 2018 Permit Modification Letter Report and on the accompanying Permit Engineering Drawings.	Same changes are applied to Subcell F1 to F4 and G4 to G7; 2021 Permit Modification Letter Report Figure 2 and Attachment C, Permit Engineering Drawings
4/13/2018	Will the cover system also be revised from the original design? A. If so, was that included in the overall slope stability analysis? B. Will the specific materials of the revised material be identified? When?	No. The cover system will remain unchanged as a part of this proposed permit modification.	No change in the answer
4/13/2018	How Did the slope stability analysis results differ from the original design?	The proposed base liner system does not introduce any interface that is more critical (lower) than what is in the permitted liner system. The stability of the permitted liner system was demonstrated in the 2011 permit submittal. In addition, all of the GCL products in the proposed liner system are internally reinforced with needle-punched fibers to ensure that the shear resistance of the internal (Bentonite) layer also exceeds the stability requirement. Improvement in stability is expected since the interface shear resistance of HDPE/GCL in the proposed liner system is superior than the interface shear resistance of HDPE/CCL in the permitted liner system.	Attachment A, Equivalency Demonstration and References; Attachment B-1, Slope Stability Calculations
4/13/2018	a.The 2011 report identified seemingly satisfactory sliding (or translational) factors of safety under various conditions, but made no mention of rotational factors of safety, including possibly failure surfaces that could intersect well into the underlying landfill and natural soil layer. Were rotational failure envelopes part of the analysis? What were the resulting factors of safety for various conditions?	Rotational failure envelops were actually examined in the 2011 permit submittal. Both rotational (aka, "circular") and sliding (aka, "non-circular") slipping planes were part of the 2011 analyses. Ranges of FS-value were 1.5-2.4 (for pre-filling condition); 1.5-1.6 (for partial filling condition); and 1.5-2.0 (for post-filling condition).	No change to 2018 response
4/13/2018	How will the design ensure that no new leachate from the expansion make it to the unlined waste cell beneath the expansion?	The approved 2011 design incorporates a "complete encapsulation" of the expansion waste by incorporating (1) continuous transition of liner systems between adjacent sub-cells and (2) tie-in of the final cover geomembrane to the expansion waste primary base liner geomembrane. Leachate from the expansion waste will be separated from the underlying (unlined) waste.	No change to 2018 response
4/13/2018	What is the anticipated settlement of the underlying landfill after the expansion?	According to the 2011 expansion submittal, approved by the EPA and MDEQ, the total settlement of the MC VI-F & G cell floor ranges from 2.5 feet to 17 feet under maximum expansion waste loading. The current proposed design changes will not alter these calculations.	No change to 2018 response
4/13/2018	How will the anticipated differential and global settlement of the preregulatory landfill challenge the expansion liner? i. Have the biaxial properties of geogrid and GCL been evaluated for those conditions?	There are no proposed changes to the geogrid already approved by the EPA and MDEQ. In any case, the estimated settlement will not adversely impact the proposed liner system. GCL is well known for its superior capability to endure settlement induced tensioning. Dr. Qian of the MDEQ stated in his book ["Geotechnical aspects of landfill design and construction". New Jersey: Prentice Hall Inc. (2001)] that a compacted clay liner can only tolerate settlement induced strain of 0.1 to 4% whereas geocomposite clay liner can tolerate 5 - 16% strain.	No change to 2018 response
4/13/2018	What is the anticipated of differential and global settlement on the slope and performance of the leachate collection system?	As concluded in the approved 2011 permit submittal, the post settlement slopes are greater than 2.24 percent on the cell floor and greater than 1.0 percent along the leachate collection pipe locations – both satisfying the regulatory requirements and demonstrating satisfactory performance of the leachate collection system. Nevertheless, as indicated in the response above, GCLs are superior than CCLs in resisting any settlement induced tensioning.	No change to 2018 response

