Langdon Environmental LLC
404 The Hill, Post Office Box 511 (Mail)
Portsmouth, New Hampshire 03802

April 16, 2025

Haverhill Conservation Commission
4 Summer Street, City Hall
Haverhill, Massachusetts. 01830

Subject: Notice of Intent - Closure and Post-Closure Use of Northern Mound and Lot 26 Ash Area of Haverhill Landfill - MassDEP File Number 033-1540
Final Response to Comments

Dear Commissioners:

The following are the final responses to comments and questions from the Conservation Agent, Robert F. Moore, Jr., on the above referenced Notice of Intent (NOI). The following items are attached to this letter as requested at the continuation of the hearing on March 27, 2025:

1. Revised Long-Term Stormwater Pollution Prevention Plan dated April 16, 2025 that incorporates the approach outlined in our March 26, 2025 letter and the figure for each of the areas (Attachment A).

2. Compiled set of plans that incorporate revisions to the plans included in our March 26, 2025 letter and revisions made to the cap components in response to comments from the Massachusetts Department of Environmental Protection (MassDEP) on the pending Corrective Action Design and Post-Closure Use Permit Application (Attachment B).

3. A schematic figures developed from the design plan set showing the stormwater Best Management Practices (BMP) features on Lot 26 Ash Area and the Northern Mound of the Haverhill Landfill (Attachment C).

We look forward to meeting with the Commission at the April 17th meeting to continue our discussions on the NOI and respond to questions or provide further clarifications.

Please do not hesitate to contact me at (617) 875-3693 with any questions or if further details are needed.

Sincerely yours,

Bruce W. Haskell

Bruce W. Haskell, P.E.
Langdon Environmental LLC

cc: Robert Moore, Haverhill
Robert Ward, Haverhill
Jarrett Temple, Holcim
Dwight Dunk, Epsilon

Attachment A – Revised LTPPP

Langdon Environmental LLC

STORMWATER MANAGEMENT LONG TERM POLLUTION PREVENTION PLAN

HAVERHILL LANDFILL NORTHERN MOUND

OLD GROVELAND ROAD (ASSESSOR'S PARCEL 776-788-27) HAVERHILL, MASSACHUSETTS

Prepared for:

Langdon Environmental LLC
404 The Hill
PO Box 511
Portsmouth, NH 03802

Prepared by:

TEC, Inc.
282 Merrimack Street
2nd Floor
Lawrence MA, 01843

April 16, 2025 - REVISED

LONG TERM POLLUTION PREVENTION PLAN
April 16, 2025 - REVISED

Name of Owner:	**City of Haverhill, MA and Holcim-NER, Inc.**
Name of Facility:	**Haverhill Landfill - Northern Mound and Lot 26 Ash Area**
Location:	**Old Groveland Road, Haverhill, Massachusetts (Assessor's Parcel 776-788-27, North side of Old Groveland Road)**

The Owner agrees to comply with the following Long-Term Pollution Prevention Plan to ensure long-term stormwater quality discharge from the site:

- *Good housekeeping practices:* The proposed development will be maintained by the owners, including landscaping, parking area management, snow removal, de-icing, waste removal, and BMP inspection/maintenance.
- *Provisions for storing materials and waste products inside or under cover*: Waste products are not anticipated to be produced or stored on this site. Any waste products produced by the users of the recreational areas shall be placed into trash receptacles for removal or taken off-site by the producer. Owners/ operators shall inspect on-site areas for litter and trash on a weekly basis. Any accumulated trash, litter, and discarded materials in this area will be removed and will be disposed of at a suitable location on a weekly basis.
- *Vehicle washing controls:* Vehicle washing is not anticipated as a use of the site.
- *Spill prevention and response plans:* There are no proposed uses at the site that would provide an opportunity for a spill of oil or hazardous materials, other than a sudden, catastrophic, vehicle failure. If a vehicle release is the result of an accident, the police and fire department will respond and address any release. In the event of a spill of hazardous waste or oil, the facility operator shall be notified immediately. The operator shall assess the incident and initiate control measures. The operator shall contact the Fire Department. The Fire Department is ultimately responsible for matters of public health and safety and should be notified immediately. Based on the assessment by the Fire Chief, additional notification to a clean-up contractor may be made. The Massachusetts Department of Environmental Protection and the EPA may be notified depending upon the nature and severity of the spill. The Fire Chief will be responsible for determining the level of clean up and notification required.

  Provisions for maintenance of lawns, gardens, and other landscaped areas: The long-term maintenance for the landscaped areas and stormwater BMPs on the capped Northern Mound and Lot 26 Ash Area are as follows:

  - The field and surrounding areas including strips along the pathways will be mowed weekly during the growing season to maintain a maintained grass cover. The field and these areas to be frequently mowed will be planted

with an appropriate grass seed mix selected and approved by the Landscape Architect.

- Other grassed areas including the two mounded areas on the Northern Mound and the top of the slope along the Merrimack River and Johnson's Creek will be maintained in the accordance with the standard procedures for capped landfills. These areas will be mowed once or twice per year to limit the establishment of woody or shrubby vegetation. These areas will be planted with the typical slope grass seed mix used by Langdon at numerous landfill sites.

- The areas on the Northern Mound to be planted with trees will not be mowed. Other vegetation establishes below the trees may occasionally be cut out or removed. The area under the trees will be planted with the same grass seed mix as the mounded area discussed above.

- The bottom and side slopes of the stormwater basins will be planted with the New England Erosion Control/Restoration Mix For Detention Basins and Moist Sites seed mix from New England Wetlands Plants or approved equal. This seed mix is intended to not be mowed. Any shrubs or small trees that get established in the basins will be periodically removed.

A schematic figure showing the different areas is attached.

Landscape areas shall be maintained in a neat and orderly fashion. Landscape maintenance debris shall not be deposited on adjacent properties and properly disposed of off-site as necessary to maintain a clean and orderly appearance. Inspect for signs of erosion, rilling, gullying. Areas should be reseeded for stabilization. If areas need constant maintenance apply mulch/wood chips to help prevent further erosion.

- *Requirements for storage and use of fertilizers, herbicides, and pesticides:* At this time there would be no foreseeable need for fertilizers, herbicides, and pesticides. If these are to be kept on site, they shall be kept indoors. The use of these chemicals shall be in a manner consistent with the products intended use and manufacturer's specifications. If fertilizers, herbicides or pesticides are required, their use will be limited to the recreational field areas.
- *Provisions for operation and management of septic systems:* Not Applicable
- *Provisions for solid waste management:* Any waste products produced by the users of the recreational areas shall be placed into trash receptacles for removal or taken off-site by the producer. Owners/ operators shall inspect on-site areas for litter and trash on a weekly basis. Any accumulated trash, litter, and discarded materials in this area will be removed and will be disposed of at a suitable location on a weekly basis.

- *Snow disposal and plowing plans relative to Wetland Resource Areas:* No snow will be stored or disposed of in surrounding resource areas. Snow plowing will be done to allow safe access to and throughout the site. No salt shall be used to treat unpaved areas during snow and ice conditions. Snow from lighter storms shall be plowed to the perimeter of the parking lots and allowed to melt onto the pavement surfaces. Snow shall be temporarily stockpiled on the pavement surface during larger storm events to keep the parking area open. Stockpiling shall be temporary and shall be located within designated areas throughout the Site, furthest away from resource areas. If Site snow storage interferes with parking lot operations (i.e. blocking of travel aisles, sight distance, or parking) the snow pile will be either removed or reduced legally within 24 hours. The City does not intend to utilize the recreational facility during the winter months when plowing of the parking lot would be required.
- *Street sweeping*: The owner will perform street sweeping as needed to minimize sediment build up along the roadway.
- *Provisions for prevention of illicit discharges to the stormwater management system:* Only stormwater is proposed to be conveyed through the stormwater management system. No illicit materials shall be permitted. The owners will be responsible for maintaining this system.
- *Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL.* The project is considered a LUHPPL, however the final capping of the landfill will eliminate all exposure to hazardous materials. In the event or a vehicular spill, the owner and fire department shall be responsible for clean-up and contamination removal.
- *Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan:* Prior to implementation of the LTPPP, the owners shall provide an on-site meeting with the maintenance personnel to present the contents and requirements of the Stormwater Operation and Maintenance Plan and the LTPPP.
- *List of Emergency contacts for implementing Long-Term Pollution Prevention Plan*: TBD

WATER QUALITY SWALE SEED MIX AS SPECIFIED. SWALE SHALL BE CUT ONCE A YEAR. GRASS LENGTH SHALL NOT BE LESS THAN 6" AFTER CUTTING

PLAYING FIELD TURF SHALL BE CUT ONCE A WEEK OR AS NECESSARY TO MAINTAIN PLAYING SURFACE

LANDFILL CAP GRASS MIX SHALL BE MOWN ONCE OR TWICE A YEAR AS NECESSARY TO PREVENT THE GROWTH OF WOODY VEGETATION. GRASS LENGTH SHALL BE NO LESS THAN 4" AFTER CUTTING.

TREE AND SHRUB AREA SHALL NOT BE MOWN OR CUT USING A STRING TRIMMER.

LEGEND

- PROPERTY LINE
- DIGITIZED EASEMENT BOUNDARY SEE GENERAL NOTE #3
- WETLAND FLAG LOCATION AND NUMBER
- WETLAND BOUNDARY BY FLAG LOCATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- HIGHEST ASTRONOMICAL TIDE (EL. 5.87)
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA 10-YEAR FLOODPLAIN (EL. 14')
- 100-YR FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21')
- APPROXIMATE EDGE OF EXISTING LANDFILLED WASTE
- PROPOSED 2 FOOT CONTOUR
- 50 PROPOSED 10 FOOT CONTOUR
- ASSUMED FINAL EDGE OF LANDFILLED WASTE
- PROPOSED CHAIN LINK FENCE
- 42.60 FINISH GRADE SPOTGRADE

NO.	DATE	BY	CHECKED	DESCRIPTION
1	3/14/25	JC	BH	RESPONSE TO REGULATORY COMMENTS

REVISIONS

BRUCE W. HUNT HISTORICAL COMMISSION

Langdon Environmental LLC

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(617) 875-3853

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VEGETATION MAINTENANCE PLAN

HAVERHILL LANDFILL–NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

FIG. 1

Attachment B – Compiled Design Plans

HAVERHILL LANDFILL-NORTHERN MOUND AND LOT 26 ASH AREA

CORRECTIVE ACTION DESIGN AND POST CLOSURE USE
CWSRF # 16799

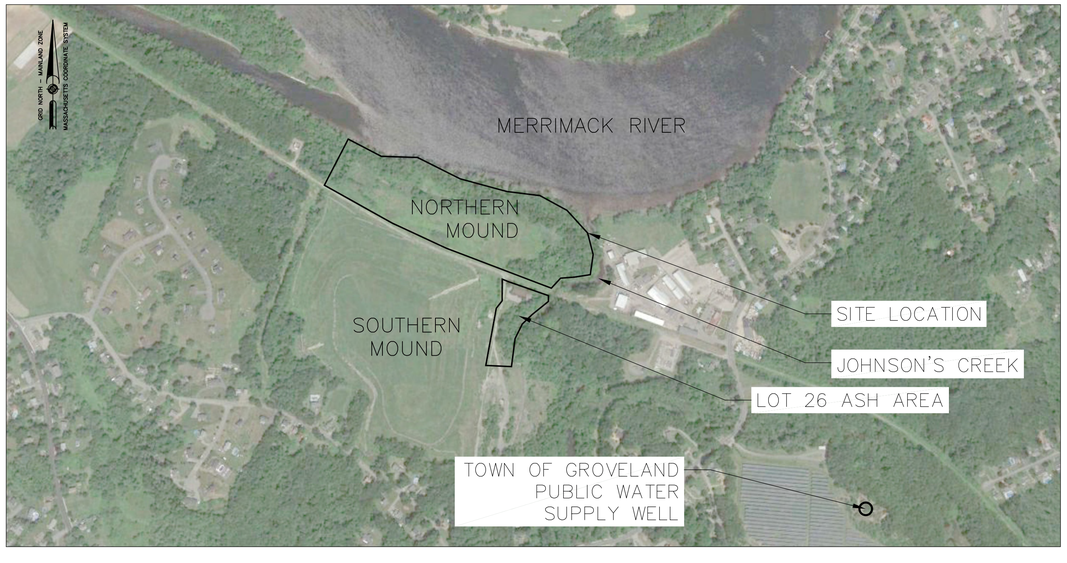
OLD GROVELAND ROAD
HAVERHILL, MA

PREPARED FOR:

CITY OF HAVERHILL MASSACHUSETTS

MAYOR: MELINDA E. BARRETT
DIRECTOR OF PUBLIC WORKS: ROBERT E. WARD

HOLCIM–NER, INC.
REGIONAL MANAGER, LAND AND ENVIRONMENT:
JARRETT TEMPLE



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MAY 2025

COMMONWEALTH OF MASSACHUSETTS
BRUCE W. HASKELL
No. 37467
REGISTERED PROFESSIONAL ENGINEER
10-10-2024

Langdon Environmental LLC
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GENERAL NOTES

1. THE TOPOGRAPHIC INFORMATION FOR NORTHERN MOUND AND LOT 26 ASH AREA SHOWN HEREIN IS FROM A FIELD SURVEY COMPLETED BY T.F. BERNIER, INC. OF CONCORD, NEW HAMPSHIRE IN AUGUST 2017. BOUNDARY INFORMATION IS FROM PLAN REFERENCE NUMBER 1. NO VERIFICATION OR UPDATING OF THE BOUNDARY INFORMATION WAS DONE IN THE PREPARATION OF THIS PLAN. KNOWN DISCREPANCIES EXIST INCLUDING THE LOCATION OF JOHNSON'S CREEK WHICH MAY AFFECT THE MUNICIPAL BOUNDARY.
2. EXISTING CONDITIONS OF YEMMA ROAD WERE COMPILED FROM PUBLICLY AVAILABLE GIS, LIDAR, ETC. CONTRACTOR TO CONFIRM LOCATIONS OF ALL BOUNDARIES, STRUCTURES, AND APPURTENANCES PRIOR TO CONSTRUCTION ACTIVITIES.
3. THE VERTICAL DATUM IS NAVD88 BASED ON MULTIPLE STATIC GPS OBSERVATIONS COMPLETED BY T.F. BERNIER, INC.
4. EASEMENT BOUNDARIES SHOWN HEREON HAVE BEEN DIGITIZED FROM PLAN REFERENCE NUMBER 1 AND ARE FOR INFORMATION PURPOSES ONLY. FOR DESCRIPTION AND COMPLETE INFORMATION SEE SAID PLAN REFERENCE NUMBER 1.
5. WETLAND DELINEATION WAS CONDUCTED BY EPSILON ASSOCIATES ON JULY 7 AND 12, 2017. DELINEATION WAS APPROVED BY HAVERHILL CONSERVATION COMMISSION IN ORDER OF RESOURCE AREA DELINEATION (ORAD) DATED JANUARY 19, 2018 AND GROVELAND CONSERVATION COMMISSION ORAD DATED JANUARY 22, 2018. ORDER OF CONDITIONS FROM HAVERHILL AND GROVELAND CONSERVATION COMMISSIONS INCLUDED IN PROJECT MANUAL.
6. ELEVATIONS BASED ON DATA FROM NOAA STATION 8440889, RIVERSIDE, MERRIMACK RIVER, MA:
   MEAN HIGH WATER (MHW)= +4.46' NAVD88.
   MEAN LOW WATER (MLW)= −1.26' NAVD88.
   CHAPTER 91 LICENSE NO. 12877
6. FEMA 100−YEAR FLOODPLAIN ZONE ELEVATION / BORDERING LAND SUBJECT TO FLOODING (BLSF) = El. 21 NAVD88. FEMA 10−YEAR FLOODPLAIN = EL. 14 NAVD88.
7. ACCESS TO MASS ELECTRIC PROPERTY TO BE MAINTAINED CONTINUOUSLY DURING CONSTRUCTION ACTIVITIES. ACCESS TO SOLAR PHOTOVOLTAIC INSTALLATION ON SOUTHERN MOUND AND BATTERY STORAGE AREA ON LOT 26 TO BE MAINTAINED CONTINUOUSLY DURING CONSTRUCTION ACTIVITIES.
8. CONTRACTOR TO FIELD LOCATE ALL PROPERTY LINES AND EASEMENTS WITHIN LIMIT OF WORK PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. CONTRACTOR TO MAINTAIN LOCATIONS THROUGHOUT CONSTRUCTION AND REESTABLISH MARKINGS AS NECESSARY. PROPERTY LINES AND EASEMENT LOCATION TO BE PROVIDED BY A REGISTERED LAND SURVEYOR LICENSED IN MASSACHUSETTS.
9. ALL CONSTRUCTION ACCESS TO BE FROM YEMMA ROAD. SEE SPECIFICATIONS FOR DESIGNATED TRUCK ROUTES.

PLAN REFERENCE NOTES

1. PLAN REFERENCE OF LAND LOCATED IN HAVERHILL AND GROVELAND MASSACHUSETTS PREPARED FOR CDM, CITY OF HAVERHILL AND AGGREGATE INDUSTRIES, SCALE: 1"=120', DATED FEBRUARY 3, 2006 PREPARED BY SCOTT L. GILES P.L.S. #13972.

SITE PREPARATION NOTES:

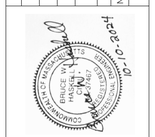
1. NOTIFY "DIGSAFE" AT 1 888−344−7233 TO ARRANGE FOR MARKING OUT EXISTING UNDERGROUND UTILITIES AT LEAST 72 HOURS (EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS) PRIOR TO BEGINNING EXCAVATION AT ANY GIVEN LOCATION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR BE ALLOWED TO START ANY KIND OF EXCAVATION WORK PRIOR TO OBTAINING ALL THE NECESSARY INFORMATION REGARDING THE LOCATION OF UNDERGROUND UTILITIES AT THE SITE.
2. THE EXISTENCE OF UTILITIES AND APPURTENANCES AS SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY, AND THE EXACT SIZE, TYPE, LOCATION AND ELEVATION SHALL BE THOROUGHLY INVESTIGATED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
3. ACCOMPLISH ALL EXCAVATION SO THAT UNDERGROUND UTILITIES OR STRUCTURES ARE NOT DAMAGED. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED DURING EXCAVATION OPERATIONS. REPAIR ANY EXISTING PIPE OR UTILITY DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.
4. CONTRACTOR SHALL BE AWARE OF ANY OVERHEAD UTILITIES AND MAKE THE NECESSARY ARRANGEMENTS TO PERFORM ANY WORK NEAR THE OVERHEAD UTILITIES, PRIOR TO THE START OF CONSTRUCTION ACTIVITIES IN THESE AREAS.
5. ALL EXCAVATION SHALL COMPLY WITH THE LATEST OSHA STANDARDS. PROVIDE ALL REQUIREMENTS OF OSHA EXCAVATION STANDARDS INCLUDING BUT NOT LIMITED TO THE PROVISIONS FOR A COMPETENT PERSON ON SITE AND REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A REGISTERED PROFESSIONAL ENGINEER.
6. ENGINEER SHALL BE NOTIFIED OF ANY STORM, SANITARY, OR OTHER PIPE DISCOVERED DURING CONSTRUCTION THAT IS NOT SHOWN ON THE DRAWINGS.
7. ADJUST ALL MANHOLES, CATCH BASINS, WATER SHUT−OFFS AND VALVES, AND ANY OTHER STRUCTURE TO BE FLUSH WITH PROPOSED FINISHED GRADE.
8. EXISTING UTILITIES, PROPERTY LINES AND SITE TOPOGRAPHY BASED ON SITE SURVEY BY GUERRIERE & HALNON, DATED JULY 7, 2015, REVISED 28 MARCH 2017.
9. LOCATIONS OF UTILITIES SHOULD STILL BE CONSIDERED APPROXIMATE. ALL UTILITIES MAY NOT BE SHOWN.
10. EXISTING MONITORING WELLS, LANDFILL GAS MONITORING WELLS, AND FLOODPLAIN LINE AND FROM FIELD SURVEY COMPLETED BY T.F. BERNIER, INC. OF CONCORD, NEW HAMPSHIRE DATED AUGUST 2019.

CONSTRUCTION NOTES:

1. THE EDGE OF LANDFILLED WASTE FOR THE NORTHERN MOUND SHOWN ON THE PLANS IS APPROXIMATE AND BASED ON SUBSURFACE INVESTIGATIONS PERFORMED BY LANGDON ENVIRONMENTAL LLC AND OTHERS. DURING CONSTRUCTION, SUPPLEMENTAL TEST PITS AND INVESTIGATIONS SHALL BE PERFORMED BY THE CONTRACTOR TO CONFIRM THE EDGE OF LANDFILLED WASTE. WHERE REQUIRED, LANDFILLED WASTE OUTSIDE THE LIMIT OF THE PROPOSED CAP WILL BE EXCAVATED AND RELOCATED WITHIN THE LIMITS OF THE LANDFILL TO BE CAPPED. ENGINEER MAY MODIFY LIMIT OF CAP AS SHOWN IF LANDFILLED WASTE LEFT IN PLACE.
2. THE EDGE OF WASTE ON LOT 26 ASH AREA IS AS APPROVED BY MASSDEP. NO ADDITIONAL TEST PITS TO DELINEATE THE EDGE OF WASTE ARE REQUIRED. ENGINEER MAY DIRECT CONTRACTOR TO PERFORM ADDITIONAL TEST PITS BASED ON FIELD OBSERVATIONS.
3. WASTE TO BE RELOCATED MAY INCLUDE MUNICIPAL SOLID WASTE, CONSTRUCTION AND DEMOLITION WASTE, MUNICIPAL WASTEWATER TREATMENT RESIDUALS FROM PAPERBOARD PROCESSING. CONTRACTOR SHALL PROVIDE ODOR CONTROLS SO AS TO NOT CREATE OFF−SITE ODOR NUISANCE CONDITIONS.
4. CONTRACTOR SHALL COVER ALL EXPOSED LANDFILLED WASTE AT THE END OF EACH OPERATING DAY IN ACCORDANCE WITH THE REQUIREMENTS OF MASSDEP'S SOLID WASTE MANAGEMENT REGULATIONS (310 CMR 19−000) AND THE SPECIFICATIONS.
5. RELOCATED SOLID WASTE WILL BE PLACED IN COMPACTED LIFTS NOT TO EXCEED THREE FEET IN THICKNESS AND COVERED WITH A MINIMUM OF SIX−INCHES OF SOIL DAILY COVER IN ACCORDANCE WITH THE REQUIREMENTS OF THE SOLID WASTE MANAGEMENT REGULATIONS (310 CMR 19.000) PROMULGATED BY THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASSDEP).
6. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE DISTURBANCE OF THE EXISTING SITE. DISTURBANCES TO INSTALL CONTROL MEASURES SHALL BE LIMITED.
7. EROSION AND SEDIMENT CONTROL MEASURES SHOWN MAY BE INSTALLED IN PHASES IF AREAS OF THE SITE ARE TO BE DISTURBED IN PHASES. EROSION CONTROLS AS SHOWN MAY BE TEMPORARILY RELOCATED TO ALLOW EXCAVATION OF LANDFILLED WASTE. FINAL LOCATION OF EROSION CONTROLS TO BE AS FAR OUTSIDE OF LIMIT OF DISTURBED AS POSSIBLE WITHOUT BEING PLACED IN FLAGGED BORDERING VEGETATED WETLAND (BVW) AREAS.
8. TEMPORARY EROSION AND STORMWATER CONTROLS SHALL BE INSTALLED TO MINIMIZE EROSION AND DAMAGE TO DELINEATED WETLAND RESOURCE AREAS. STORMWATER CONTROLS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) TO BE PREPARED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTION

REVISIONS



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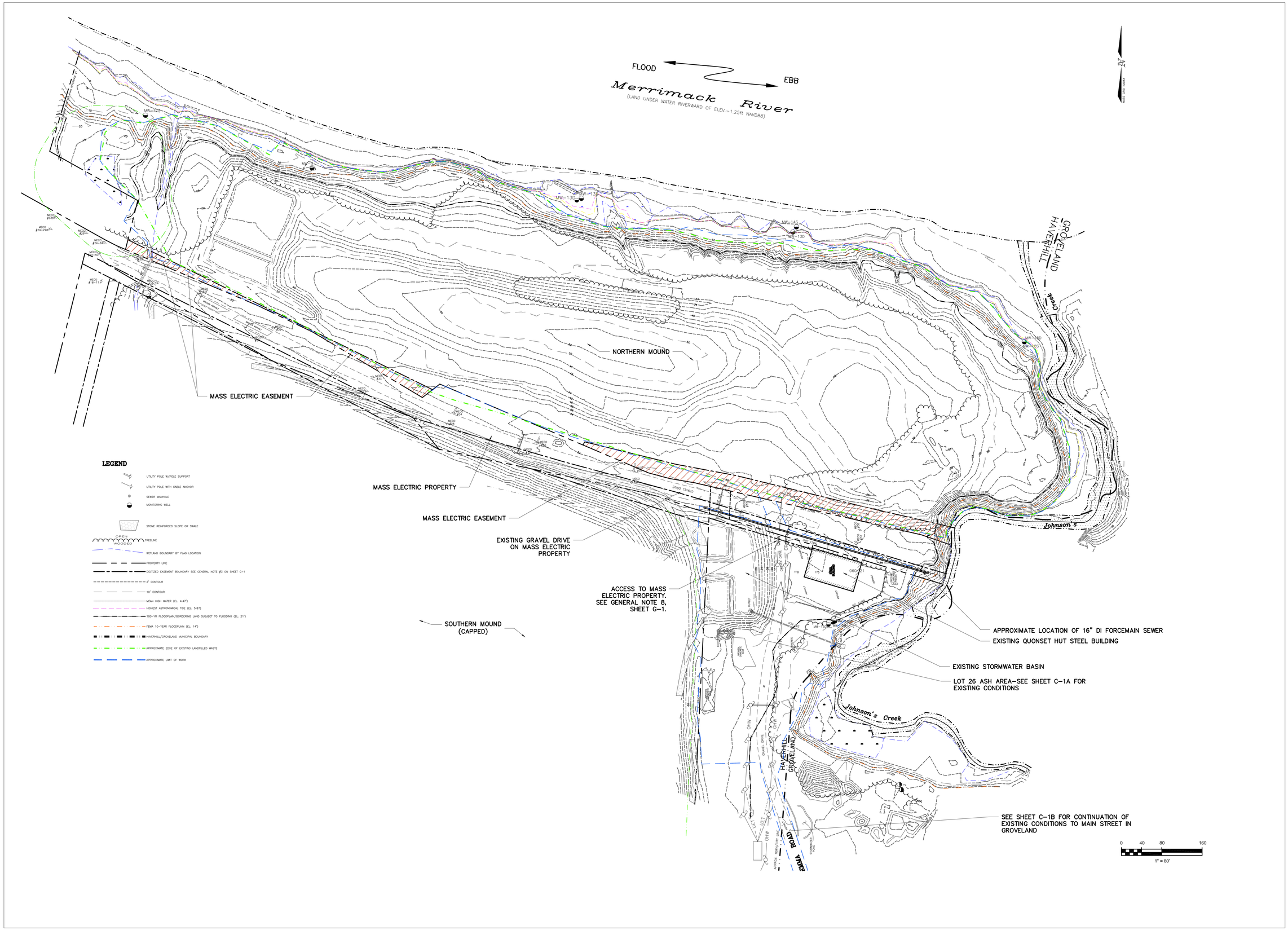
GENERAL NOTES

HAVERHILL LANDFILL−NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

G−1



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EXISTING CONDITIONS
PLAN-NORTHERN MOUND

HAVERHILL LANDFILL-NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-1

SOUTHERN MOUND (CAPPED)

APPROXIMATE LOCATION OF CLEAN CORRIDOR CONSTRUCTED DURING CLOSURE OF SOUTHERN MOUND.

