

CONSTRUCTION DOCUMENTS
LANDFILL FINAL COVER SYSTEM REPAIR
Plaistow Unlined Municipal Landfill
Plaistow, New Hampshire



PLAISTOW
NEW HAMPSHIRE
INCORPORATED 1749

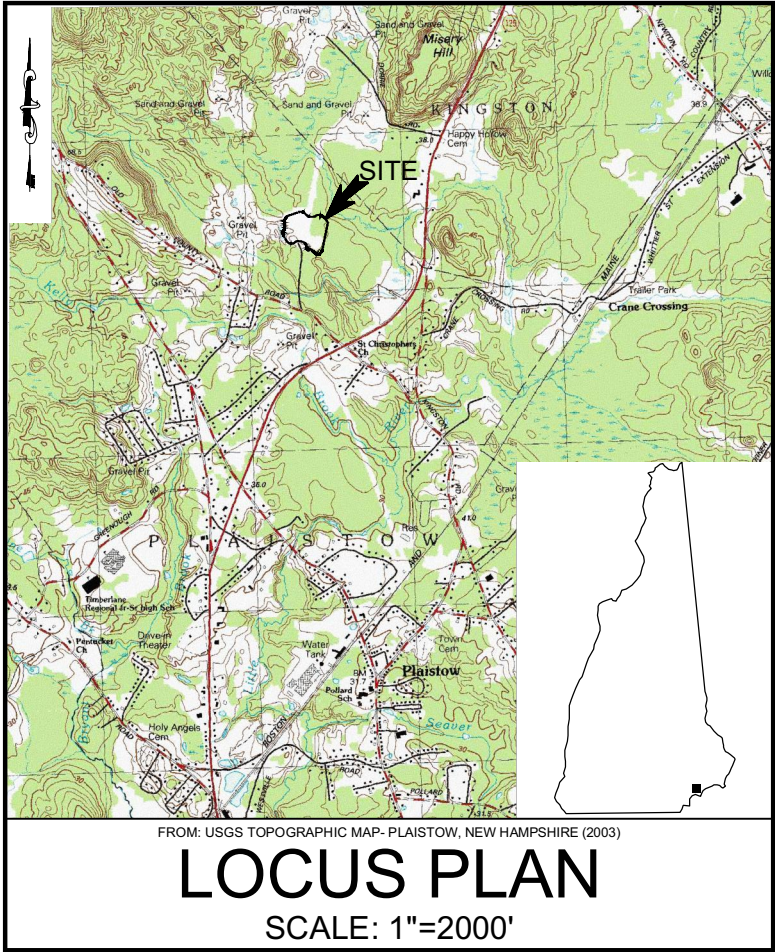
Prepared for the Town of Plaistow, New Hampshire
File No. 4705.01
November 2020

DRAWINGS

FINAL COVER SYSTEM REPAIR
CONSTRUCTION DRAWINGS
PLAISTOW UNLINED MUNICIPAL LANDFILL
PLAISTOW, NEW HAMPSHIRE
SEPTEMBER 2020

SHEET INDEX

SHEET	TITLE
1	NOTES, LEGEND, AND ABBREVIATIONS
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5	PROPOSED ADDITIONAL LOW PERMEABILITY SOIL GRADING PLAN
6	PROPOSED FINAL GRADING AND LFG MODIFICATIONS PLAN
7	LANDFILL CROSS SECTIONS
8-9	FINAL COVER SYSTEM DETAILS
10	LANDFILL GAS DETAILS
11-12	EROSION AND SEDIMENTATION CONTROL DETAILS



NOT FOR CONSTRUCTION

PREPARED FOR:



TOWN OF PLAISTOW
PLAISTOW, NEW HAMPSHIRE

PREPARED BY:



20 FOUNDRY STREET, CONCORD, NEW HAMPSHIRE 03301
(603) 229-1900 FAX (603) 229-1919

SANBORN ||| HEAD



PROJECT NUMBER
4705.01

SHEET NUMBER:
1 OF 12

© 2020 SANBORN HEAD INC. ALL RIGHTS RESERVED. PLANNING AND DESIGN DIVISION. PROJECT: FINAL COVER SYSTEM REPAIR CONSTRUCTION DRAWINGS. SHEET: OVERALL SITE PLAN. DATE: 11/19/2020. SCALE: 1"=100'. DRAWN BY: J. ABESAMRA. DESIGNED BY: J. ABESAMRA. REVIEWED BY: K. ANDERSON. PROJECT MGR: K. ANDERSON. PIC: E. STEINHAUSER. DATE: SEPTEMBER 2020.

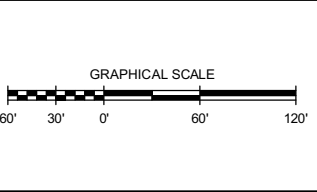


- NOTES:
1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND INFORMATION.
 2. THE AERIAL PHOTOGRAPH IMAGE WAS CAPTURED USING AUTOCAD CIVIL 3D FROM STREAMING ONLINE FROM BING. IMAGE WAS CAPTURED ON JANUARY 7, 2020.

LEGEND

- 1985 LIMIT OF WASTE
— 1985 PROPOSED LIMIT OF CAP

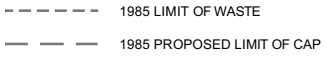
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NO.	DATE	DESCRIPTION	BY

DRAWN BY: J. ABESAMRA
DESIGNED BY: J. ABESAMRA
REVIEWED BY: K. ANDERSON
PROJECT MGR: K. ANDERSON
PIC: E. STEINHAUSER
DATE: SEPTEMBER 2020

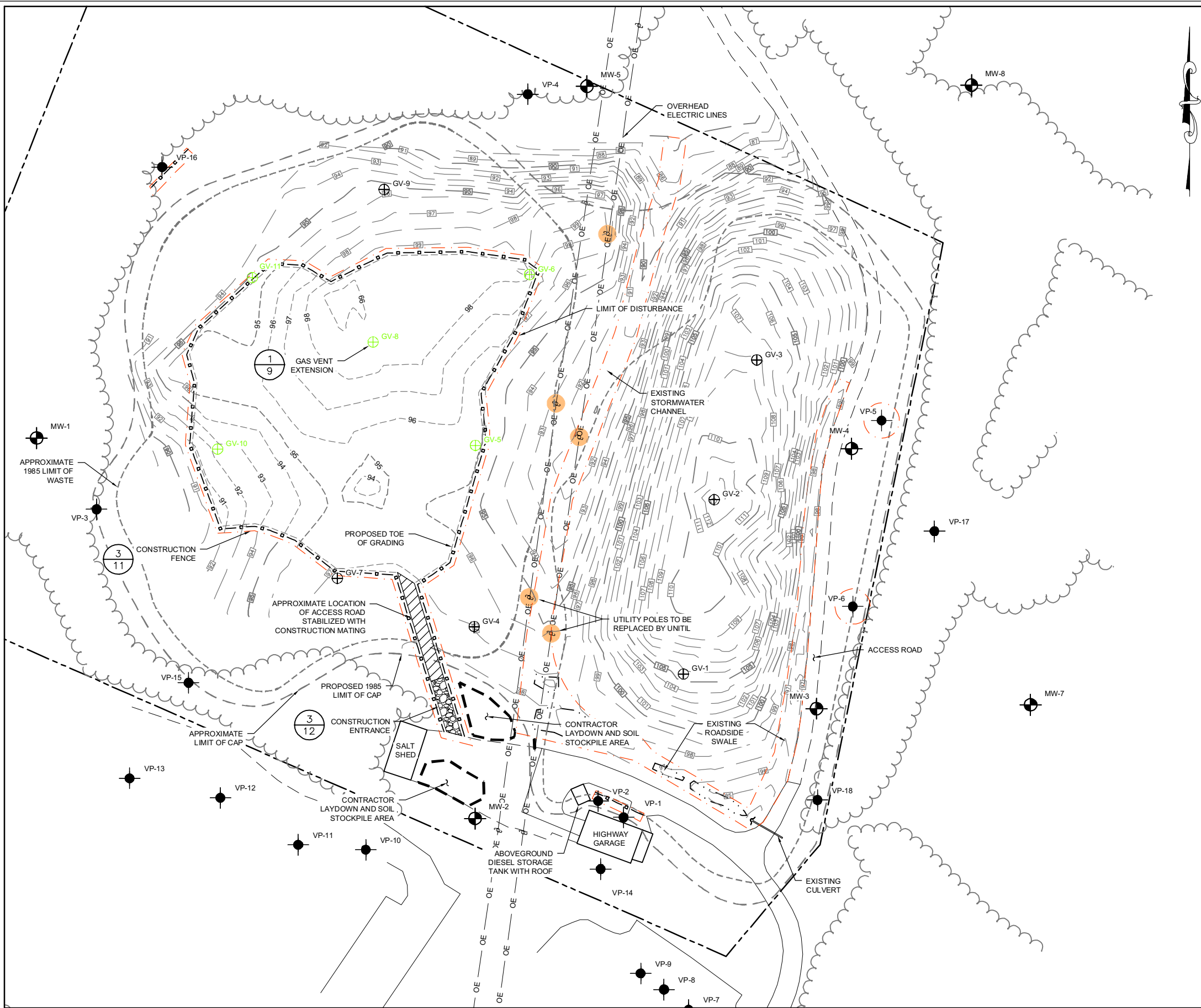
FINAL COVER SYSTEM REPAIR CONSTRUCTION DRAWINGS PLAISTOW UNLINED MUNICIPAL LANDFILL PLAISTOW, NEW HAMPSHIRE	PROJECT NUMBER: 4705.01
OVERALL SITE PLAN	SHEET NUMBER: 2 OF 12



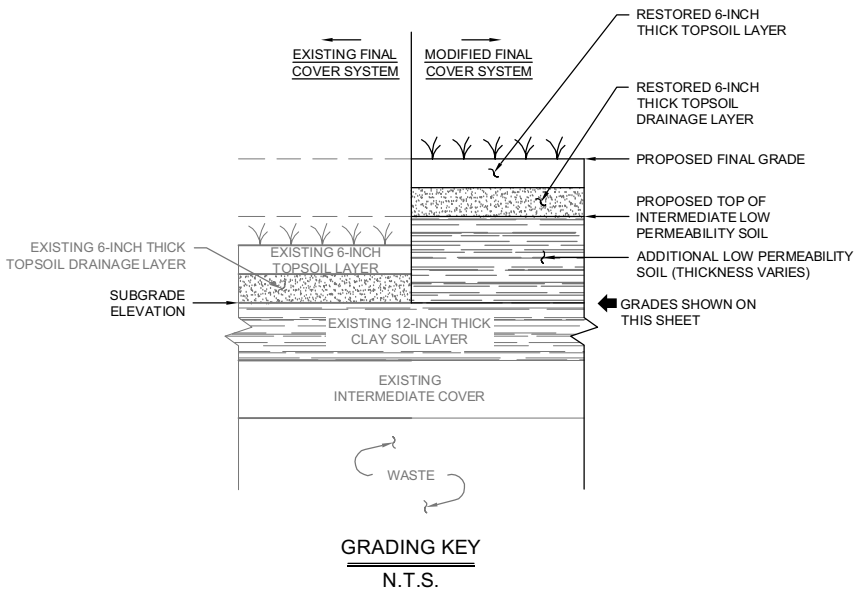
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											DRAWN BY: J. ABESAMRA DESIGNED BY: J. ABESAMRA REVIEWED BY: K. ANDERSON PROJECT MGR: K. ANDERSON PIC: E. STEINHAUSER DATE: SEPTEMBER 2020	FINAL COVER SYSTEM REPAIR CONSTRUCTION DRAWINGS PLAISTOW UNLINED MUNICIPAL LANDFILL PLAISTOW, NEW HAMPSHIRE	PROJECT NUMBER: 4705.01
			NO.	DATE	DESCRIPTION	BY	EXISTING CONDITIONS PLAN	SHEET NUMBER: 3 OF 12					

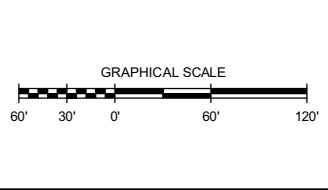
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- NOTES:
1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND INFORMATION.
 2. CONTRACTOR TO PROTECT EXISTING GAS VENTS, MONITORING WELLS AND GAS VAPOR PROBES LOCATED WITHIN THE LIMIT OF WORK. DAMAGE TO EXISTING GAS VENTS, MONITORING WELLS AND GAS PROBES DURING CONSTRUCTION WILL BE REPAIRED BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
 3. CONTRACTOR TO REMOVE AND STOCKPILE TOPSOIL AND TOPSOIL DRAINAGE LAYER (LOCATED ABOVE THE CLAY SOIL CAP) SEPARATELY.
 4. EXISTING CLAY SOIL LAYER OF THE FINAL COVER SYSTEM TO REMAIN IN PLACE AND UNDISTURBED.
 5. UNTIL TO REPLACE THE FIVE UTILITY POLES LOCATED WITHIN THE LIMIT OF FINAL COVER SYSTEM PRIOR TO THE START OF THE FINAL COVER SYSTEM REPAIR. THE LOCATIONS OF THE REPLACEMENT UTILITY POLES TO BE DETERMINED BY UNTIL DURING INSTALLATION.
 6. THE CONTRACTOR SHALL MAINTAIN A 20-FOOT (VERTICAL AND HORIZONTAL) DISTANCE FROM THE OVERHEAD ELECTRICAL LINES.



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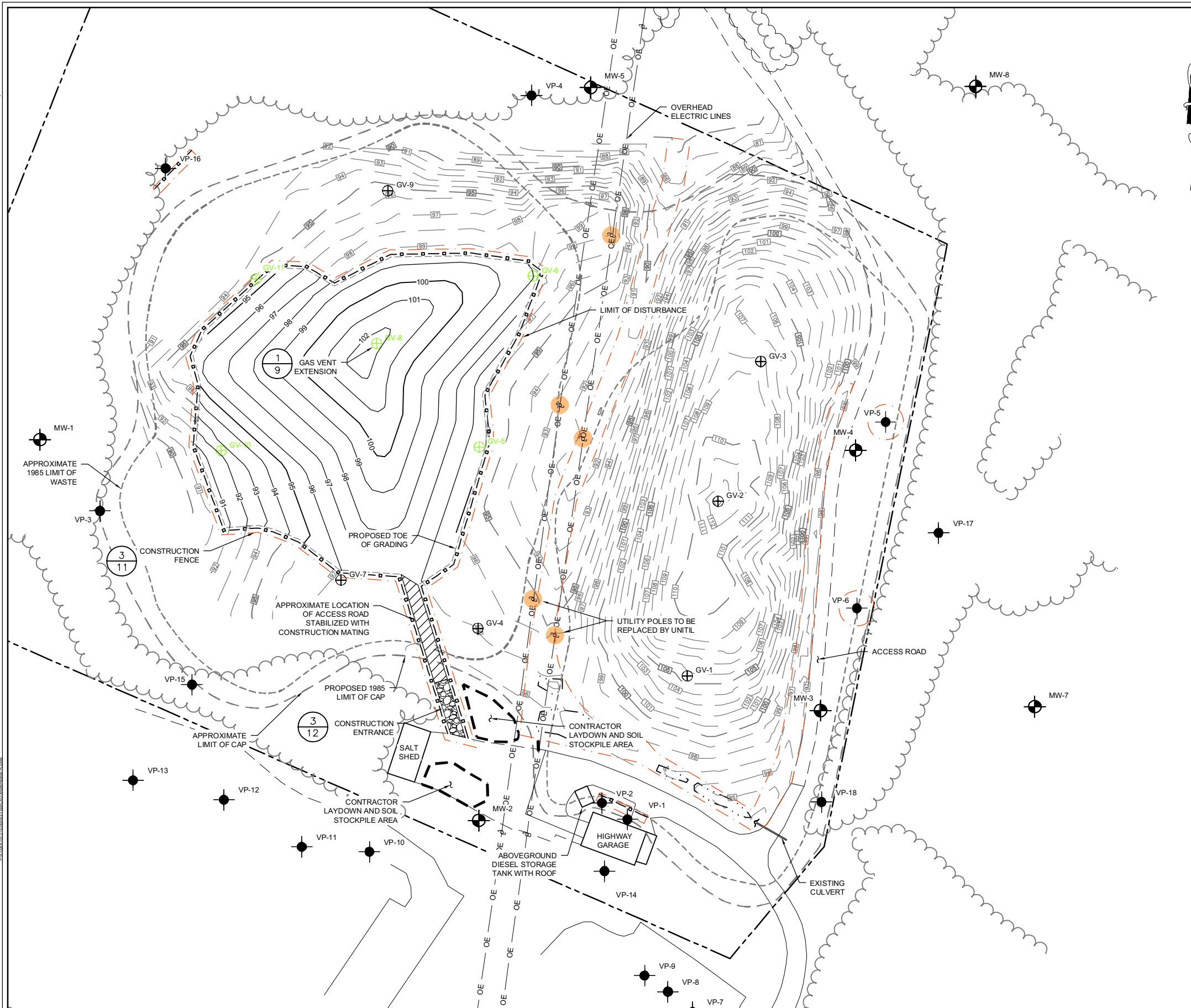


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REVIEWED BY: K. ANDERSON
PROJECT MGR: K. ANDERSON
PIC: E. STEINHAUSER
DATE: SEPTEMBER 2020

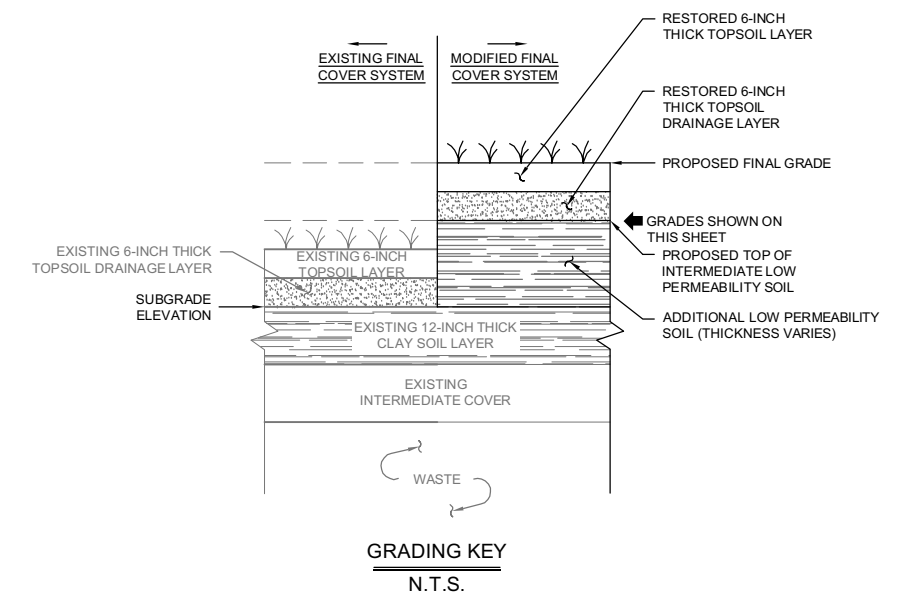
FINAL COVER SYSTEM REPAIR CONSTRUCTION DRAWINGS PLAISTOW UNLINED MUNICIPAL LANDFILL PLAISTOW, NEW HAMPSHIRE	PROJECT NUMBER: 4705.01
PROPOSED SUBGRADE PLAN	SHEET NUMBER: 4 OF 12

FILE: P:\A700\A705.09\Graphics Files\C AD\Const\F05 Proposed Intermediate ClayGrading Plan.dwg
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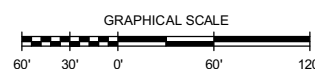


NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND INFORMATION.
2. CONTRACTOR TO PROTECT EXISTING GAS VENTS, MONITORING WELLS AND GAS VAPOR PROBES LOCATED WITHIN THE LIMIT OF WORK. DAMAGE TO EXISTING GAS VENTS, MONITORING WELLS AND GAS PROBES DURING CONSTRUCTION WILL BE REPAIRED BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
3. CONTRACTOR TO REMOVE AND STOCKPILE TOPSOIL AND TOPSOIL DRAINAGE LAYER (LOCATED ABOVE THE CLAY SOIL CAP) SEPARATELY.
4. EXISTING CLAY SOIL LAYER OF THE FINAL COVER SYSTEM TO REMAIN IN PLACE AND UNDISTURBED.
5. UNTIL TO REPLACE THE FIVE UTILITY POLES LOCATED WITHIN THE LIMIT OF FINAL COVER SYSTEM PRIOR TO THE START OF THE FINAL COVER SYSTEM REPAIR. THE LOCATIONS OF THE REPLACEMENT UTILITY POLES TO BE DETERMINED BY UNTIL DURING INSTALLATION.
6. THE CONTRACTOR SHALL MAINTAIN A 20-FOOT (VERTICAL AND HORIZONTAL) DISTANCE FROM THE OVERHEAD ELECTRICAL LINES.