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4/13/2018	GCLs can be subject to rapid changes in hydraulic properties when exposed to specific leachate constituents like calcium. Have the GCLs been evaluated for chemical resistance to the anticipated waste leachates? What method was used and what was the result?	Yes the GCLs had been conservatively evaluated by the manufacture's R&D laboratory for chemical resistance (compatibility) of the primary GCL (Resistex 200™) against leachate samples supplied by WDI. After 100 hours of permeation , the lab has measured a permeability of 1.0×10^{-9} cm/sec with 0.35 pore volumes of leachate passing through the specimen. This means that the bentonite polymer blend in the Resistex® 200 FLW9 GCL is hydrating and cutting off flow. The GCL manufacture, based on the preliminary test results, recommend a conservative "upper bound" estimate for permeability as 5×10^{-9} cm/sec to be used for techcnial purposes. With additional time and data collected from the site specific testing, the permeability value is expected to decrease further. For the demonstrative calculations, a conservative permeability of 1×10^{-8} cm/sec was used in the flux demonstration. In other words, an extra adjustment factor of 2.0 was applied for additional conservatism.	No change to 2018 response
4/13/2018	GCLs can be subject to thinning under strain and wetting. How will this be prevented?	Thinning of GCLs can be prevented by maintaining adequate thickness (min. 1 ft) of cover soil between the equipment tires/tracks and the GCL at all times during the installation process. This important requirement will be included in the CQA plan and will be strictly enforced via full-time CQA observation/verification during construction of the proposed liner system.	No change to 2018 response
4/13/2018	The design recognizes that subgrade preparation will be essential, yet 1 inch diameter stones are allowable before the proof rolling (final prep) of the surface. Once assembled, those stones may contribute to localized thinning of the GCL clay. Have designers considered a smaller allowable stone size AND considered a specification pertaining to angularity of the stones, which also affect thinning and/or puncture of the GCL material?	Based on the industry standard and past experiences, stone particle protrusion can be effectively eliminated by limiting the maximum-allowed stone size to 1" in the upper most lift of the attenuation layer and requiring proof-rolling of the prepared subgrade before GCL deployment. All subgrade preparation requirements will be listed in the CQA Plan and technical specifications. The Certifying Engineer's approval of the subgrade will be obtained prior to GCL installation.	No change to 2018 response
4/13/2018	How will the GCLs be protected after installation? The bearing capacity slide of March 28 (2018) indicates 1 ft of soil atop the GCL at all times, is this sufficient for construction vehicles?	Industry standard and past experiences have demonstrated that an adequate thickness of cover soil (minimum 12 inches) will prevent damage of GCLs due to construction equipment loading. Specifications of allowable construction vehicles will be listed in the CQA plan or on the drawings issued for construction.	No change to 2018 response
4/13/2018	What is the estimated Impact of the overburden on leachate generation from the cell underlying the expansion?	Leachate generation will be reduced due to cutting off infiltration through the existing cell's clay cap by the installation of the new double composite liner. Although not required by rule, WDI will continue to remove leachate from the underlying cell.	No change to 2018 response
4/13/2018	Is there a plan to circulate leachate on the expansion?	No. There is no plan to recirculate leachate on the expansion.	No change to 2018 response
5/3/2018	CTI needs to consider increasing both the width and depth of the anchor trench shown in West Perimeter Dike 4 on revised Drawing No. 22A. It seems to be impossible to bend and bury total 9 to 10 layers of geosynthetic materials (including four layers of GCL, two layers of 80-mil geomembrane, two layers of geocomposite, and one or two layers of geogrid) into a 2'x' 2' standard anchor trench.	The size of the anchor trench is increased to 3 ft x 3 ft as now shown on Detail 4 of Drawing No. 22A, included in Attachment B of the Permit Modification Letter Report.	No change to 2018 response; see Detail 6 of Sheet 15, included in Attachment C.
5/3/2018	The geocomposite used as the primary leachate drainage layer in MC VI-G Phase 2 (Subcell G3) shown in MC VI Phase 2 (Subcell 6E) to MC VI-G Phase 2 (Subcell G3) Tie-In Detail 1 on the revised Drawing No. 22B should be extended to overlap the existing primary leachate drainage geocomposite layer in MC VI Phase 2 (Subcell 6E) and the geonet cores should be joined by ties with plastic fasteners and the top geotextiles should be sewed together. The geocomposite used as the leak detection layer should also do this.	The detail is revised. The requirements for geocomposite connection are added in Detail 3 on Sheet 22A, included in Attachment B of the Permit Modification Letter Report. Detail 3 on Sheet 22A was referenced to all tie-in connections.	No change to 2018 response; see Detail 4 on Sheet 15, included in Attachment C.