APPROXIMATE EDGE OF EXISTING SOUTHERN MOUND FINAL CAP (TO BE FIELD CONFIRMED)

EXISTING 24" RCP DRAIN PIPE

CONCRETE AND BUILDING DEBRIS

BROKEN CONCRETE SLAB

BROKEN CONCRETE SLAB

EXISTING UTILITY POLES

DELINEATED LIMIT OF LOT 26 ASH AREA

EXISTING GRAVEL ACCESS ROAD. SEE GENERAL NOTE 7.

GRAVEL DRIVE

OHW

GRAVEL DRIVE

GATE

GATE

GATE

GATE

CONCRETE

24" RCP

ASPHALT

BIT. CURB

HAVERHILL

GROVELAND

APPROX. TOWN/CITY LINE

MW-15D

MW-15M

MW-15S

INV.=9.0

CONCRETE DEBRIS

Johnson's Creek

PRESERVE AND PROTECT EXISTING MONITORING WELLS

APPROXIMATE LOCATION OF FORCEMAIN SEWER

PRECAST CONCRETE PIECES

18"RCP

18" RCP

EXISTING STORMWATER BASIN WITH FOREBAYS AND OUTFALL STRUCTURE

NORTHERN MOUND

MECO #31

MECO #37

POLES FOR INTERCONNECTION OF SOUTHERN MOUND SOLAR PV INSTALLATION (TYP.)

EXISTING QUONSET HUT BUILDING

MASS ELECTRIC PROPERTY

200' RIVERFRONT AREA

MECO #32

MECO #38

EXISTING CHAIN LINK FENCE

16" DI SEWER FORCE MAIN. CONTRACTOR TO VERIFY LOCATION.

100' WETLAND BUFFER ZONE

MASS GRID NAD83

0 15 30 60

1" = 30'

LEGEND

- EXISTING UTILITY POLE W/POLE SUPPORT
- EXISTING UTILITY POLE WITH CABLE ANCHOR
- MW EXISTING MONITORING WELL
- A116 WETLAND FLAG LOCATION AND NUMBER
- OPEN / WOODED TREELINE
- WETLAND BOUNDARY BY FLAG LOCATION
- CHAINLINK FENCE
- EROSION CONTROL BARRIER
- TURTLE EXCLUSION BARRIER
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- 10 YEAR FLOODPLAIN (EL. 14)
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21)
- HAVERHILL/GROVELAND MUNICIPAL BOUNDARY
- EDGE OF EXISTING SOUTHERN MOUND FINAL CAP
- DELINEATED LIMIT OF LOT 26 ASH AREA

REVISIONS

COMMONWEALTH OF MASSACHUSETTS BRUCE W. HAMILTON CIVIL No. 47182 REGISTERED PROFESSIONAL ENGINEER 10-10-2024

Langdon Environmental LLC

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EXISTING CONDITIONS
PLAN-LOT 26 ASH AREA

HAVERHILL LANDFILL-NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-1A

SOUTHERN MOUND (CAPPED–SOLAR PV INSTALLATION ON PLATEAU)

LIMIT OF LOT 26 ASH AREA. SEE SHEET C–1A FOR EXISTING CONDITIONS

EXISTING FENCED SOLAR BATTERY STORAGE FACILITY

Johnson's Creek

HAVERHILL
GROVELAND

YEMMA ROAD

APPROXIMATE LOCATION OF BORDERING LAND SUBJECT TO FLOODING (ELEV. 21)

LIMITS OF YEMMA ROAD PAVEMENT

EXISTING 8" WATER LINE

JOHNSON'S CREEK.

ACCESS ROAD TO SOUTHERN MOUND AND SOLAR PHOTOVOLTAIC INSTALLATION

EXISTING ENTRANCE GATE

APPROXIMATE LOCATION OF BORDERING LAND SUBJECT TO FLOODING (ELEV. 21)

EXISTING RESIDENCE

OLD GROVELAND ROAD (PUBLIC–50' WIDE)

LAWRENCE ROAD

MAIN STREET

YEMMA ROAD

HAVERHILL
GROVELAND

LEGEND

- PROPERTY LINE
- WETLAND FLAG LOCATION AND NUMBER
- WETLAND BOUNDARY BY FLAG LOCATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA 10–YEAR FLOODPLAIN (EL. 14')
- 100–YR FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21')
- HAVERHILL/GROVELAND MUNICIPAL BOUNDARY
- APPROXIMATE EDGE OF EXISTING LANDFILLED WASTE
- PROPOSED 2 FOOT CONTOUR
- 50 PROPOSED 10 FOOT CONTOUR
- FINAL EDGE OF LANDFILLED WASTE/ PROPOSED LIMIT OF FINAL CAP.
- LIMIT OF LOT 26 ASH AREA
- APPROXIMATE LIMIT OF WORK
- UTILITY POLE
- UTILITY POLE WITH CABLE ANCHOR
- TURTLE EXCLUSION BARRIER

NOTE:
TOPOGRAPHIC INFORMATION AND PROPERTY LINES ALONG OLD GROVELAND ROAD AND MAIN STREET ARE FROM PUBLICLY AVAILABLE INFORMATION AND ARE APPROXIMATE.

0 40 80 160
1" = 80'

REVISIONS

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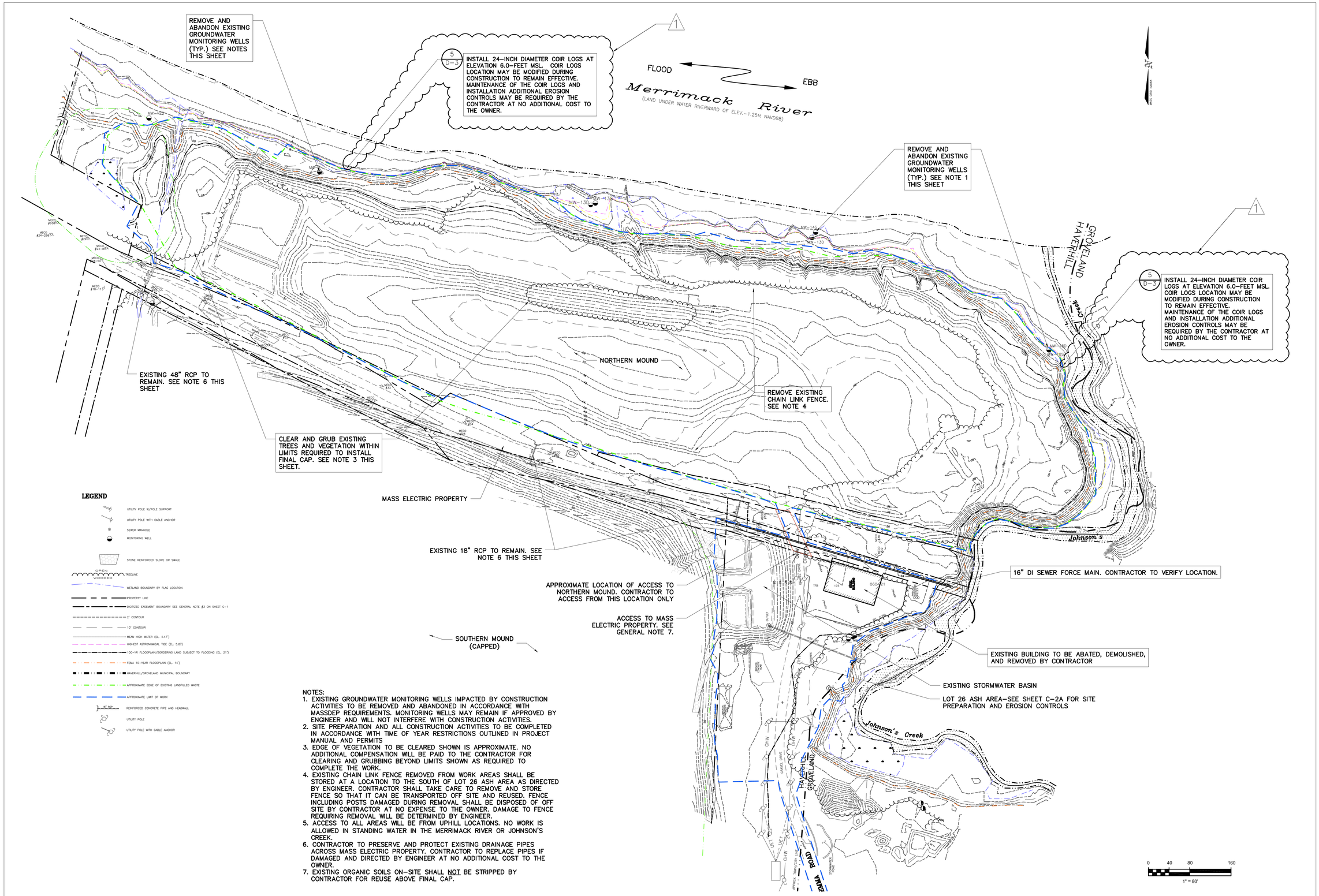
EXISTING CONDITIONS PLAN–YEMMA ROAD

HAVERHILL LANDFILL–NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C–1B



LEGEND

- UTILITY POLE W/POLE SUPPORT
- UTILITY POLE WITH CABLE ANCHOR
- SEWER MANHOLE
- MONITORING WELL
- STONE REINFORCED SLOPE OR SWALE
- OPEN / WOODED — TREELINE
- WETLAND BOUNDARY BY FLAG LOCATION
- PROPERTY LINE
- DIGITIZED EASEMENT BOUNDARY SEE GENERAL NOTE #3 ON SHEET G-1
- 2' CONTOUR
- 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- HIGHEST ASTRONOMICAL TIDE (EL. 5.87)
- 100-YR FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21')
- FEMA 10-YEAR FLOODPLAIN (EL. 14')
- HAVERHILL/GROVELAND MUNICIPAL BOUNDARY
- APPROXIMATE EDGE OF EXISTING LANDFILLED WASTE
- APPROXIMATE LIMIT OF WORK
- 18" RCP — REINFORCED CONCRETE PIPE AND HEADWALL
- UTILITY POLE
- UTILITY POLE WITH CABLE ANCHOR

NOTES:

1. EXISTING GROUNDWATER MONITORING WELLS IMPACTED BY CONSTRUCTION ACTIVITIES TO BE REMOVED AND ABANDONED IN ACCORDANCE WITH MASSDEP REQUIREMENTS. MONITORING WELLS MAY REMAIN IF APPROVED BY ENGINEER AND WILL NOT INTERFERE WITH CONSTRUCTION ACTIVITIES.
2. SITE PREPARATION AND ALL CONSTRUCTION ACTIVITIES TO BE COMPLETED IN ACCORDANCE WITH TIME OF YEAR RESTRICTIONS OUTLINED IN PROJECT MANUAL AND PERMITS
3. EDGE OF VEGETATION TO BE CLEARED SHOWN IS APPROXIMATE. NO ADDITIONAL COMPENSATION WILL BE PAID TO THE CONTRACTOR FOR CLEARING AND GRUBBING BEYOND LIMITS SHOWN AS REQUIRED TO COMPLETE THE WORK.
4. EXISTING CHAIN LINK FENCE REMOVED FROM WORK AREAS SHALL BE STORED AT A LOCATION TO THE SOUTH OF LOT 26 ASH AREA AS DIRECTED BY ENGINEER. CONTRACTOR SHALL TAKE CARE TO REMOVE AND STORE FENCE SO THAT IT CAN BE TRANSPORTED OFF SITE AND REUSED. FENCE INCLUDING POSTS DAMAGED DURING REMOVAL SHALL BE DISPOSED OF OFF SITE BY CONTRACTOR AT NO EXPENSE TO THE OWNER. DAMAGE TO FENCE REQUIRING REMOVAL WILL BE DETERMINED BY ENGINEER.
5. ACCESS TO ALL AREAS WILL BE FROM UPHILL LOCATIONS. NO WORK IS ALLOWED IN STANDING WATER IN THE MERRIMACK RIVER OR JOHNSON'S CREEK.
6. CONTRACTOR TO PRESERVE AND PROTECT EXISTING DRAINAGE PIPES ACROSS MASS ELECTRIC PROPERTY. CONTRACTOR TO REPLACE PIPES IF DAMAGED AND DIRECTED BY ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
7. EXISTING ORGANIC SOILS ON-SITE SHALL <u>NOT</u> BE STRIPPED BY CONTRACTOR FOR REUSE ABOVE FINAL CAP.

NO.	DATE	BY	CHECKED	DESCRIPTION
1	3/14/25	JC	BH	RESPONSE TO REGULATORY COMMENTS

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SITE PREPARATION AND EROSION CONTROLS PLAN– NORTHERN MOUND

HAVERHILL LANDFILL–NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-2

SOUTHERN MOUND (CAPPED)

APPROXIMATE LOCATION OF CLEAN CORRIDOR CONSTRUCTED DURING CLOSURE OF SOUTHERN MOUND.

APPROXIMATE EDGE OF EXISTING SOUTHERN MOUND FINAL CAP (TO BE FIELD CONFIRMED)

REMAINING CONCRETE AND BUILDING DEBRIS TO BE BROKEN UP AND BURIED BELOW THE CAP (TYP.)

DELINEATED LIMIT OF LOT 26 ASH AREA

CONTRACTOR TO PROTECT UTILITY POLES WITH APPROPRIATE BARRIERS (TYP.)

CLEAR AND GRUB EXISTING VEGETATION TO LIMITS REQUIRED TO INSTALL NEW CAP. SEE NOTE 3 ON SHEET C-2

EXISTING GRAVEL ACCESS ROAD. SEE GENERAL NOTE 7.

APPROX. TOWN/CITY LINE

2/D-6 INSTALL TURTLE EXCLUSION BARRIER ALONG ROAD. FINAL LOCATION TO BE APPROVED BY ENGINEER

1/D-6 EROSION CONTROL BARRIERS (TYP.)

24" DIA. RCP TO BE MAINTAINED UNTIL REPLACED.

PRESERVE AND PROTECT EXISTING MONITORING WELLS

18"RCP TO REMAIN. SEE NOTE 6 ON SHEET C-2

EXISTING TEMPORARY STORMWATER BASIN TO BE MAINTAINED UNTIL REPLACED. NOTE BASIN RECEIVES STORMWATER FROM SOUTHERN MOUND AND MASS ELECTRIC PROPERTY

NORTHERN MOUND

POLES FOR INTERCONNECTION OF SOUTHERN MOUND SOLAR PV INSTALLATION (TYP.). POLES TO BE PROTECTED DURING CONSTRUCTION

EXISTING QUONSET HUT BUILDING TO BE ABATED, DEMOLISHED AND REMOVED

MASS ELECTRIC PROPERTY

EXISTING CHAIN LINK FENCE TO BE REMOVED AND STORED ON-SITE. SEE NOTE 4 ON SHEET C-2

EXISTING ASPHALT TO BE BROKEN UP AND BURIED BELOW FINAL CAP

16" DI SEWER FORCE MAIN. CONTRACTOR TO FIELD VERIFY LOCATION IF NEEDED. CONTRACTOR TO PROTECT PIPE.

200' RIVERFRONT AREA

100' WETLAND BUFFER ZONE

HAVERHILL

GROVELAND

Johnson's Creek

BROKEN CONCRETE SLAB

GRAVEL DRIVE

GATE

ASPHALT

BIT. CURB

24" RCP

18" RCP

OHW

MECO #37

MECO #38

PRECAST CONCRETE PIECES

MW-19D

MW-19S

INV.=9.0

LEGEND

- EXISTING UTILITY POLE W/POLE SUPPORT
- EXISTING UTILITY POLE WITH CABLE ANCHOR
- EXISTING MONITORING WELL
- WETLAND FLAG LOCATION AND NUMBER
- OPEN WOODED TREELINE
- WETLAND BOUNDARY BY FLAG LOCATION
- CHAINLINK FENCE
- EROSION CONTROL BARRIER
- TURTLE EXCLUSION BARRIER
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- 10 YEAR FLOODPLAIN (EL. 14)
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21)
- HAVERHILL/GROVELAND MUNICIPAL BOUNDARY
- EDGE OF EXISTING SOUTHERN MOUND FINAL CAP
- DELINEATED LIMIT OF LOT 26 ASH AREA

SEE SHEET C-2 FOR SITE PREPARATION NOTES

0 15 30 60
1" = 30'

REVISIONS

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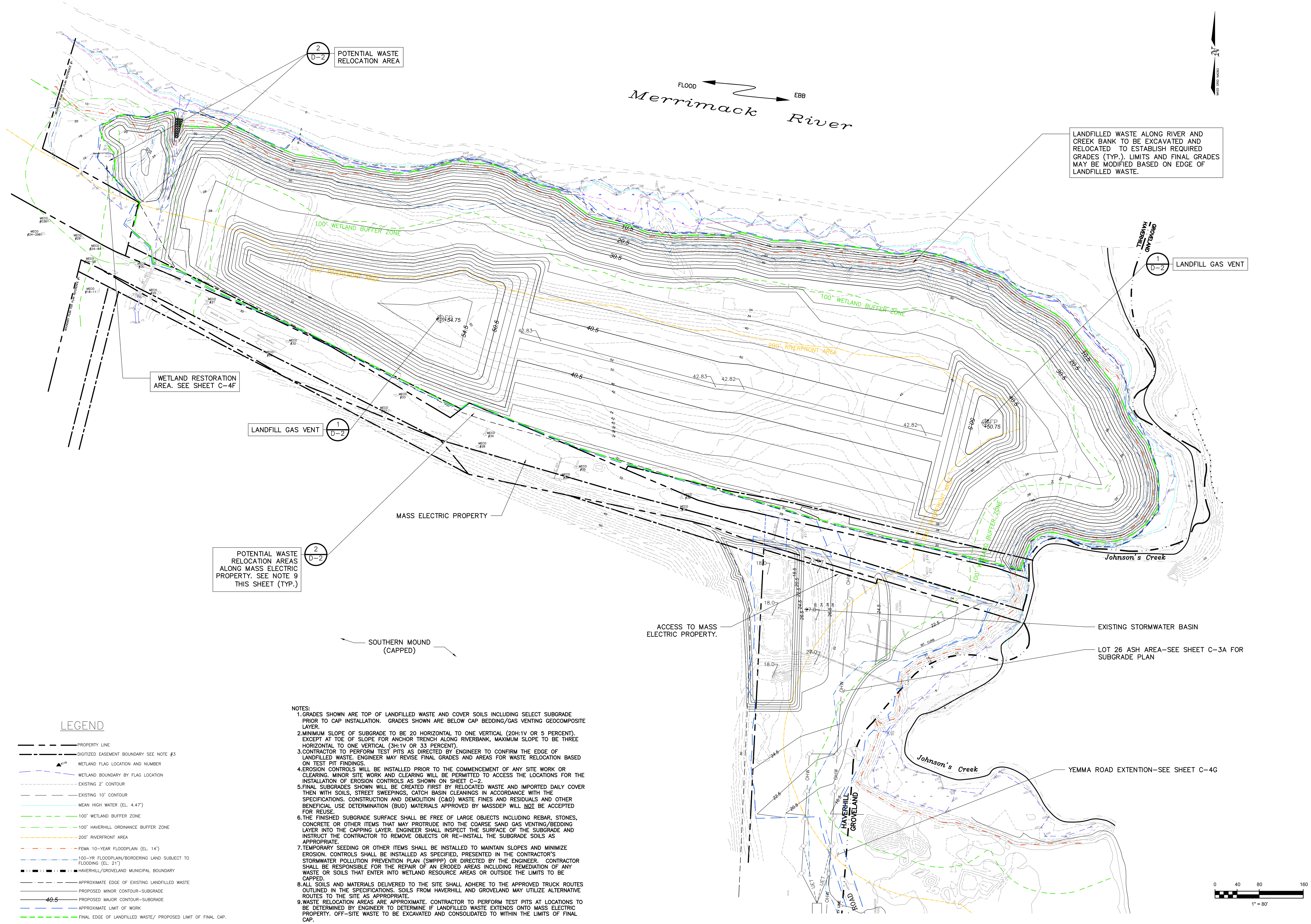
SITE PREPARATION AND EROSION CONTROLS PLAN-LOT 26 ASH AREA

HAVERHILL LANDFILL-NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-2A



LEGEND

- PROPERTY LINE
- DIGITIZED EASEMENT BOUNDARY SEE NOTE #3
- A116 — WETLAND FLAG LOCATION AND NUMBER
- WETLAND BOUNDARY BY FLAG LOCATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA 10-YEAR FLOODPLAIN (EL. 14')
- 100-YR FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21')
- HAVERHILL/GROVELAND MUNICIPAL BOUNDARY
- APPROXIMATE EDGE OF EXISTING LANDFILLED WASTE
- PROPOSED MINOR CONTOUR-SUBGRADE
- 40.5 — PROPOSED MAJOR CONTOUR-SUBGRADE
- APPROXIMATE LIMIT OF WORK
- FINAL EDGE OF LANDFILLED WASTE/ PROPOSED LIMIT OF FINAL CAP.
- FP — LANDFILL GAS VENT
- 42.83 — SUBGRADE SPOTGRADE