NOT FOR CONSTRUCTION

[illegible]

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DATE: SEPTEMBER 2020

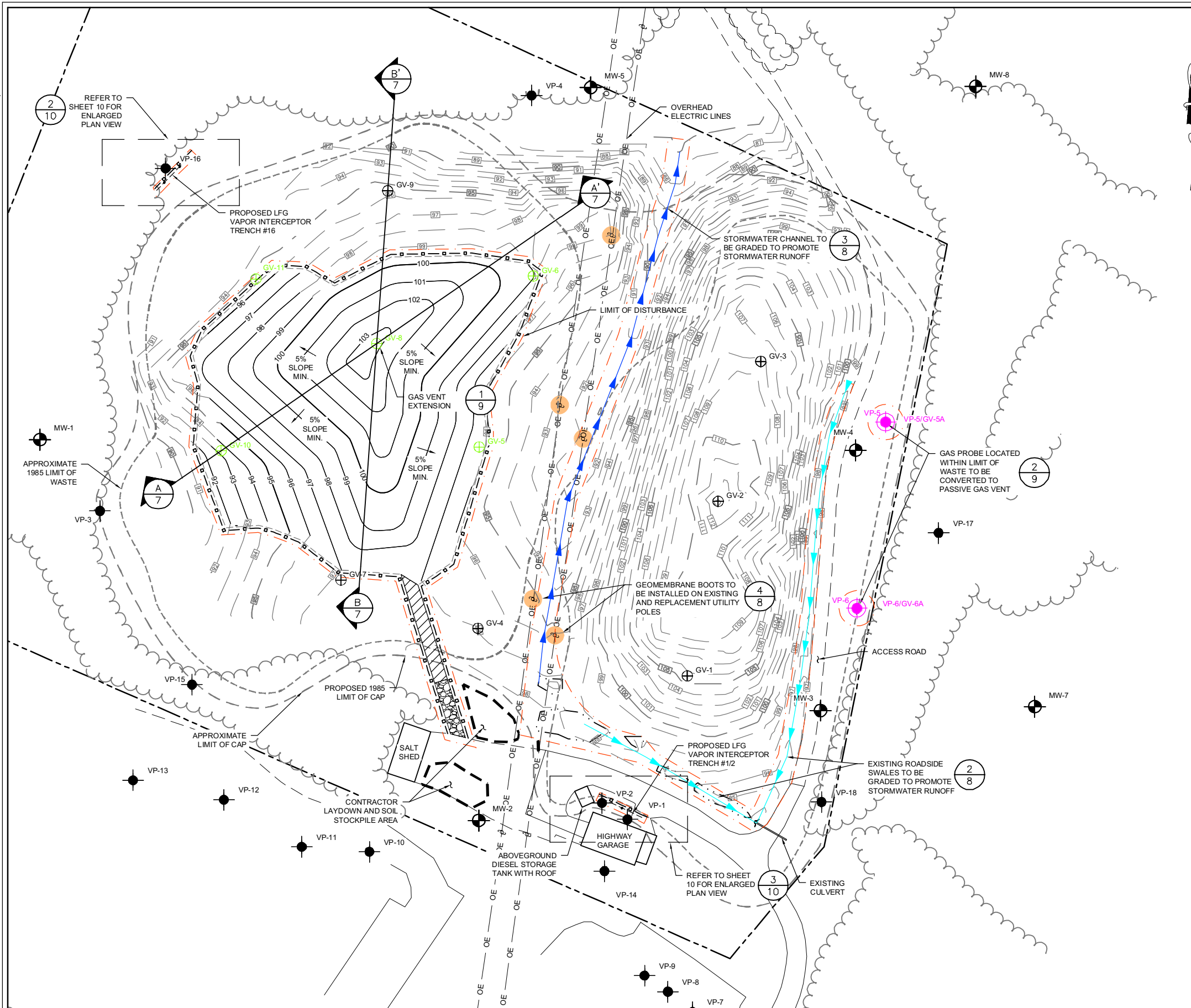
FINAL COVER SYSTEM REPAIR
CONSTRUCTION DRAWINGS
PLAISTOW UNLINED MUNICIPAL LANDFILL
PLAISTOW, NEW HAMPSHIRE

PROPOSED ADDITIONAL LOW
PERMEABILITY SOIL GRADING PLAN

PROJECT NUMBER:
4705.01

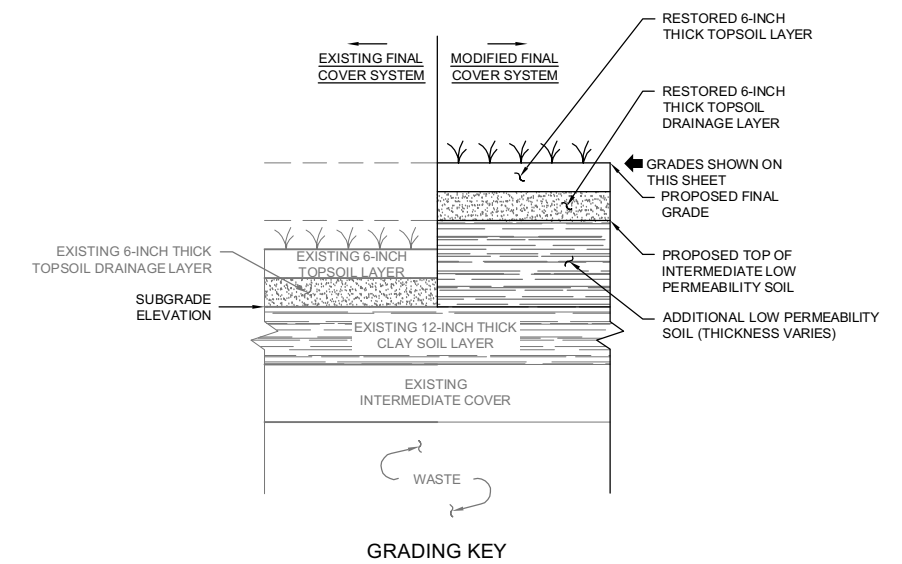
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5 OF 12

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LAYOUT: P06
USER: ddombrowski

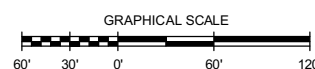


NOTES:

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2. CONTRACTOR TO PROTECT EXISTING GAS VENTS, MONITORING WELLS AND GAS VAPOR PROBES LOCATED WITHIN THE LIMIT OF WORK. DAMAGE TO EXISTING GAS VENTS, MONITORING WELLS AND GAS PROBES DURING CONSTRUCTION WILL BE REPAIRED BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
3. CONTRACTOR TO REMOVE AND STOCKPILE TOPSOIL AND TOPSOIL DRAINAGE LAYER (LOCATED ABOVE THE CLAY SOIL CAP) SEPARATELY.
4. EXISTING CLAY SOIL CAP TO REMAIN IN PLACE.



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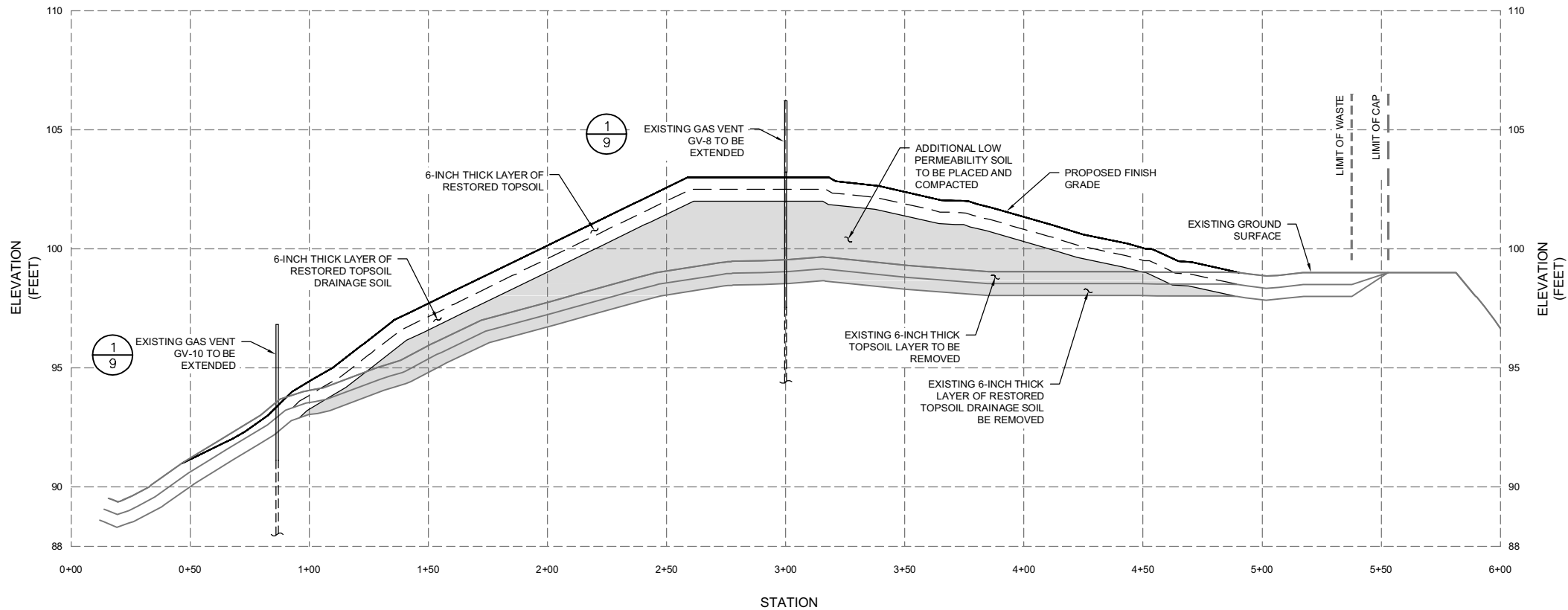
DRAWN BY: J. ABESAMRA
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REVIEWED BY: K. ANDERSON
PROJECT MGR: K. ANDERSON
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FINAL COVER SYSTEM REPAIR
CONSTRUCTION DRAWINGS
PLAISTOW UNLINED MUNICIPAL LANDFILL
PLAISTOW, NEW HAMPSHIRE

**PROPOSED FINAL GRADING AND
LFG MODIFICATIONS PLAN**

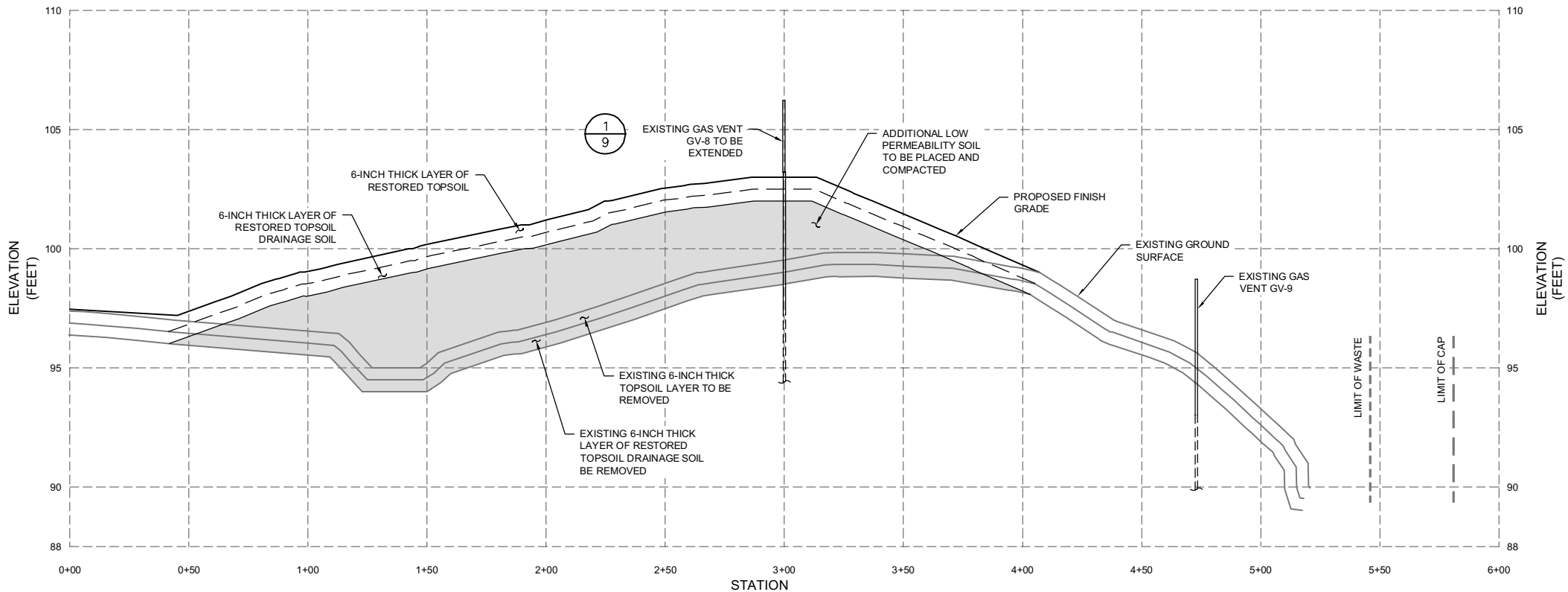
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4705.01

SHEET NUMBER:
6 OF 12



LANDFILL CROSS-SECTION A-A'

SCALE AS NOTED

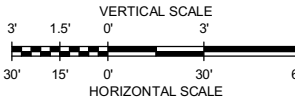


LANDFILL CROSS-SECTION B-B'

SCALE AS NOTED

NOT FOR CONSTRUCTION

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PIC: E. STEINHAUSER
DATE: SEPTEMBER 2020

FINAL COVER SYSTEM REPAIR
CONSTRUCTION DRAWINGS
PLAISTOW UNLINED MUNICIPAL LANDFILL
PLAISTOW, NEW HAMPSHIRE

LANDFILL CROSS
SECTIONS

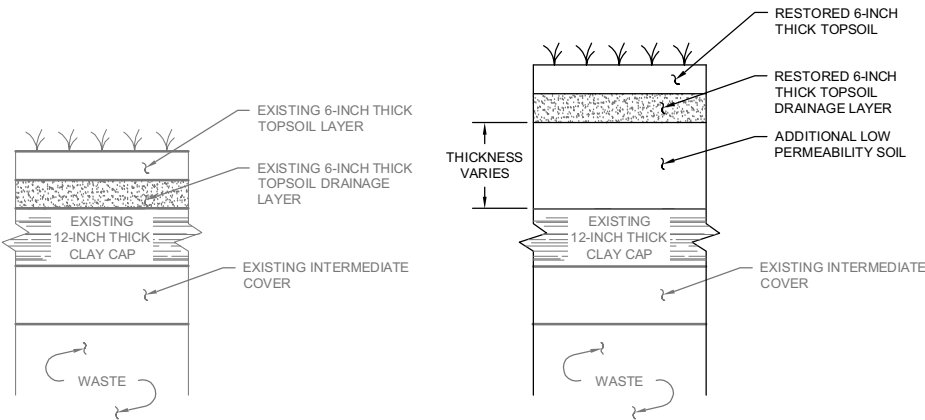
PROJECT NUMBER:
4705.01
SHEET NUMBER:
7 OF 12

© 2020 SANBORN HEAD ASSOCIATES, INC. MADE IN: D:\Drawings\101818

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TYPICAL EXISTING CONDITIONS

TYPICAL PROPOSED CONDITIONS

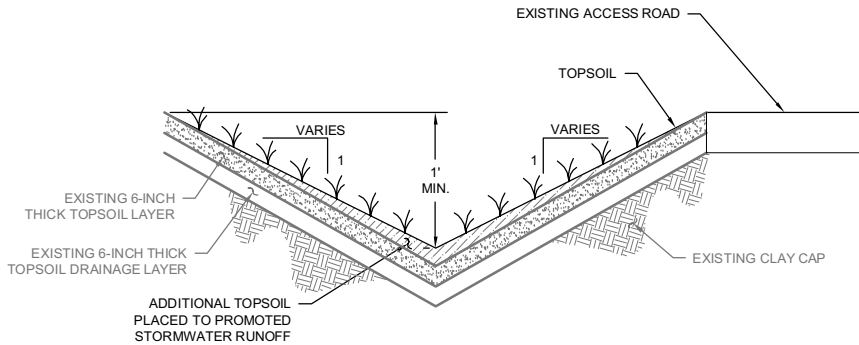
NOTE:

1. EXISTING FINAL COVER SYSTEM SECTION FROM THE DETAIL TITLED "CROSS-SECTION OF GRAVEL ACCESS ROAD FOR CLAY COVERING SYSTEM FROM THE PLAN TITLED, "GRAVEL ACCESS ROAD AND SYNTHETIC COVER ANCHORING DETAILS, PLAISTOW LANDFILL CLOSURE", PREPARED BY DUBOIS & KING INC., DATED FEBRUARY 1985. ORIGINAL SCALE: 1" = 2'.

FINAL COVER SYSTEM SECTION

1

NOT TO SCALE



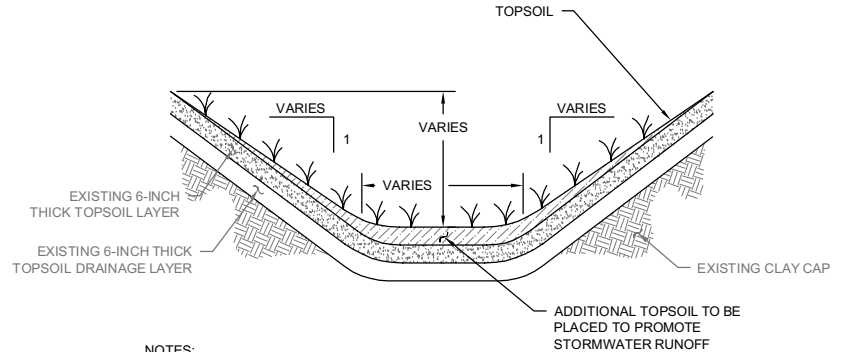
NOTES:

1. ADDITIONAL TOPSOIL TO BE PLACED IN THE SWALE TO PROMOTE STORMWATER RUNOFF.
2. SWALE SLOPE SHALL BE A MINIMUM SLOPE OF 0.5%.

DRAINAGE SWALE

2

NOT TO SCALE



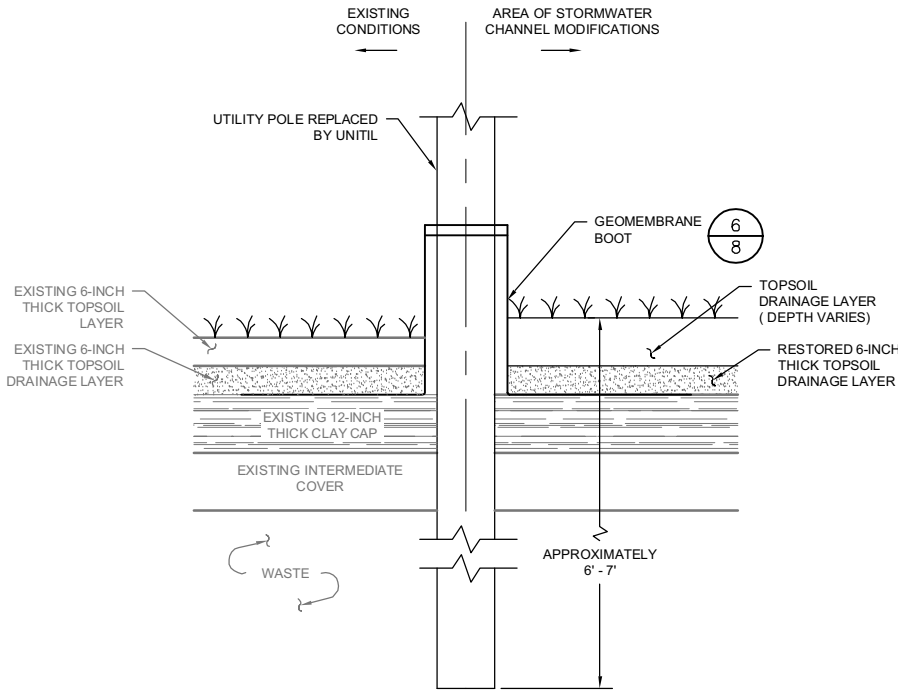
NOTES:

1. ADDITIONAL TOPSOIL TO BE IN THE INVERT STRMWATER CHANNEL TO PROMOTE STORMWATER RUNOFF.
2. THE STORMWATER CHANNEL SLOPE SHALL BE A MINIMUM SLOPE OF 0.5%.