5/3/2018	The overlapped connections of the geocomposite layers used as the primary leachate drainage layer and the leak detection layer shown in in MC VI-G Phase 1 and MC VI-G Phase 2 Tie-In Detail 2 on revised Drawing No. 22B should be revised. The geocomposite used as the primary leachate drainage layer in MC VI-G Phase 2 (Subcells G2 and G3) shown in MC VI-G Phase 1 and MC VI-G Phase 2 Tie-In Detail 2 on revised Drawing No. 22B should be extended to cover the existing primary leachate drainage geocomposite layer and the geonet cores should be joined by ties with plastic fasteners and the top geotextiles should be sewed together. The geocomposite used as the leak detection layer should also do this. Just like the shingles and tiles on the roof, the shingles on the upper part of the slope should always cover the shingles on the lower part of the slope.	The detail is revised. The requirements for geocomposite connection are added in Detail 3 on Drawing No. 22A, included in Attachment B of the Permit Modification Letter Report. Detail 3 on Sheet 22A was referenced to all tie-in connections including those on Drawing No. 22B.	No change to 2018 response; see Detail 4 on Sheet 15, included in Attachment C.
5/9/2018	Two shear resistance requirements obtained from the slope stability analysis shown Page 10/13 should not only include the interfaces between geosynthetic-to-geosynthetic or geosynthetic-to-soil, but also include internal shear strengths for different GCLs.	Agree. The following paragraph will replace the current language on Page 10 of 13 of the Equivalency Information and References (Attachment A). "WDI will, as part of the CQA requirements, conduct direct shear tests (ASTM D6243) for relevant GCL-related interfaces (e.g., against 80-mil textured HDPE geomembranes, between different GCL products, against cohesive attenuation layer soils, etc.) as well as internal shear strength for different GCL products before approving the products to be used for construction of the MC VI-G Phase 2 liner system."	No change to 2018 response
5/9/2018	It is indicated in Design Criteria/Design Basis (with Reference to Source of Data) in Page 1 of 2 that "1. Average daily peak leachate generation rates were obtained from "Leachate Generation Estimation and Head Calculation" (NTH, 2011), which are 8,960 gal/acre/day for Subcell G2 and 7,874 gal/acre/day for Subcell G3. This part of the calculation process and calculation results conducted by NTH should be attached in Appendix A-2 for checking by the reviewers.	The calculation sheets and related attachments for Leachate Generation Estimation and Head Calculation (NTH, 2011) are included in this response package as Appendix A-2.4.	The leachate infiltration rates were determined using HELP models with the proposed liner grades and the cell layouts; see Attachment B-5.2: Leachate Generation (HELP Model) Analysis
5/9/2018	It is only indicated in Design Criteria/Design Basis (with Reference to Source of Data) in Page 1 of 2 that the maximum drainage length of Subcells G2 and G3 is 200 ft and floor slopes are 5.6% and 5.8%, respectively. But, the maximum slope lengths of the 3:1 sideslope in Subcells G2 and G3, which were used in the maximum leachate head calculation, were not indicated.	A new figure on page 1 of Appendix A-2.2, indicating the location of the maximum drainage length on the side slope, is included in the revised calculation sheet.	Attachment B-5: Maximum Head-on-Liner Calculation

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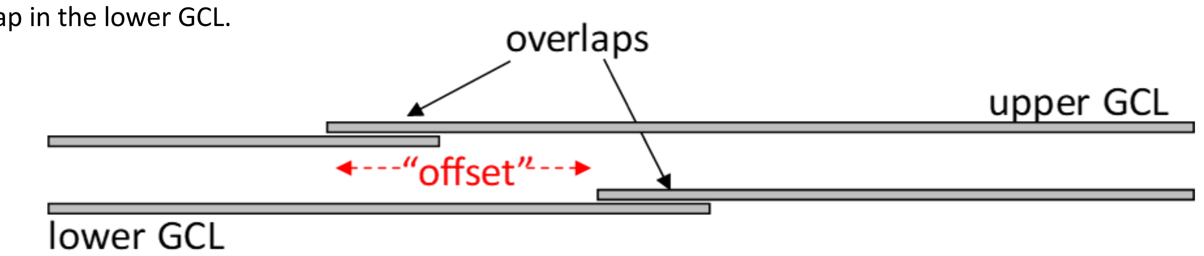
5/9/2018	The same inflow rate of 8,960 gal/acre/day was used to calculate the maximum leachate head on the liner for Subcell G2 floor and 3(H):1(V) sideslope. If the inflow rate was calculated by using HELP model, the inflow rate results should be different for the flat subbase and 3(H):1(V) sideslope. It is the same for Subcell G3 floor and 3(H):1(V) sideslope.	