NOTES:

1. GRADES SHOWN ARE TOP OF LANDFILLED WASTE AND COVER SOILS INCLUDING SELECT SUBGRADE PRIOR TO CAP INSTALLATION. GRADES SHOWN ARE BELOW CAP BEDDING/GAS VENTING GEOCOMPOSITE LAYER.
2. MINIMUM SLOPE OF SUBGRADE TO BE 20 HORIZONTAL TO ONE VERTICAL (20H:1V OR 5 PERCENT). EXCEPT AT TOE OF SLOPE FOR ANCHOR TRENCH ALONG RIVERBANK, MAXIMUM SLOPE TO BE THREE HORIZONTAL TO ONE VERTICAL (3H:1V OR 33 PERCENT).
3. CONTRACTOR TO PERFORM TEST PITS AS DIRECTED BY ENGINEER TO CONFIRM THE EDGE OF LANDFILLED WASTE. ENGINEER MAY REVISE FINAL GRADES AND AREAS FOR WASTE RELOCATION BASED ON TEST PIT FINDINGS.
4. EROSION CONTROLS WILL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE WORK OR CLEARING. MINOR SITE WORK AND CLEARING WILL BE PERMITTED TO ACCESS THE LOCATIONS FOR THE INSTALLATION OF EROSION CONTROLS AS SHOWN ON SHEET C-2.
5. FINAL SUBGRADES SHOWN WILL BE CREATED FIRST BY RELOCATED WASTE AND IMPORTED DAILY COVER THEN WITH SOILS, STREET SWEEPINGS, CATCH BASIN CLEANINGS IN ACCORDANCE WITH THE SPECIFICATIONS. CONSTRUCTION AND DEMOLITION (C&D) WASTE FINES AND RESIDUALS AND OTHER BENEFICIAL USE DETERMINATION (BUD) MATERIALS APPROVED BY MASSDEP WILL NOT BE ACCEPTED FOR REUSE.
6. THE FINISHED SUBGRADE SURFACE SHALL BE FREE OF LARGE OBJECTS INCLUDING REBAR, STONES, CONCRETE OR OTHER ITEMS THAT MAY PROTRUDE INTO THE COARSE SAND GAS VENTING/BEDDING LAYER INTO THE CAPPING LAYER. ENGINEER SHALL INSPECT THE SURFACE OF THE SUBGRADE AND INSTRUCT THE CONTRACTOR TO REMOVE OBJECTS OR RE-INSTALL THE SUBGRADE SOILS AS APPROPRIATE.
7. TEMPORARY SEEDING OR OTHER ITEMS SHALL BE INSTALLED TO MAINTAIN SLOPES AND MINIMIZE EROSION. CONTROLS SHALL BE INSTALLED AS SPECIFIED, PRESENTED IN THE CONTRACTOR'S STORMWATER POLLUTION PREVENTION PLAN (SWPPP) OR DIRECTED BY THE ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF AN ERODED AREAS INCLUDING REMEDIATION OF ANY WASTE OR SOILS THAT ENTER INTO WETLAND RESOURCE AREAS OR OUTSIDE THE LIMITS TO BE CAPPED.
8. ALL SOILS AND MATERIALS DELIVERED TO THE SITE SHALL ADHERE TO THE APPROVED TRUCK ROUTES OUTLINED IN THE SPECIFICATIONS. SOILS FROM HAVERHILL AND GROVELAND MAY UTILIZE ALTERNATIVE ROUTES TO THE SITE AS APPROPRIATE.
9. WASTE RELOCATION AREAS ARE APPROXIMATE. CONTRACTOR TO PERFORM TEST PITS AT LOCATIONS TO BE DETERMINED BY ENGINEER TO DETERMINE IF LANDFILLED WASTE EXTENDS ONTO MASS ELECTRIC PROPERTY. OFF-SITE WASTE TO BE EXCAVATED AND CONSOLIDATED TO WITHIN THE LIMITS OF FINAL CAP.

REVISIONS

BRUCE W. HASKELL CIVIL No. 37467 — COMMONWEALTH OF MASSACHUSETTS — REGISTERED PROFESSIONAL ENGINEER — 10-10-2024

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WASTE RELOCATION/CAP SUBGRADE PLAN- NORTHERN MOUND

HAVERHILL LANDFILL-NORTHERN MOUND & LOT 26 ASH AREA HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-3

NORTHERN MOUND–SEE SUBGRADE PLAN SHEET C–3

RECONSTRUCTED STORMWATER BASIN

SOUTHERN MOUND (CAPPED)

SEE NOTE 3. THIS SHEET ABOUT FILLING AROUND UTILITY POSTS (TYP.)

200' RIVERFRONT AREA

100' WETLAND BUFFER ZONE

Johnson's Creek

HAVERHILL

GROVELAND

LEGEND

- PROPERTY LINE
- WETLAND FLAG LOCATION AND NUMBER
- WETLAND BOUNDARY BY FLAG LOCATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA 10–YEAR FLOODPLAIN (EL. 14')
- 100–YR FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21')
- HAVERHILL/GROVELAND MUNICIPAL BOUNDARY
- APPROXIMATE EDGE OF EXISTING LANDFILLED WASTE
- PROPOSED 2 FOOT CONTOUR
- 50 PROPOSED 10 FOOT CONTOUR
- FINAL EDGE OF LANDFILLED WASTE/ PROPOSED LIMIT OF FINAL CAP.
- LIMIT OF LOT 26 ASH AREA
- APPROXIMATE LIMIT OF WORK
- MECO #32 UTILITY POLE
- UTILITY POLE WITH CABLE ANCHOR

NOTES:

1. ALL ASH AND SOILS EXCAVATED FROM LOT 26 ASH AREA SHALL REMAIN WITHIN CAP LIMITS AND NOT PLACED IN NORTHERN MOUND UNLESS APPROVED BY ENGINEER.
2. CONTRACTOR TO COORDINATE WITH POLE OWNER TO RAISE POLES AS NEEDED TO MEET FINAL GRADES.

0 20 40 80

1" = 40'

REVISIONS

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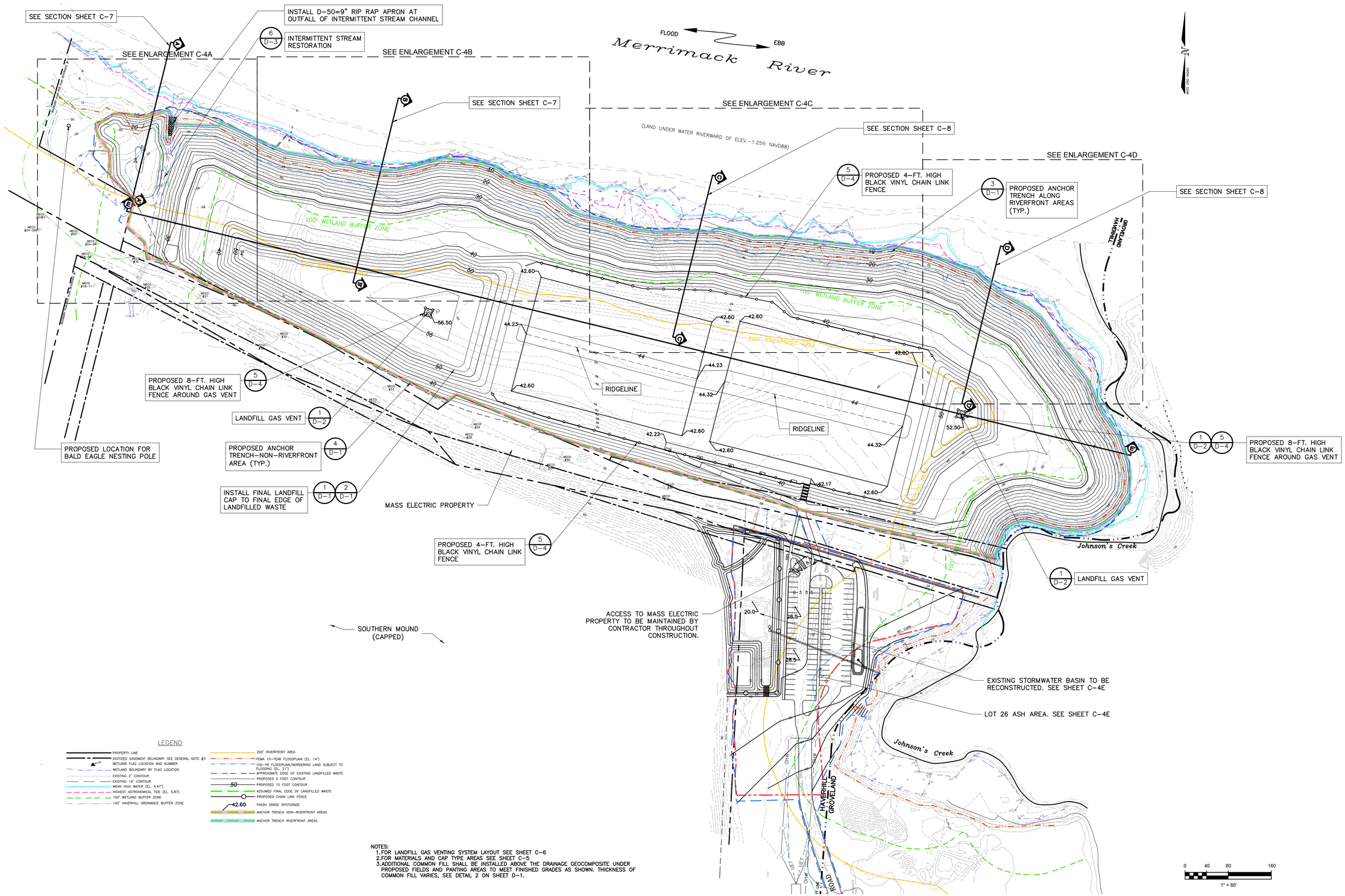
WASTE RELOCATION/CAP SUBGRADE PLAN–LOT 26 ASH AREA

HAVERHILL LANDFILL–NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C–3A

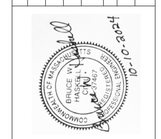


LEGEND

- PROPERTY LINE
- DIGITIZED EASEMENT BOUNDARY SEE GENERAL NOTE #3
- WETLAND FLAG LOCATION AND NUMBER
- WETLAND BOUNDARY BY FLAG LOCATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- HIGHEST ASTRONOMICAL TIDE (EL. 5.87)
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA 10-YEAR FLOODPLAIN (EL. 14')
- 100-YR FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21')
- APPROXIMATE EDGE OF EXISTING LANDFILLED WASTE
- PROPOSED 2 FOOT CONTOUR
- 50 PROPOSED 10 FOOT CONTOUR
- ASSUMED FINAL EDGE OF LANDFILLED WASTE
- PROPOSED CHAIN LINK FENCE
- 42.60 FINISH GRADE SPOTGRADE
- ANCHOR TRENCH NON-RIVERFRONT AREAS
- ANCHOR TRENCH RIVERFRONT AREAS

NOTES:
1. FOR LANDFILL GAS VENTING SYSTEM LAYOUT SEE SHEET C-6
2. FOR MATERIALS AND CAP TYPE AREAS SEE SHEET C-5
3. ADDITIONAL COMMON FILL SHALL BE INSTALLED ABOVE THE DRAINAGE GEOCOMPOSITE UNDER PROPOSED FIELDS AND PANTING AREAS TO MEET FINISHED GRADES AS SHOWN. THICKNESS OF COMMON FILL VARIES, SEE DETAIL 2 ON SHEET D-1.

REVISIONS



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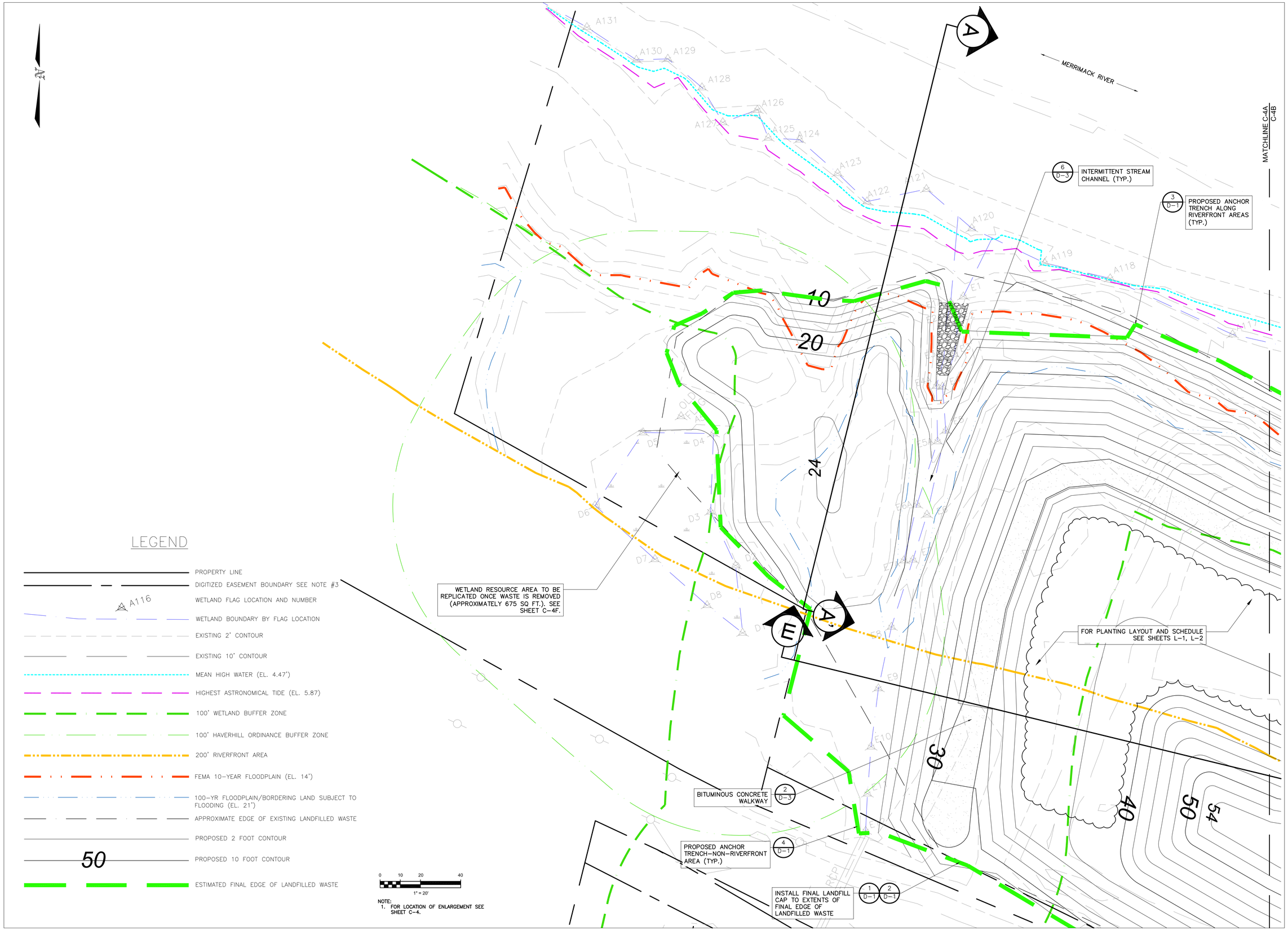
FINISH GRADING PLAN-NORTHERN MOUND

HAVERHILL LANDFILL-NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-4



LEGEND

- PROPERTY LINE
- DIGITIZED EASEMENT BOUNDARY SEE NOTE #3
- A116 WETLAND FLAG LOCATION AND NUMBER
- WETLAND BOUNDARY BY FLAG LOCATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- HIGHEST ASTRONOMICAL TIDE (EL. 5.87)
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA 10-YEAR FLOODPLAIN (EL. 14')
- 100-YR FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21')
- APPROXIMATE EDGE OF EXISTING LANDFILLED WASTE
- PROPOSED 2 FOOT CONTOUR
- 50 PROPOSED 10 FOOT CONTOUR
- ESTIMATED FINAL EDGE OF LANDFILLED WASTE

NOTE:
1. FOR LOCATION OF ENLARGEMENT SEE SHEET C-4.

REVISIONS

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10-22-24

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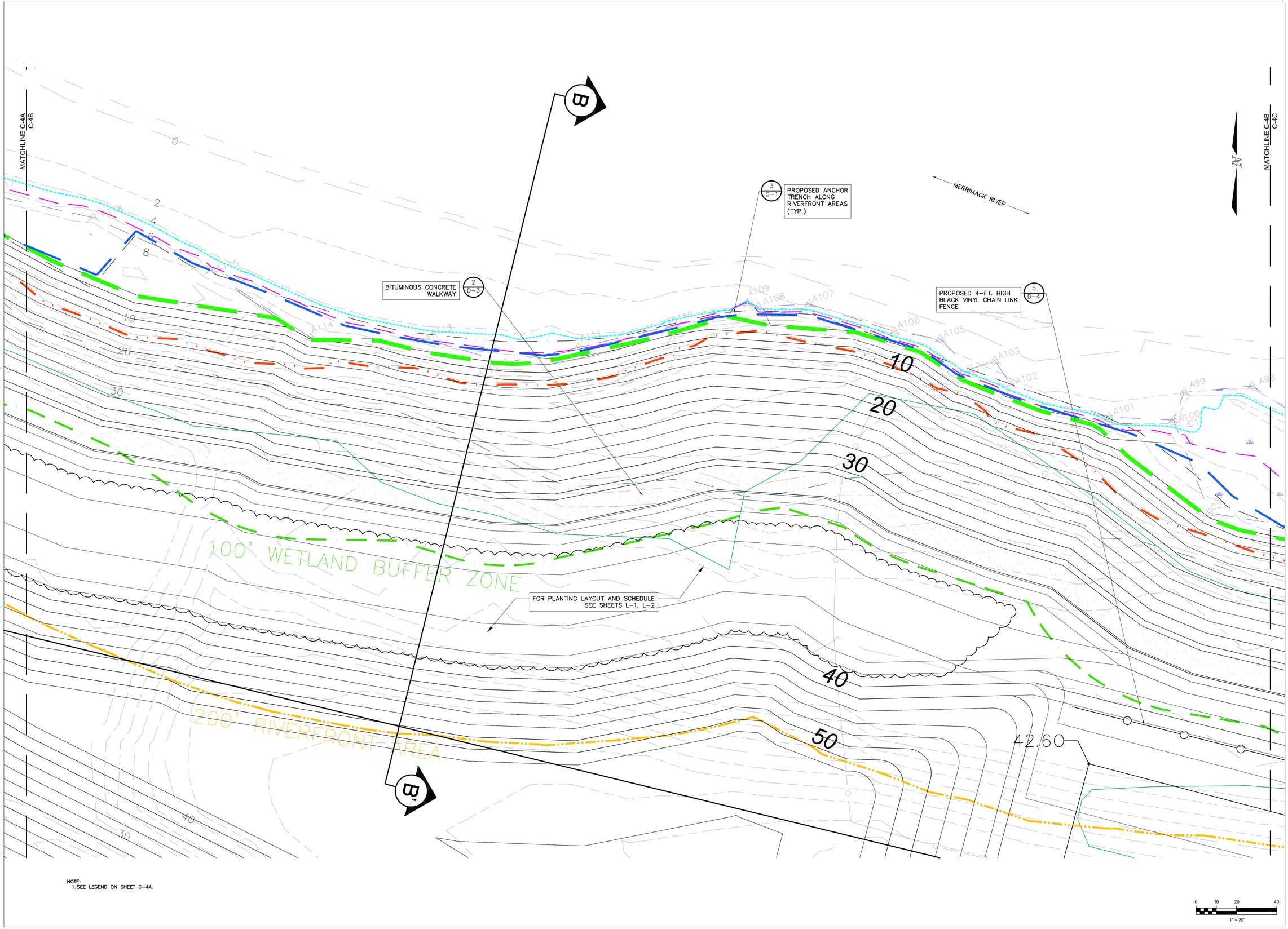
FINISH GRADE ENLARGEMENT I-NORTHERN MOUND

HAVERHILL LANDFILL-NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-4A



NOTE:
1. SEE LEGEND ON SHEET C-4A.

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FINISH GRADE ENLARGEMENT II
-NORTHERN MOUND

HAVERHILL LANDFILL-NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-4B

MATCHLINE C-4B C-4C

MATCHLINE C-4C C-4D

MERRIMACK RIVER

BITUMINOUS CONCRETE WALKWAY (2 / D-3)

PROPOSED ANCHOR TRENCH ALONG RIVERFRONT AREAS (TYP.) (3 / D-1)

100' WETLAND BUFFER ZONE

200' RIVERFRONT AREA

FOR PLANTING LAYOUT AND SCHEDULE SEE SHEETS L-1, L-2

PROPOSED 4-FT. HIGH BLACK VINYL CHAIN LINK FENCE (5 / D-4)

42.60

42.60

NOTE:
1. SEE LEGEND ON SHEET C-4A.

0 10 20 40
1" = 20'

REVISIONS

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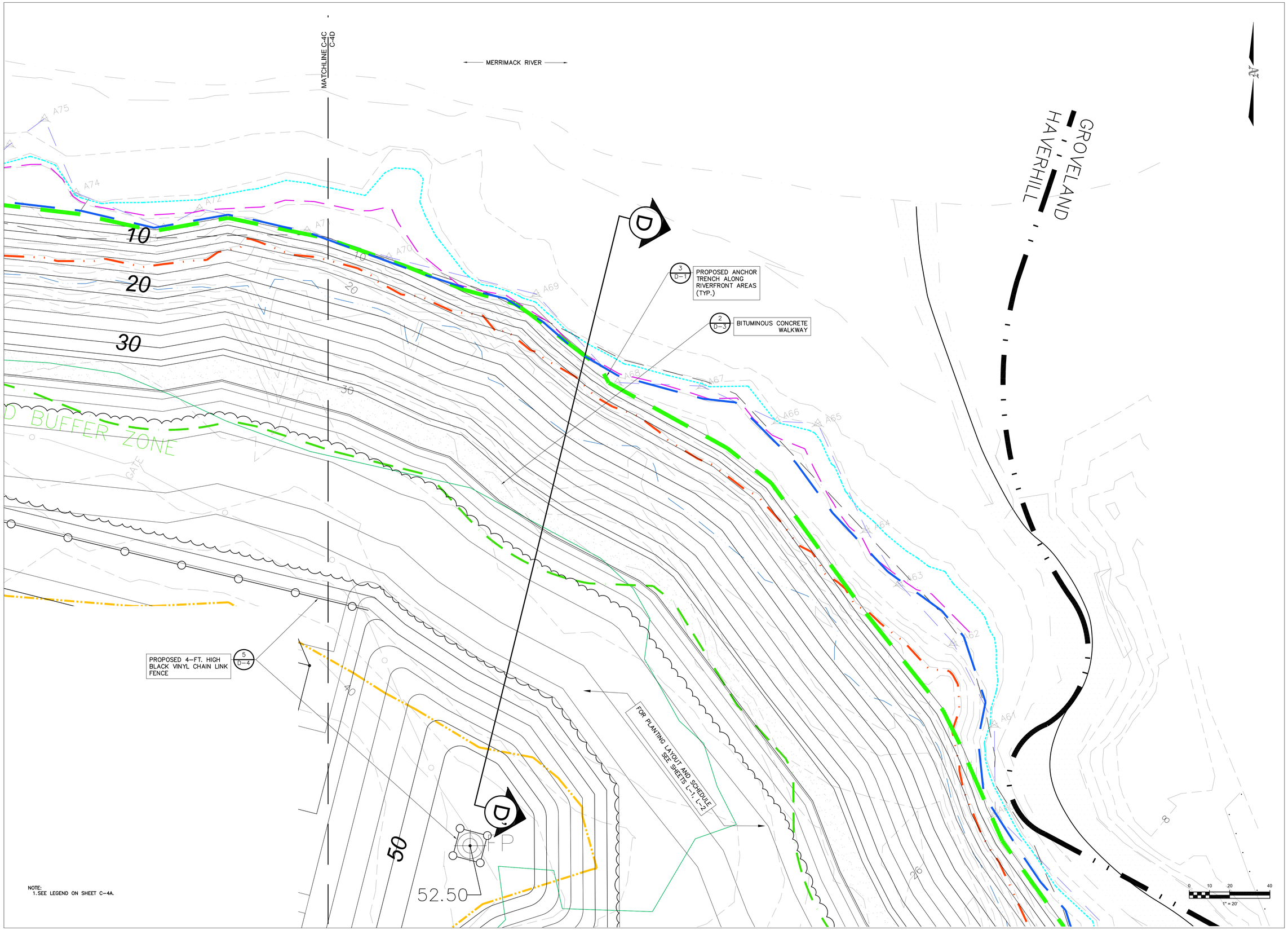
FINISH GRADE ENLARGEMENT
III-NORTHERN MOUND

HAVERHILL LANDFILL-NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-4C



NOTE:
1. SEE LEGEND ON SHEET C-4A.