STORMWATER CHANNEL

3

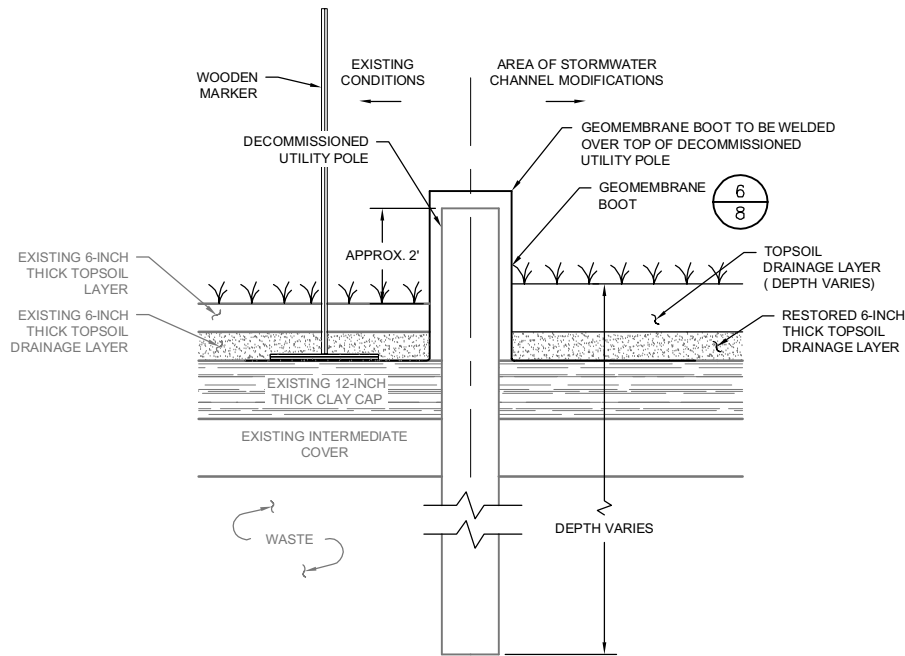
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UTILITY POLE FINAL COVER SYSTEM PENETRATION DETAIL

4

NOT TO SCALE



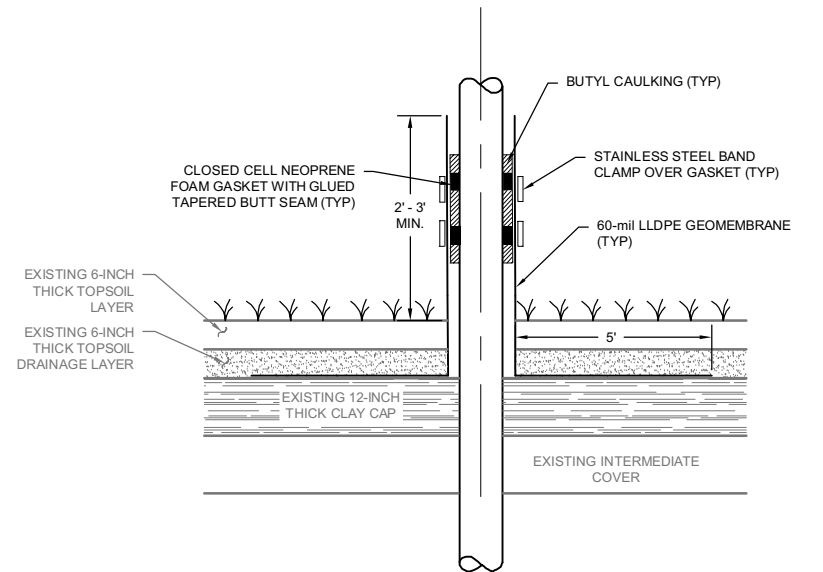
NOTE:

1. WOODEN MARKERS TO BE PLACED ADJACENT TO DECOMMISSIONED UTILITY POLES TO PROVIDE VISUAL DEMARCATION. WOODEN MARKERS SHALL CONSIST OF A 2"x3"x6' WOODEN POST FASTENED TO A 2'x2'x3/8" PLYWOOD BASE (OR APPROVED EQUAL). MARKERS SHALL BE INSTALLED PLUMB.

DECOMMISSIONED UTILITY POLE FINAL COVER SYSTEM PENETRATION DETAIL

5

NOT TO SCALE



GEOMEMBRANE BOOT DETAIL

6

NOT TO SCALE

NOT FOR CONSTRUCTION

SANBORN HEAD

SCALE: AS NOTED



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DESIGNED BY: J. ABESAMRA
REVIEWED BY: K. ANDERSON
PROJECT MGR: K. ANDERSON
PIC: E. STEINHAUSER
DATE: SEPTEMBER 2020

FINAL COVER SYSTEM REPAIR
CONSTRUCTION DRAWINGS
PLAISTOW UNLINED MUNICIPAL LANDFILL
PLAISTOW, NEW HAMPSHIRE

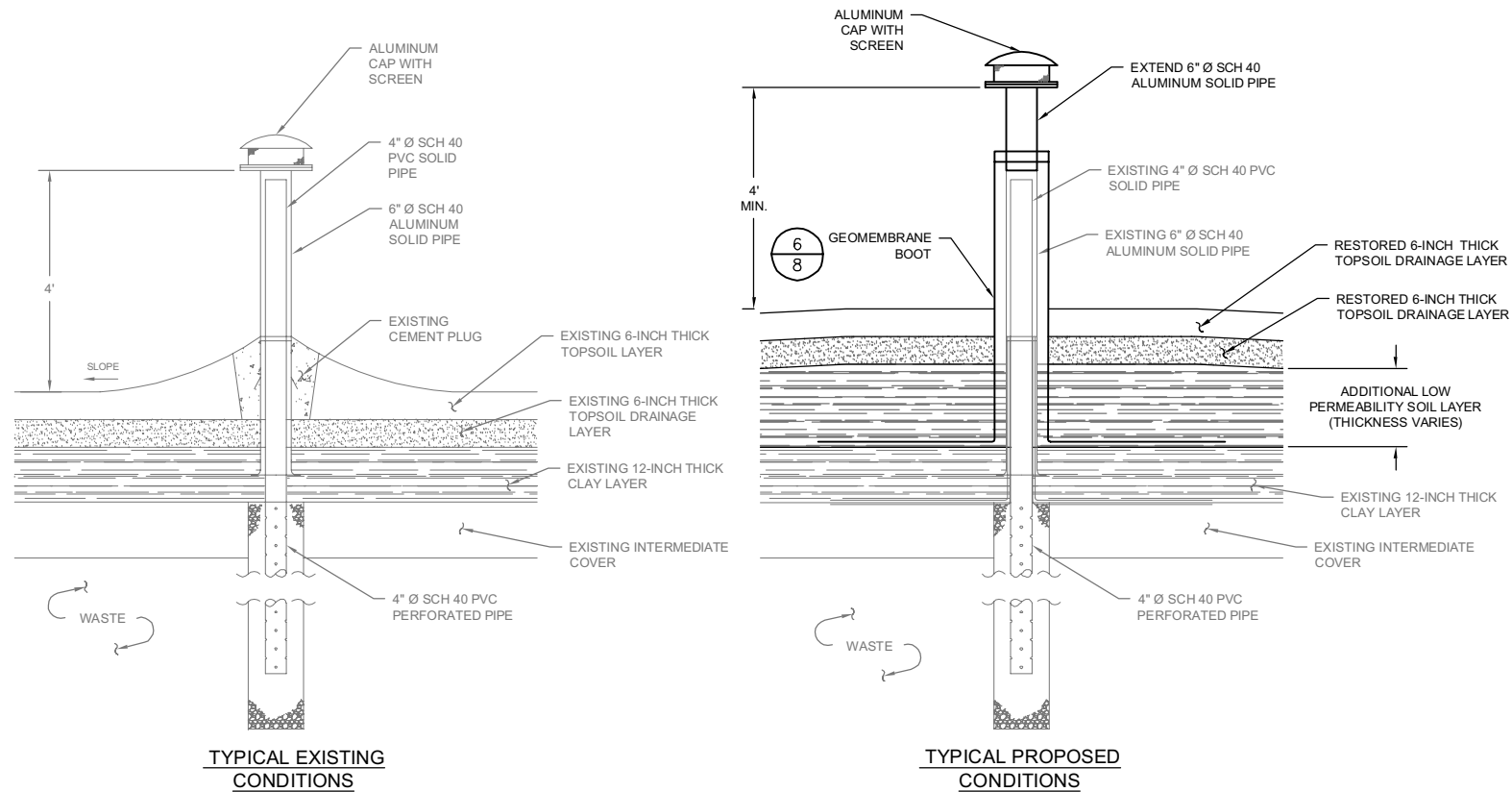
PROJECT NUMBER:

4705.01

FINAL COVER SYSTEM
DETAILS

SHEET NUMBER:

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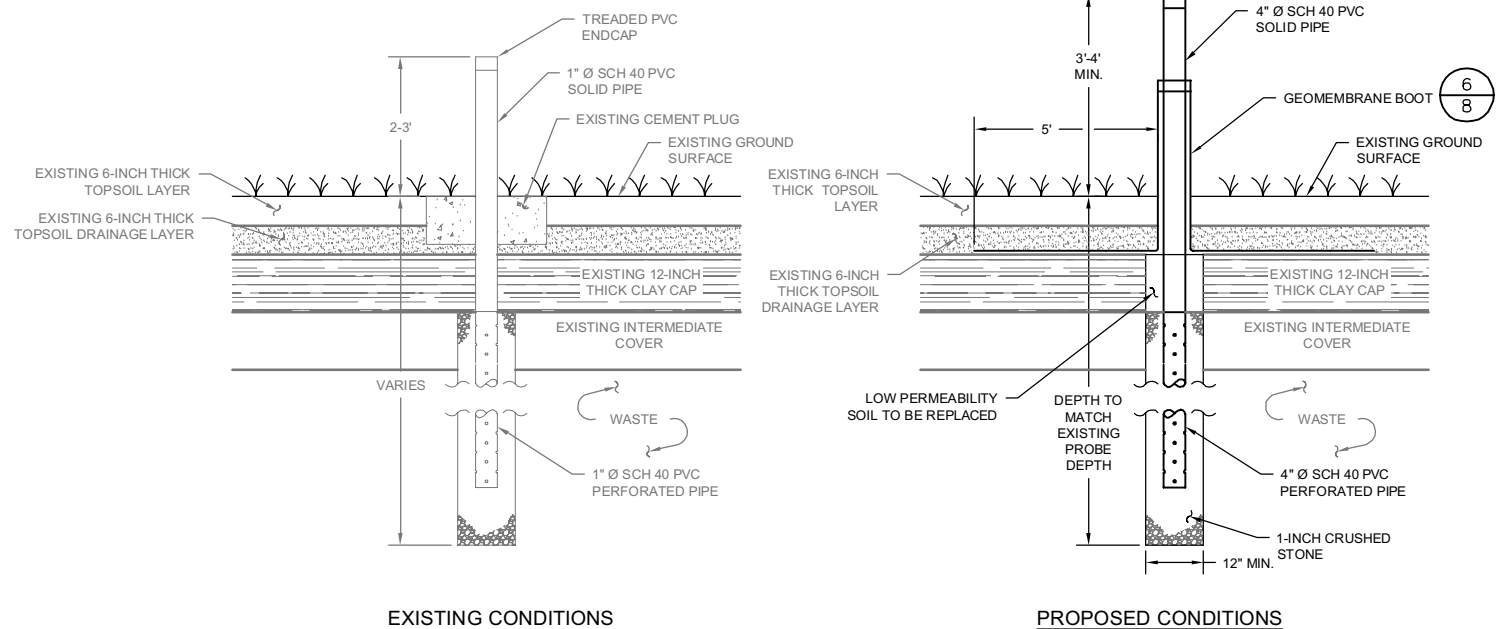
NOTE:

1. GAS VENT EXTENSION DETAIL DRAWN FROM THE DETAIL TITLED "GAS VENT AND CLAY COVER SYSTEM FROM THE PLAN TITLED, "GAS VENT AND COVER SYSTEM DETAILS, PLAISTOW LANDFILL CLOSURE", PREPARED BY DUBOIS & KING INC., DATED FEBRUARY 1985. ORIGINAL SCALE: 1" = 1'.

GAS VENT EXTENSION DETAIL

1

NOT TO SCALE



NOTES:

1. EXISTING GAS VAPOR PROBES VP-5 AND VP-6 ARE LOCATED INSIDE THE LIMIT OF WASTE AND PROPOSED TO BE CONVERTED TO PASSIVE GAS VENTS.
2. LANDFILL GAS IS ASSUMED TO BE PRESENT. CONTRACTOR SHALL MONITOR THE CONSTRUCTION AREA WHEN MODIFYING THE VAPOR PROBES.

EXISTING GAS PROBE CONVERSION TO GAS VENT DETAIL

(2)

NOT TO SCALE

NOT FOR CONSTRUCTION

SANBORN || HEAD

SCALE: AS NOTED

[illegible]

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REVIEWED BY: K. ANDERSON
PROJECT MGR: K. ANDERSON
PIC: E. STEINHAUSER
DATE: SEPTEMBER 2020

FINAL COVER SYSTEM REPAIR
CONSTRUCTION DRAWINGS
PLAISTOW UNLINED MUNICIPAL LANDFILL
PLAISTOW, NEW HAMPSHIRE

FINAL COVER SYSTEM DETAILS

PROJECT NUMBER:

4705.01

SHEET NUMBER:

9 OF 12

NOT TO SCALE

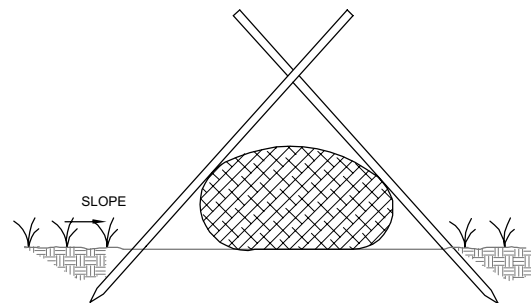
SCALE 1" = 10'

SCALE 1" = 10'

0 OF 12

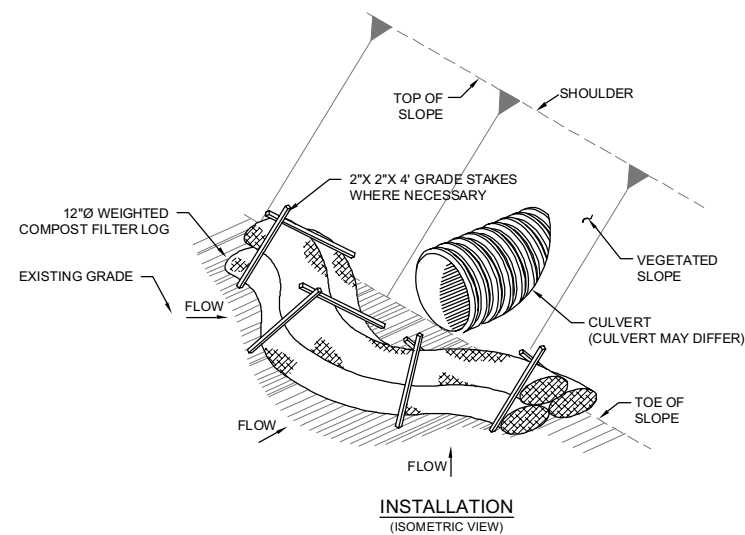
PROJECT NUMBER:
4705.01

SHEET NUMBER:
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1 SEDIMENT FILTER LOG

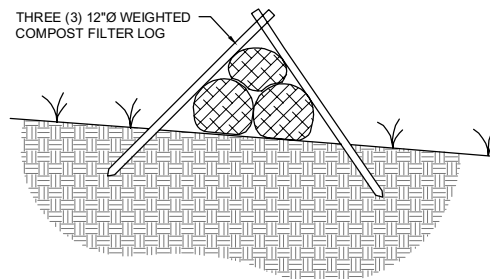
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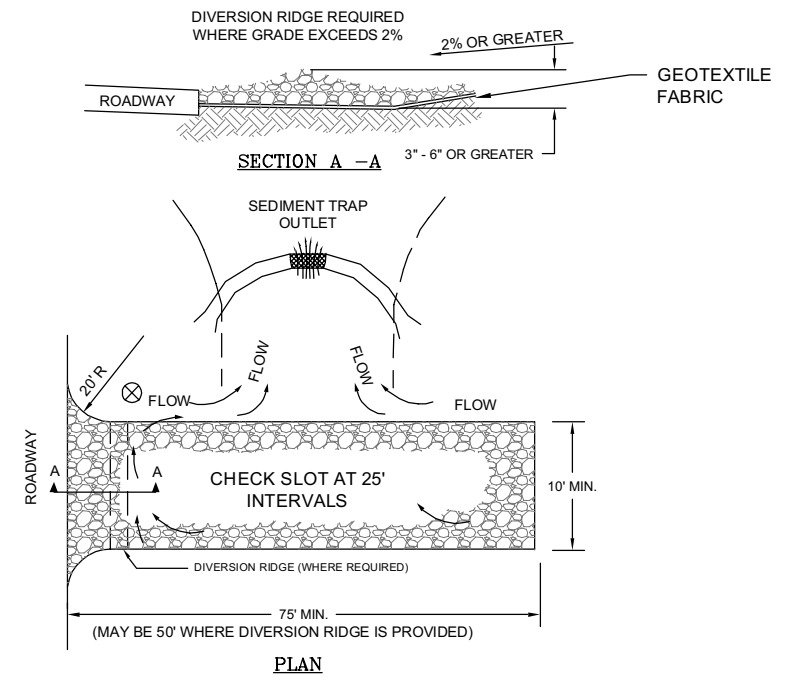
SEDIMENT FILTER LOG
INLET PROTECTION

2

NOT TO SCALE



ANCHORING
(ELEVATION VIEW)



NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

SOURCE:

1. "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3 EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION" REVISION 1.0, DECEMBER 2008, PAGE 127.