A single leachate generation rate for each cell was reported in the current permit application report (approved by the MDEQ on May 4, 2012 and EPA on September 27, 2013). The generation rates of 8,960 and 7,874 gal/acre/day were estimated for Subcells G2 and G3, respectively. According to CTI's past design experiences, these leachate generation rates for sideslopes are significantly higher than any other landfill in Michigan. It is also CTI's understanding that steeper (e.g., 3H:1V) sideslope inclination tends to result in higher drainage capacity and the maximum head-on-liner will likely occur near the toe of the slope. To verify this understanding, CTI repeated the head-on-liner calculation using a "doubled" leachate generation rate. As shown in the attached calculation sheet, the calculated maximum head-on-liner value remains unchanged. Please also note that the higher performance Resistex® 200 GCL used on the cell floor will be extended 5-ft vertically up the side slope. The estimated maximum leachate head on the sideslope will actually occur within this "enhanced" section.	The leachate infiltration rates were determined using HELP models with the proposed liner grades and the cell layouts; see Attachment B-5.2: Leachate Generation (HELP Model) Analysis
5/9/2018	In Head on Liner Calculation for Subcell G2 – Side Slope, it was obtained that the maximum head on liner (McEnroe numerical) in all slope is equal to 5.18 inches. However, the result listed in the box indicate that the maximum head on liner (McEnroe 93 with free drain) is only 0.9982 inches. It is the same for Subcell G3 – Side Slope. CTI must clarify this discrepancy.	Since the "free draining" condition will not be met for the sideslope cases, the results from the McEnroe 96 equation (for free draining condition) are not valid in this calculation. The value was included on the spreadsheet for comparison purposes only. All irrelevant results have been removed from the spreadsheet to avoid confusion.	No change to 2018 response; see Attachment B-5: Maximum Head-on-Liner Calculation
5/9/2018	"The maximum head on liner (McEnroe 93 with free drain + Superposition)" is listed in the box in Head on Liner Calculations. What is this meaning and what is "Superposition"?	"Superposition" in this case is an approach which estimates the head-on-liner by adding the depth of leachate at the discharge point (i.e., leachate collection pipe) to the maximum head-on-liner determined using the McEnroe Equitation under a free draining condition). All irrelevant results have been removed from the spreadsheet to avoid confusion. Results from the numerical solution, which are relevant to this calculation, remain.	No change to 2018 response; see Attachment B-5: Maximum Head-on-Liner Calculation
5/9/2018	CTI should give a description to explain how two equations used for Slope 1 and Slopes 2 – 5 were derived from McEnroe 1993's paper. Is it not continuous to connect these five segments of the curves, i.e., it should be a continuous phreatic surface of the leachate flow?	The derivation of the equations and verification of the results using numerical solution are documented in a CTI internal report, which is attached with this response package. The phreatic surface is continuous however the shape of the curve at each segment may vary.	No change to 2018 response; see Attachment B-5: Maximum Head-on-Liner Calculation
5/9/2018	In Head on Liner Calculations, the thicknesses of sand used in the calculations were 3.0, 3.0, 3.0, 3.0, and 2.0 inches for Slopes 5, 4, 3, 2, and 1 at Subcell G2 – Floor; 2.0, 2.0, 2.0, 2.0, and 2.0 at Subcell G3 – Floor; 6.0, 6.0, 6.0, 6.0, and 6.0 at Subcells G2 and G3 – Side Slope. Do these thicknesses represent the saturated depth of the 12-inch protective sand placed on the geocomposite drainage layer? Was the combined (apparent) permeability calculated from the combination of the permeabilities of the thickness of the geocomposite and the saturated depth of the sand layer? If so, the leachate flow in the geocomposite and protective sand layer is in a unconfining flow condition. If the leachate depth is greater than the thickness of the geocomposite, the saturated depth in the protective sand layer is unknown. It will change with the phreatic surface. The true saturated depth in the sand layer can be calculated by using trial and error method. Using a fixed saturated sand depth will affect the correctness of the calculated maximum leachate head results.	An assumed saturated thickness of the sand layer is used to determine the combined hydraulic conductivity of the saturated drainage layer per the approach presented by Qian et al. 2004 (Qian, X.D., Gray, D.H., and Koerner, R.M. (2004), "Estimation of Maximum Liquid Head over Landfill Barriers," Journal of Geotechnical and Geoenvironmental Engineering, ASCE, 130:5, 488-497). $k_{combined} = k_{geonet} + \left(k_{sand} - k_{geonet}\right)\frac{t_{sand}^2}{\left(t_{sand} + t_{geonet}\right)^2}$ One of the ways to estimate the thickness of the saturated sand layer is using the trial-and-error method. However, even with the trial-and-error method, thickness of the saturated sand layer is not a "true" depth of leachate in the layer since the saturated thicknesses vary within each segment. To simplify the calculation and provide a conservative result (higher head on liner), an assumed saturated thickness, which is greater than the maximum head-on-liner in the same segment was utilized in the calculation.	No change to 2018 response; see Attachment B-5: Maximum Head-on-Liner Calculation