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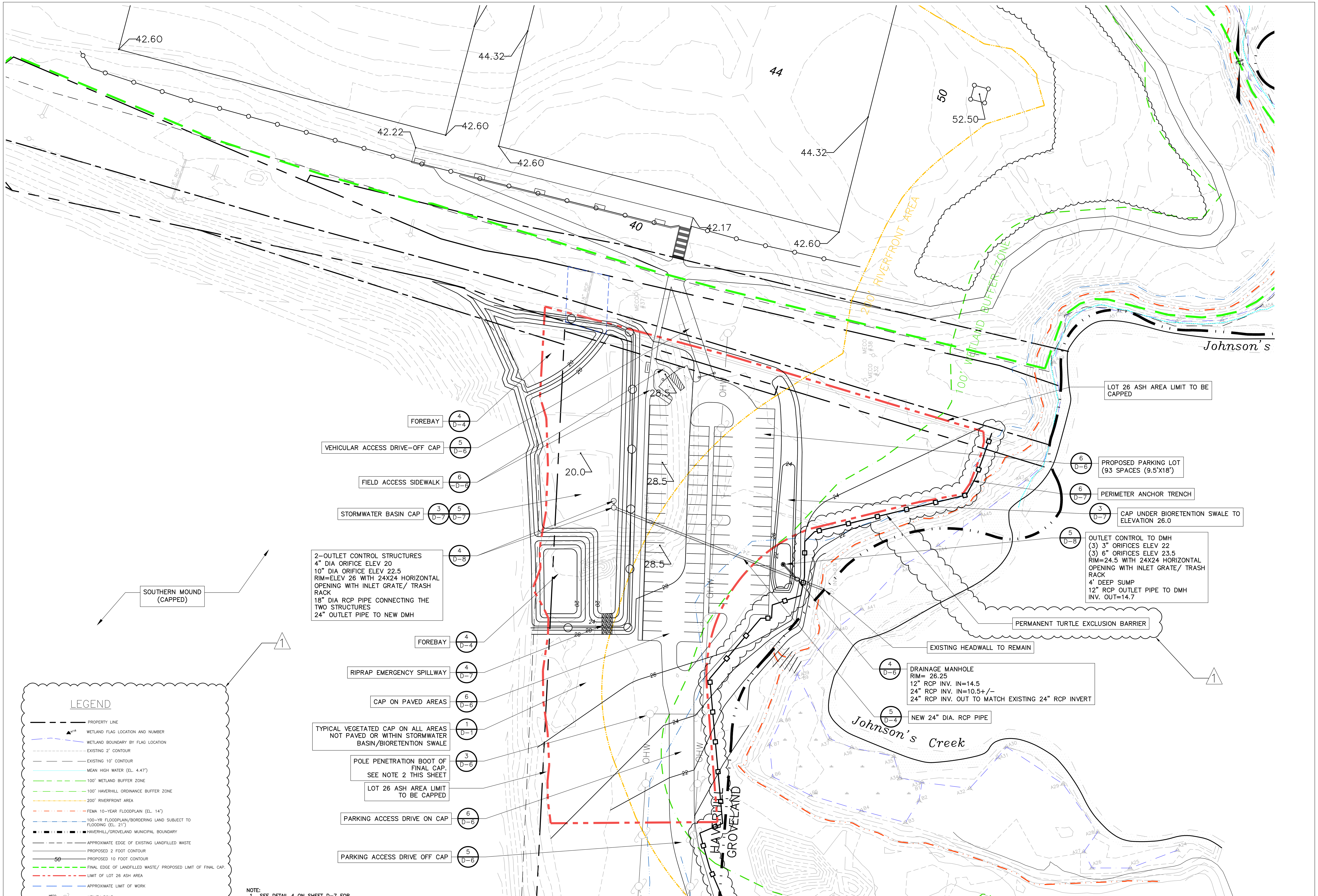
FINISH GRADE ENLARGEMENT IV
-NORTHERN MOUND

HAVERHILL LANDFILL-NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-4D



LEGEND

- PROPERTY LINE
- WETLAND FLAG LOCATION AND NUMBER
- WETLAND BOUNDARY BY FLAG LOCATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA 10-YEAR FLOODPLAIN (EL. 14')
- 100-YR FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21')
- HAVERHILL/GROVELAND MUNICIPAL BOUNDARY
- APPROXIMATE EDGE OF EXISTING LANDFILLED WASTE
- PROPOSED 2 FOOT CONTOUR
- 50 PROPOSED 10 FOOT CONTOUR
- FINAL EDGE OF LANDFILLED WASTE/ PROPOSED LIMIT OF FINAL CAP.
- LIMIT OF LOT 26 ASH AREA
- APPROXIMATE LIMIT OF WORK
- MECO #32 UTILITY POLE
- UTILITY POLE WITH CABLE ANCHOR
- PERMANENT TURTLE EXCLUSION BARRIER

NOTE:
1. SEE DETAIL 4 ON SHEET D-7 FOR TYPICAL CROSS-SECTION THROUGH STORMWATER BASIN
2. EXISTING UTILITY POLES TO BE RELOCATED WILL BE COORDINATED WITH POLE OWNER PRIOR TO CONSTRUCTION. CONTRACTOR TO COORDINATE WITH OWNER TO MAINTAIN AND RAISE POLES AS REQUIRED.

NO.	DATE	BY	CHECKED	DESCRIPTION
1	3/14/25	JC	BH	RESPONSE TO REGULATORY COMMENTS

REVISIONS

COMMONWEALTH OF MASSACHUSETTS BRUCE W. HASKELL CIVIL No. 37467 REGISTERED PROFESSIONAL ENGINEER 10-10-2024

Langdon Environmental LLC
404 THE HILL, PO BOX 511
PORTSMOUTH, NH 03802
(617) 875-3693

Proj. Mgr: BWH
Designed : JEC
Drawn : JEC
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Scale : AS NOTED
Date : OCT. 2024

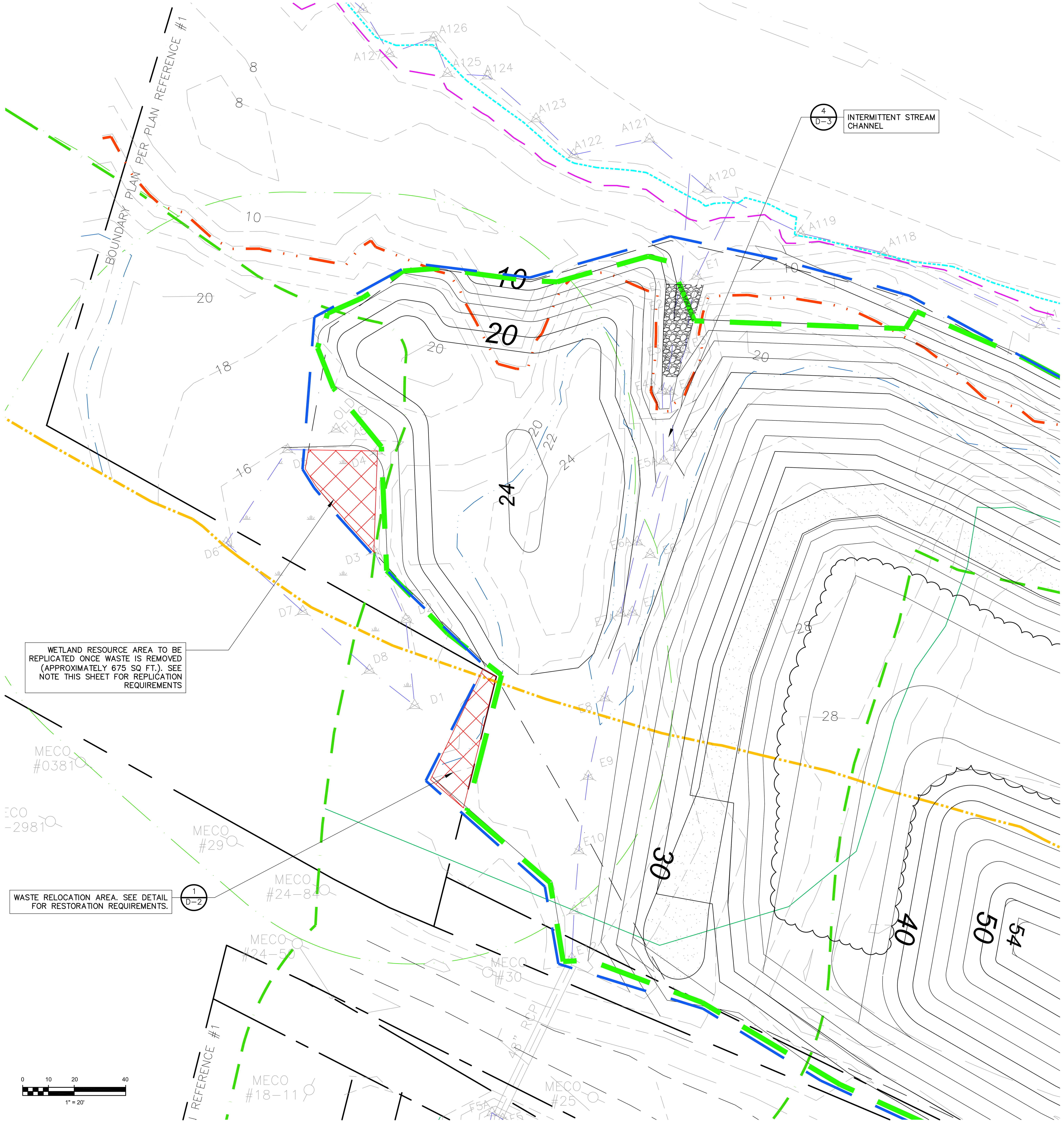
FINAL CAPPING AND GRADING PLAN-LOT 26 ASH AREA

HAVERHILL LANDFILL-NORTHERN MOUND & LOT 26 ASH AREA HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-4E



NOTES:
1. SEE SHEET C-4A FOR LEGEND INFORMATION
2. TEMPORARILY ALTERED BVW AND IVW WILL BE RESTORED IN-PLACE BY:
A. ESTABLISHING SUB-GRADES WITH COMMON FILL,
B. ESTABLISHING FINISH GRADES WITH 12-INCHES OF ORGANIC RICH TOPSOIL,
C. ESTABLISHING FINISH GRADES TO MATCH PRE-CONSTRUCTION GRADES OR SLIGHTLY LOWER
D. SEEDING THE DISTURBED BVW OR IVW WITH A WETLAND SEED MIX (NEW ENGLAND WETLAND PLANTS, INC. – NEW ENGLAND WETMIX, OR APPROVED EQUAL).

REVISIONS

Langdon Environmental LLC

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Date: OCT. 2024

WETLAND RESOURCE AREA RESTORATION PLAN-NORTHERN MOUND

HAVERHILL LANDFILL-NORTHERN MOUND & LOT 26 ASH AREA HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-4F

SOUTHERN MOUND (CAPPED)

6 D-6 ON-CAP BITUMINOUS CONCRETE PAVEMENT-ROADWAY

LIMIT OF LOT 26 ASH AREA

EXISTING FENCED SOLAR BATTERY STORAGE FACILITY

Johnson's Creek

1

PERMANENT TURTLE EXCLUSION BARRIER.TURTLE EXCLUSIONS BARRIER SHALL BE A 4-FOOT TALL, SMALL MESH (1¼-INCH MESH) CHAIN-LINK FENCE

CONTRACTOR TRAILER AND MATERIAL STORAGE AREA. CONTRACTOR TO RESTORE TO EXISTING GRADES UPON COMPLETION OF CONSTRUCTION

5 D-6 OFF-CAP BITUMINOUS CONCRETE PAVEMENT-ROADWAY

APPROXIMATE LOCATION OF BORDERING LAND SUBJECT TO FLOODING (ELEV. 21)

PAVE NEW SURFACE TO 24' WIDTH

PERMANENT TURTLE EXCLUSION BARRIER.TURTLE EXCLUSIONS BARRIER SHALL BE A 4-FOOT TALL, SMALL MESH (1¼-INCH MESH) CHAIN-LINK FENCE

2 D-8 TURTLE NESTING AREA-FINAL LOCATION TO BE DETERMINED BASED ON CONSULTATION WITH NHESP

JOHNSON'S CREEK. WETLAND RESOURCE AREAS NOT DELINEATED

BITUMINOUS CONCRETE PAVEMENT-ROADWAY 4 D-3

ACCESS ROAD TO SOUTHERN MOUND

EXISTING 8" WATER LINE TO REMAIN

EXISTING ENTRANCE GATE TO REMAIN

LIMIT OF NEW PAVEMENT

HAVERHILL GROVELAND

APPROXIMATE LOCATION OF BORDERING LAND SUBJECT TO FLOODING (ELEV. 21)

EXISTING RESIDENTIAL BUILDING

PROPOSED REGRADING TO IMPROVE SIGHT-LINES ALONG MAIN STREET

YEMMA ROAD

HAVERHILL GROVELAND

OHW

WETLAND

1

LEGEND

- PROPERTY LINE
- WETLAND FLAG LOCATION AND NUMBER
- WETLAND BOUNDARY BY FLAG LOCATION
- EXISTING TREELINE
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA 10-YEAR FLOODPLAIN (EL. 14')
- 100-YR FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21')
- HAVERHILL/GROVELAND MUNICIPAL BOUNDARY
- APPROXIMATE EDGE OF EXISTING LANDFILLED WASTE
- PROPOSED 2 FOOT CONTOUR
- 50 PROPOSED 10 FOOT CONTOUR
- FINAL EDGE OF LANDFILLED WASTE/ PROPOSED LIMIT OF FINAL CAP.
- LIMIT OF LOT 26 ASH AREA
- APPROXIMATE LIMIT OF WORK
- UTILITY POLE
- UTILITY POLE WITH CABLE ANCHOR
- PERMANENT TURTLE EXCLUSION BARRIER

1

POTENTIAL TURTLE HABITAT AREA

NOTE:
TOPOGRAPHIC INFORMATION, UTILITIES, AND PROPERTY LINES ALONG OLD GROVELAND ROAD AND MAIN STREET ARE FROM PUBLICLY AVAILABLE INFORMATION AND ARE APPROXIMATE.

0 40 80 160
1" = 80'

NO.	DATE	BY	CHECKED	DESCRIPTION
1	3/14/25	JC	BH	RESPONSE TO REGULATORY COMMENTS

REVISIONS

Langdon Environmental LLC
404 THE HILL, PO BOX 511
PORTSMOUTH, NH 03802
(617) 875-3693

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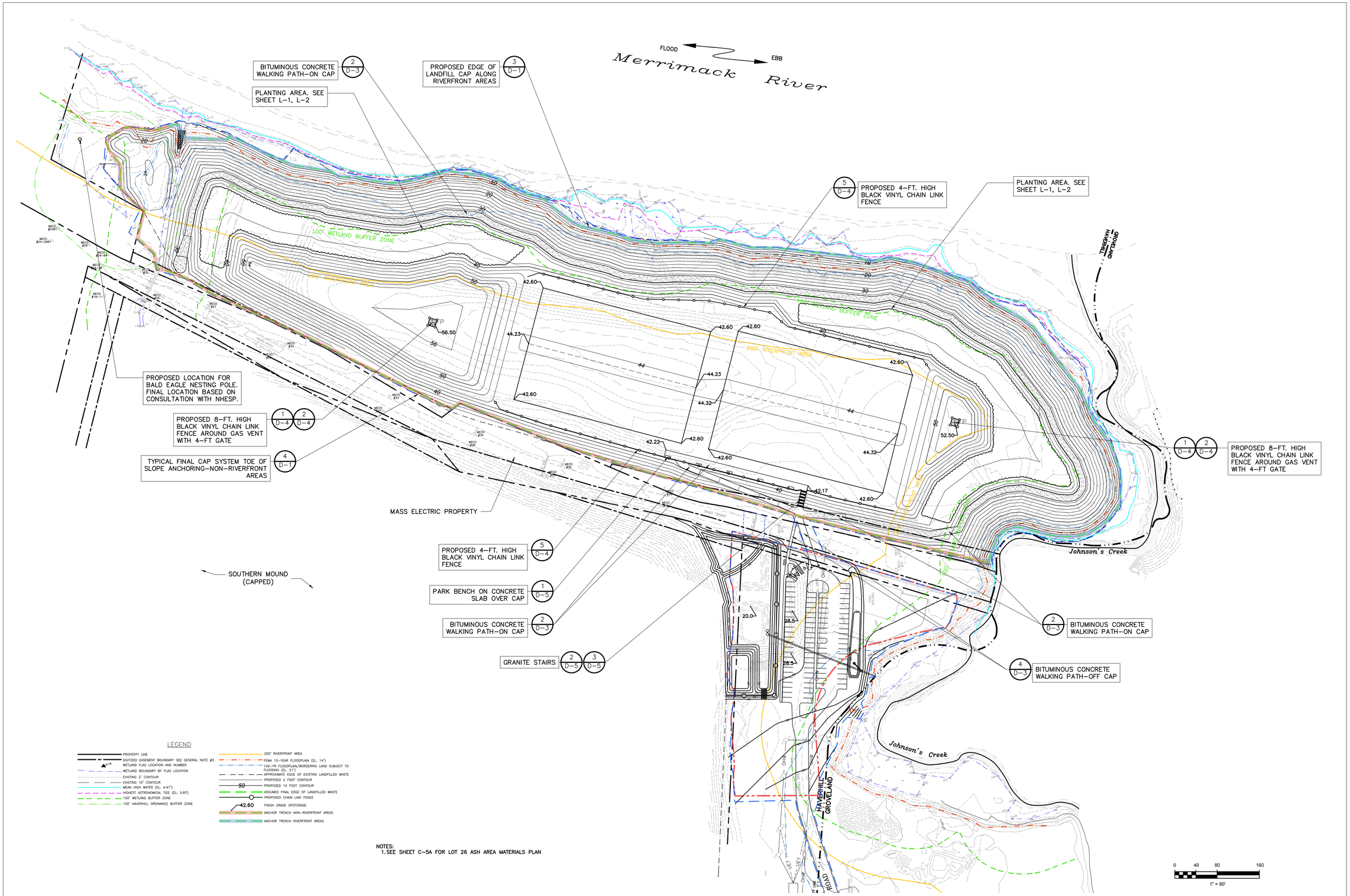
FINISH GRADE PLAN-YEMMA ROAD

HAVERHILL LANDFILL-NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-4G



NOTES:
1. SEE SHEET C–5A FOR LOT 26 ASH AREA MATERIALS PLAN

REVISIONS

Langdon Environmental LLC
404 THE HILL, PO BOX 511
PORTSMOUTH, NH 03802
(617) 875–3693

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Date : OCT. 2024

MATERIALS PLAN–NORTHERN MOUND

HAVERHILL LANDFILL–NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C–5

BIKE RACK ON CONCRETE PAD (8/D-2) (7/D-6)

BITUMINOUS CONCRETE PAVEMENT WALKING PATH (2/D-3)

FENCE ON PRECAST CONCRETE BLOCK (6/D-4)

RECONSTRUCTED STORMWATER BASIN (4/D-7)

SOUTHERN MOUND (CAPPED)

ON-CAP BITUMINOUS CONCRETE PAVEMENT (6/D-6)

LOT 26 ASH AREA LIMIT

OFF CAP BITUMINOUS CONCRETE PAVEMENT (5/D-6)

LOT 26 ASH AREA LIMIT

16" DI SEWER FORCE MAIN. CONTRACTOR TO VERIFY LOCATION.

(1/D-8) ACCESSIBLE PARKING SIGN (1 OF 2)

(6/D-2) SINGLE LEAF BARRICADE GATE

(6/D-6) PROPOSED PARKING LOT. ON CAP BITUMINOUS CONCRETE PAVEMENT

(5/D-4) NEW 24" RCP PIPE IN TRENCH

(3/D-6) PENETRATION OF FINAL CAP BOOT DETAIL (TYP).

Johnson's

Johnson's Creek

HAVERHILL

GROVELAND

200' RIVERFRONT AREA

100' WETLAND BUFFER ZONE

LEGEND

- PROPERTY LINE
- WETLAND FLAG LOCATION AND NUMBER
- WETLAND BOUNDARY BY FLAG LOCATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA 10-YEAR FLOODPLAIN (EL. 14')
- 100-YR FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21')
- HAVERHILL/GROVELAND MUNICIPAL BOUNDARY
- APPROXIMATE EDGE OF EXISTING LANDFILLED WASTE
- PROPOSED 2 FOOT CONTOUR
- 50 PROPOSED 10 FOOT CONTOUR
- FINAL EDGE OF LANDFILLED WASTE/ PROPOSED LIMIT OF FINAL CAP.
- LIMIT OF LOT 26 ASH AREA
- APPROXIMATE LIMIT OF WORK
- MECO #32 UTILITY POLE
- UTILITY POLE WITH CABLE ANCHOR
- TURTLE EXCLUSION BARRIER

NOTE:
1. SEE SHEET C-5 FOR NORTHERN MOUND MATERIALS PLAN.