TEMPORARY GRAVEL
CONSTRUCTION EXIT

3

NOT TO SCALE

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[illegible]

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CONSTRUCTION DRAWINGS
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PLAISTOW, NEW HAMPSHIRE

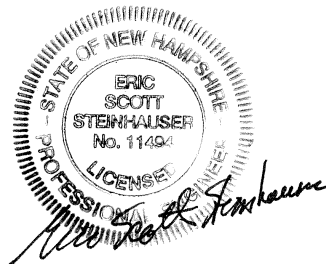
**EROSION AND SEDIMENTATION
CONTROL DETAILS**

PROJECT NUMBER:
4705.01

SHEET NUMBER:
12 OF 12

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS
LANDFILL FINAL COVER SYSTEM REPAIR
Plaistow Unlined Municipal Landfill
Plaistow, New Hampshire



Prepared for the Town of Plaistow, New Hampshire
File No. 4705.01
October 2020

SPECIFICATIONS CONTENTS

Division 1 - General Requirements

- Section 01000 – Definitions
- Section 01010 – Summary of Work
- Section 01150 – Measurement and Payment Basis
- Section 01160 – Survey Control
- Section 01200 – Project Coordination and Meetings
- Section 01340 – Submittals
- Section 01400 – Quality Control
- Section 01500 – Construction Facilities and Temporary Controls
- Section 01550 – Project Record Documents

Division 2 – Sitework

- Section 02235 – Dust Control and Work Area Maintenance
- Section 02300 – Earthwork
- Section 02370 – Erosion and Sedimentation Control
- Section 02480 – Restoration of Surfaces
- Section 02920 – Topsoil, Hydroseeding, and Turf Establishment
- Section 02950 – Site Cleanup and Site Restoration

DIVISION 1

GENERAL REQUIREMENTS

CONTENTS
DIVISION 1 – GENERAL REQUIREMENTS

Section 01000 – Definitions

Section 01010 – Summary of Work

Section 01150 – Measurement and Payment Basis

Section 01160 – Survey Control

Section 01200 – Project Coordination and Meetings

Section 01340 – Submittals

Section 01400 – Quality Control

Section 01500 – Construction Facilities and Temporary Controls

Section 01550 – Project Record Documents

SECTION 01000

DEFINITIONS

PART 1 – GENERAL

1.1 The following Definitions are applicable to the Drawings, specifications and Construction Quality Assurance (CQA) Plan:

- A. The term “Owner” refers specifically to the Town of Plaistow, New Hampshire.
- B. The term “Engineer” shall mean the firm that prepared the Drawings, Specifications, and CQA Plan for the Project. Sanborn, Head & Associates, Inc. is the Engineer for the Project.
- C. The term “Contractor” is the general contractor responsible for constructing the prescribed design in accordance with the Drawings and Specifications. The Contractor may retain the services of specialty subcontractors (e.g., material suppliers). The Contractor must have experience in successful general earthwork, and shall have current local, state, and federal licenses as appropriate.
- D. The term “Contractor’s Surveyor” will be a subcontractor to the Contractor, and is responsible for construction layout and obtaining interim and final as-built information for the project. The Contractor’s Surveyor must be a licensed professional in the state of New Hampshire with a minimum of five years of construction surveying experience and be familiar with the surveying skills required for this project, and be a party independent of the Owner and the Engineer. The final as-built information will be used by the Engineer and/or the CQA Consultant to produce Record Drawings as required in the Specifications. The qualifications required of the Contractor’s Surveyor and surveying requirements for the project are provided in the Specifications.
- E. The CQA Consultant will be a qualified representative of a qualified engineering firm, that is experienced in observing and documenting construction. The CQA Consultant is a party, independent from the Contractor. The CQA Consultant will be a team of individuals experienced in the provision of CQA services for similar projects. The CQA team must be experienced in monitoring the construction of the various components of the project and must include a Professional Engineer licensed in the State of New Hampshire.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

[END OF SECTION]

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SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.1 WORK TO BE DONE

- A. The Contractor shall furnish all material, labor, equipment, supervision, coordination, and incidentals required to perform the Work under the contract for the Final Cover System Repair Construction project.
- B. The Work for this Agreement shall include, but not be limited to, the following:
 - 1. Mobilize personnel, equipment and materials to the site;
 - 2. Establish vertical and horizontal control at work site;
 - 3. Inspect and accept the preconstruction conditions at the work site;
 - 4. Delineate and demarcate the limit of disturbance based on the Drawings;
 - 5. Installing and maintaining construction erosion and sediment control features, construction fence, sediment filter sock, inlet protection, construction matting, and construction entrance;
 - 6. Stage equipment and supplies within the limit of disturbance or approved areas identified by the Owner;
 - 7. Install the temporary construction mats in the access area and construct the temporary construction entrance.
 - 8. Extend the landfill gas vents in the area of final cover system repair to achieve clearance to final finish grade;
 - 9. Excavate and stockpile topsoil for reuse;
 - 10. Excavate and stockpile topsoil drainage layer for reuse;
 - 11. Furnish, place, and compact low permeability soil to achieve a minimum 5% slope as shown on the Drawings;
 - 12. Haul and re-install topsoil drainage layer to achieve the minimum thickness based on the Drawings and Details. Furnish and place supplemental topsoil drainage layer material if needed to achieve the minimum thickness.
 - 13. Haul and re-install topsoil to achieve the minimum thickness based on the Drawings and Details. Furnish and place supplemental topsoil if needed to achieve the minimum thickness.
 - 14. Excavate and install geomembrane boot on utility poles and decommissioned utility poles, install wooden markers;
 - 15. Place and shape additional topsoil in existing drainage swale and stormwater channel to provide positive pitch based on the Drawings and details.
 - 16. Convert existing landfill gas probes to passive landfill gas vents;
 - 17. Seed and mulch all disturbed area within the final cover system and extent of drainage swale and stormwater channel;
 - 18. Install temporary erosion controls, sediment filter logs, adjacent to the proposed landfill gas interceptor trench locations;

19. Construct the landfill gas vapor interceptor trenches and associated vertical riser pipes;
20. Remove erosion control and sedimentation controls once disturbed areas are stabilized;
21. Prepare as-built drawings of the completed work in accordance with the requirements in the Specifications; and
22. Demobilize from the site.

1.2 COORDINATION WITH OWNER

- A. Plaistow Unlined Municipal Landfill is an inactive waste disposal and recycling facility where the Highway Department and other Municipality Sectors operate on site. The Contractor shall coordinate the work with the Owner so that access to the Owner's operations is disrupted as little as possible.
- B. To limit disruption of Owner's operations, the Contractor shall coordinate with the Owner any portion of the Work that may impact the Owner's operations including, but not limited to, material deliveries and stockpiling, earthwork activities, and the installation of landfill gas mitigation components.
- A. The Contractor's staging area shall be located within an area designated by the Owner. Stockpiles of material shall only be located in designated areas or areas approved by the Owner.
- D. Neither the Contractor nor any of their employees shall park any vehicle anywhere on the site, except at such locations specifically approved by Owner.
- E. The Owner may perform other work related to the Project at the site by Owner's own forces; have other work performed by utility owners; or award work on site to other contractors. The Contractor shall fully cooperate with the other contractors and shall carefully adapt scheduling and performance of the Work under this Contract to accommodate the additional work. The Contractor shall not commit or permit any action that will interfere with the performance of work by any other contractor. Additionally, the Contractor shall avoid any labor conflicts, of any kind, between the Contractor's employees and the employees of other contractors performing related work at the site. The Contractor will not be entitled to additional compensation, or an extension of time, for any labor disputes or conflicts arising from any labor conflicts between Contractor's employees and the employees of other contractors at the site.
- F. The Owner will furnish information or services under Owner's control with reasonable promptness to avoid delay in the orderly progress of the Work.

1.3 SPECIAL REQUIREMENTS

- A. The Contractor is responsible for protecting the project site from stormwater runoff from adjacent areas and repairing erosion and sedimentation within the project site caused by stormwater runoff produced from surrounding tributary areas.
- B. The Contractor is responsible for protecting areas down gradient of the area under construction from erosion and sedimentation caused by stormwater runoff from the area under construction.
- C. The Contractor is responsible for protecting existing structures including, but not limited to, existing gas vents, groundwater monitoring wells, gas vapor probes, fire hydrants, utility poles, overhead electric lines lights, guardrail, and electrical transformer. Any damage shall be repaired as directed by the Owner at no additional cost.
- D. The Contractor shall maintain a 20-foot (vertical and horizontal) distance from the overhead electrical lines.
- E. The Contractor and/or subcontractors must abide by the Contractor's Health and Safety Plan, as approved by the Owner and the Owner's Safety Regulations for Outside Contractors.

PART 2 – PRODUCTS

2.1 AVAILABILITY OF SOIL MATERIALS

- A. Low permeability soil, supplemental topsoil, supplemental topsoil drainage layer material, and Crushed Stone are **not** available on-site and shall be provided by the Contractor.
- B. Topsoil and topsoil drainage layer material shall be stripped from the "to be disturbed" areas of construction and stockpiled in area(s) designated by the Owner.

2.2 AVAILABILITY OF MATERIALS

- A. Several existing features at the site are proposed to be reused or reclaimed for use on this project, including, but not limited to, gas vent aluminum caps. The Contractor shall review with the Owner the condition and feasibility of reusing the features and proceed at the direction of the Owner.
- B. All other materials necessary for performance of the Work shall be provided by the Contractor.

PART 3 – EXECUTION

3.1 CONTRACTOR USE OF SITE AND PREMISES

- A. Limit use of site and premises to allow:
 - 1. Owner occupancy.
 - 2. Work by others and Work by Owner.
- B. No work shall be performed outside the established limit of disturbance as can be inferred from the Drawings without prior approval from the Owner.
- C. The Contractor shall confine materials and their storage, and the operation of work to limits indicated by laws, ordinances permits, directions of the Owner and the Engineer, and as shown on the Drawings or otherwise indicated in the Contract Documents, and will not unreasonably encumber the premises with such materials, but shall store them in orderly fashion so that they will not interfere with the Work under this Construction Agreement or other agreements, or with the operation of the Owner's facilities.
- D. The Contractor may stockpile materials on-site prior to placement; however, the Contractor is solely responsible for grading and sealing earth material stockpile surfaces and installing and maintaining the necessary temporary erosion control measures.
- E. All materials shall be loaded and trucked to the project site by the Contractor for use during the construction. Any onsite areas disturbed by the Contractor must be returned to their original condition. Dust control shall be provided as needed or as indicated by the Owner.

[END OF SECTION]

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SECTION 01150

MEASUREMENT AND PAYMENT BASIS

PART 1 – GENERAL

1.1 MEASUREMENT

- A. All measurement of items for contractual payment will be determined by a survey performed under the direction of a professional engineer or surveyor licensed in the State of New Hampshire.
- B. All payment items outlined in the Item Definitions as a lineal foot basis shall be measured along the centerline of such structure.
- C. All payment items outlined in the Item Definitions as an aerial acreage or square footage basis shall be measured by the horizontal projection of the work.

1.2 BASIS OF PAYMENT

- A. The basis of payment shall be on a per unit basis as outlined in the Item Definitions. Additions or deletions for non-lump sum items will be calculated from the aforementioned survey and respective unit price.
- B. Unit costs shall include all costs for overhead and profit and for supplying materials, labor, equipment, and tools, and all applicable Federal, State, County, City, and Local taxes, necessary to complete the Work in accordance with the Specifications, Drawings, and Contract Conditions.

1.3 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

- A. Unit adjustments to the Work may be made by the Owner. The Contractor shall accept payment in full at the contract unit price for the actual quantities of Work performed. **No allowance will be made for anticipated profits if units of the Work are increased or decreased.**

1.4 ELIMINATED CONTRACT ITEMS

- A. The Owner may eliminate any item(s) from the Contract should it/they be found unnecessary for the proper completion of the Contracted Work. **Such action shall in no way invalidate the Contract, and no allowance will be made for eliminated items in final payments to the Contractor.**

1.5 INCIDENTAL WORK

- A. Incidental Work items for which payment is not measured or made include, but are not limited to:
1. Clean up;
 2. Site restoration;
 3. Cooperation with the Owner;
 4. Dewatering;
 5. Temporary shelters and utilities;
 6. Traffic regulation;
 7. Survey Control;
 8. Dust Control;
 9. All other Work indicated in the Construction Documents and not specifically listed among the items defined below; and
 10. Project management.

PART 2 – MEASUREMENT AND PAYMENT OF ITEMS

BASE ITEMS

Item No. 1 – Mobilization/Demobilization

Mobilization requires the Contractor to furnish and/or deliver to the job site all materials (excluding materials to be supplied by the Owner or that are specifically furnished by the Contractor under another item), resources and equipment, and maintain temporary support facilities required to perform the Work.

The Contractor shall attend a pre-construction meeting with the Owner, Engineer, CQA Consultant, and others designated by the Owner.

The Contractor shall prepare all required written plans and schedules, including but not limited to:

1. A Site-Specific Health and Safety Plan;
2. Initial and progress construction schedules;
3. Subcontractor work plans;
4. Information required by the Owner to complete the Notice of Intent (NOI) to construct a solid waste facility required by the New Hampshire Department of Environmental Services (NHDES);
5. The project's construction Stormwater Pollution Prevention Plan (SWPPP) and the Contractor shall electronically file the NOI for coverage under the EPA's Construction General Permit (CGP).

Demobilization requires the Contractor to: (i) remove from the job site all materials, resources, equipment, temporary support facilities and all remaining construction debris; and (ii) leave the project site "broom clean" at the completion of the Project.

Payment for this Item will be on a lump sum basis, with half of the amount paid by the Owner as part of the initial application for payment and the remaining half paid upon final completion of the Work and the Contractor's completion of the demobilization process which includes submittal of the Record Drawings.

Item No. 2 – Pre-Construction Vertical and Horizontal Control Survey

This Item includes all labor, materials, tools, and equipment required to: (i) complete a pre-construction survey to establish vertical and horizontal control at the site; (ii) prepare a detailed survey of pre-construction conditions including but not limited to: visible site features, accurate property lines and easements, and topography; and (iii) convert Drawings from assumed vertical and horizontal datums to New Hampshire State Plane Coordinate System. The surveying functions shall be performed in accordance with Specification Section 01160 and directed by a Professional Land Surveyor licensed in the State of New Hampshire.

Payment for this Item will be on a lump sum basis following receipt and acceptance of the final pre-construction drawings.

Item No. 3 – Erosion and Sediment Control

This Item includes all labor, materials, tools, and equipment required to furnish, install, and maintain all erosion control measures throughout the duration of the project in accordance with the Drawings, Specifications, and U.S. Environmental Protection Agency (EPA) Construction General Permit (CGP) (Contractor to obtain).

This Item includes the Contractor's inspection and maintenance of the erosion control measures in accordance with the Construction Stormwater Pollution Prevention Plan, which includes weekly inspections during the life of the project and after each storm event that produces 0.25 inches or more of rainfall. All damaged temporary erosion control measures will be repaired promptly at no additional cost to the Owner. Soil erosion caused by stormwater runoff associated with the construction is the responsibility of the Contractor and will be repaired at no additional cost to the Owner.

The Work includes, but is not necessarily limited to constructing and maintaining construction fencing, sediment filter logs, inlet protections, construction matting, and the temporary construction entrance throughout the duration of the project. Removal of sediment from the swales and removal of the temporary erosion control devices upon the establishment of permanent vegetative cover is incidental to the Work. Also, the Contractor is required to perform haul road maintenance and maintain dust control under this item.

Erosion and Sediment Controls required for the project include:

- a. *Construction Fence* includes furnishing, installing, and maintaining orange heavy-duty diamond grid construction snow/barrier fence installed on temporary stakes in accordance with the Drawings and Specifications. Payment for construction fence will be made on a linear foot basis for the actual amount installed and maintained.

- b. *Sediment Filter Log* includes furnishing, installing, and maintaining sediment filter logs and temporary stakes in accordance with the Drawings and Specifications. Payment for sediment filter logs will be made on a linear foot basis for the actual amount installed and maintained.
- c. *Inlet Protection* includes furnishing, installing, and maintaining sediment filter log inlet protection on temporary stakes in accordance with the Drawings and Specifications. Payment for inlet protection will be made for each inlet protection constructed and maintained.
- d. *Construction Matting* includes furnishing, installing, and maintaining an engineered matting to span the width of construction access road in accordance with the Drawings to provide protection of landfill final cover system from equipment and vehicle traffic throughout the duration of construction. Payment for construction matting will be made on a square foot basis for the actual amount installed and maintained.
- e. *Construction Entrance* includes constructing and maintaining the stabilized construction entrance from stone and geotextile the full width of the construction access road where shown on Drawings to provide an area where mud can be dislodged from tires before vehicles leave construction site. Payment for construction entrance will be made for each construction entrance constructed and maintained.

Item No. 4 – Strip and Stockpile Vegetative Soil

This Item includes all labor, materials, tools, and equipment to excavate, haul, and stockpile vegetative soil in accordance with the Drawings. The vegetative soil consists of two material layers, the approximately 6-inch thick Topsoil and Drainage layers. The Contractor shall segregate the Topsoil and Drainage Layer materials and place materials in separate stockpiles. Maintaining the stockpile and associated temporary stormwater controls for the duration of the project is incidental to this Item. The existing low permeability soil layer shall not be disturbed during stripping of the vegetative soils and will be repaired at no additional cost to the Owner.

Payment for this Item will be made on a square yard basis of material excavated, hauled, and stockpiled based on a comparison of pre- and post-construction survey performed by the Contractor and approved by the Owner.

Item No. 5 – Importing, Placing, and Compacting Low Permeability Soil

This Item includes all labor, materials, tools, and equipment to furnish, place, and compact the Low Permeability Soil to achieve a minimum 5 percent slope in accordance with the Drawings and Specifications. Low Permeability Soil shall be obtained from an approved material source by the Owner and/or CQA Consultant and shall meet the requirements of the Specifications.

Payment for this Item will be made on a cubic yard basis of Low Permeability Soil furnished, placed, and compacted based on a comparison of pre- and post-construction surveys performed by the Contractor and approved by the Owner.

Item No. 6 – Replace Stockpile Vegetative Soil Layers

This Item includes all labor, materials, tools, and equipment to excavate, haul, replace, and compact stockpiled vegetative soil layers in accordance with the Drawings and Specifications. The vegetative soil consists of two material layers, and will be installed as 6-inch thick Topsoil and Drainage layers. The existing low permeability soil layer shall not be disturbed during placement of the vegetative soils and will be repaired at no additional cost to the Owner.

The Contractor shall furnish, place and compact supplemental Topsoil and Drainage Layer soils as needed to reconstruct each layer its design thickness of 6 inches. Supplemental Topsoil and drainage layer soils shall be furnished, placed, and compacted in accordance with the Drawings and Specifications.

Payment for this Item will be made on a square yard basis of material excavated, hauled, and stockpiled based on a comparison of pre- and post-construction survey performed by the Contractor and approved by the Owner.

Item No. 7 – Seed and Mulch

This Item includes all labor, materials, equipment, and tools, to furnish and install erosion control matting, hydroseed, mulch, and final stabilization of all disturbed areas in accordance with the Drawings and Specifications.

Payment will be made on a square yard basis as measured by survey once a satisfactory stand of vegetation is established as determined by Owner.

Item No. 8 – Gas Vent Extension

This Item includes all labor, materials, tools, and equipment to extend the 6-inch diameter Schedule 40 aluminum pipe of the existing landfill gas (LFG) vents in accordance with the Drawings and Specifications. The Work includes:

1. Removing and salvaging the existing aluminum cap;
2. Installing Contractor-supplied aluminum solid extension pipe;
3. Installing Contractor-supplied geomembrane boot seals; and
4. Reinstalling undamaged aluminum cap with screen.

Payment for this Item will be made for each gas vent extended.

Item No. 9 – Gas Probe Conversion

This Item includes all labor, materials, tools, and equipment to convert the existing gas probes to gas vents in accordance with the Drawings and Specifications. The Work includes:

1. Removing and disposing of the existing 1-inch diameter PVC gas probe pipe and cement plug;
2. Over drilling the existing gas probe column to the existing depth;

3. Installing Contractor-supplied 4-inch diameter Schedule 40 PVC perforated pipe, solid pipe, pipe couplings, and elbows with mesh screen, and backfilling with Crushed Stone; and
4. Installing Contractor-supplied geomembrane boot seals.

Payment for this Item will be made for each gas probe conversion.

Item No. 10 – Vapor Trenches

This Item includes all labor, materials, tools, and equipment to excavate and construct the vapor interceptor trenches. The work includes:

1. Excavate a 3-foot wide trench to a depth to be field-determined based on the elevation of the groundwater table (estimated to range between 17 to 23 feet below ground surface [bgs]).
2. Line the trench with a nonwoven geotextile and backfilled with Crushed Stone.
3. Furnish and install a 4-inch diameter perforated SDR 35 polyvinyl chloride (PVC) collection pipe 18 inches bgs.
4. Furnish and install 4-inch diameter vertical PVC pipes that will extend 3 to 4 feet above the ground surface and topped with two 90-degree elbows to limit rainwater from entering the pipes. The vertical vent pipes will be spaced approximately 25-feet on center.

Payment for this Item will be made on a linear foot basis of vapor trench installed based on a post-construction survey performed by the Contractor and approved by the Owner. PVC and vertical pipes, nonwoven geotextile, and Crushed Stone are incidental to this item.

Item No. 11 – Utility Pole Geomembrane Boot

This Item includes all labor, material, tools, and equipment to furnish and install the 60-mil thick LLDPE geomembrane boots on the utility poles and decommission utility poles located within the landfill footprint in accordance with the Drawings and Specifications. Excavation, backfill, and compaction required for installation of the geomembrane boots is incidental to this Item. Additionally, the Contractor shall furnish and install wooden markers adjacent to the decommissioned utility poles in accordance to the Drawings.

Payment for this Item will be made per each geomembrane boot installed on the utility poles and decommissions utility poles.

Item No. 12 – Drainage Swale

This Item includes all labor, materials, tools, and equipment to furnish, haul, place, and shape Topsoil to regrade the existing drainage swales to promote stormwater runoff in accordance with the Drawings and Specifications

Payment for this Item will be made on a linear foot basis of restored drainage swale based on a comparison of pre- and post-construction survey performed by the Contractor and approved by the Owner. Seeding and mulching of the drainage swale is incidental to Item No. 7.

Item No. 13 – Stormwater Channel

This Item includes all labor, materials, tools, and equipment to furnish, haul, place, and shape Topsoil to regrade existing Stormwater Channel to promote stormwater runoff in accordance with the Drawings and Specifications.

Payment for this Item will be made on a linear foot basis of drainage swale regraded based on a comparison of pre- and post-construction survey performed by the Contractor and approved by the Owner. Seeding and mulching of the stormwater channel is incidental to Item No. 7.

Item No. 14 – As-Built Survey & Record Drawings

This Item includes all labor, materials, tools, and equipment to prepare the as-built drawings as required by the Specifications. The work includes maintaining redline mark-ups of the drawings modified as work progresses. Draft as-Built drawings shall be provided with each monthly payment requisition for the items constructed and included in the requisition to allow the CQA Consultant to confirm the quantities within the requisition.

Payment for this Item will be on a lump sum basis following receipt and acceptance of the final As-Built Drawings.