5/9/2018	CTI should explain why the thickness of geonet was assumed to be 0 for Slope 5 at Subcells G2 and G3 – Side Slope and the thickness of sand was still 6.0 inches.	The thickness of the geonet is not zero in "Slope 5". The thickness of the geonet is zero in "Slope 1" which was not used in the calculation. Note that the flow length was also set to zero for "Slope 1" in both spreadsheets.	No change to 2018 response; see Attachment B-5: Maximum Head-on-Liner Calculation
5/9/2018	The geosynthetic-to-geosynthetic interface, geosynthetic-to-soil interface and GCL internal friction requirements obtained from slope stability analysis must be added in the CQA program document beyond GCL CQA program and the material and construction specifications shown in the Drawings.	Agree. All interface- and internal-shear resistance testing associated with various GCL products, including standard methods, procedures and minimum requirements will be included both in the technical specifications and on the construction drawings as part of the CQA program.	No change to 2018 response
5/9/2018	The material specifications of 5-ft cohesive soil used as an attenuation layer placed beneath the two layers of GCL primary liner, such as particle gradation or CL, LL and PI, dry density requirement for compaction, must be also included in the CQA program document and shown in the Drawings.	Agree. Soil properties such as Atterberg limits (ASTM D4318) and grain size distribution (ASTM D422) will be tested to confirm that the proposed material meets the classification requirements (SC, CH, CL, CL/ML or ML per the Unified Soil Classification System - ASTM D2487). Modified Proctor moisture-density correlation (ASTM D1557) will also be tested to determine the maximum dry density of the tested soil. Field testing will be performed to verify the in-place density of the attenuation soil meets the minimum 90% requirement.	No change to 2018 response
5/14/2018	Will a Construction Quality Assurance (CQA) program document be submitted?	Other than the GCL Section, which will be superseded by the CQA documents included in Attachment D of the submitted Permit Modification Letter Report ("GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines"), the current CQA Plan (approved by the MDEQ on May 4, 2012 and EPA on September 27, 2013) will remain as the official CQA program document for the construction of Master Cell VI-F & G.	No change to 2018 response; see Attachment D: GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines
5/14/2018	CQA must address the Geomembrane/Geocomposite interface with regards to slope stability.	The following paragraphs on Page 10 of 13 of the "Equivalency Information and References" (Attachment A of the submitted Permit Modification Letter Report) should properly address all interface- and internal shear resistance issues associated with slope stability. •As long as the interim waste slope during filling does not exceed an inclination of 3.5(H) to 1(V), a friction angle of 13.8 degrees or higher between any different geosynthetic-to-geosynthetic or geosynthetic-to-soil interfaces will result in satisfactory factor of safety (FS) values of 1.5 or greater. •As long as a combination of friction and adhesion under an overburden pressure of 1.0 psi is greater than a friction angle of 21.8 degrees, stability of liner systems on slopes not steeper than 3(H) to 1(V) can be ensured. WDI will, as part of the CQA requirements, conduct direct shear tests (ASTM D6243) for relevant GCL-related interfaces (e.g., against 80-mil textured HDPE geomembranes, between different GCL products, against cohesive attenuation layer soils, etc.) as well as internal shear strength for different geosynthetic products before approving the products to be used for construction of the MC VI-G Phase 2 liner system."	No change to 2018 response; see Attachment A: Technical Equivalency Demonstration