0 20 40 80
1" = 40'

REVISIONS

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PORTSMOUTH, NH 03802
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Date : OCT. 2024

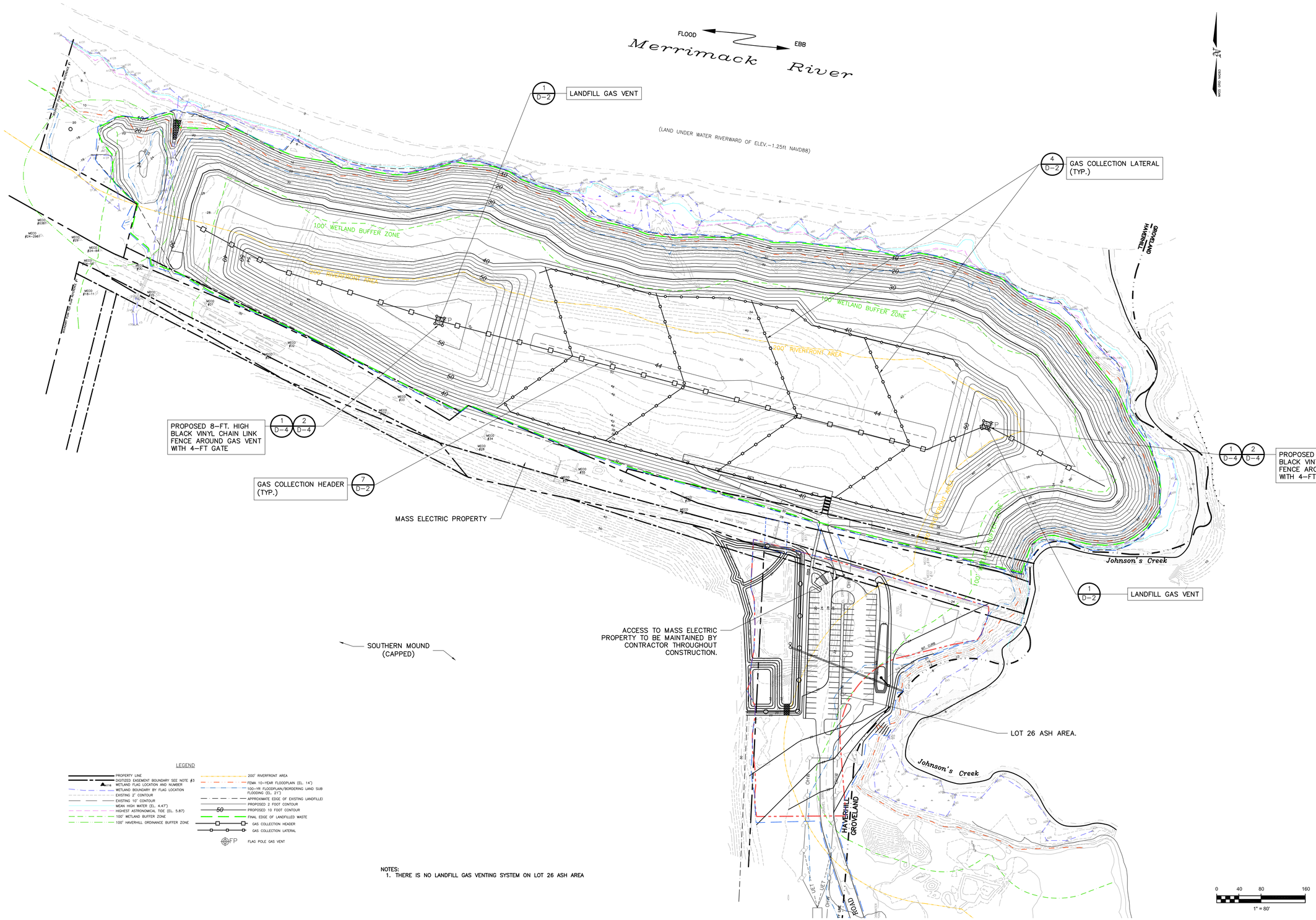
MATERIALS PLAN-LOT 26 ASH AREA

HAVERHILL LANDFILL-NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-5A



LEGEND

- PROPERTY LINE
- DIGITIZED EASEMENT BOUNDARY SEE NOTE #3
- WL116 WETLAND FLAG LOCATION AND NUMBER
- WETLAND BOUNDARY BY FLAG LOCATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- HIGHEST ASTRONOMICAL TIDE (EL. 5.87)
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA 10-YEAR FLOODPLAIN (EL. 14')
- 100-YR FLOODPLAIN/BORDERING LAND SUB FLOODING (EL. 21')
- APPROXIMATE EDGE OF EXISTING LANDFILLED
- PROPOSED 2 FOOT CONTOUR
- 50 PROPOSED 10 FOOT CONTOUR
- FINAL EDGE OF LANDFILLED WASTE
- GAS COLLECTION HEADER
- GAS COLLECTION LATERAL
- FP FLAG POLE GAS VENT

NOTES:
1. THERE IS NO LANDFILL GAS VENTING SYSTEM ON LOT 26 ASH AREA

REVISIONS

Langdon Environmental LLC
404 THE HILL, PO BOX 511
PORTSMOUTH, NH 03802
(617) 875-3693

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Scale : AS NOTED
Date : OCT. 2024

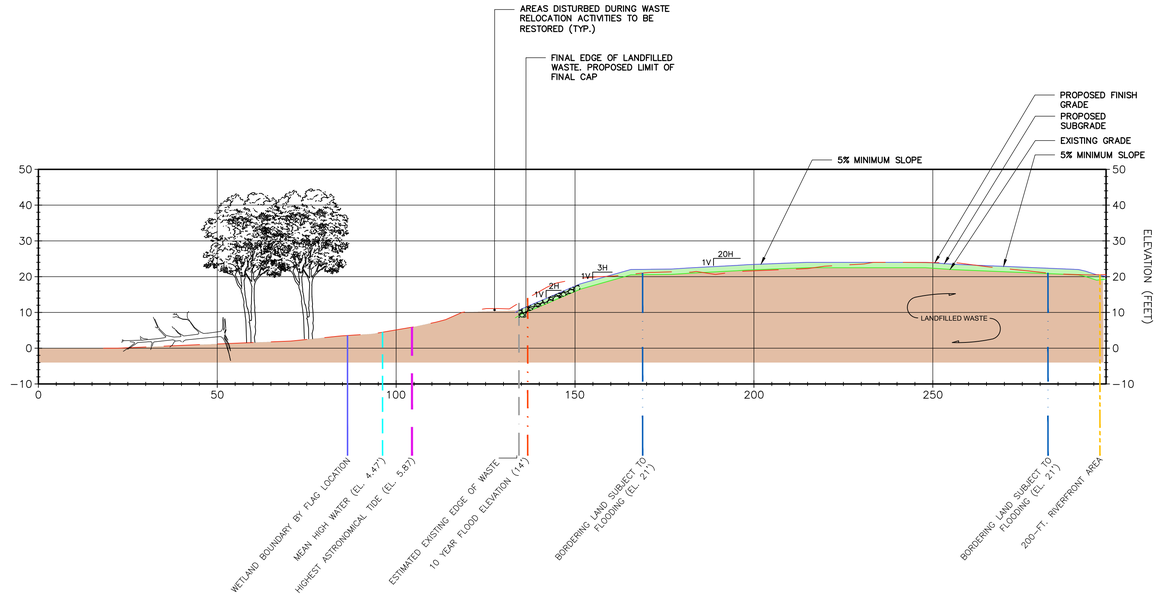
LANDFILL GAS COLLECTION AND VENTING SYSTEM-NORTHERN MOUND

HAVERHILL LANDFILL-NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

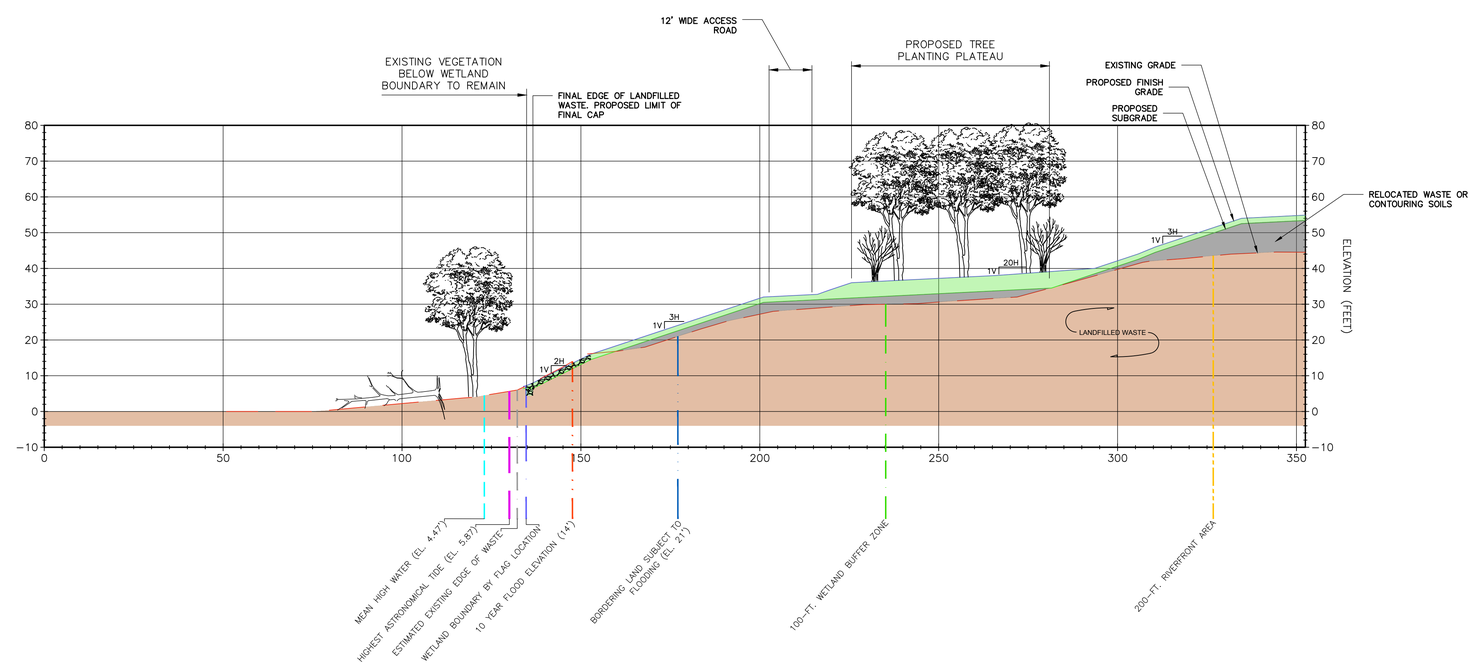
Proj. No.

Dwg. No.

C-6



SECTION A–A'



SECTION B–B'

NOTES:
1. SEE SHEET C–4A FOR LEGEND INFORMATION
2. TEMPORARILY ALTERED BVW AND IVW WILL BE RESTORED IN–PLACE BY:
A. ESTABLISHING SUB–GRADES WITH COMMON FILL,
B. ESTABLISHING FINISH GRADES WITH 12–INCHES OF ORGANIC RICH TOPSOIL,
C. ESTABLISHING FINISH GRADES TO MATCH PRE–CONSTRUCTION GRADES OR SLIGHTLY LOWER
D. SEEDING THE DISTURBED BVW OR IVW WITH A WETLAND SEED MIX (NEW ENGLAND WETLAND PLANTS, INC. – NEW ENGLAND WETMIX, OR APPROVED EQUAL).

NOTE:
SEE SHEET C–4 FOR SECTION LOCATIONS

0 10 20 40
1" = 20'

REVISIONS

Langdon Environmental LLC
404 THE HILL, PO BOX 51
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(617) 875–3693

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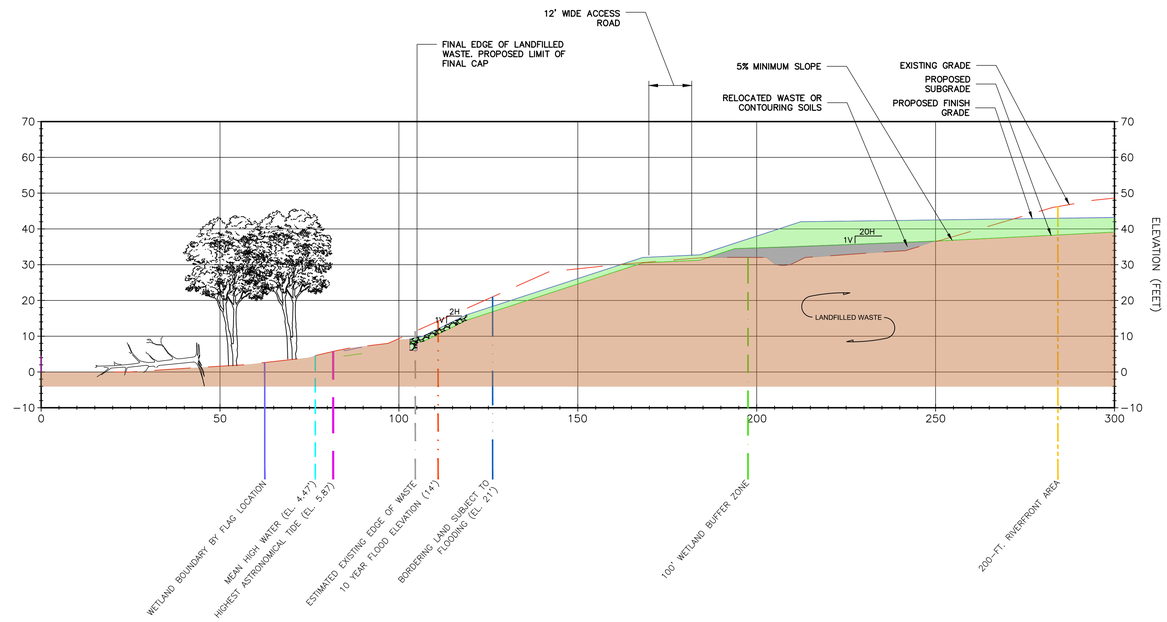
CROSS SECTIONS I–NORTHERN MOUND

HAVERHILL LANDFILL–NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

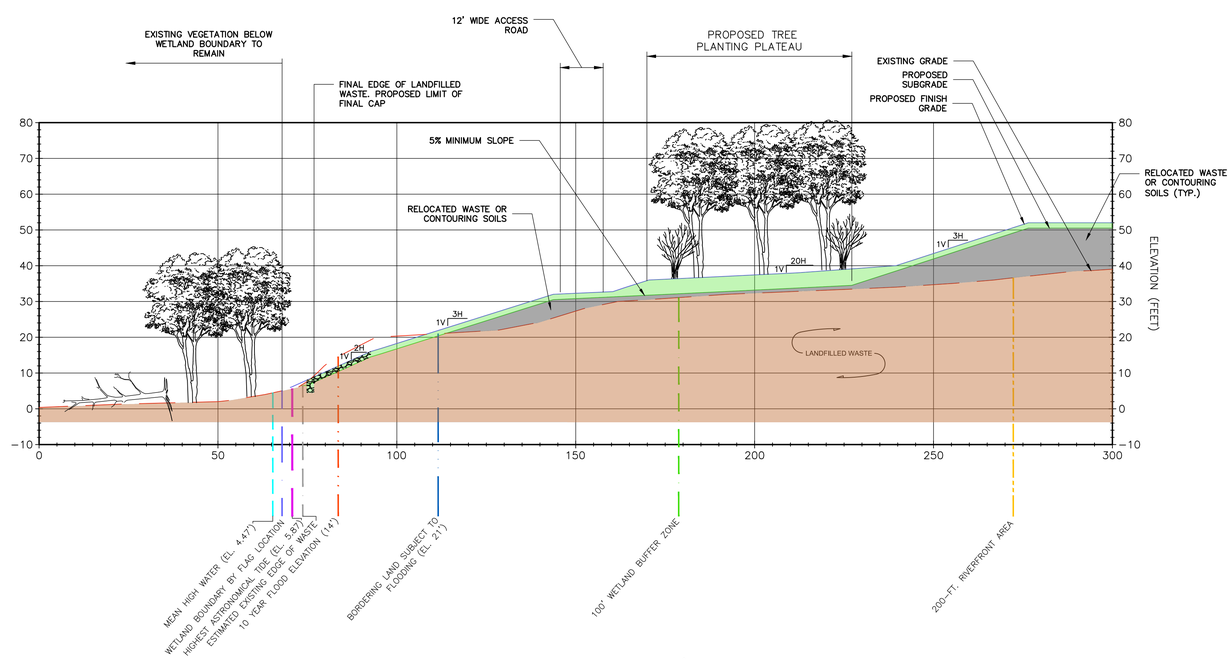
Proj. No.

Dwg. No.

C–7



SECTION C–C'



SECTION D–D'

NOTES:
1. SEE SHEET C–4A FOR LEGEND INFORMATION
2. TEMPORARILY ALTERED BVW AND IVW WILL BE RESTORED IN–PLACE BY:
A. ESTABLISHING SUB–GRADES WITH COMMON FILL,
B. ESTABLISHING FINISH GRADES WITH 12–INCHES OF ORGANIC RICH TOPSOIL,
C. ESTABLISHING FINISH GRADES TO MATCH PRE–CONSTRUCTION GRADES OR SLIGHTLY LOWER
D. SEEDING THE DISTURBED BVW OR IVW WITH A WETLAND SEED MIX (NEW ENGLAND WETLAND PLANTS, INC. – NEW ENGLAND WETMIX, OR APPROVED EQUAL).

NOTE:
SEE SHEET C–4 FOR SECTION LOCATIONS

0 10 20 40
1" = 20'

REVISIONS

COMMONWEALTH OF MASSACHUSETTS BRUCE W. HOLLOWELL CIVIL No. 47145 REGISTERED PROFESSIONAL ENGINEER
10-10-2024

Langdon Environmental LLC
404 THE HILL, PO BOX 511
PORTSMOUTH, NH 03802
(617) 975–3693

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Date : OCT. 2024

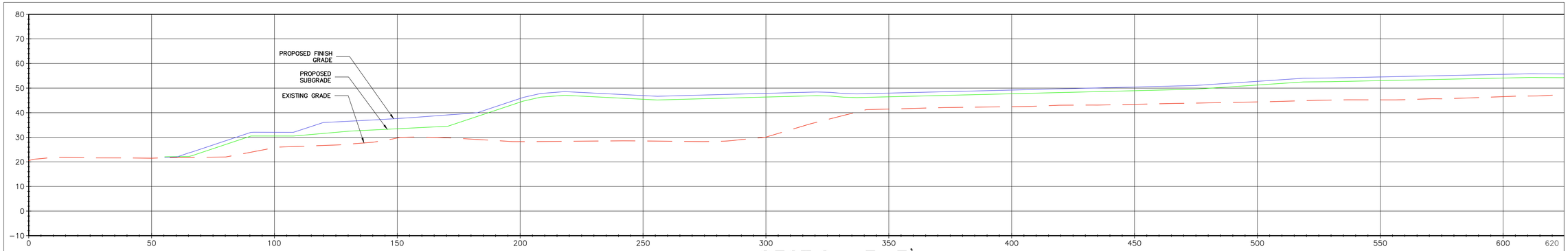
CROSS SECTIONS II–NORTHERN MOUND

HAVERHILL LANDFILL–NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

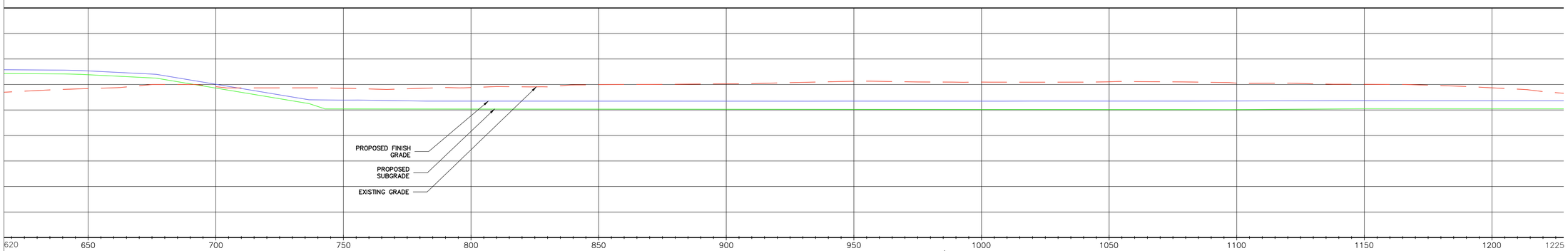
Proj. No.

Dwg. No.

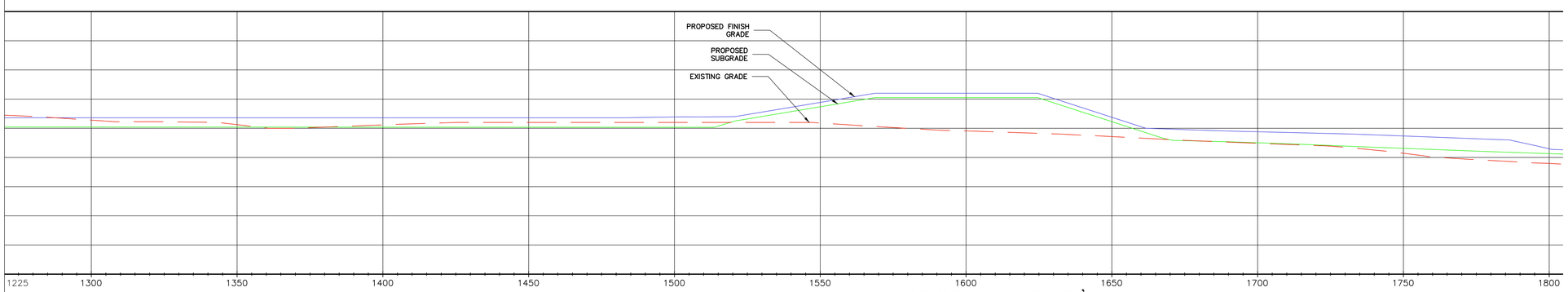
C–8



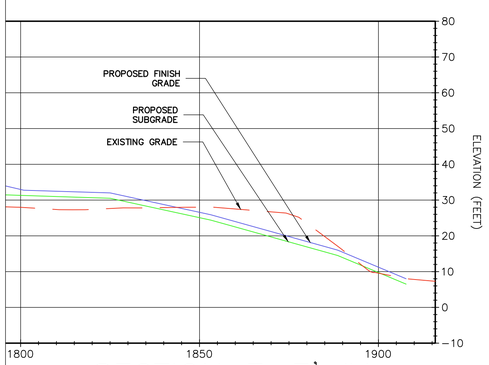
SECTION E–E' I



SECTION E–E' II



SECTION E–E' III



SECTION E–E' IV

NOTE:
SEE SHEET C–4 FOR SECTION LOCATIONS

0 10 20 40
1" = 20'

REVISIONS

BRUCE W. HAMILTON
COMMONWEALTH OF MASSACHUSETTS
CIVIL
No. 37175
REGISTERED PROFESSIONAL ENGINEER
10-10-2024

Langdon Environmental LLC
404 THE HILL, PO BOX 511
PORTSMOUTH, NH 03802
(617) 875–3693

Proj. Mgr.: BWH
Designed : JEC
Drawn : JEC
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Scale : AS NOTED
Date : OCT. 2024

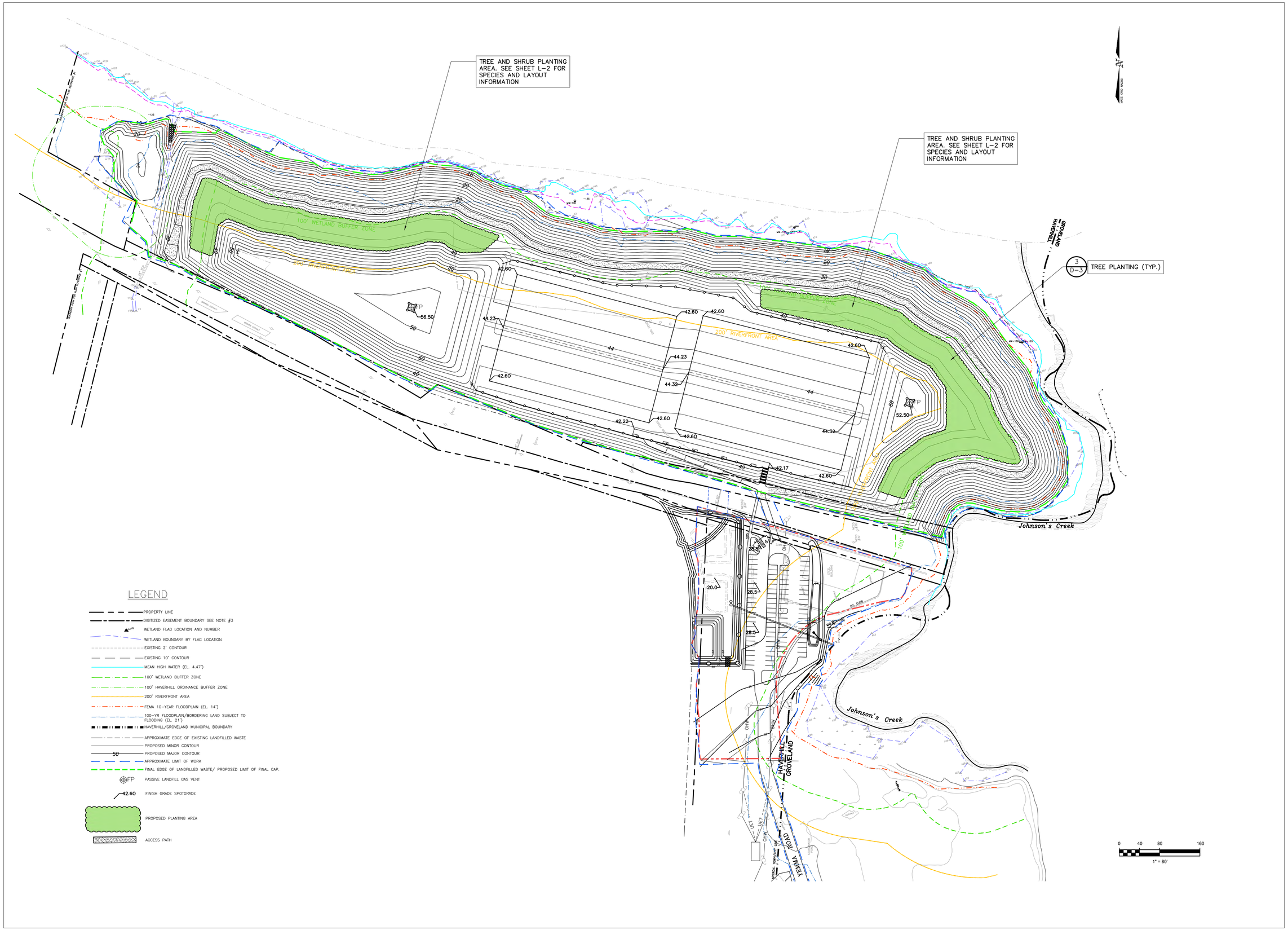
SECTIONS III–NORTHERN MOUND

HAVERHILL LANDFILL–NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C–9



REVISIONS

Langdon Environmental LLC

404 THE HILL, PO BOX 511
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(617) 875-3693

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Designed : JEC
Drawn : JEC
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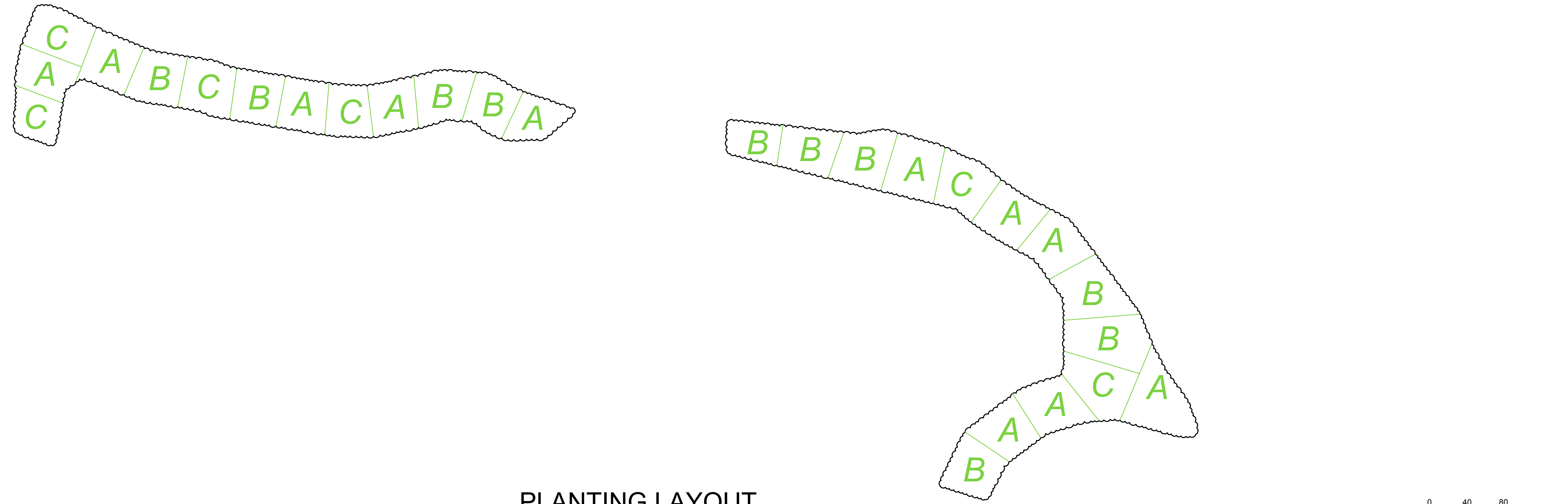
LANDSCAPE PLAN–NORTHERN MOUND