Item No. 15 – Payment Bond

This Item includes furnishing a payment bond for the project and will be paid on a lump sum basis.

Item No. 16 – Performance Bond

This Item includes furnishing a performance bond for the project and will be paid on a lump sum basis.

ALTERNATE ITEMS**Alternate Item No. A-1 – Demolition and Removal of the Existing Salt Shed**

This Alternate Item includes all labor, materials, tools, and equipment to demolish the existing salt shed. The Work includes but is not limited to:

1. Identifying a permitted solid waste disposal facility that will accept the salt shed demolition materials and perform all pre-source disposal testing required to dispose of demolition debris.
2. Demolishing the existing salt shed structure and associated concrete footings from the site.
3. Disposing of all demolition debris from the site at a permitted solid waste facility.

The former salt shed area and adjacent paved area shall be free of debris and stabilized prior to the Contractor demobilizing from the site.

Payment for this Item will be made on a lump sum basis.

Alternate Item No. A-2 – Removal of Tire Piles

This Item includes all labor, materials, tools, and equipment to remove the tires and associated debris from the two tire piles around the landfill perimeter. The Work includes but is not limited to:

1. Identifying a permitted solid waste disposal facility waste disposal facility to receive tires and associated debris and perform all pre-source disposal testing required to dispose of the tires and associated debris.
2. Removing the tires and associated debris through means that will not disturb existing trees or the existing landfill cover system (i.e., hand removal, mini excavator, dumpsters).
3. Disposing of all debris from the site at a permitted solid waste facility.

Payment for this Item will be made on a lump sum basis.

PART 3 – EXECUTION

Not used.

[END OF SECTION]

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SECTION 01160

SURVEY CONTROL

PART 1 – GENERAL

1.1 PRE-CONSTRUCTION VERTICAL AND HORIZONTAL CONTROL SURVEY

- A. The Contractor shall employ competent personnel to provide the surveying functions directed by a New Hampshire licensed Land Surveyor.
- B. The Contractor shall prepare a pre-construction survey to establish vertical and horizontal control. The controls shall be in the New Hampshire State Plane Coordinate System on the North American Datum of 1983 (NAD 83). All Vertical Data shall be on the North American Vertical Datum of 1988 (NAVD 88). Permanent horizontal and vertical control shall be installed at the project site outside of limit of disturbance and limits of final cover system.
- C. The Contractor shall prepare a detailed survey of pre-construction conditions including but not limited to: visible site features, accurate property lines and easements, and topography. The Contractor shall provide the pre-construction survey to the Owner in electronic files prepared in Autodesk DWG format prior to the commencement of work.
- D. The Contractor shall convert the Drawings from assumed vertical and horizontal datums to New Hampshire State Plane Coordinate System on the North American Datum of 1983 (NAD 83) and the North American Vertical Datum of 1988 (NAVD 88). The Contractor shall provide the converted Drawings to the Owner and Engineer in electronic files prepared in Autodesk DWG format prior to the commencement of work.

1.2 LINES, GRADES, AND LEVELS

- A. Reference stakes and benchmarks shall be replaced at the Contractor's expense if damaged or destroyed by construction operations.
- B. The Contractor shall make all measurements and check all dimensions necessary for the proper construction of the Work in accordance with the Drawings and Specifications. During the execution of the Work, the Contractor shall make all necessary measurements to prevent misalignment of the Work and shall be responsible for accurate construction.
- C. The Contractor is responsible for providing a surveyor to measure quantities for payment. Measured quantities for payment shall be submitted to the Owner. The Owner reserves the right to employ a surveyor to check the Contractor's measurements prior to payment.

- D. The Contractor shall employ a New Hampshire licensed Professional Land Surveyor to obtain an as-built survey of the subgrade and top of low permeability soil. This survey is to be certified by the surveyor and prepared at a scale of 1 inch equals 60 feet. **Note that survey data obtained using survey equipment fixed to a dozer or other heavy machinery will not be acceptable for as-built documentation and will not be accepted by the Owner or Engineer.** Only survey data obtained through use of a total station or aerial survey will be accepted.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.1 GENERAL

- A. The Contractor shall obtain as-built elevation information using the site coordinate system and datum established in paragraph 1.1.A.
- B. The survey equipment used shall have a precision to the 0.01 feet.
- C. As-built survey shall include a topographic plan of the entire area of work.
- D. As-built survey information shall be provided for locations and elevations of major infrastructure including, but not limited to:
1. Subgrade excavation;
 2. Top of Low Permeability Soil;
 3. Landfill gas system components;
 4. Limits of Topsoil installed; and
 5. Landfill gas collection trenches and vents.
- E. As-built survey drawings shall be prepared using computer aided drafting software and saved in .dwg format. The electronic file shall contain the survey points used to generate the drawing.
- F. As-built survey drawings are to be provided within 30 days of issuance of a “Certificate of Substantial Completion.”

[END OF SECTION]

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SECTION 01200

PROJECT COORDINATION AND MEETINGS

PART 1 – GENERAL

1.1 PRECONSTRUCTION CONFERENCES

- A. The Contractor shall not commence work until after attending a preconstruction conference at the project site with representatives of the Contractor, the Construction Quality Assurance (CQA) Consultant, the Engineer, and the Owner. The preconstruction conference will be arranged by the Owner and is intended to establish lines of communication between the parties involved. The time and place of the preconstruction conference will be provided with the Notice of Award.

1.2 PROGRESS MEETINGS

- A. The Contractor will arrange for weekly progress meetings. The meetings will be held to review the work progress, to discuss upcoming work, to make necessary adjustments to schedules, to discuss submittals, changes, substitutions, and other items affecting the project. The Owner will preside at progress meetings.
- B. Attendance at the progress meetings will include the Contractor and the Owner, and as needed the Engineer, major subcontractors, and suppliers as appropriate to discuss agenda topics for each meeting.
- C. The Contractor shall provide to the Owner an updated construction schedule at each progress meeting.

1.3 JOB SITE ADMINISTRATION

- A. The Contractor shall provide a competent and authorized Superintendent at the project site during all working hours who shall act as the agent of the Contractor.
- B. The Superintendent shall be a competent English-speaking experienced construction professional capable of reading and thoroughly understanding the Drawings and Specifications and have full authority to fulfill the Contractor's duties and responsibilities required to successfully perform the Work. If, in the opinion of the Owner, the Superintendent or any of their successors prove incompetent, not conscientious, or not industrious, then the Contractor shall replace him upon written request by the Owner.
- C. The Contractor shall only employ competent individuals on the job. Whenever the Owner notifies the Contractor in writing that, in its opinion, any individual on the job, whether employed by the Contractor or any of the subcontractors, is not adhering to the Safety and Health Rules or imperils the safety of others, or is incompetent, unfaithful, disorderly, or otherwise unsatisfactory, such individual

shall be discharged from the Work and shall not be employed on the Work, except with the written consent of the Owner.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

[END OF SECTION]

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SECTION 01340

SUBMITTALS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This section specifies the general requirements and procedures for preparing and transmitting data to the Owner and/or Engineer for their information or review. The Contractor shall deliver all submittals to the Owner and/or Engineer in a form acceptable to the Owner and/or Engineer.

1.2 CONTRACTOR'S DRAWINGS

- A. The Drawings show the general arrangement and such details as are necessary to provide a description of the Work.
- B. As indicated below, the Contractor shall prepare shop and working drawings, for temporary and permanent work, and for the proposed methods of construction as required under the applicable sections of the Specifications, complete with all relevant calculations, descriptions, technical, and performance data, as necessary to adequately perform the Work. The Contractor shall take responsibility for such drawings and for the safe and successful construction of the Work.
- C. Shop drawings shall be presented in a clear and thorough manner, complete with respect to dimensions, design criteria, materials of construction, and like information to enable the Owner to review the information as required.
- D. Sheet size: 8½" x 11" or larger, as required.

1.3 PRODUCT DATA

- A. The Contractor shall submit copies of product data sheets as required in the Specifications. The Contractor shall clearly mark each copy of product data sheets to identify applicable products, models, options and other data.

1.4 MANUFACTURER'S INSTRUCTIONS

- A. Where required in individual Specification Section, the Contractor shall submit the manufacturer's printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, in quantities specified for the product data.

1.5 SAMPLES

- A. All samples shall be clearly identified as to material, manufacturer, any pertinent catalog numbers, and its intended use, and shall be of sufficient size and quantity to clearly illustrate functional characteristics of the item, with integrally related parts and attachment devices.

1.6 CONTRACTOR RESPONSIBILITIES

- A. Review shop drawings and samples prior to submission.
- B. Determine and verify:
 - 1. Field measurements;
 - 2. Field construction criteria;
 - 3. Catalog numbers and similar data; and
 - 4. Conformance to specifications.
- C. Coordinate each submittal with the requirements of the Work and the Constuction Documents.
- D. Notify the Owner in writing, at time of submission, of any deviations in submittals from requirements of Construction Documents. Any such deviations permitted by the Owner will require modifications to the Construction Documents.
- E. Begin no fabrication or work that requires submittals until submittals have been reviewed by the Owner and/or Engineer.

1.7 SUBMISSION REQUIREMENTS

- A. Submittals shall be provided electronically. If a paper copy must be submitted, then one copy may be submitted to the Engineer promptly in accordance with approved schedule and in such sequence as to cause no delay in Work.
- B. The Contractor shall complete all of the following items no later than the specified number of calendar days. Associated shipping, work, and use of materials by the Contractor shall not begin until the Engineer's review of each respective submittal is complete and where resubmission by the Contractor is not required by the Engineer. The Engineer shall reply to the Contractor within 7 days of receipt of each submittal and state whether or not the Contractor must resubmit.

Submittal	Due (Calendar Days)
Pre-Construction Conditions Survey	At least 10 days prior to mobilizing to the site
Shop Drawings, Product Data and Samples, Material Specifications/ Submittals related to but not necessarily limited to: Sediment Filter Logs; Construction Fence; Construction Matting; Pipe; Geomembrane and geotextile;and Soil and aggregate materials.	At least 15 working days prior to placement and/or use.
Laboratory test reports of soil samples.	15 working days prior to placement and/or use
Final Record Document Submittal.	Within 30 Days of Substantial Completion and no more than 14 days from demobilization from the site and prior to Final Acceptance and Payment.
Contractor's Written Certification of Substantial Completion.	Prior to application for final payment.

C. Submittals shall contain the following information:

1. Date of submission;
2. Project title and number;
3. Names of:
 - a. Contractor
 - b. Manufacturer/supplier
4. Product identification, with specification section number;
5. Field dimensions, clearly identified as such;
6. Relation to adjacent or critical features of work or materials;
7. Applicable standards, such as ASTM or Federal Specification numbers;
8. Identification of deviations from Contract Documents; and
9. Revision identification on resubmittals.

1.8 RESUBMISSION REQUIREMENTS

- A. Make any corrections or changes in submittals required by the Owner and/or Engineer and resubmit revised editions.
- B. Shop drawings:
 1. Revise initial shop drawings, and resubmit as specified for initial submittal; and
 2. Indicate any changes made other than those requested by the Owner and/or Engineer.

1.9 OWNER'S RESPONSIBILITIES

- A. Submittal review is only for general conformance to the design concept/intent and compliance with information given in the Contract Documents. Review shall not extend to means, methods, sequences, techniques, procedures of construction, or to safety precautions or program incident thereto. Review of a separate item as such will not indicate approval of assembly in which the item functions.
- B. Return submittals to the Contractor for distribution or for resubmission, if required.
- C. The Owner's review of submittals shall not relieve Contractor from responsibility for any deviations from Construction Documents unless Contractor has, in writing, called the Owner's attention to such deviation at time of submission and the Owner has given written concurrence pursuant to Project Documents to specific deviation, nor shall any concurrence by the Owner relieve Contractor from responsibility for errors or omissions in submittals.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

[END OF SECTION]

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SECTION 01400

QUALITY CONTROL

PART 1 – GENERAL

1.1 GENERAL QUALITY CONTROL

- A. The Contractor shall maintain quality control over the suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality.
- B. The Contractor shall perform all required tests needed to ensure and document that the Work was completed as intended and designed. The Contractor may use its own qualified resources or retain the services of a qualified consultant and/or testing laboratory. Once available, the results of all testing performed shall be provided to the Owner.
- C. The Contractor shall comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- D. A Construction Quality Assurance (CQA) Consultant, retained by the Owner, will observe and document the construction and will perform sampling and laboratory testing as defined in the CQA Plan.

1.2 MANUFACTURER'S INSTRUCTIONS AND CERTIFICATES

- A. The Contractor shall comply with manufacturers' instructions in full detail, including each step in sequence. If instructions conflict with any drawing or specification, then the Contractor should request clarification from the Owner before proceeding.
- B. The Contractor shall submit the manufacturer's certificate that products meet or exceed the specified requirements.

1.3 OBSERVATION AND TESTING BY OWNER

- A. The Owner will employ and pay for services of a CQA Consultant that is independent of the Contractor to perform construction observation/documentation/sampling/testing, including in-place soil density testing. These services will be performed in accordance with the CQA Plan.
- B. The Contractor shall cooperate with the CQA Consultant and the Owner, and furnish tools, samples of materials, and assistance as requested.
- C. The Contractor shall allow the CQA Consultant ample time and opportunity for testing materials used in the Work.

- D. The Work shall at all times be subject to the observation of the Owner, Engineer, and the CQA Consultant. Observation or non-observation by the Owner, Engineer, or the CQA Consultant shall not relieve the Contractor from their contractual obligation to furnish work and material as required, and properly complete the Construction in accordance with the Construction Documents.
- E. If the Owner considers that the Construction is not being properly accomplished, then all or any part of the Work and any materials or equipment incorporated in it may be condemned or rejected. If any material, equipment, or Work is condemned or rejected by the Owner, then the Contractor shall bear all expenses for removal and proper replacement of such material, equipment or work required to be provided by the Construction Documents. The expense of replacing any work done by others that is adversely affected by removal and proper replacement of improper work done by the Contractor shall be borne by the Contractor.

1.4 SUBSTANDARD WORK OR MATERIALS

- A. Any defective or substandard work or materials furnished by the Contractor that is discovered before the final acceptance of the Work, as established by the Certificate of Substantial Completion, or during the subsequent guarantee period, shall be removed immediately even though it had been overlooked by the Owner and recommended for payment. Any equipment or materials condemned or rejected by the Owner shall be tagged as such and shall be immediately removed from the site. Satisfactory work or materials shall be substituted for that rejected.
- B. The Owner may order tests on substandard or damaged work, equipment, or materials to determine the required functional capability for possible acceptance, if there is no other reason for rejection. The cost of such tests shall be borne by the Contractor and the nature, extent, and supervision of the tests will be as determined by the Owner. If the results of the tests indicate that the required functional capability of the work, equipment, or material was not impaired, consistent with the final general appearance of same, the work, equipment, or materials may be deemed acceptable. If the results of such tests reveal that the required functional capability of the questionable work or materials was impaired, then such work or materials shall be deemed substandard and shall be replaced. The Contractor may elect to replace the substandard work or material instead of performing the tests.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

[END OF SECTION]

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SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 – GENERAL

1.1 CONSTRUCTION FACILITIES

- A. The Contractor shall provide space for an administrative office, including restrooms and electricity. The Contractor shall assume responsibility for providing any weather tight storage area needed. The Contractor is required to maintain telephone, facsimile, and Internet service. All materials and equipment shall be stored in area designated on the Drawings.
- B. The Contractor shall maintain roads accessing public thoroughfares to serve the project area.
- C. The Contractor shall maintain areas outside the limits of work free of waste materials, debris, and rubbish that are a direct result of work performed by the Contractor.

1.2 TEMPORARY UTILITIES

- A. The Contractor shall be responsible for providing and paying for temporary utilities needed on-site including power service, lighting, heat, ventilation, telephone service, facsimile service, sanitary facilities, and drinking water.
- B. Water to be used for construction activities such as dust control, hydroseeding, and water that may be necessary to facilitate compaction shall be obtained from bulk water delivery or a metered connection to Town water. The Contractor shall obtain any required permits at no additional cost to the Owner.

1.3 TEMPORARY CONTROLS

- A. The Contractor shall provide and pay for barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- B. The Contractor shall maintain excavations free of water, protect the site from puddling or running water, and furnish and install all required temporary erosion control facilities to comply fully with New Hampshire Department of Environmental Services requirements and as called for in the Construction Documents.
- C. The Contractor shall protect installed work, provide special protection where specified in individual specification sections, and provide temporary and removable protection for installed products. The Contractor shall minimize erosion of, or fugitive dust resulting from, placed material or material stockpiles by providing the proper materials and equipment to adequately seal the surface of such materials. At the

request of the Owner, the Contractor shall immediately install additional temporary protection as deemed necessary by the Owner.

1.4 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. The Contractor shall remove temporary above-grade or buried utilities, equipment, facilities, and materials prior to Substantial Completion inspection. The Contractor shall restore existing and permanent facilities used during construction to original or better condition.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

[END OF SECTION]

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SECTION 01550

PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.1 MAINTENANCE OF RECORD DOCUMENTS AND SAMPLES

- A. The Contractor shall maintain at the site for the Owner's permanent records one complete set of Record Documents, which include a copy of the red-line markups, as-built Drawings, Specifications, Addenda, Change Orders, Owner Field Orders, Shop Drawings, Quality Control Field Reports, Product Data, and Samples. The red-line markups are to be marked up by the Contractor and serve as the basis for the Record Drawings by the Engineer.
- B. The Record Documents shall be stored in the Contractor's field office apart from other field documents used by the Contractor for construction purposes. The Contractor shall maintain the Record Documents in clean, dry, legible condition and in good order. The Record Documents shall be made available at all times for inspection by the Owner. The Owner shall have the right to hold applications for progress payments until such time that Record Documents are updated to current conditions.

1.2 RED-LINE MARKUP

- A. The Contractor shall mark all changes on the red-line markup upon construction of that item of the Work. The Contractor shall record information concurrently with construction progress and shall not cover any work until the required information has been recorded on the red-line markup.

1.3 AS-BUILT DRAWINGS

- A. The Contractor shall retain a New Hampshire licensed Professional Land Surveyor to prepare as-built drawings of the constructed Work as outlined in these specifications. The as-built drawings shall include, but not necessarily be limited to, the following:
 - 1. Topographic plan of all changes in terrain; and
 - 2. Survey plan and points tables of all new and relocated utilities, structures and pavement limits.
- B. The as-built drawings shall be signed by the Professional Land Surveyor, and provided to the Owner and Engineer in electronic format (i.e., AutoCAD .DWG and .pdf) and as a paper copy, plotted at 22-in. x 34-in. on bond paper, within 30 days of issuance of the "Certificate of Substantial Completion."

1.4 SUBMITTAL OF RECORD DOCUMENTS

- A. The Contractor shall provide the red-line markup and as-built drawings to the Engineer who will prepare the Record Drawings. The Contractor shall coordinate with the Engineer, providing additional information as requested, until the Record Drawings are complete to the satisfaction of the Owner.
- B. The Contractor shall submit the Record Documents to the Owner for review and approval together with certification that all deviations from the Construction Agreement recorded on it and that the Record Documents reflect the Work that was performed.
- C. The Record Documents shall be submitted no later than 30 days from the issuance of the "Certificate of Substantial Completion." Final payment on this Construction Agreement will not be made until the Record Documents have been reviewed and approved by the Owner.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

[END OF SECTION]

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DIVISION 2

SITEWORK

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DIVISION 2 – SITEWORK

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Section 02370 – Erosion and Sedimentation Control

Section 02480 – Restoration of Surfaces

Section 02920 – Topsoil, Hydroseeding, and Turf Establishment

Section 02950 – Site Cleanup and Site Restoration

SECTION 02235

DUST CONTROL AND WORK AREA MAINTENANCE

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. The Contractor shall be responsible for minimizing the creation of dust and for the maintain the work area in an orderly manner from the time of mobilization through demobilization.
- B. Dust control shall be of paramount importance during construction activities at the site. The Contractor shall conduct operations and maintain the project site, haul and access roads, and soil stockpile areas, so as to minimize the creation and dispersion of dust. Dust control shall be used throughout the work at the site.
- C. Haul road maintenance and the maintenance of the work area shall be the responsibility of the Contractor. Haul road maintenance shall be performed to ensure safe and efficient access. Haul roads shall be located and constructed to disturb the smallest area practical. Haul roads shall be constructed using a ground protection matting or equivalent where installed above the existing final cover system.
- D. Work area maintenance shall also include the protection of monitoring wells, vapor probes, gas vents, and other features that may exist at the site.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Water for dust control shall be obtained from bulk water delivery or a metered connection to town water. Contractor is responsible for obtaining any permits.
- B. Chemical dust suppressants shall not be used.