Responses to MDEQ / US EPA Region 5 Questions on 2018 WDI Permit Modification			
Question Date	**Question**	**Response provided in the 2018 Permit Modification**	**Answers for Current Submittal "2021 Permit Modfication"**
5/14/2018	CQA must address the rolling and prepping of soil upon which the GCL lies.	As indicated on Page 11 of 13 of the "Equivalency Information and References" (Attachment A of the submitted Permit Modification Letter Report), technical specifications for the GCL (included in Attachment D of the submitted Permit Modification Letter Report) limit any stone particle in the upper most lift of the subgrade soils (i.e., the attenuation layer and the structural fill) to be not larger than 1 inch (25 mm) in size. Proof-rolling of the prepared subgrade surface is also required to reduce stone particle protrusion.	No change to 2018 response; see Attachment A: Technical Equivalency Demonstration and Attachment D: GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines
5/14/2018	CQA must address the weights of vehicles allowed after installation of GCL.	As indicated on Page 17 of 25 of CETCO GCL CQA Manual (Attachment D of the submitted Permit Modification Letter Report entitled "GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines") no heavy equipment should come in direct contact with the GCL. In some cases, however, it is necessary to drive equipment directly on the GCL. Permission to do so will be granted by CETCO through the CQA engineer on a case-by-case basis only and will include restrictions on low-pressure, rubber-tired equipment only. Additionally, as indicated on Page 10 of 13 of the "Equivalency Information and References" (Attachment A of the submitted Permit Modification Letter Report), a minimum thickness of 1 foot (300 mm) of cover soil is specified as a technical requirement and CQA site personnel will observe/verify/document that such a requirement is maintained between the equipment tires/tracks and the GCL at all times during the installation process.	No change to 2018 response; see Attachment A: Technical Equivalency Demonstration and Attachment D: GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines
5/14/2018	Anticipated settlement of underlying landfill after expansion is 3-17 feet. Did designer consider increasing overlap of the GCL materials to allow for this deformation to prevent overlapped GCL panels from separating and opening flow paths during settlement?	As indicated in the CETCO GCL CQA Manual (Attachment D of the Permit Modification Letter Report entitled "GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines"), the minimum acceptable overlap between GCL panels is 6 inches (150 mm). This overlap distance is considered as industry standard for over 2 decades and has been commonly used in numerous applications – including many landfill overfill liner (aka "piggybacking") and final closure systems. To name a few, the following commercial and municipal MSW landfills all have incorporated GCL in their permitted piggybacking liner or final closure systems using the same overlapping distance: • Eagle Valley Security Landfill – Orion Charter Township, Michigan • Westside Security Landfill – Three Rivers, Michigan • Pine Tree Acres Landfill - Lenox, Michigan • Northern Oaks Security Landfill – Harrison, Michigan • Woodland Meadows Security Landfill – Van Buren Township, Michigan • Smiths Creek Landfill – Smiths Creek, Michigan • City of Midland Landfill – Midland, Michigan • Wexford County Landfill – Manton, Michigan It is important to recognize that final closure systems (of landfills, surface impoundments, etc.), compared with the proposed cell liner application, provide much less "confining" overburden pressure. Higher overburden pressure, and consequently greater shear resistance, keeps the overlapped GCL seams from separating when experiencing uneven settlement. WDI believes that the proposed overlapping distance, with much greater confining overburden pressure provided by the proposed cell liner application, will adequately prevent the separation of GCL panels. However, WDI will request "offsetting" the overlapping area between the upper and lower GCL layers to provide additional redundancy and maximize the protection. This additional installation and CQA requirements will be incorporated in the construction drawings of Subcells G2 and G3.	No change to 2018 response; see Attachment D: GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines

Responses to MDEQ / US EPA Region 5 Questions on 2018 WDI Permit Modification			
Question Date	**Question**	**Response provided in the 2018 Permit Modification**	**Answers for Current Submittal "2021 Permit Modfication"**
5/14/2018	What damage might occur to the leachate collection system during settlement of the underlying landfill?	As concluded in the approved 2011 permit submittal, the "post settlement" slopes are greater than 2.24 percent on the cell floor and greater than 1.0 percent along the leachate collection pipe locations – both satisfying the regulatory requirements and demonstrating satisfactory performance of the leachate collection system.	"Volume III – WDI Operating License Application, Master Cells VI F & G, Basis of Design Report", NTH Consultants, submitted February 2011, revised September 2011
5/14/2018	The buffer layer for the GCL does not address the angularity of stone. Has this been addressed?	As indicated on Page 11 of 13 of the "Equivalency Information and References" (Attachment A of the submitted Permit Modification Letter Report), maximum stone size in the upper most lift of the subgrade soils (i.e., the attenuation layer underneath the primary liner and the structural fill layer underneath the secondary liner) will be limited to not larger than 1 inch (25 mm). Any stone particles that are greater than 1' in size, or more angular than "sub-rounded" in shape will be handpicked and the remaining cavity will be backfilled with clay. Moreover, proof-rolling of the subgrade surface is also required before the deployment of GCL. This procedure is intended to create a "smooth" subsurface and further reduce the chance of any significant stone particle protrusion. Combining with the superb "self-healing" characteristic inherent to bentonite, it is believed that the above CQA requirements are sufficient and adequate to address potential concerns associated with substrate stone angularity and ensure a superb liner performance.	No change to 2018 response; see Attachment A: Technical Equivalency Demonstration and Attachment D: GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines
5/23/2018	In the WDI permit modification, revision 1, Attachment C, WDI had provided answers to EPA questions. I would like to get clarification on the response to our May 14, 2018, comment # 2. In the response, WDI stated: "WDI believes that the proposed overlapping distance, with much greater confining overburden pressure provided by the proposed cell liner application, will adequately prevent the separation of GCL panels. However, WDI will request "offsetting" the overlapping area between the upper and lower GCL layers to provide additional redundancy and maximize the protection. This additional installation and CQA requirements will be incorporated in the construction drawings of Subcells G2 and G3." Can you clarify what is meant by "offsetting" in the response?	Both the primary and the secondary liners have two layers of GCL. As shown in the sketch below, each roll of GCL will overlap the adjacent roll by six inches. WDI will ensure that each overlap in the upper GCL does not vertically coincide with any overlap in the lower GCL.  	No change to 2018 response; see Attachment D: GCL Manufacturer Specifications, CQA Manual, and Installation Guidelines
5/30/2018	On sheet 22, detail 5/22 MC VI-E Phase 1 Transfer Trench Detail it shows the Removal of the riser pipes. My question is, is there a detail drawing of how they will be tied back into the system as shown in detail 8/22 on sheet 22 for the leachate collection system. Or can you explain what the plan was for the riser pipes.	To be clear, WDI has not made any changes to detail 5 of sheet 22, previously approved by EPA and MDEQ. No part of this detail is affected by the proposed design change to MC VI-G Phase 2 (the subject of WDI's current submittal). The tie-in shown in detail 5 of sheet 22 pertains exclusively to the future connection of MC VI subcell G1 to the leachate collection sump at the southwest corner of MC VI subcell E. But to answer your question, you are correct that the existing E southwest sump riser pipe will be eliminated when this future tie-in occurs; the collection pipe that enters the E southwest sump will be terminated and leachate will flow by gravity through the E southwest sump into G1 via the one foot sand layer, geocomposite and five extra layers of geonet with minimum transmissivity 1.3 x 10-3 m^2/s.	Not appliable to this modification.