HAVERHILL LANDFILL–NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

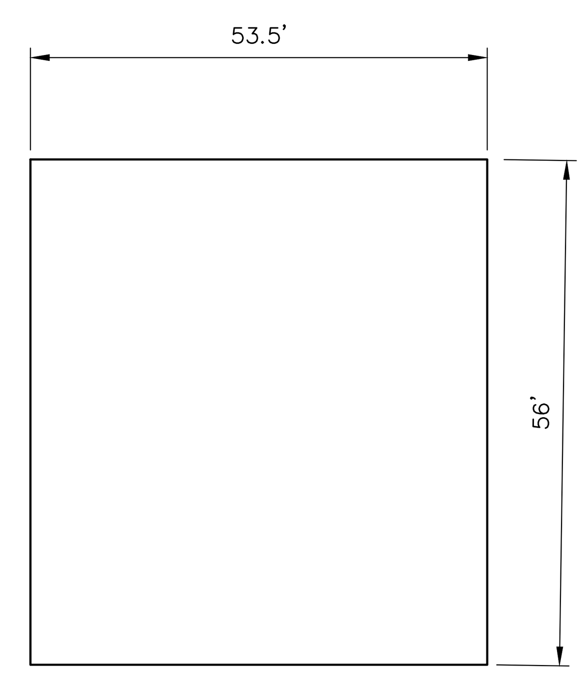
Dwg. No.

L-1



PLANTING LAYOUT

PLANTING LOT = +/- 3,000SF



PLANTING LOT A

SPECIES	QUANTITY
RED MAPLE	8
RIVER BIRCH	7
HEMLOCK	5
WINTERBERRY	4

PLANTING LOT B

SPECIES	QUANTITY
RED OAK	8
WHITE OAK	7
BASSWOOD	5
MOUNTAIN LAUREL	4

PLANTING LOT C

SPECIES	QUANTITY
ELDERBERRY	5
VIBURNUM	15
BLUEBERRY	16

NOTE:
SEE SHEET L-1 FOR PLANTING LOCATIONS

Plant Schedule					
Symbol	**Quantity**	**Botanical Name**	**Common Name**	**Size**	**Root**
Trees					
AR	88	ACER RUBRUM	RED MAPLE	2-2.5" CAL.	BB
QR	80	QUERCUS RUBRA	RED OAK	2-2.5" CAL.	BB
QA	70	QUERCUS ALBA	WHITE OAK	2-2.5" CAL.	BB
TC	55	TSUGA CANADENSIS	CANADIAN HEMLOCK	5'-6' H	BB
BN	77	BETULA NIGRA	RIVER BIRCH	1.5-2" CAL.	BB
TA	50	TILIA AMERICANA	BASSWOOD	2-2.5" CAL.	BB
Shrubs					
IV	44	ILEX VERTICILLATA	COMMON WINTERBERRY	#7 POT	20% MALE
KL	40	KALMIA LATIFOLIA	MOUNTAIN LAUREL	3-4' H	COLLECTED
VC	96	VACCINIUM CORYMBOSUM	HIGH BUSH BLUEBERRY	3-4' H	
VD	90	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	#7 POT	
SC	30	SAMBUCUS CANADENSIS	AMERICAN ELDER	#7 POT	

NOTES:
1. FINAL PLANTING LOCATIONS SHALL BE AS DIRECTED BY ENGINEER
2. PLANTINGS MAY BE MODIFIED BASED ON DEPTH OF SOILS ABOVE FINAL CAP AS INSTALLED.

REVISIONS

10-10-2024

Langdon Environmental LLC
404 THE HILL, PO BOX 511
PORTSMOUTH, NH 03802
(617) 875-3693

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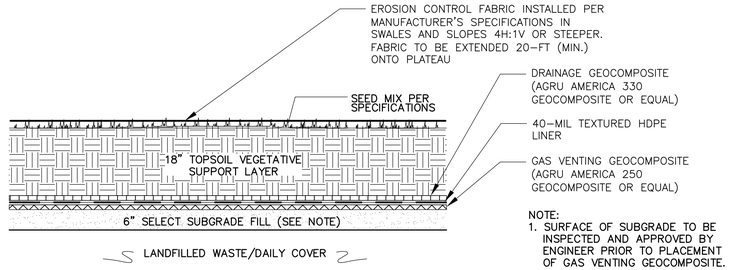
LANDSCAPE LAYOUT PLAN AND SCHEDULE–NORTHERN MOUND

HAVERHILL LANDFILL–NORTHERN MOUND & LOT 26 ASH AREA HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

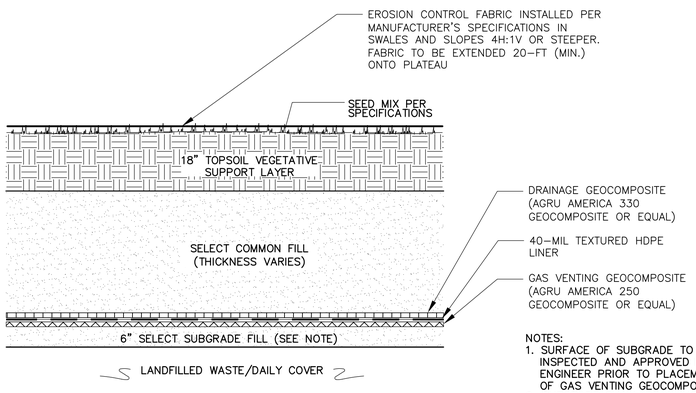
L-2



NOTE:
1. SURFACE OF SUBGRADE TO BE INSPECTED AND APPROVED BY ENGINEER PRIOR TO PLACEMENT OF GAS VENTING GEOCOMPOSITE.
2. SUBGRADE SHALL BE 1-INCH MINUS GRADATION.

TYPICAL VEGETATED CAP CROSS SECTION-NORTHERN MOUND / LOT 26 ASH AREA

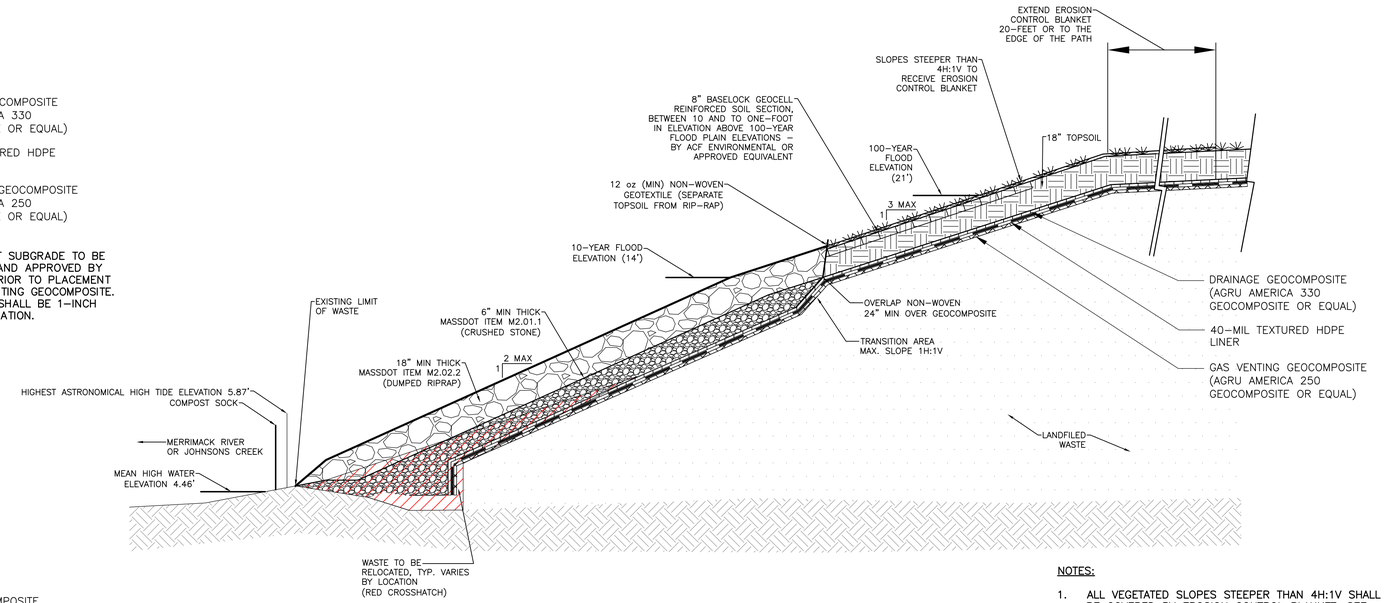
DETAIL 1 / D-1
N.T.S.



NOTES:
1. SURFACE OF SUBGRADE TO BE INSPECTED AND APPROVED BY ENGINEER PRIOR TO PLACEMENT OF GAS VENTING GEOCOMPOSITE.
2. SUBGRADE SHALL BE 1-INCH MINUS GRADATION.

TYPICAL VEGETATED CAP CROSS SECTION-PLANTING AND FIELD AREAS-NORTHERN MOUND

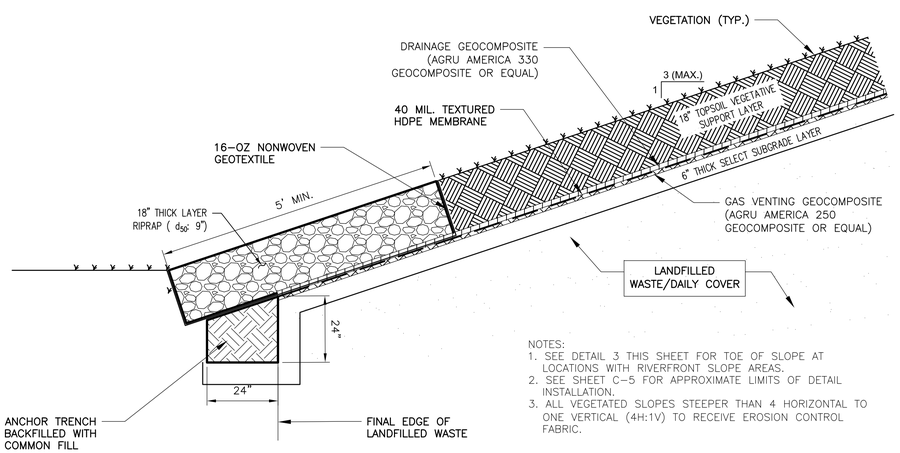
DETAIL 2 / D-1
N.T.S.



NOTES:
1. ALL VEGETATED SLOPES STEEPER THAN 4H:1V SHALL BE COVERED BY EROSION CONTROL BLANKET. SEE DETAIL THIS SHEET
2. SEE APPROXIMATE LIMITS OF DETAIL ON SHEET C-5.

PROPOSED EDGE OF LANDFILL CAP ALONG RIVERFRONT AREAS-NORTHERN MOUND

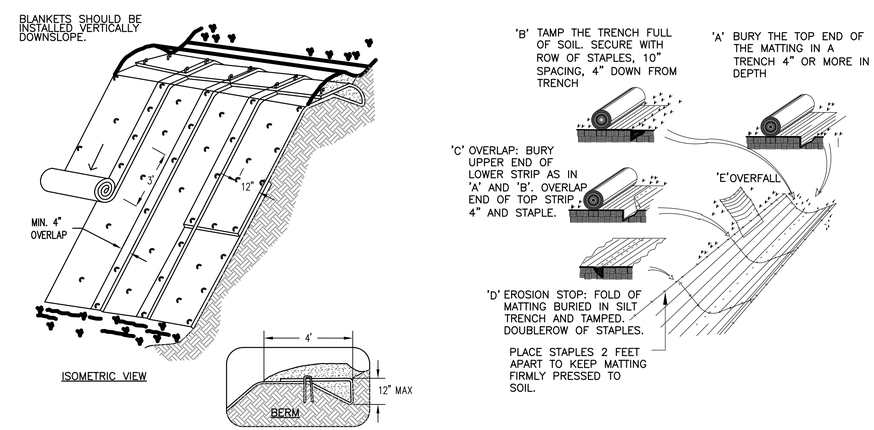
DETAIL 3 / D-1
N.T.S.



NOTES:
1. SEE DETAIL 3 THIS SHEET FOR TOE OF SLOPE AT LOCATIONS WITH RIVERFRONT SLOPE AREAS.
2. SEE SHEET C-5 FOR APPROXIMATE LIMITS OF DETAIL INSTALLATION.
3. ALL VEGETATED SLOPES STEEPER THAN 4 HORIZONTAL TO ONE VERTICAL (4H:1V) TO RECEIVE EROSION CONTROL FABRIC.

TYPICAL FINAL CAP SYSTEM TOE OF SLOPE ANCHORING-NON RIVERFRONT AREAS- NORTHERN MOUND

DETAIL 4 / D-1
SCALE: NTS



SLOPE CONDITION

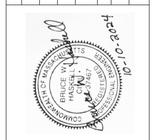
SWALE CONDITION

NOTES:
1. ALL SLOPES STEEPER THAN 4H:1V SHALL BE COVERED BY EROSION CONTROL BLANKET.
2. STAPLE DIMENSIONS AND SIZE PER MANUFACTURER'S SPECIFICATIONS. STAPLES SHALL NOT BE LONGER THAN 12" AND SHALL NOT DAMAGE THE 40-MIL. HDPE FML OR DRAINAGE GEOCOMPOSITE.

EROSION CONTROL BLANKET-ALL AREAS

DETAIL 5 / D-1
N.T.S.

REVISIONS



Langdon Environmental LLC
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Drawn : JEC
Checked : BWH
Scale : AS NOTED
Date : OCT. 2024

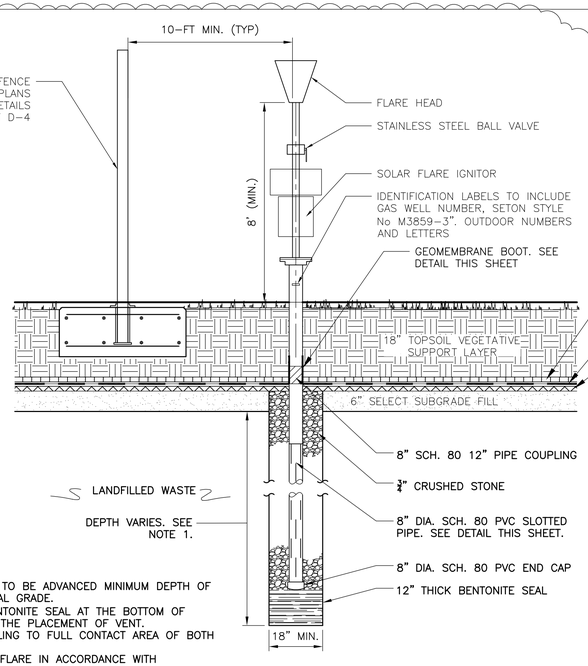
DETAILS I

HAVERHILL LANDFILL-NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

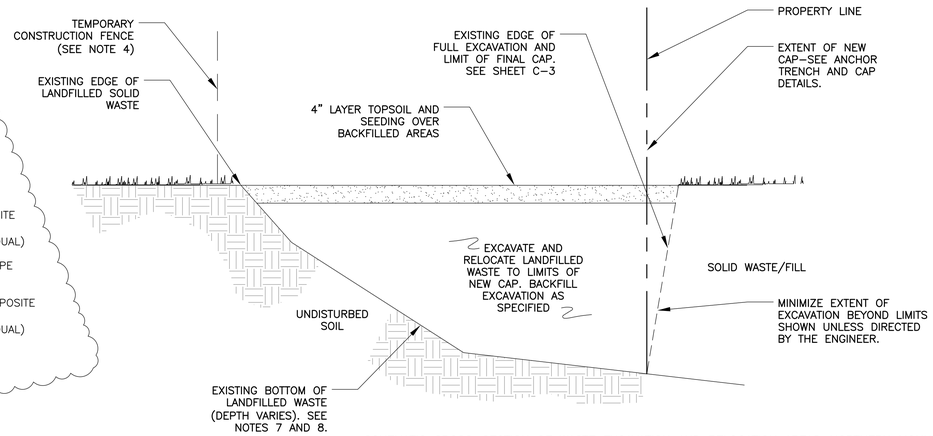
D-1



NOTES:
1. GAS VENT BOREHOLE TO BE ADVANCED MINIMUM DEPTH OF TEN FEET BELOW FINAL GRADE.
2. PLACE 12" THICK BENTONITE SEAL AT THE BOTTOM OF BOREHOLE PRIOR TO THE PLACEMENT OF VENT.
3. SOLVENT WELD COUPLING TO FULL CONTACT AREA OF BOTH PIPES.
4. INSTALL SOLAR VENT FLARE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
5. CONTRACTOR TO PROVIDE RECOMMENDED APPROACH TO CONNECT HORIZONTAL HEADER COLLECTION PIPES TO GAS VENT TO ENGINEER FOR REVIEW AND APPROVAL.
6. CONNECTIONS FROM HORIZONTAL FLAT PANEL CONNECTIONS TO LANDFILL GAS VENTS SHALL BE MANUFACTURERS STANDARD AND SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION

SUMMIT LANDFILL GAS VENT-SOLAR VENT FLARE

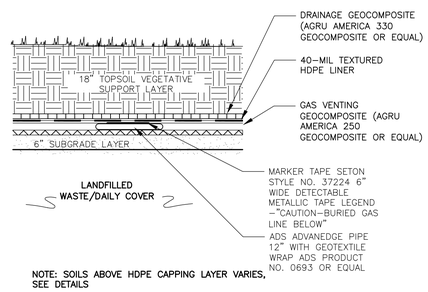
DETAIL 1 / D-2
N.T.S.



SCHEMATIC CROSS-SECTION OF WASTE EXCAVATION AND RELOCATION AREAS-NORTHERN MOUND

DETAIL 2 / D-2
N.T.S.

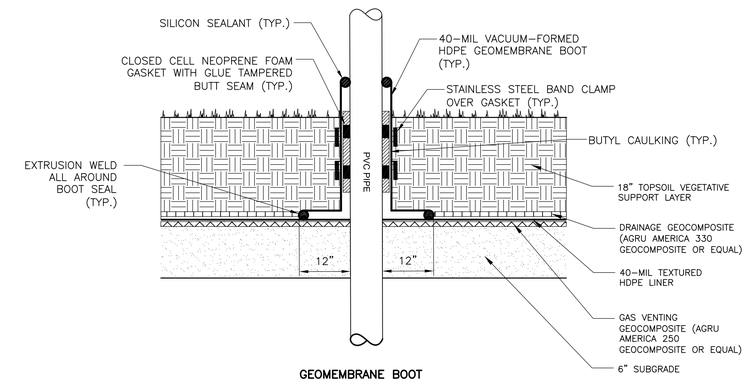
NOTES:
1. DURING WASTE EXCAVATION, A 6-INCH CLEAN SOIL DAILY COVER LAYER TO BE PLACED OVER EXPOSED WASTE AT THE END OF EACH DAY. CONTRACTOR MAY USE A TARP THAT IS PROPERLY WEIGHTED AS AN ALTERNATIVE TO SOIL COVER WITH APPROVAL BY ENGINEER.
2. CONTRACTOR TO CONTROL STORMWATER TO NOT RUN INTO OPEN EXCAVATION AREAS.
3. CONTRACTOR TO MINIMIZE EXTENT OF OPEN EXCAVATIONS AT THE END OF EACH DAY.
4. FOR WASTE EXCAVATION ADJACENT TO AND ON MASS ELECTRIC PROPERTY, CONTRACTOR TO MAINTAIN TEMPORARY FENCING AND TAKE ALL NECESSARY ADDITIONAL MEASURES TO LIMIT PUBLIC ACCESS TO EXCAVATIONS AND ACTIVE CONSTRUCTION AREAS.
5. EXCAVATED AREAS OUTSIDE OF CAP TO BE BACKFILLED WITH SOIL TYPES AS SPECIFIED.
6. FINISH BACKFILL GRADES TO BE EXISTING ELEVATIONS UNLESS GRADING SHOWN ON SHEET C-4 IS DIFFERENT.
7. BOTTOM LIMIT OF EXCAVATION TO BE DETERMINED BY ENGINEER BASED ON REMOVAL OF ALL SOLID WASTE AND VISUALLY IMPACTED SOILS.
8. CONTRACTOR TO PROVIDE SURVEYED ELEVATION AND LIMITS OF BOTTOM OF WASTE EXCAVATION AREAS.



NOTE: SOILS ABOVE HDPE CAPPING LAYER VARIES, SEE DETAILS

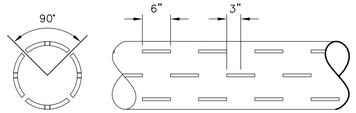
TYPICAL LANDFILL GAS HEADER COLLECTION LATERAL PIPE-NORTHERN MOUND

DETAIL 4 / D-2
N.T.S.



GEOMEMBRANE BOOT

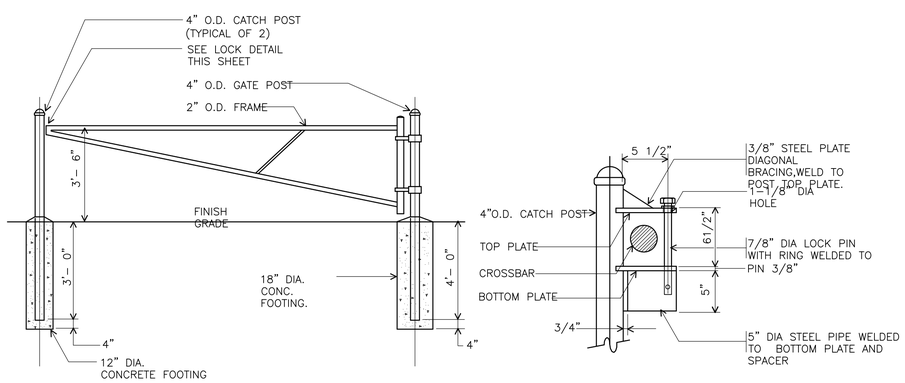
DETAIL 5 / D-2
N.T.S.