PART 3 – EXECUTION

3.1 GENERAL

- A. The Contractor shall implement strict dust control measures during active construction periods on-site. These control measures will generally consist of water applications as required to prevent dust emissions.

- B. Existing access roads shall be used by the Contractor whenever possible. If new haul roads are required to access work areas, then the Contractor shall obtain approval from the Owner prior to their construction. Construction of haul roads necessary to perform the work of this contract shall be part of the contracted work. The Contractor shall maintain all haul roads used during execution of work.
- C. Any existing structures (such as monitoring wells, vapor probes, gas vents, etc.) that are to remain are to be protected by the Contractor from damage during construction. Measures taken for this protection shall include flagging and construction of barricades where necessary. Any structure damaged by construction activity shall be repaired and/or replaced by the Owner at the Contractor's expense.

[END OF SECTION 02235]

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SECTION 02300

EARTHWORK

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals necessary to perform all excavating, hauling, stockpiling, backfilling/filling, compacting, and grading required to complete the Work shown on the Drawings and specified herein.
- B. The Contractor shall work with the Construction Quality Assurance (CQA) Consultant and provide assistance as needed so that the required quality assurance sampling and testing may be performed. Quality assurance activities shall be considered germane to the Work and not be a cause for scheduling delays. Quality assurance requirements are defined in the Construction Quality Assurance Plan.

1.2 REFERENCES

- A. New Hampshire Department of Transportation, Standard Specifications for Road and Bridge Construction, 2016 (NHDOT Specifications).
- B. ASTM Standards, latest version.

1.3 SUBMITTALS

- A. The Contractor shall submit to the Engineer and the Owner for review the proposed Work Plan for construction, including processing of soil materials, filling, compaction, and moisture control for the various portions of the Work at least seven (7) days prior to the start of construction. The Engineer's or the Owner's review shall be for method only. The Contractor shall remain responsible for the adequacy and safety of the methods.
- B. The Contractor shall submit to the Engineer and the Owner for review the earth materials proposed for construction at least 15 days prior to intended use. Earth materials shall conform to the requirements of this specification.

1.4 SOIL TESTING AND CONSTRUCTION MONITORING

- A. Prior to the placement of the soil, and during such placement, the CQA Consultant or the Owner may select areas within the limits of the fill for compaction testing. The Contractor shall cooperate fully in obtaining the information desired and shall allow the CQA Consultant sufficient time to make necessary observations and tests.

- B. Construction Quality Assurance testing is defined in the Construction Quality Assurance Plan.
- C. Payment for testing will be made by the Owner. If test results are unsatisfactory, all costs involved in correcting deficiencies in compacted materials to the satisfaction of the CQA Consultant and the Owner will be borne by the Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Low Permeability Soil
 - 1. Low Permeability Soil shall consist of soil that is 100 percent finer by weight than the 1-inch sieve. The material shall contain no sharp, angular stones, and shall have a hydraulic conductivity less than or equal to 1×10^{-7} cm/sec when placed and compacted.
 - 2. Low Permeability Soil shall be free from ice, snow, roots, sod, rubbish, and other deleterious or organic matter.
 - 3. The Engineer or the Owner may collect soil samples for the following tests:
 - a. Particle-Size Analysis (ASTM D422);
 - b. Laboratory Compaction Characteristics of Soil (ASTM D698);
 - c. Atterberg Limits (ASTM D4318);
 - d. In-Place Density and Water Content (ASTM D6938); and
 - e. Hydraulic Conductivity Testing (ASTM D5084)
 - 4. Particle-size (ASTM D422), Laboratory Compaction Characteristics (ASTM D698), Atterberg Limits (ASTM D4318), and hydraulic conductivity (ASTM D5084) tests will be performed by the Contractor on samples obtained by the Contractor from proposed borrow sources. Any change in the source material or change of quality of the material may require a new series of tests to determine acceptability.
- B. Topsoil
 - 1. Topsoil shall conform with Technical Specification Section 02920 Topsoil, Hydroseeding and Turf Establishment.
- C. Topsoil Drainage Layer
 - 1. Topsoil Drainage Layer soil to be stripped and temporarily stockpiled prior to the placement of the additional low permeability soil.
 - 2. Topsoil Drainage Layer to be restored to a minimum thickness of 6 inches.
 - 3. Topsoil Drainage Layer soil shall be free from ice, snow, roots, sod, rubbish and other deleterious or organic matter.
- D. Crushed Stone
 - 1. Crushed Stone shall be Number 57 stone as listed in Table 703-1 of the NHDOT Specifications.

PART 3 – EXECUTION

3.1 GENERAL EXCAVATION BELOW GRADE

- A. The Contractor shall plan and perform its operations so as to prevent damage to existing structures, safeguard people and property, minimize disruptions to site traffic, protect the structures to be installed, and provide safe working conditions in compliance with local safety regulations and provisions of the Occupational Safety and Health Act (OSHA).
- B. Excavation shall be made to the elevations and dimensions shown on the Drawings. Excavate sufficient material to provide suitable room for construction providing bracing and support as required. The bottom of the excavations shall be rendered firm and dry and, in all respects, acceptable to the CQA Consultant.
- C. Remove, by pumping or other means, water accumulated in excavations to maintain a dry and stable subgrade until earthwork operations are complete. All dewatering shall be performed at the Contractor's cost.
- D. Where the soil subgrade has been softened, eroded, or otherwise disturbed by flooding, exposure during unfavorable weather, or other causes, it shall be over-excavated and replaced with suitable material at no cost to the Owner.
- E. When the excavation has reached the required depths, the CQA Consultant shall be notified and will observe conditions. If, in the opinion of the CQA Consultant, the material in its undisturbed natural condition, at or below the normal grade of the excavation as indicated on the Drawings is unsuitable, then the unsuitable material shall be removed and be replaced with suitable material as directed by the CQA Consultant. The Contractor shall be responsible for the removal, relocation, and stockpiling of unsuitable material. Unsuitable material is classified here as stumps, excessively wet soil, ledge, ice, topsoil, subsoil, organics, existing fill, or other deleterious material.
- F. The Contractor shall preserve the material below and beyond the lines of excavation. If the bottom of an excavation is extended below the limits shown on the Drawings or specified or directed by the CQA Consultant, then the excavation shall be backfilled and compacted with suitable fill in accordance with these specifications at the Contractor's expense.

3.2 EXCAVATION FOR TRENCHES

- A. Excavate as necessary to install the landfill gas interceptor trenches.
- B. Trench excavations shall be carried out in a manner that will preserve the undisturbed state of the subgrade soil. Dewatering shall be performed as necessary to provide a dry excavation.

- C. Trenching required for the installation of landfill gas interceptor trenches shall be made to the depths indicated on the Drawings and in such a manner and to such widths as will give suitable room for laying the pipe within the trenches, for bracing and supporting, and for pumping and drainage facilities. The Contractor shall render the bottom of the excavations firm and dry, and in all respects acceptable to the CQA Consultant.
- D. The Contractor shall not excavate more trench than can be completely backfilled after installation of the pipe. Excavations shall not be left open overnight unless otherwise approved by the CQA Consultant.
- E. To the extent possible, the trench invert shall slope uniformly in accordance with the Drawings. Trench slope shall match the slope of the pipe. Slight adjustments in the depths and alignments may be necessary to maintain a minimum cover as shown on the Drawings. Decrease in pipe slope from that specified or called out on the Drawings is not acceptable.

3.3 TRENCH BACKFILL

- A. As soon as practicable after the landfill gas interceptor piping has been placed and the pipe joints made in accordance with the appropriate section(s) of the Specifications and Drawings, and the pipe has been observed and approved by the CQA Consultant, backfilling shall be performed.
- B. The Contractor is responsible for the satisfactory execution of pipe line construction. If subsequent testing shows defects in materials or workmanship, then the Contractor shall make any and all necessary repairs and replacements at their own expense to the satisfaction of the CQA Consultant.
- C. Backfill shall be as specified for the particular type of pipe installation. Selected backfill shall be placed simultaneously on either side of the pipe in such a manner as to avoid displacement of the pipe alignment. In placing the material, care shall be taken that stones do not strike the pipe. Damaged pipe shall be replaced at no cost to the Owner.
- D. For applications requiring Crushed Stone bedding, the bedding shall be placed to the spring line of the pipe and so shaped that the pipe shall be firmly supported across its diameter for the full length of the barrel. Particular care shall be taken to provide recesses in the bedding or trench bottom, as required, to relieve any load on each bell.
- F. Placement of bedding shall be done by persons skilled in this operation and shall precede the laying of pipe by no more than a few feet.

- G. No stone or rock fragment greater than 3 inches in any dimension shall be placed into the trench nor shall large masses of backfilling material be dropped into the tamped layers of backfill until one foot of backfill has been placed over the top of the pipe.
- H. Remove excessively wet soil before placement of additional lifts. Do not use frozen material or place fill material on frozen subgrade.

3.4 SUBGRADE PREPARATION

- A. Prior to low permeability soil placement, the subgrade should be compact, dry, and free from debris, ice, and snow. Fill shall not be placed over frozen.
- B. The Contractor shall excavate in such a manner as to minimize disturbance of the underlying clay cap layer. Any deterioration of the subgrade between excavation and additional low permeability soil placement shall be the responsibility of the Contractor and shall be repaired at the Contractor's expense.
- C. All subgrades will be observed by the CQA Consultant prior to additional low permeability soil placement. Sufficient time must be given to the CQA Consultant to inspect and perform the necessary tests on the subgrade

3.5 FILL PLACEMENT AND COMPACTION – GENERAL

- A. Fill material shall be used where noted on the Drawings.
- B. Fill shall be placed in continuous loose layers and compacted to the compaction criteria specified in Paragraph 3.7, unless otherwise noted or approved by the Engineer. The loose lift fill thickness shall not exceed 12 inches unless demonstrated to the satisfaction of the CQA Consultant that specified degree of compaction can be obtained with thicker lifts. Smaller lift heights may be required to achieve specified compaction.
- C. All fill shall be placed "in the dry." The fill areas shall be graded to drain and provide a smooth surface, which will readily shed water.
- D. Fill containing ice, snow, frozen soil, large rocks, or other deleterious material shall not be placed without removal of unacceptable materials.
- E. Fill placement shall not be allowed during weather conditions that do not allow for proper moisture and density controls.
- F. Fill that is too wet for proper compaction shall be disced, harrowed, rototilled, or otherwise dried to a proper moisture content for compaction to the required density.

- G. Fill that is too dry for proper compaction shall receive water uniformly applied over the surface of the loose layer. Compaction shall not be performed until the moisture content of the fill material is uniform. Sufficient water shall be added to allow for compaction to the required density at the required moisture content.
- H. The CQA Consultant will observe construction, obtain soil samples for laboratory testing, and perform in-situ compaction tests.
- I. The CQA Consultant's presence does not include supervision or direction of the actual work by the Contractor, his employees, or agents. Neither the presence of the CQA Consultant nor any observations and testing performed by him shall excuse the Contractor from defects discovered in their work.
- J. The Contractor shall protect existing environmental monitoring devices such as groundwater monitoring wells, gas probes and gas vents within the area of work during fill placement and compaction as directed by the Owner.

3.6 EARTHWORK ACTIVITIES ABOVE FINAL COVER SYSTEM AREAS

- A. Construction equipment used in areas that have final cover system shall be low ground pressure (LGP) equipment having a contact pressure equal to or less than 5 pounds per square inch (psi).
- B. LGP equipment is required for striping Topsoil and Topsoil Drainage Layer, and for placing and compacting the additional low permeability soil and restoration of the Topsoil and Topsoil Drainage Layer.
- C. Travel ways for non-LGP equipment above the final cover system areas shall be stabilized with construction matting.
- D. The Contractor shall have a "spotter" when dumping soil to ensure no deleterious material is mixed in with the final cover soils (i.e., rocks, sticks, etc.) and to maintain minimum distances from the existing overhead utilities.

3.7 FILL COMPACTION CRITERIA

- A. The degree of soil compaction shall be based on a maximum dry density as determined by ASTM D698. The degree of compaction required, unless otherwise noted in the Drawings or directed and approved by the Engineer and the Owner, shall be 95 percent.
- B. The compacted low permeability clay shall exhibit a maximum in-place hydraulic conductivity of 1×10^{-7} cm/sec.

[END OF SECTION 02300]

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SECTION 02370

EROSION AND SEDIMENTATION CONTROL

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, tools, and equipment, and perform all operations necessary for erosion and sedimentation control work indicated on the Drawings and as specified herein.

1.2 SUBMITTALS

- A. The Contractor shall submit to the Owner or Engineer, at least 15 days prior to installation of erosion and sedimentation controls, the manufacturer's brochure containing complete information and instructions pertaining to the proposed material properties and installation.

1.3 PROJECT CONDITIONS

- A. Erosion and sediment controls must be in place and accepted by the Owner or Engineer prior to initiating earthwork activities.
- B. Earthmoving activities shall be performed in such a manner as to prevent the potential for erosion and to control resulting sedimentation.
- C. The Contractor shall implement and maintain erosion and sedimentation control measures as shown on the Drawings, or as directed by the Owner or the Engineer from the start of construction until provisional acceptance of seeded areas.

1.4 GENERAL METHODOLOGY

- A. Erosion and sedimentation control methods shall consider all factors that contribute to erosion and sedimentation including, but not limited to, the following:
 - 1. Topographic features of the Project area.
 - 2. Types, depth, slope and areal extent of the soil.
 - 3. Proposed alteration of the area.
 - 4. Amount of runoff from the project area and the upgradient watershed areas.
 - 5. Staging of earthmoving activities.
 - 6. Temporary control measures and facilities for use during earthmoving.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Construction Fence
 - 1. Construction fence shall be installed along the limit of disturbance as a visual demarcation;
 - 2. Construction fence shall be orange heavy duty diamond grid construction snow/barrier fence;
 - 3. Construction fence shall be a minimum of 36 inches in width;
 - 4. Stakes for fencing shall be in accordance with the manufacturer's recommendations; and
 - 5. Construction fence shall be securely fastened to posts a minimum of 4 feet long spaced between 4 and 6 feet apart.
- B. Hay bales shall consist of rectangular-shaped bales of cured straw or hay free from noxious weed seed, and rough or woody material, and weighing at least 40 pounds per bale.
- C. Sediment Filter Logs
 - 1. Sediment Filter Logs shall be a compost-filled bio- or photo-degradable tubular mesh product capable of trapping sediment before or within the device while allowing stormwater runoff to pass through.
 - 2. The mesh shall be of natural biodegradable materials to avoid problems with the sock trapping endangered snakes or lizards, such as biodegradable jute, sisal, burlap, or coir fiber fabric.
 - 3. The mesh fabric shall be clean, evenly woven, and free of encrusted concrete or other contaminating materials and free from cuts, tears, broken or missing yarns and thin, open, or weak places.
 - 4. Each sediment Filter Log shall have a diameter of no less than 8 inches.
 - 5. The mesh opening shall be no smaller than 1/8 inch.
 - 6. The compost shall be derived from green material consisting of chipped, shredded, or ground vegetation, or clean recycled wood products, and be reasonably free of visible contaminants. It shall not be derived from mixed municipal solid waste and shall not contain paint, petroleum products, pesticides or any other chemical residues harmful to animal life or plant growth. The compost shall not possess objectionable odors.
 - 7. The Sediment Filter Log must have a minimum durability of one year after installation.
- D. Erosion Control Blankets shall be a Rolled Erosion Control Product that complies with Temporary Slope Stabilization Type D as defined Section 645 of the NHDOT Specifications.
- E. Mulch shall consist of cured straw free from primary noxious weed seeds, twigs, debris and rough or woody materials. Mulch shall be free from rot or mold and

shall be acceptable to the Engineer or Owner. Alternately, mulch shall be specially processed cellulose homogeneous fiber containing no growth or germination-inhibiting factors. Processed cellulose fiber shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material become uniformly suspended to form a slurry when sprayed on the ground. The material shall allow homogeneous absorption and percolation of moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air dry weight content. Mulch shall be utilized on all newly-graded subgrade and topsoil areas that cannot be seeded within five (5) days.

PART 3 – EXECUTION

3.1 CONSTRUCTION SEQUENCE

- A. Installation of erosion control measures shall be completed prior to beginning any site work.
- B. Sediment barriers are temporary berms, diversions, or other barriers that are constructed to retain sediment on-site by retarding and filtering storm runoff. Sediment barriers shall be used across minor swales and ditches, and at other applications where the structure is of a temporary nature and structural strength is not required.
- C. All temporary erosion control measures shall be maintained throughout the course of site construction activities until provisional acceptance of the site vegetation by the Owner, at which time the Contractor shall remove all remaining temporary erosion control structures, and properly dispose of accumulated sediment at temporary or permanent erosion control structures on-site in areas approved by the Owner.
- D. The Construction Quality Assurance (CQA) Consultant or Owner may order that additional erosion and sediment controls be installed or that temporary erosion and sediment controls be replaced. The Contractor shall comply with CQA Consultant's or Owner's request and immediately install the required controls.

3.2 CONSTRUCTION METHODS

- A. All temporary erosion control measures shall be installed as shown on the Drawings or as directed by the Owner or the Engineer.
- B. All temporary erosion control measures shall be installed in accordance with manufacturer's instructions.
- C. Mulch shall be applied at a rate of 100 lbs/1000 ft².

- D. The Contractor shall provide protection against washouts by an approved method. Any washout that occurs either in the Contractor's work area or in areas topographically below his work shall be regraded and reseeded at the Contractor's expense until an accepted vegetative stand is established.

3.3 MAINTENANCE AND INSPECTION

- A. Contractor shall inspect and document all temporary erosion control measures as required by the Construction Stormwater Pollution Prevention Plan. Any damaged erosion control measure shall be repaired/replaced.

[END OF SECTION 02370]

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SECTION 02480

RESTORATION OF SURFACES

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals necessary to complete the work under this Section including operations that cannot be specified in detail as separate items, but can be sufficiently described as to the kind and extent of work involved.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.1 EXISTING SITE ACCESS ROADS AND STREETS

- A. The Contractor shall be responsible for maintaining and restoring all site access roads from which the surface is removed, broken, or damaged, or in which the ground has caved or settled due to the construction activities.
- B. The Contractor shall match the existing surfacing for depth, materials and surface finish, including striping and pavement markings, except as otherwise specified.

3.2 TEMPORARY ACCESS ROADS

- A. The Contractor shall be responsible for removing all temporary access road stabilization installed in the area of the existing final cover system to support construction activities (e.g., construction matting, temporary construction entrances, etc.) and for restoring and vegetating the final cover system in disturbed areas.
- B. The Contractor shall match the existing surfacing for depth, materials, and slope. The Contractor shall provide positive slope for stormwater runoff.

3.3 MATERIAL STORAGE AND STOCKPILE AREAS

- A. The Contractor shall be responsible for maintaining all material storage and soil stockpile areas and for restoring these areas to the original surface completion type and provide positive slope for stormwater runoff following completion of construction activities.

END OF SECTION 02480

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SECTION 02920

TOPSOIL, HYDROSEEDING, AND TURF ESTABLISHMENT

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required to strip, haul, and temporary stockpile the existing topsoil located within the limit of disturbance.
- B. Following placement and compaction of the additional low permeability soil the Contractor shall furnish all labor, materials, equipment and incidentals required to place a 6-inch thick layer of Topsoil, including but not limited to hauling the temporarily stockpiled topsoil, placement, finish grade, furnish and apply lime and fertilizer, furnish and hydraulically apply seed and mulch, and maintain all seeded areas as specified herein. Contractor shall furnish additional Topsoil if required to place a 6-inch thick layer as specified.
- C. Contractor shall seed all areas disturbed by construction operations. All areas disturbed or not having sufficient vegetation to prevent erosion shall be seeded.

1.2 SAMPLES AND APPROVAL OF MATERIAL

- A. Samples of all materials shall be submitted for inspection and acceptance upon Engineer's request.
- B. Schedules for seeding and fertilizing must be submitted to the Engineer and the Owner for approval prior to the work being performed.
- C. The Contractor shall submit results of soil analysis and fertilizer recommendations to the Engineer at least 15 days prior to seeding and fertilizing.
- D. Prior to the start of work, the Construction Quality Assurance (CQA) Consultant and the Owner shall be furnished with a certified statement for approval as to the number of pounds of materials to be used per 100 gallons of water. The statement shall also specify the number of square feet of seeding that can be covered with the quantity of solution in the hydroseeder.
- E. The Contractor shall submit the proposed seed mix including the manufacturer's certificate of compliance to the CQA Consultant for review at least 15 days prior to seeding.
- F. A manufacturer's certificate of compliance to the specified mix shall be submitted for each seed type. The certificates shall include the guaranteed percentages of

- purity, weed content, and germination of the seed, and the net weight and date of shipment. No seed may be sown until the Contractor has submitted the certificates.
- G. Seed bag tags shall be provided to the CQA Consultant at the time of seeding.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Topsoil shall be fertile, natural soil capable of sustaining vigorous plant growth, typical of the locality, free from stones greater than 3 inches, roots, sticks, clay, peat, weeds and sod and obtained from naturally well drained areas. It shall not be excessively acidic or alkaline nor contain toxic material harmful to plant growth.
- B. Fertilizer shall be a complete commercial fertilizer selected based on the recommendations of the soil analysis. It shall be delivered to the site in the original unopened containers each showing the manufacturer's guaranteed analysis. Fertilizer shall be stored so that when used it shall be dry and free flowing.
- C. Lime shall be ground limestone containing not less than eighty-five percent (85%) calcium and magnesium carbonates.
- D. Fertilizer, seed, and lime shall be furnished in new, clean, sealed, and properly labeled bags, with the following information clearly marked:
1. Manufacturer name
 2. Type
 3. Weight
 4. Guaranteed analysis
- E. Grass seed mixture shall conform to the requirements of Slope Seed Type 44 as specified in Section 644 of the 2016 edition of the New Hampshire Department of Transportation, Standard Specifications for Road and Bridge Construction (NHDOT Specifications), or other seed mix approved by the Engineer.
- F. Grass seed shall be from the same or previous year's crop; each variety of seed shall have a percentage of germination not less than ninety (90), a percentage of purity of not less than eighty-five (85) and shall have not more than one percent (1%) weed content.
- G. The seed shall be furnished and delivered premixed in the proportions specified above.
- H. Mulch shall be dry hay or straw mulch free of mold.

PART 3 – EXECUTION

3.1 APPLICATION

- A. Unless otherwise shown on the Drawings, Topsoil shall be placed to a minimum thickness of 6 inches.
- B. For all areas to be seeded:
 - 1. Lime shall be applied uniformly over the area at the rate defined in Table 642-1 of the NHDOT Specifications.
 - 2. Fertilizer shall be applied uniformly over the area at the defined in Table 643-1 of the NHDOT Specifications unless the results of the soil tests indicate otherwise.
 - 3. Seed shall be applied uniformly over the area at the minimum rate defined in Table 644-3 of the NHDOT Specifications.
- C. The Contractor shall use care when mixing fertilizer to assure the mix is in accordance with this specification and to preclude over fertilizing. Sprayers shall be loaded over vegetated surfaces. Empty containers shall be disposed of in accordance with instructions on the product label.
- D. In the event of a spill of fertilizer or hydroseed mix, the Owner shall be notified and the spill shall be cleaned up promptly.
- E. The application of fertilizer and lime shall be performed hydraulically in one operation with hydroseeding.
- F. The application of mulch is to be by pneumatic blower.

3.2 INSTALLATION

- A. The subgrade of all areas to be covered with Topsoil and seeded shall be raked and all rubbish, sticks, roots, and stones larger than 3 inches shall be removed.
- B. Subgrade surfaces in all areas shall be tracked immediately after fine grading and raking has been completed. Tracking is to be performed with bulldozers operating perpendicular to the slope or in the direction of water flow. The tracks of the bulldozers are to have grousers of sufficient height to leave visible depressions in the subgrade. The depressions are to be perpendicular to the slope or to the direction of water flow to reduce erosion potential until Topsoil is placed. During the tracking, all depressions caused by settlement or tracking shall be filled with additional Topsoil and the surface shall be regraded and tracked until an even finished grade is created.
- C. The subgrade shall be observed and approved by the CQA Consultant before Topsoil is placed. After Topsoil has been spread and fine graded, all large stiff clods,

lumps, brush, roots, stumps, litter, and other foreign material shall be removed from the area covered with Topsoil and disposed of by the Contractor. The entire area where Topsoil has been placed shall then be tracked as indicated in paragraph 3.2.B.

- D. Application of fertilizer, lime, seed, and mulch shall not occur in non target areas including but not limited to: paved areas, riprap-lined swales, gravel access roads, etc. Furthermore, hydroseeding shall not take place within a 25-foot vegetated buffer strip to be established between disturbed areas and surface water.
- E. Application of fertilizer, lime seed, and mulch shall only be performed during those periods within the seasons that are normal for such work as determined by the weather and locally accepted practice, and as approved by the Engineer. Seeding and fertilizing shall be performed between April 1 and June 1 or between August 15 and October 15, or as directed or permitted by the Engineer. The Contractor shall hydroseed and mulch only on a calm day and shall not hydroseed when heavy precipitation is expected.
- F. Lime and fertilizer are to be spread hydraulically in one operation with the hydroseeding.
- G. Seeding shall be done within five (5) days following soil preparation. Seed shall be applied hydraulically at the rates and percentages indicated. The spraying equipment and mixture shall be so designed that when the mixture is sprayed onto an area, the lime, fertilizer and seed shall be equal in quantity to the specified rates.
- H. When protection of newly graded areas is necessary at a time that is outside of the normal seeding season, the Contractor shall protect those areas by whatever means necessary (such as straw or erosion control mats) or by other measures as approved by the Engineer and the Owner.

3.3 MAINTENANCE AND PROVISIONAL ACCEPTANCE

- A. The Contractor shall keep all seeded areas watered and in good condition, shall reseed if and when necessary until a good, healthy, uniform growth is established over the entire area seeded, and shall maintain these areas in an approved condition until provisional acceptance.
- B. On slopes, the Contractor shall protect against wash outs by an approved method. Any wash out that occurs shall be regraded and reseeded at the Contractor's expense until a good vegetative cover is established.
- C. The Engineer or the Owner will observe work for provisional acceptance at the end of the eight (8) week grass maintenance period upon the written request of the Contractor, which must be received at least ten (10) days before the anticipated date of observation.

- D. A satisfactory stand will be defined as a section of grass of 10,000 square feet or larger that has:
 - 1. No bare spots larger than three (3) square feet.
 - 2. No more than ten percent (10%) of total area with bare spots larger than one (1) square foot.
 - 3. No more than fifteen percent (15%) of total area with bare spots larger than 6 inches square.
 - 4. The observations by the Engineer or the Owner will determine whether maintenance shall continue in any area or manner.
- E. After all necessary corrective work and cleanup has been completed, the Engineer or the Owner will acknowledge the provisional acceptance of the seeded areas. The Contractor's responsibility for maintenance of seeded areas, or parts of seeded areas shall cease on receipt of provisional acceptance.

3.4 GUARANTEE PERIOD AND FINAL ACCEPTANCE

- A. All seeded areas shall be guaranteed by the Contractor for not less than one (1) full year from the time of provisional acceptance.
- B. At the end of the guarantee period, the Engineer or the Owner will make observations upon written request submitted by the Contractor, which must be received at least ten (10) days before the anticipated date. Seeded areas not demonstrating satisfactory stands as outlined above, as determined by the Engineer or the Owner, shall be renovated, reseeded, and maintained meeting all requirements as specified herein.
- C. After all necessary corrective work has been completed, the Engineer or the Owner shall acknowledge in writing the final acceptance of the seeded areas.

[END OF SECTION 02920]

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SECTION 02950

CLEANUP AND SITE RESTORATION

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals necessary to complete the work under this Section including operations that cannot be specified in detail as separate items, but can be sufficiently described as to the kind and extent of work involved.

PART 2 – PRODUCTS

(Not used)

PART 3 – EXECUTION

3.1 CLEANUP

- A. During the course of the work, the Contractor shall keep the project area in as clean and neat a condition as is possible. Lumber, equipment, temporary structures, and other refuse remaining from the construction operations shall be removed from the project site. The Contractor shall leave the entire project area in a neat and orderly condition.
- B. The Contractor is responsible for disposing of all excess material and residue resulting from construction operations. Excess materials consisting of soil or aggregate shall be disposed of by the Contractor in on-site areas designated by the Owner.
- C. Upon establishment of vegetation, the Contractor shall remove all temporary erosion control structures under the direction of the Owner.

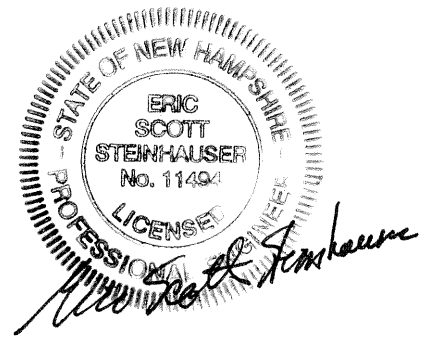
3.2 INCIDENTAL WORK

- A. The Contractor shall perform all incidental work not otherwise specified but obviously necessary for the proper completion of the Contract in accordance with the Drawings and Specifications.

[END OF SECTION 02950]

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CONSTRUCTION QUALITY ASSURANCE PLAN



CONSTRUCTION QUALITY ASSURANCE PLAN
LANDFILL FINAL COVER SYSTEM REPAIR
Plaistow Unlined Municipal Landfill

Plaistow, New Hampshire
Solid Waste Permit No. DES-SW-PFC-04-001

Prepared for the Town of Plaistow, New Hampshire
File No. 4705.01
September 2020

ERRATA SHEET

Sanborn Head and Associates, Inc. (Sanborn Head) prepared this CQA Plan in association with the Type I-B Permit Modification Application (PMA) for the proposed final cover system repair. The final cover system repair is proposed to address the differential settlement that has occurred since the landfill final cover system was constructed. Landfill gas (LFG) migration from the Landfill is also addressed. This Closure Plan was prepared in accordance with Env-Sw 1106.04(c) and identifies the post closure monitoring and maintenance requirements for the Landfill.

This Errata Sheet defines the roles and responsibilities of the Construction Quality Assurance (CQA) personnel presented in this CQA Plan. The following outlines the minimum qualifications and specific duties of the Project and Residential Engineer, respectively:

Project Engineer

The Project Engineer, denoted as the CQA Managing Engineer in this CQA Plan, shall comply with the requirements of Env-Sw 1104.06. The roles and responsibilities of the CQA Managing Engineer are outlined in this CQA Plan. The CQA Managing Engineer may delegate tasks to the CQA Site Manager, but all certifications will be signed and stamped by the CQA Managing Engineer. Depending on the CQA Consultant, the roles of the CQA Managing Engineer and to the CQA Site Manager may be fulfilled by the same person.

Resident Engineer

The Resident Engineer, denoted as the CQA Monitor in this CQA Plan, shall comply with the requirements of Env-Sw 1104.06. The roles and responsibilities of the CQA Site Monitor are outlined in this CQA Plan and shall conform to Env-Sw- 805.16(d). Depending on the CQA Consultant, the roles of the CQA Site Manager and the CQA Monitor may be fulfilled by the same person.

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APPENDIX A – TESTING FORMS

Daily Field Report

1.0 INTRODUCTION

This Construction Quality Assurance (CQA) Plan addresses the quality assurance activities specific to the construction of the final cover system repair at the Plaistow Unlined Municipal Landfill in Plaistow, New Hampshire. The purpose of this CQA Plan is to establish the roles and responsibilities of the parties involved with the project, lines of communications between parties, and procedures to document that construction was performed in accordance with the Construction Drawings (Drawings) and Specifications. In the context of this plan, quality assurance refers to means and actions employed to assure that the components of the final cover system repair are constructed in accordance with the Drawings and Specifications. Quality assurance is provided by a party independent of the Contractor.

Quality Control refers to those actions taken by the Contractor, its subcontractors, and the manufacturers to ensure that materials and workmanship meet the requirements of the Drawings and Specifications, and applies to manufacturing, shipment, handling, and installation of manufactured components. This CQA Plan does not address design guidelines, installation specifications, or selection of the components. The Specifications define the quality of materials and workmanship to be used and employed. The CQA Plan defines the means to assure the level of material and workmanship used in the construction meets or exceeds the requirements of the Drawings and Specifications.

2.0 PARTIES

The project organization chart depicting the key roles and lines of communication for the construction of the Landfill final cover system repair is presented below, followed by the duties and responsibilities of each of the parties.

2.1 Owner

In this CQA Plan and the Drawings and Specifications, the term “Owner” refers specifically to the Town of Plaistow, New Hampshire.

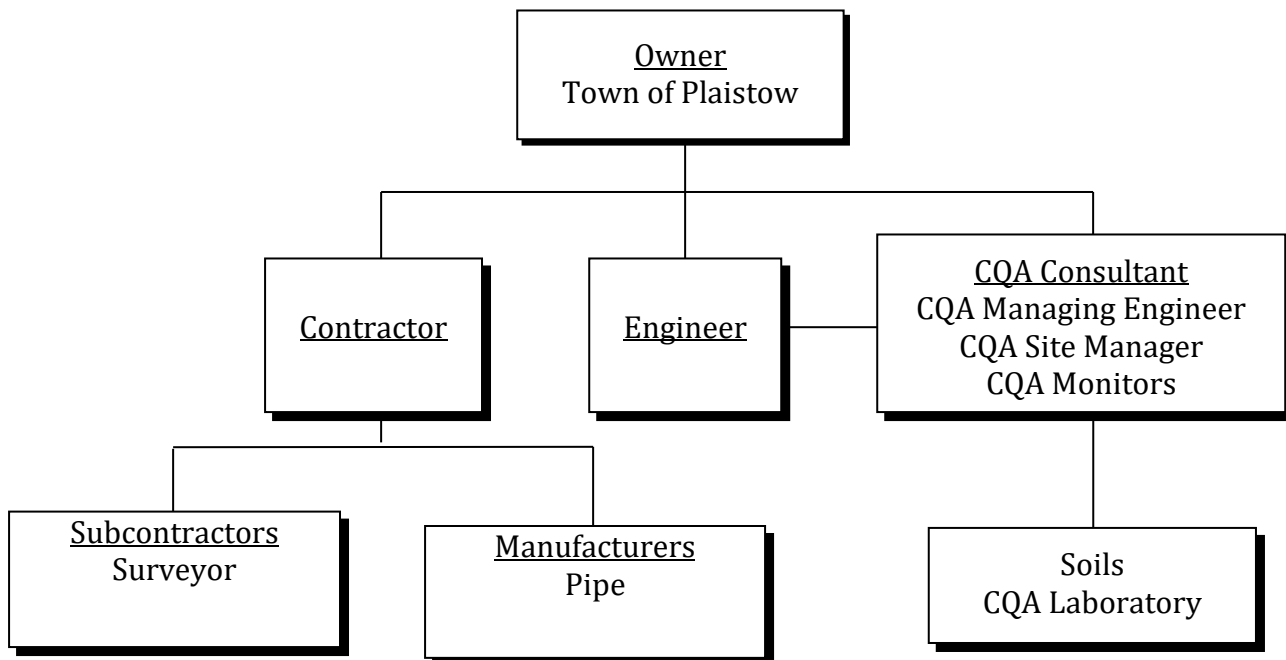
2.2 Project Manager

The Project Manager is the official representative of the Owner (i.e., Owner’s Representative) and is responsible for the coordination and management of activities associated with construction of the Project.

2.3 Engineer

The Engineer is the firm that prepared the Drawings, Specifications, and CQA Plan for the Project. Sanborn, Head & Associates, Inc. is the Engineer for the Project.

PROJECT ROLES AND LINES OF COMMUNICATION



2.4 Contractor

The Contractor is the general contractor responsible for constructing the prescribed design in accordance with the Drawings and Specifications. The Contractor may retain the services of specialty subcontractors (e.g., material suppliers). The Contractor must have experience in successful general earthwork, and shall have current local, state, and federal licenses as appropriate.

2.5 Contractor's Surveyor

The Contractor's Surveyor must be a licensed professional in the state of New Hampshire with a minimum of five years of construction surveying experience and be familiar with the surveying skills required for this project, and be a party independent of the Owner and the Engineer. The Contractor's Surveyor will be a subcontractor to the Contractor, and is responsible for construction layout and obtaining interim and final as-built information for the project. The final as-built information will be used by the Engineer and/or the CQA Consultant to produce Record Drawings as required in the Specifications. The qualifications required of the Contractor's Surveyor and surveying requirements for the project are provided in the Specifications.

3.0 CQA CONSULTANT

3.1 Overview

The CQA Consultant is a qualified representative of a qualified engineering firm, that is experienced in observing and documenting construction. The number of CQA Consultant personnel needed on site at a given time is dictated by the Contractor's schedule as determined by the CQA Consultant.

The CQA Consultant is responsible for observing and documenting the construction activities as defined in this CQA Plan. Specific duties of the CQA Consultant personnel include:

- Reviewing the Drawings and Specifications, and all modifications thereto;
- Reviewing other project-specific documentation, including proposed layouts, and manufacturer and Contractor literature;
- Documenting construction operations using field reports, logs, and/or photographs;
- Attending project meetings;
- Noting activities that could result in damage and/or delays;
- Reporting unapproved construction deviations to the Engineer and the Owner;
- Verifying that the Contractor is obtaining as-built survey information as required by this CQA Plan, the Drawings, and Specifications; and
- Preparing a construction documentation report.

The CQA Consultant is a party, independent from the Contractor. The CQA Consultant will be a team of individuals experienced in the provision of CQA services for similar projects. The CQA team must be experienced in monitoring the construction of the various components of the project and must include a Professional Engineer licensed in the State of New Hampshire.

The CQA team will include the CQA Managing Engineer, a CQA Site Manager, and the CQA Monitor(s). The CQA Managing Engineer will lead the CQA team. The CQA team may utilize the services of other qualified individuals to assist with the assignments. Together, the CQA team will perform several assignments during construction. These assignments will include performing CQA for earthwork construction and all other related components of the project. The CQA team is responsible for observing and performing field testing and documentation activities related to the performance of the various components of the design. Field and laboratory testing are to be performed in accordance with applicable standards and specifications.

3.2 CQA Managing Engineer

The CQA Managing Engineer will be a Professional Engineer licensed in the State of New Hampshire. They will review approved construction clarifications and changes, and will serve as technical reviewer of the construction documentation report. The CQA Managing Engineer will be in direct communication with the Owner, Engineer, and CQA personnel during construction.

Other responsibilities of the CQA Managing Engineer include:

- Becoming familiar with the Drawings, Specifications, and CQA Plan;
- Attending the preconstruction meetings, progress meetings, and any resolution meetings when requested;

- Administering the CQA program (i.e., assigns and manages all CQA personnel, reviews field reports, and provides engineering review of CQA-related issues);
- Providing quality control of the CQA personnel, including site visits;
- Reviewing changes to the Drawings, Specifications, and CQA Plan; and
- Preparing the construction documentation report with assistance from the CQA Site Manager, including a review of the as-built record drawings provided by the Contractor.

3.3 CQA Site Manager

The CQA Site Manager will interact on a frequent basis with project personnel, and will have authority over the field CQA personnel. The responsibilities and duties of the CQA Site Manager include the following:

- Becoming familiar with the concepts used to develop the Drawings and Specifications;
- Acting as the on-site (resident) representative of the CQA Consultant;
- Evaluating conformance of materials and construction with the requirements of the Drawings and Specifications;
- Familiarizing the CQA Monitors with the site and CQA requirements for the project;
- Reporting any unresolved deviations from the CQA Plan to the Engineer and/or Owner;
- Managing the daily activities of the CQA Monitors;
- Attending the CQA-related meetings (e.g., resolution, preconstruction, daily, weekly);
- Assisting the CQA Managing Engineer in preparing documentation for Requests for Information (RFI) or other clarifications to the Drawings and/or Specifications;
- Administering the CQA program (i.e., assigning and managing CQA personnel, reviewing field reports, and providing review of CQA-related issues);
- Reviewing the as-built survey information submitted by the Contractor;
- Verifying the calibration and condition of all CQA equipment;
- Reviewing all CQA Monitors' daily reports and logs;
- Preparing daily and weekly report, noting relevant observations reported by the CQA Monitors;
- Overseeing the collection and shipping of laboratory test samples;
- Reviewing and reporting results of laboratory testing;
- Periodically checking stockpiles or borrow pit sources for variability of the soils, and verifying that conformance testing is performed;
- Reviewing the work of the Contractor's equipment operators, to ensure that care is taken to protect other portions of the work;
- Establishing additional test requirements beyond those required in the CQA Plan, when necessary;
- Reviewing Supplier and Manufacturer certifications, when necessary;

- Designating a senior CQA Monitor to act on his/her behalf whenever he/she is absent from the site while operations are on-going; and
- Preparing the construction documentation report with the CQA Managing Engineer.