NOTE:
1. PVC PIPE SHALL BE PERFORATED WITH SLOTS ⅛" TO ¼" WIDE BY 6" LONG. FOUR SLOTS PER ROW SPACED 90° APART, WITH ADJACENT ROWS OFFSET BY 45°.

PVC SLOTTED PIPE

DETAIL 3 / D-2
N.T.S.

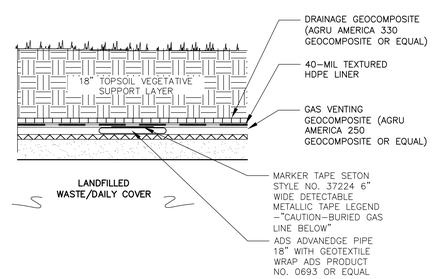


SINGLE LEAF BARRICADE GATE

LOCK POST AND LOCKING ASSEMBLY

BARRICADE GATE

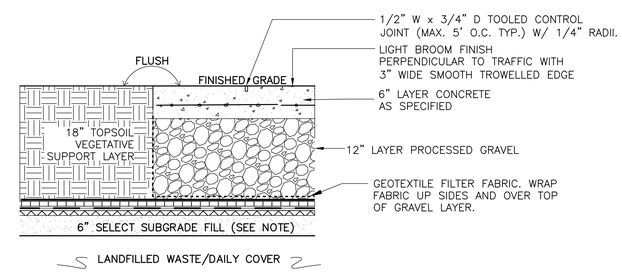
DETAIL 6 / D-2
NOT TO SCALE



NOTE: SOILS ABOVE HDPE CAPPING LAYER VARIES, SEE DETAILS

TYPICAL LANDFILL GAS HEADER COLLECTION PIPE-NORTHERN MOUND

DETAIL 7 / D-2
N.T.S.



CONCRETE PAD ON CAP

DETAIL 8 / D-2
N.T.S.

NO.	DATE	BY	CHECKED	DESCRIPTION
1	3/14/25	JC	BH	RESPONSE TO REGULATORY COMMENTS

REVISIONS

COMMONWEALTH OF MASSACHUSETTS BRUCE W. HAMILTON CIVIL No. 47462 REGISTERED PROFESSIONAL ENGINEER
10-28-24

Langdon Environmental LLC
404 THE HILL, PO BOX 511
PORTSMOUTH, NH 03802
(617) 875-3663

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Drawn : JEC
Checked : BWH
Scale : AS NOTED
Date : OCT. 2024

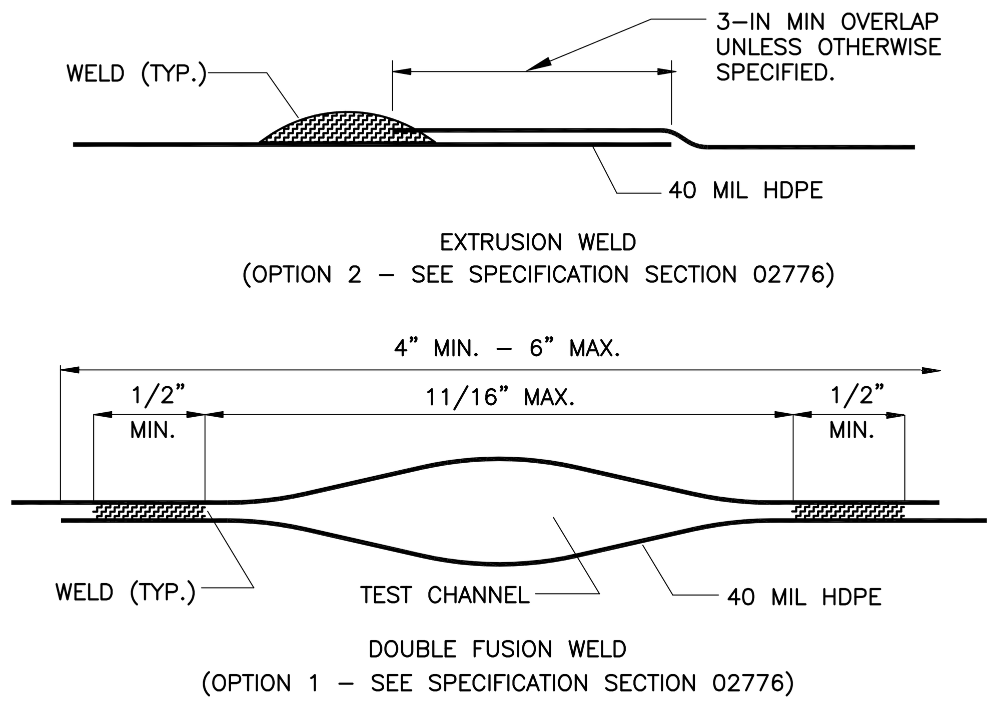
DETAILS II

HAVERHILL LANDFILL-NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

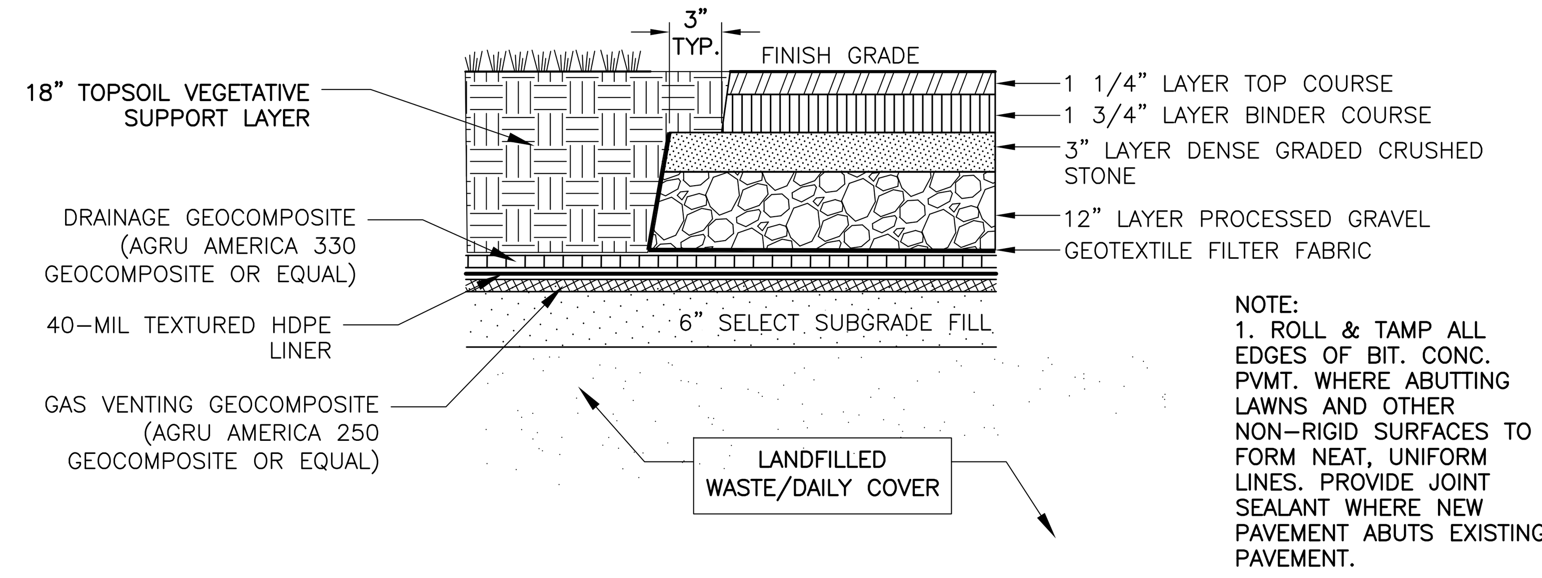
Dwg. No.

D-2



HDPE WELD DETAIL

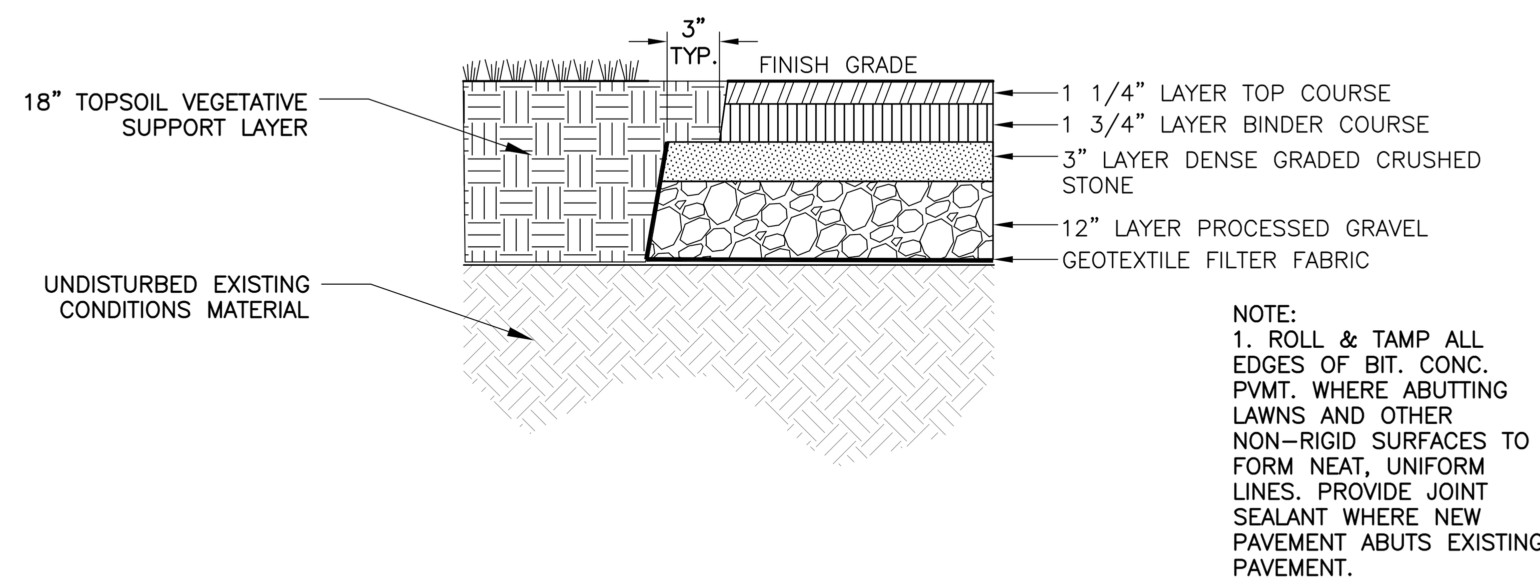
DETAIL 1
SCALE: NTS
D-3



NOTE:
1. ROLL & TAMP ALL EDGES OF BIT. CONC. PVMT. WHERE ABUTTING LAWNS AND OTHER NON-RIGID SURFACES TO FORM NEAT, UNIFORM LINES. PROVIDE JOINT SEALANT WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT.

BITUMINOUS CONCRETE WALKING PATH-ON CAP

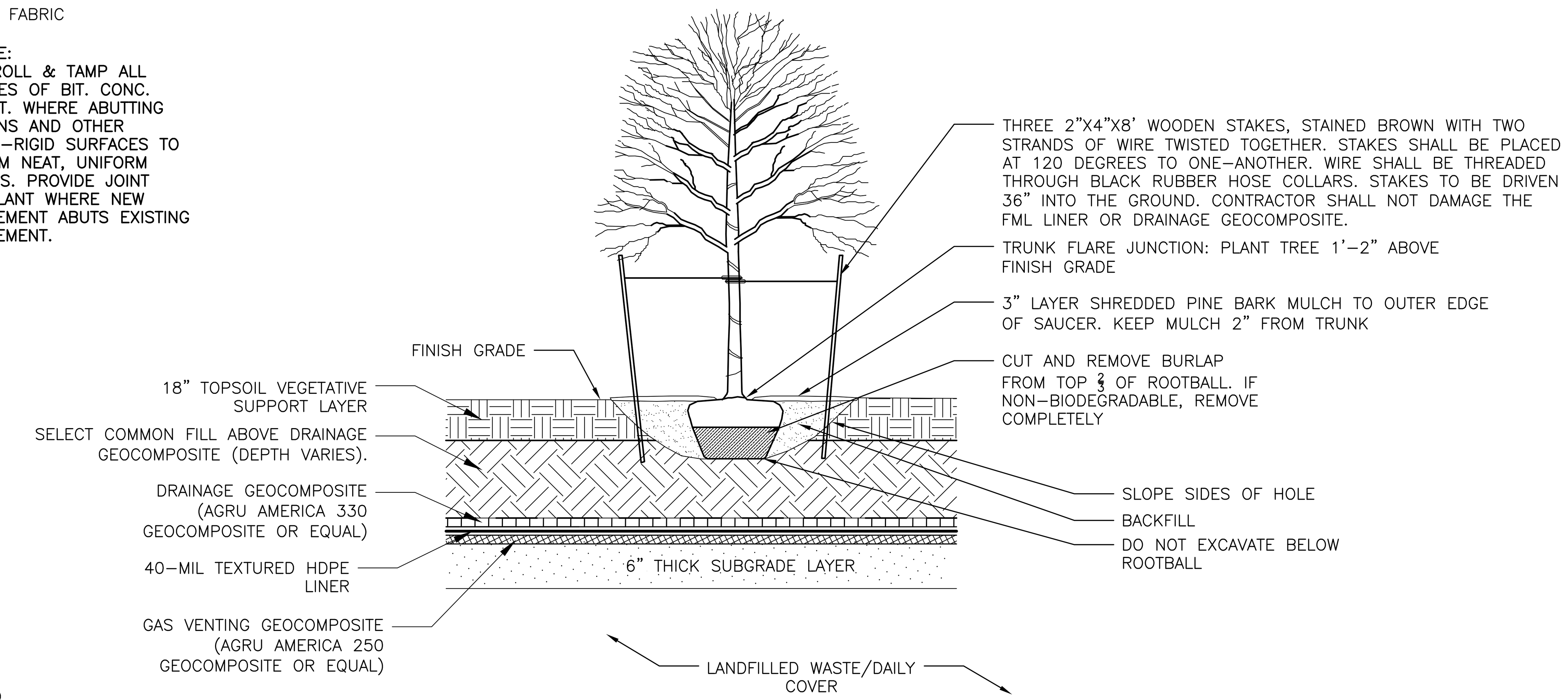
DETAIL 2
N.T.S.
D-3



NOTE:
1. ROLL & TAMP ALL EDGES OF BIT. CONC. PVMT. WHERE ABUTTING LAWNS AND OTHER NON-RIGID SURFACES TO FORM NEAT, UNIFORM LINES. PROVIDE JOINT SEALANT WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT.

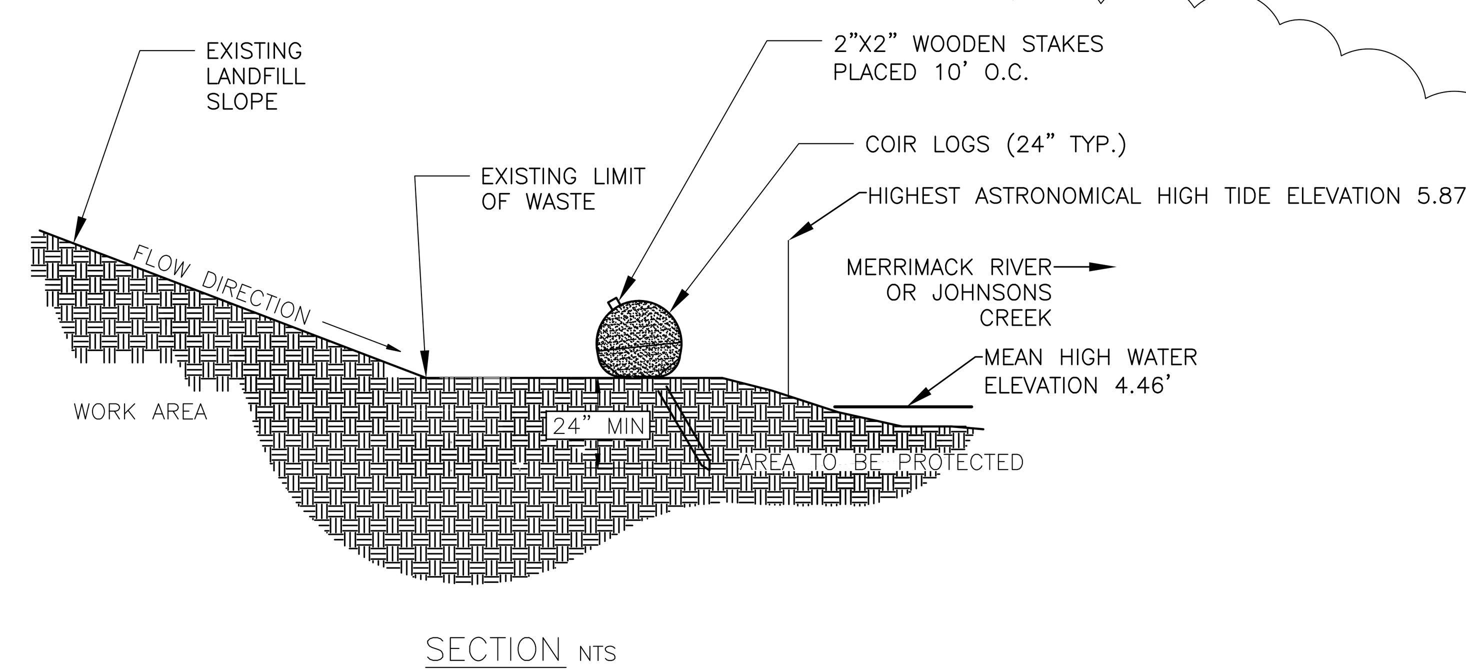
BITUMINOUS CONCRETE WALKING PATH-OFF CAP

DETAIL 4
N.T.S.
D-3

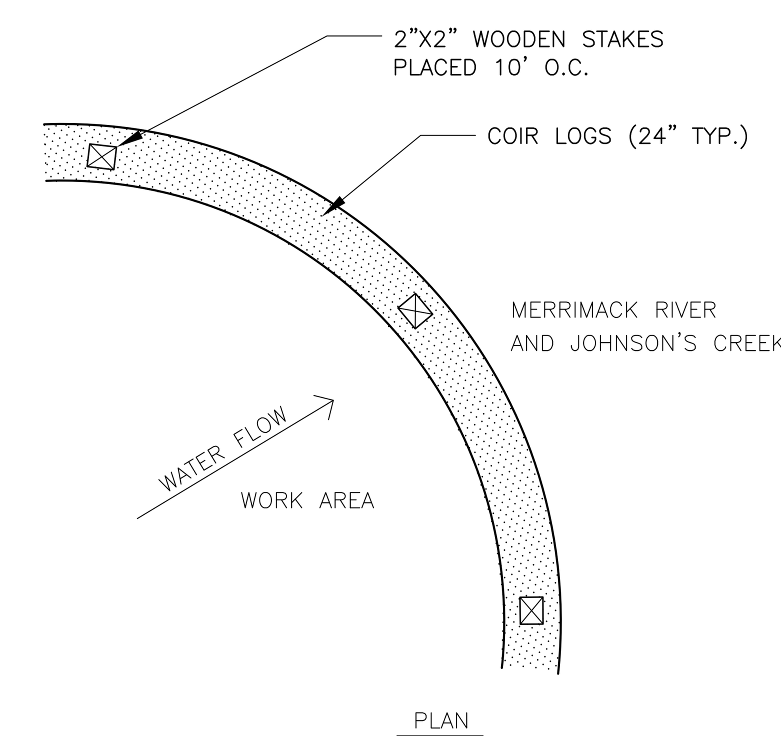


TREE PLANTING

DETAIL 3
NOT TO SCALE
D-3

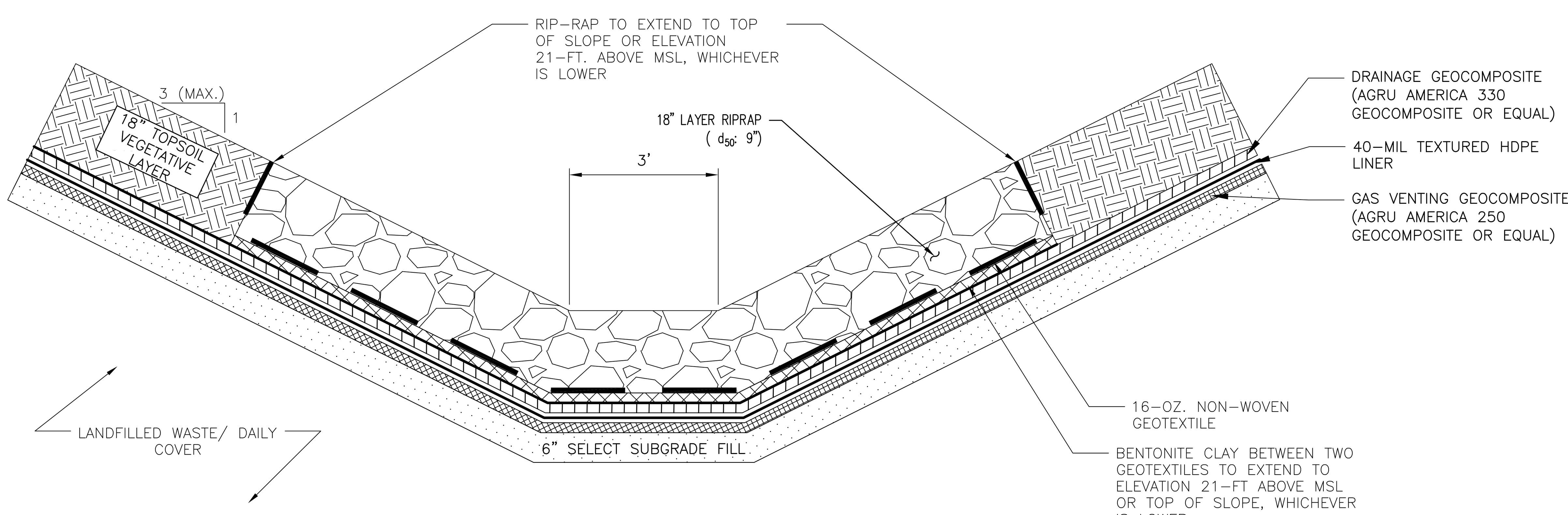


NOTES
1. COIR LOGS TO BE INSTALLED AT OR ABOVE THE HIGHEST ASTRONOMICAL HIGH TIDE ELEVATION AT ELEVATION 5.87.
2. CONTRACTOR MAY TEMPORARILY REMOVE COIR LOGS TO BE ABLE TO CONDUCT CAPPING OPERATIONS. NO WORK IS ALLOWED IN STANDING WATER IN THE MERRIMACK RIVER OR JOHNSON'S CREEK. REMOVED COIR LOGS TO BE RE-INSTALLED IN ACCORDANCE WITH DETAIL AT END OF EACH DAY.
3. CONTRACTOR MAY PROPOSE ALTERNATIVE APPROACHES TO INSTALL COIR LOGS TO ENGINEER FOR REVIEW AND APPROVAL. ALTERNATIVES SHALL PROVIDE THE SAME LEVEL OF PROTECTION AS DETAIL SHOWN.
4. CONTRACTOR TO MAINTAIN COIR LOGS THROUGHOUT DURATION OF CONSTRUCTION AND UNTIL VEGETATION ON THE SLOPES IS ESTABLISHED. COIR LOGS CAN ONLY BE REMOVED WITH THE APPROVAL OF THE ENGINEER. MAINTENANCE OF THE COIR LOGS SHALL BE AT NO ADDITIONAL COST TO THE OWNER.
5. CONTRACTOR MAY BE REQUIRED TO INSTALL ADDITIONAL EROSION CONTROLS BY ENGINEER TO PROTECT DISCHARGE OF SILT AND SEDIMENTS INTO THE MERRIMACK RIVER AND JOHNSONS CREEK AT NO ADDITIONAL COST TO THE OWNER.