3.4 CQA Monitors

The duties of the CQA Monitor(s) are assigned by the CQA Site Manager and include monitoring, logging, and/or documenting associated earthwork construction. The duties to be performed and activities to be monitored by the CQA Monitor(s) associated with earthwork specifically include:

- Observing and documenting soil excavation, stockpiling, and placement;
- Observing and documenting soil moisture content and moisture conditioning, if required;
- Observing and documenting collection of soil samples for laboratory testing;
- Testing the in-situ moisture and density of compacted earthen materials;
- Observing and documenting operations to protect completed areas before the covering materials are placed;
- Examining the soil surfaces for signs of excessive wetting, desiccation, or other disturbance prior to placement of any other cover materials; and
- Observing and documenting scarification, rewetting, recompaction, or proof rolling required to repair deteriorated areas.

3.5 Soils CQA Laboratory

The Soils CQA Laboratory will have experience in the physical testing of soils and be familiar with, and properly equipped to perform the geotechnical testing required by the CQA Plan.

3.6 CQA Surveyor

During the project, the CQA Consultant may verify the as-built locations and elevations of the Contractor's work by collecting independent survey data to compare with the Contractor's survey data. The CQA Surveyor will be provided access to the site and relevant components of the project for the purpose of obtaining independent survey data. The CQA Surveyor shall be use control established at the site and control installed by the Contractor's Surveyor. Upon request by the Owner, the Contractor will provide survey data to the CQA Consultant and Engineer in electronic format and the same horizontal and vertical datums as shown on the Drawings for comparison.

The CQA Surveyor shall be a competent professional with a minimum of five years of construction surveying experience, be familiar with the surveying practices required for this project, and be a party independent of the Contractor. The CQA Surveyor will be retained by either the Owner or the CQA Consultant. Data obtained by the CQA Surveyor will not be used for preparing as-built documentation. The responsibilities of the CQA Surveyor are presented in Section 5.0.

4.0 PROJECT MEETINGS

4.1 Introduction

In order to facilitate construction, clearly define construction goals and activities, and avoid unnecessary delays, close coordination between the Owner, Engineer, CQA Consultant, and Contractor is essential. To meet this objective, meetings will be held prior to and at regular intervals throughout the project schedule.

4.2 Preconstruction Meeting

Following award of the project to the Contractor and prior to mobilization, a Preconstruction meeting shall be held at the site with the Owner, Contractor, Engineer, CQA Consultant, and others designated by the Owner.

The preconstruction meeting should include discussion of the following activities:

- Reviewing the responsibilities of each party;
- Confirming the lines of authority and communication;
- Communicating relevant documents to project parties;
- Reviewing critical design details of the project;
- Addressing any appropriate modifications to the Drawings or Specifications so that the fulfillment of design or performance standards can be achieved;
- Establishing an understanding by the parties of the CQA Plan, and CQA and CQC procedures to be followed during the project;
- Establishing work area security and safety protocol in accordance with the Owner's and the Contractor's health and safety plans;
- Describing off-site soil source locations;
- Establishing soil stockpiling locations;
- Confirming the methods for documenting and reporting, and for distributing documents and reports;
- Confirming acceptance and approval process for task completion prior to schedule sequence advancement; and
- Establishing procedures for processing applications for payment.

Items discussed during the preconstruction meeting will be documented by a person designated at the beginning of the meeting, and minutes will be transmitted within one week of the meeting to the attending parties and others designated by the Owner.

4.3 Progress Meetings

A progress meeting (via teleconference or at the site) will be held each week during construction between select CQA personnel, the Contractor, and the Owner. The CQA Managing Engineer and Engineer will participate in the weekly meetings when appropriate. Current progress, planned activities for the upcoming week, and any new business or

revisions to the work will be discussed at these meetings. Minutes of the progress meetings will be recorded by a member of the CQA team and will document problems, decisions, and questions discussed. Matters requiring action raised in the meeting will be reported to the appropriate parties. Minutes of weekly progress meetings will be distributed within three days of the meeting to each party present at the meeting, and to others designated by the Owner.

Daily progress meetings will be held between the CQA Site Monitor and the Contractor prior to the start of work or following the completion of work. The purpose of these meetings is to review the previous day's activities, review the upcoming day's activities, and identify potential construction problems. Major items discussed during these meetings will be documented in the CQA Site Manager's daily field reports.

4.4 Problem or Work Deficiency Meetings

Special meetings will be held by the Owner when and if problems or deficiencies are present or judged likely to occur. At a minimum, these meetings will be attended by the Contractor, the Owner, and select CQA personnel. The purpose of these meetings is to define and resolve the problem or work deficiency as follows:

- Define and discuss the problem or deficiency;
- Review alternative solutions; and
- Implement an action plan to resolve the problem or deficiency.

Items discussed during these meetings will be documented by the Owner, and if deemed necessary, minutes will be transmitted to the appropriate parties.

5.0 CQA SURVEYING

CQA surveying of lines and grades may be performed during construction to independently verify the work, as requested by the Owner, the Engineer, and/or the CQA Consultant. The overall responsibilities of the Contractor's Surveyor are described in the Specifications. The CQA Surveyor will use the control monuments established by the Contractor's Surveyor prior to the start of construction. The CQA Consultant will coordinate the CQA Surveyor's fieldwork for the aspects of construction, as needed.

The scope of CQA surveying will include, but not necessarily be limited to:

- Verifying the horizontal and vertical coordinates of selected construction control points;
- Verifying layer thickness, especially of soil components of the final cover system; and
- Verifying information regarding the horizontal alignment and vertical profile of, site drainage features, landfill gas vents, etc.

It will be the responsibility of the CQA personnel and the CQA Surveyor to coordinate the CQA surveying work such that areas are promptly surveyed, interim results are reviewed, and approval is granted for the Contractor to proceed with subsequent work in the areas.

The CQA Site Manager will report any nonconformancies or inconsistencies to the Owner and Contractor promptly to limit the potential for construction delays.

6.0 DOCUMENTATION

6.1 Introduction

An effective CQA Plan depends largely on the recognition that the construction activities should be monitored, and that the work monitored should be documented. The CQA Consultant will document that the quality assurance requirements were addressed and satisfied.

The CQA Site Manager will provide the CQA Managing Engineer and Owner with signed descriptive remarks, data sheets, and logs to verify that the monitoring activities were performed. The CQA Site Manager will maintain a complete file of the Drawings, Specifications, CQA Plan, checklists, test procedures, daily logs, and other pertinent documents at the job site, or in an electronic format that can be accessed through the internet. The CQA Site Manager will verify that the Contractor maintains a current set of red-line Drawings and Contract Documents, which will be kept up-to-date by the Contractor, at all times, with the latest changes to the Drawings and Specifications. The red-line Drawings and Construction Documents will be transmitted to the Owner at the conclusion of the project.

6.2 Daily Recordkeeping

Standard reporting procedures will include preparation of a daily CQA report which, at a minimum, will consist of: (i) field notes, including memoranda of meetings and/or discussions with the Contractor, Subcontractors, or the Owner; (ii) CQA monitoring logs and testing data sheets; and (iii) construction problem and solution summary sheets. This information will be regularly submitted to and reviewed by the CQA Managing Engineer.

The CQA Site Manager will prepare a daily field report each day, summarizing their discussions with the Contractor and/or subcontractors, construction operations, and CQA activities. Daily field reports will also be prepared by each member of the CQA Consultant team. At a minimum, the daily field reports will include the following information:

- Arrival and departure time of CQA personnel;
- Weather conditions (temperature, sky conditions, precipitation, etc.);
- Site conditions with specific reference and personnel involved in the Project;
- A detailed description of work performed;
- A record of meeting minutes and telephone conversations;
- Decisions made regarding acceptance of work, and/or corrective actions to be implemented for instances of substandard quality; and
- Results of laboratory testing as reported or received by CQA personnel on-site.

6.3 Monitoring Logs and Test Data Sheets

Monitoring logs and test data sheets will be prepared daily. At a minimum, these logs and data sheets will include the following information:

- An identifying sheet number for cross referencing and document control;
- Date, project name, location, and other identification;
- Data on weather conditions;
- A reduced-scale site plan showing the work areas and test locations;
- Descriptions and locations of on-going construction;
- Equipment and personnel in each work area, including subcontractors;
- Descriptions and specific locations of areas, or units, of work being tested and/or observed and documented;
- Locations where tests and samples were taken;
- A summary of test results;
- Calibrations or recalibrations of test equipment, and actions taken as a result of recalibration;
- Delivery schedule of off-site materials received, including quality control documentation;
- Decisions made regarding acceptance of units of work, and/or corrective actions to be taken in instances of substandard quality; and
- Signature of the CQA Site Manager and/or the CQA Monitor(s).

In any case, the logs must be completely filled out with no items left blank.

6.4 Construction Problem and Solution Data Sheets

Construction problem and solution data sheets describing special construction situations will be cross-referenced with specific observation logs and testing data sheets, and must include the following information, when available:

- An identifying sheet number for cross-referencing and document control;
- A detailed description of the situation or deficiency;
- The location and probable cause of the situation or deficiency;
- How and when the situation or deficiency was found or located;
- Documentation of the response to the situation or deficiency;
- Final results of responses;
- Measures taken by the Contractor to prevent a similar situation from occurring in the future; and
- The signature of the CQA Site Manager and/or CQA Monitor, and signature of the CQA Managing Engineer indicating concurrence.

The Owner and Engineer will be made aware of significant recurring non-conformance with the Drawings and Specifications. The Owner and/or Engineer will then evaluate the cause of the non-conformance and recommend appropriate changes in procedures or Specifications. These changes will be submitted to the Engineer for approval. When this type of evaluation is made, the results will be documented, and revisions to procedures or Specifications will be approved by the Owner and Engineer.

A summary of the supporting data sheets, along with final testing results and the CQA Site Manager's approval of the work, will be required upon completion of construction for which the construction situation, deficiency, and/or defect was satisfactorily repaired and completed.

6.5 Photographic Documentation

A photographic log will be developed to serve as a pictorial record of work progress, and illustrate issues and mitigation activities taken. The digital color images will be presented in chronological order and with a brief description for each. The log will be presented to the Owner upon completion of the Project.

6.6 Design and/or Specifications Changes

Changes to the Drawings and/or Specifications may be identified during construction. In such cases, the CQA Site Manager will notify the Owner and Engineer. Drawing and/or Specification changes will be made only with the written agreement of the Owner and Engineer, and will take the form of an addendum to the Contract Documents.

6.7 Progress Reports

The CQA Consultant will prepare a summary progress report each week, or at time intervals established at the preconstruction meeting. As a minimum, this report will include the following information:

- A unique identifying sheet number for cross-referencing and document control;
- The date, project name, location, and other information;
- A summary of work activities during the progress reporting period;
- A summary of construction situations, deficiencies, and/or defects occurring during the progress reporting period;
- A summary of test results, failures and retests; and
- The signature of the CQA Managing Engineer and the CQA Site Manager.

6.8 Construction Documentation Report

At the completion of the project, the CQA Consultant will submit to the Owner a signed and sealed construction documentation report. The construction documentation report will certify: (i) that the work was performed in substantial compliance with the Drawings, Specifications, and CQA Plan; and (ii) physical sampling and testing, except as properly

authorized, was performed at the appropriate frequencies. The report will include the necessary document to support the construction activities represented.

At a minimum, the construction documentation report will include: (i) a narrative of construction activities; (ii) observation logs and testing data sheets including sample location plans; (iii) construction problems and solutions data sheets; (iv) summary of approved Drawing and Specifications changes; (v) record Drawings; and (vi) a summary statement sealed and signed by a Professional Engineer licensed in the State of New Hampshire.

The Record Drawings will include scale drawings depicting the location of the construction and details pertaining to the extent of construction (e.g., depths, plan dimensions, elevations, soil component thickness, etc.).

7.0 EROSION AND SEDIMENT CONTROLS

7.1 Preconstruction Qualifying of Material Sources

Prior to construction, the Contractor will be required to provide the CQA Site Manager and/or Engineer with the quality control information and certification from the supplier(s) of seed, mulches or matting, etc. required in the Specifications.

The CQA Site Manager and/or Engineer will examine the suppliers' certifications to verify that the property values listed on the certifications meet or exceed the requirements of the Specifications, and that proper and complete documentation was provided by the Contractor for the temporary and permanent erosion and sedimentation materials that will be used at the site. The CQA Site Manager will report deviations from the above requirements to the Contractor prior to approving installation of the materials.

7.2 Field Evaluation/Monitoring of Construction Techniques

The CQA Site Manager will observe the Contractor's work activities and will verify that, prior to initiating work in a given area, temporary erosion and sediment controls, as required in the Drawings and Specifications was installed. The CQA Site Manager will routinely verify that the Contractor keeps the site free from excessive sediment and in as neat a condition as possible. This includes, but is not limited to, the project area, haul roads, detention basins, borrow areas, stockpile areas, and the entrance area to the facility.

The CQA Site Manager and/or Engineer will verify that the Contractor selects the appropriate erosion and sediment controls, installs the erosion control measures appropriately, and performs the necessary inspections, including routine weekly inspections and unscheduled inspections as soon as reasonably possible during or after rainfall events that produces runoff from the construction site. If excessive sediment or damage to the erosion control measures is observed, then the Contractor will be responsible for implementing appropriate corrective measures. The Contractor may accompany the CQA Site Manager during these inspections, or may perform independent inspections required in the Drawings and Specifications. The CQA Site Manager will be responsible for reviewing the

Contractor's erosion control inspection checklist forms within one working day of the Contractor submitting the forms.

The CQA Site Manager will verify that stockpiles are located as shown on the Drawings or as approved by the Owner, and that the Contractor installed and is maintaining all erosion and sedimentation control measures around these areas, as required in the Specifications.

7.3 Deficiencies, Problems, and Repairs

The CQA Site Manager will report deficiencies and noncompliances in the erosion and sedimentation controls to the Contractor. The extent of the deficiencies will be evaluated by observations, review of records, or other means deemed appropriate by the CQA Site Manager and/or Owner. The Contractor will promptly correct the deficiency to the satisfaction of the CQA Site Manager, or as directed by the Owner.

8.0 EARTHWORK

8.1 Preconstruction Qualifying of Material Sources

Prior to construction with a given soil material, the Contractor will provide the CQA Consultant with the test results for each proposed material from each proposed material source. The CQA Consultant will review the test results to verify that each material meets the requirements of the Specifications. Results of the preconstruction tests will not be counted toward the conformance testing frequency requirements, provided the results meet the specified material properties. The CQA Consultant may also request that the Contractor provide a sample of each material for additional testing, if further preconstruction qualification testing by the CQA Consultant is warranted.

If a preconstruction qualifying sample fails to meet the requirements of the Specifications, then the CQA Consultant will notify the Contractor. Use of the material will not be allowed until the material is pre-qualified by further tests. Additional tests, if necessary, will be performed by the CQA Consultant at the request of the Owner and/or Engineer.

8.2 Material Conformance Testing

During construction, a conformance testing program will be implemented by the CQA Consultant to verify that the physical properties of the earthwork materials meet the specified material properties. The CQA Consultant will obtain soil samples for conformance testing from borrow sources, on-site stockpiles, or from trucks as they unload material in the work area. Conformance sampling and laboratory testing of soil will be performed in accordance with the Specifications.

If a sample fails a conformance test, then the CQA Consultant will notify the Contractor and use of the material represented by that sample will not be allowed. Additional tests may be performed by the CQA Consultant if directed by the Owner, or the Contractor will use material from a different source.

8.3 Field Evaluation/Monitoring of Construction Techniques

The CQA Consultant will monitor and document the earthwork activities. Monitoring the construction work for the earthwork materials will include the following:

- Monitoring the thickness of lifts as loosely placed and after being compacted;
- Documenting the type of construction equipment and methods used to place and compact the material;
- Observing the action of the compaction and heavy hauling equipment on the construction surface (i.e., penetration, pumping, cracking, etc.) to detect inadequate compaction;
- Verifying that proper equipment and methods are used to place soil over the existing components of the final cover system, and that rutting and damage to underlying final cover system soils are minimized; and
- Verifying that only low-ground pressure equipment traverse over the existing final cover system areas unless an approved thickness of protective soil or construction matting is first placed.

9.0 FIELD TESTING OF WORK PRODUCTS

9.1 Routine Field Testing

Conformance field testing (primarily grain-size distribution, hydraulic conductivity, density, and moisture content testing) of placed/compacted earthwork materials will be performed by the CQA Consultant during construction to confirm that the requirements of the Specifications are met. Conformance field testing will be performed according to test methods provided in the Specifications. The CQA Consultant will select the test locations.

Soil components to be used within the final cover system repair shall be tested for grain size (ASTM D422) and hydraulic conductivity (ASTM D2434) in accordance with Env-Sw 805.16(b).

Moisture/density testing will be performed primarily using a nuclear gauge (in accordance with ASTM D 6938). The CQA Consultant will routinely verify the dry density calibration of the nuclear gauge throughout construction using standard calibration methods recommended by the equipment manufacturer.

The CQA Consultant will be responsible for submitting enough samples to the Soils CQA Laboratory to meet the minimum testing frequency.

9.2 Modified Testing Frequency

A modified testing frequency may be used at the discretion of the CQA Consultant when initial testing or visual observations of construction performance indicate a potential problem. Additional testing for suspected areas will be considered when:

- The compactor rollers slip during compaction operations;
- The lift thickness is greater than specified;

- The material is at a highly variable moisture content;
- Dirt-clogged rollers are used to compact the material;
- The material properties are highly variable;
- The degree of compaction is doubtful; or
- As directed by the CQA consultant or Owner.

During construction, the frequency of testing may also be increased in the following situations:

- Adverse weather conditions;
- Breakdown of equipment;
- At the start and finish of grading;
- If the material initially fails to meet compaction requirements; or
- The work area is reduced.

9.3 Deficiencies, Problems, and Repairs

If a deficiency or noncompliance is discovered, then the CQA Consultant will promptly evaluate the extent and nature of the defect. The extent of the deficient area will be evaluated by additional tests, observations, a review of records, or other means deemed appropriate (e.g., proof-rolling by the Contractor).

After defining the extent and nature of a defect, the CQA Consultant will notify the Contractor, and at times, the Owner, to schedule appropriate retests after the work deficiency is corrected.

If a specification criterion cannot be met, or unusual weather conditions hinder work, then the CQA Consultant will develop and present to the Owner or Engineer suggested alternative solutions for approval. Retests recommended by the CQA Consultant must verify that the deficiency was corrected before additional work is performed by the Contractor in the area of the deficiency.

10.0 GENERAL OBSERVATION AND DOCUMENTATION

In addition to the CQA components identified above, the CQA personnel was present to observe and document the construction of critical components of the project not specifically referenced herein. The Contractor will provide the CQA Consultant with at least 48 hours advance notice prior to performing work requiring observation to allow the CQA Consultant to schedule the appropriate personnel. Likewise, if scheduled work requiring the presence of CQA personnel is cancelled, then the Contractor will notify the CQA Manager promptly.

TESTING SUMMARY TABLES

CONFORMANCE TESTING SUMMARY TABLES

Table 1 – Clay Covering (Low Permeability) Soil Conformance Testing Summary

Properties	Test Method	Frequency (Area Fill) ⁽¹⁾	Frequency (Trench)
Grain Size Analysis	ASTM D422 (w/o hydrometer)	1 per 3,000 yd ³ (minimum of 1 per material source)	1 per 3,000 yd ³ (minimum of 1 per material source)
Moisture Content	ASTM D2216	1 per 3,000 yd ³ (minimum of 1 per material source)	1 per 3,000 yd ³ (minimum of 1 per material source)
Standard Proctor	ASTM D698	1 per 3,000 yd ³ (minimum of 2 per material source)	1 per 3,000 yd ³ (minimum of 1 per material source)
Hydraulic Conductivity	ASTM D5084	1 per 3,000 yd ³ (minimum of 1 per material source)	Not Applicable
Nuclear Density and Moisture Content	ASTM D6938	1 per 3,000 yd ³	1 per Lift per 200 Linear Feet

Table 2 - Aggregate Conformance Testing Summary

Properties	Test Method	Frequency
Grain Size Analysis	ASTM D422 (w/o hydrometer)	1 per 3,000 yd ³ (minimum of 1 per material source)

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APPENDIX A

TESTING FORMS

Daily Field Report		Page No. 1 of 1	
Project I.D.: Landfill Final Cover System Repair Construction		Location: Plaistow Unlined Municipal Landfill, Plaistow, NH	
		Report No.:	File No.
Time On-Site: 0.0	Office Time: 0.0	Contractor:	
Travel Time: 0.0	Total Time: 0.0	Date:	
Equipment On-Site:	Site Visitors:	Weather:	
		Field Representative:	
		Arrived: 0000 hrs.	Departure: 0000 hrs.
Field Representative Date	Attachments:		
Reviewed By Date	☐ None ☐ Field Density Test Summary ☐ Field Sketch ☐ Other		