COIR LOGS SEDIMENT CONTROL

DETAIL 5
N.T.S.
D-3



INTERMITTENT STREAM CHANNEL

DETAIL 6
N.T.S.
D-3

NO.	DATE	BY	CHECKED	DESCRIPTION
1	3/14/25	JC	BH	RESPONSE TO REGULATORY COMMENTS

REVISIONS

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Checked : BWH
Scale : AS NOTED
Date : OCT. 2024

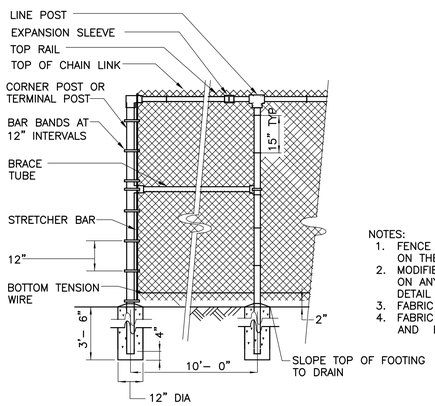
DETAILS III

HAVERHILL LANDFILL-NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

D-3

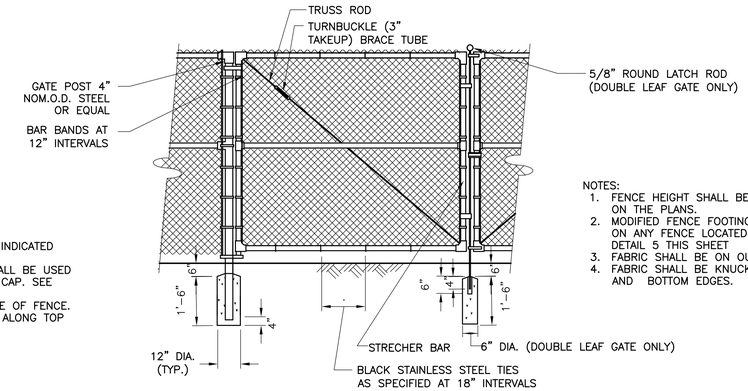


NOTES:
1. FENCE HEIGHT SHALL BE AS INDICATED ON THE PLANS.
2. MODIFIED FENCE FOOTING SHALL BE USED ON ANY FENCE LOCATED ON CAP. SEE DETAIL 5 THIS SHEET
3. FABRIC SHALL BE ON OUTSIDE OF FENCE.
4. FABRIC SHALL BE KNUCKLED ALONG TOP AND BOTTOM EDGES.

CHAIN LINK FENCE

DETAIL 1 / D–4

NOT TO SCALE

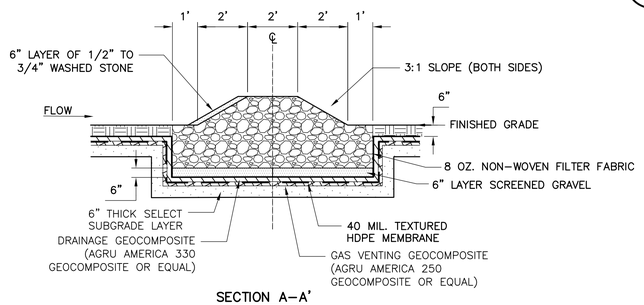


NOTES:
1. FENCE HEIGHT SHALL BE AS INDICATED ON THE PLANS.
2. MODIFIED FENCE FOOTING SHALL BE USED ON ANY FENCE LOCATED ON CAP. SEE DETAIL 5 THIS SHEET
3. FABRIC SHALL BE ON OUTSIDE OF FENCE.
4. FABRIC SHALL BE KNUCKLED ALONG TOP AND BOTTOM EDGES.

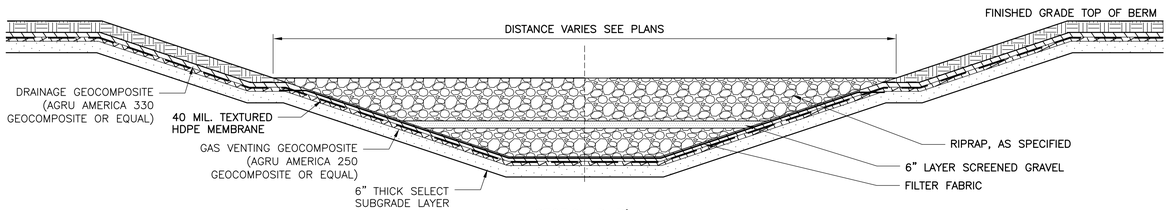
CHAIN LINK FENCE–LEAF SWING GATE

DETAIL 2 / D–4

NOT TO SCALE



SECTION A–A'

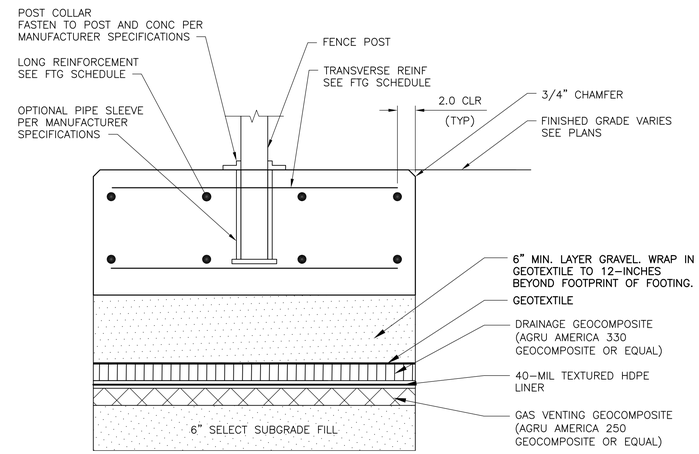


SECTION B–B'

FOREBAY

DETAIL 3 / D–4

SCALE: NTS



MODIFIED FENCE FOOTING SCHEDULE

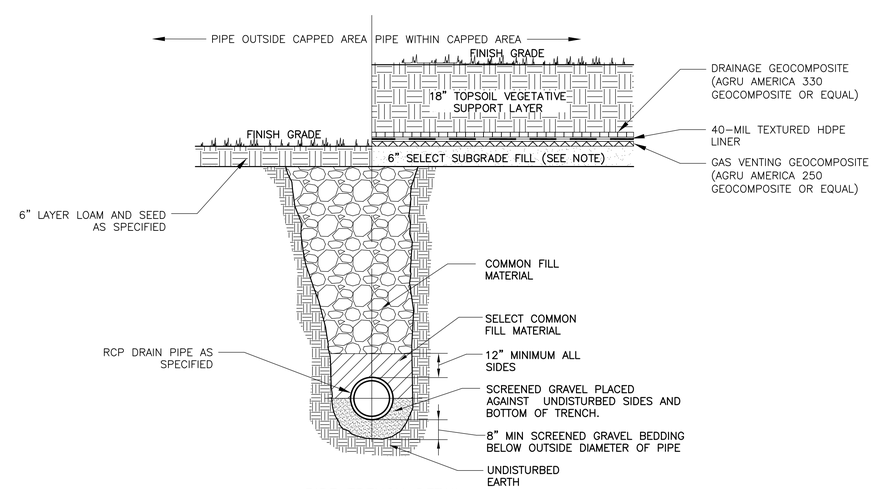
	FOOTING HEIGHT	FOOTING WIDTH	LONGITUDINAL REINFORCEMENT	TRANSVERSE REINFORCEMENT
4'–0" FENCE 6'–0" FENCE	1'–2"	2'–0"	2–#4 T&B	#4@12
8'–0" FENCE	1'–2"	3'–6"	4–#4 T&B	#4@12

NOTE:
1. MODIFIED FOOTINGS SHALL BE USED IN LOCATIONS WHERE FENCE IS TO BE INSTALLED ABOVE CAPPED AREAS WITH LESS THAN 4–FT. COVER OVER DRAINAGE GEOCOMPOSITE LOCATIONS TO BE CONFIRMED BY CONTRACTOR.

MODIFIED FENCE FOOTING ON TOP OF FML CAP

SECTION 4 / D–4

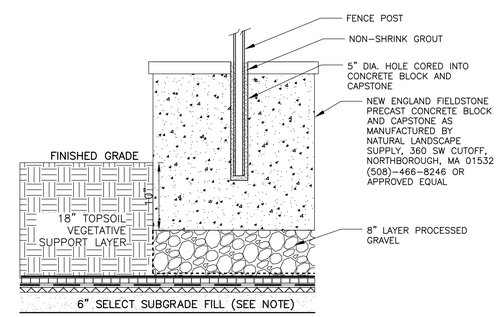
NOT TO SCALE



PIPE TRENCH DETAIL

DETAIL 5 / D–4

NOT TO SCALE



FENCE ON PRECAST CONCRETE BLOCK

DETAIL 6 / D–4

N.T.S.

REVISIONS

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Scale : AS NOTED
Date : OCT. 2024

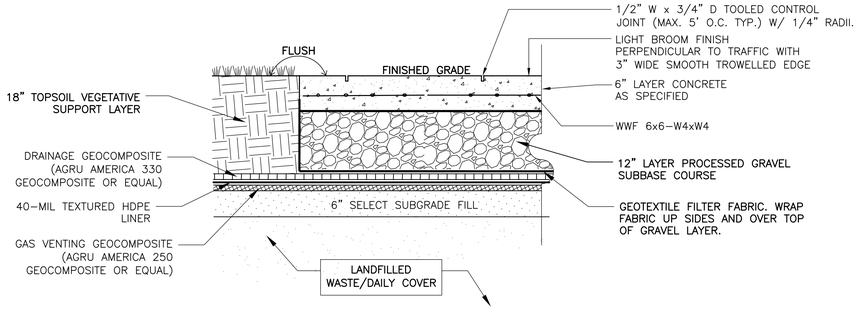
DETAILS IV

HAVERHILL LANDFILL–NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

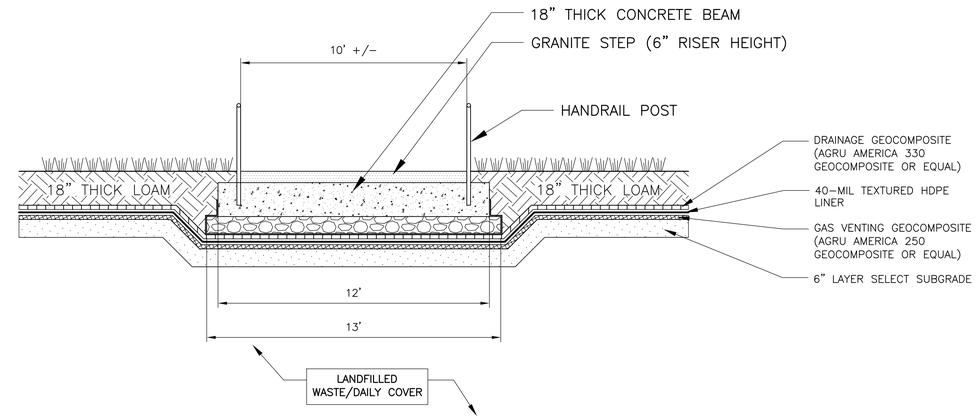
D–4



CONCRETE PAD (ON CAP)

DETAIL 1 / D-5

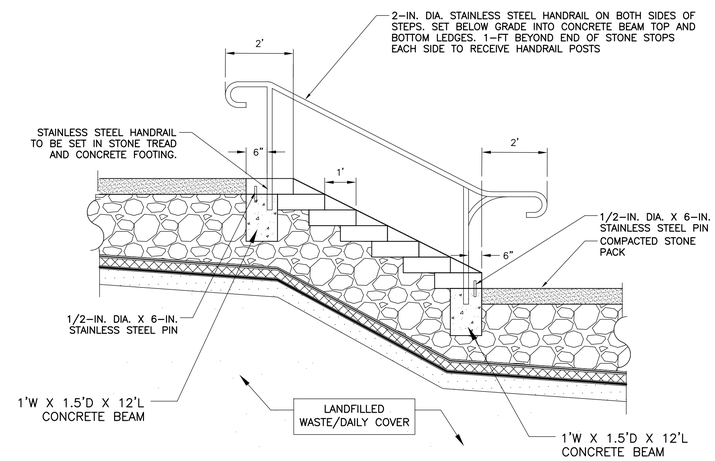
N.T.S.



GRANITE STAIRCASE PERPENDICULAR CROSS SECTION

DETAIL 2 / D-5

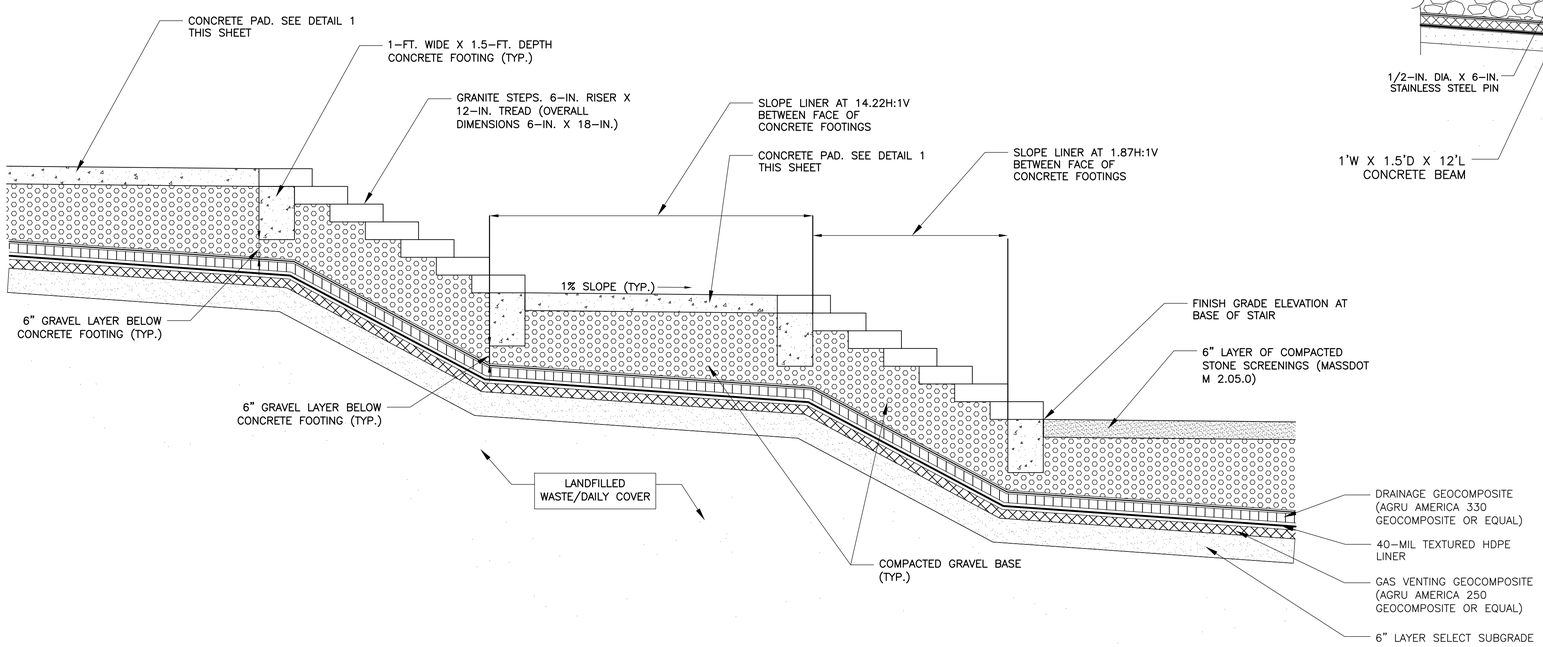
SCALE: NTS



GRANITE STAIRS

DETAIL 3 / D-5

SCALE: NTS

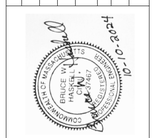


TYPICAL CROSS SECTION- GRANITE STEPS

DETAIL 4 / D-5

SCALE: NTS

REVISIONS



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Proj. Mgr.: BWH
Designed : JEC
Drawn : JEC
Checked : BWH
Scale : AS NOTED
Date : OCT. 2024

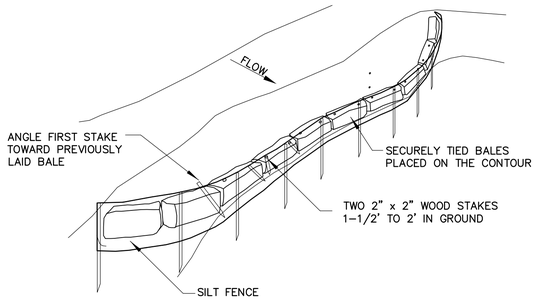
DETAILS V

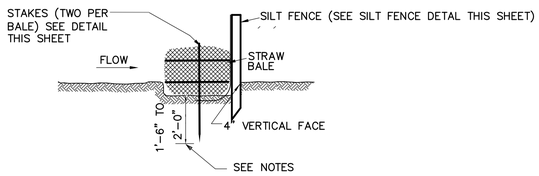
HAVERHILL LANDFILL-NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

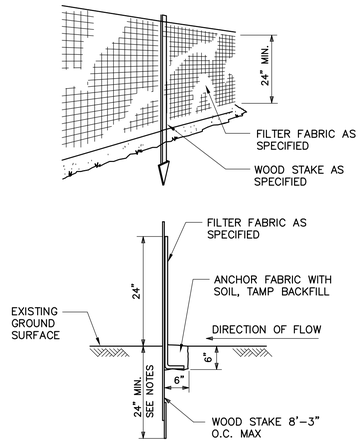
D-5





EROSION CONTROLS–LOT 26 ASH AREA

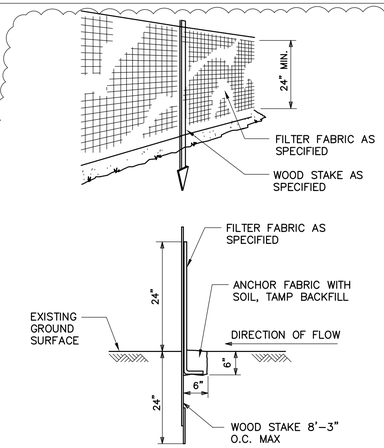
DETAIL 1 / D-6
N.T.S.



SILT FENCE DETAIL

N.T.S.

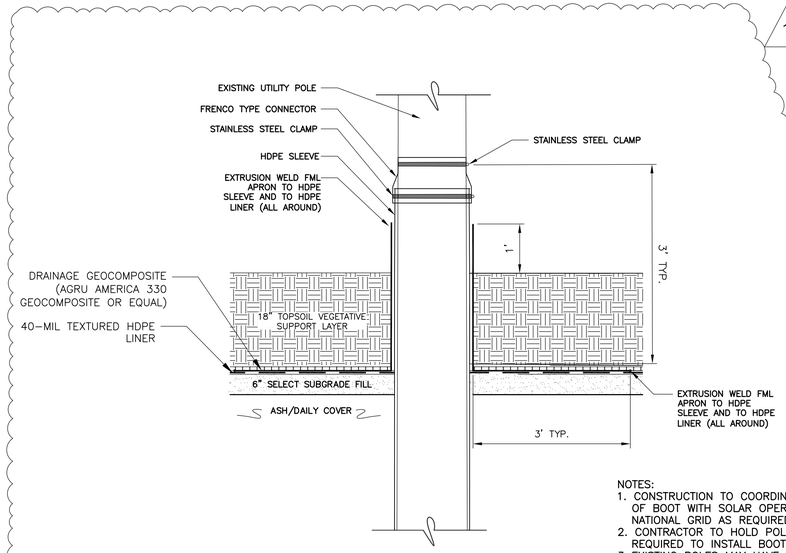
NOTE:
1. EROSION CONTROLS TO BE MAINTAINED BY CONTRACTOR FOR THE DURATION OF CONSTRUCTION. EROSION CONTROLS TO BE REPAIRED OR REPLACED AS REQUIRED OR AS DIRECTED BY THE ENGINEER.



NOTES:
1. CONTRACTOR TO MAINTAIN TURTLE EXCLUSION FENCE FOR THE DURATION OF CONSTRUCTION, EXCEPT AS NEEDED TO CONSTRUCT FINAL CAP AND PARKING AREA.
2. SEE PROJECT MANUAL FOR TIME OF YEAR RESTRICTIONS TO REMOVE EXCLUSION FENCE IF NEEDED FOR CONSTRUCTION.

TEMPORARY CONSTRUCTION TURTLE EXCLUSION FENCE

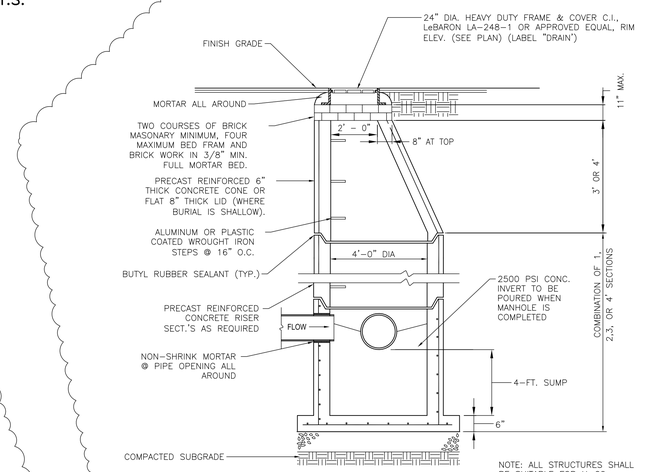
DETAIL 2 / D-6
N.T.S.



NOTES:
1. CONSTRUCTION TO COORDINATE INSTALLATION OF BOOT WITH SOLAR OPERATOR AND NATIONAL GRID AS REQUIRED
2. CONTRACTOR TO HOLD POLE IN-PLACE AS REQUIRED TO INSTALL BOOT.
3. EXISTING POLES MAY HAVE TO BE RAISED OR LOWERED PRIOR TO INSTALLATION OF BOOT. SEE FINAL GRADES ON SHEET C-4E.

POLE PENETRATION BOOT DETAIL

DETAIL 3 / D-6
SCALE: NTS



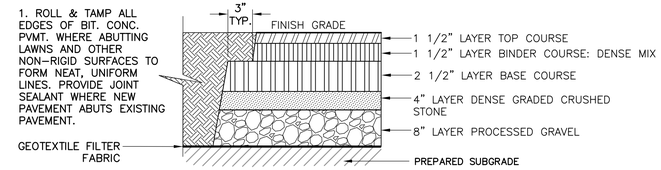
NOTE: ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.

DRAINAGE MANHOLE

DETAIL 4 / D-6
SCALE: NTS

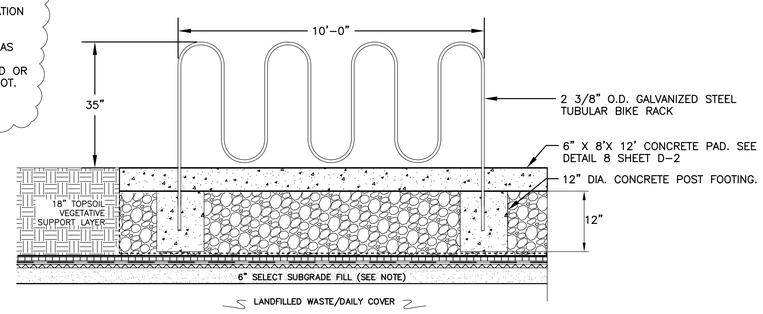
NOTES:

1. ROLL & TAMP ALL EDGES OF BIT. CONC. PVMT. WHERE ABUTTING LAWNS AND OTHER NON-RIGID SURFACES TO FORM NEAT, UNIFORM LINES. PROVIDE JOINT SEALANT WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT.



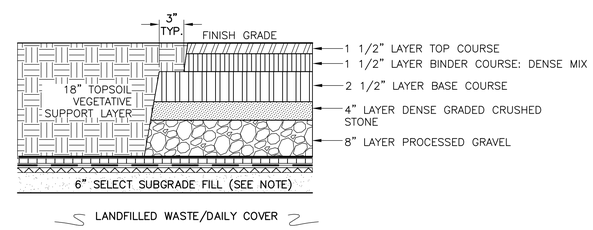
OFF-CAP BITUMINOUS CONCRETE PAVEMENT: ROADWAY

DETAIL 5 / D-6
SCALE: NTS



BICYCLE RACK

DETAIL 7 / D-6
NOT TO SCALE



ON-CAP BITUMINOUS CONCRETE PAVEMENT: ROADWAY

DETAIL 6 / D-6
SCALE: NTS

NO.	DATE	BY	CHECKED	DESCRIPTION
1	3/14/25	JC	BH	RESPONSE TO REGULATORY COMMENTS

REVISIONS

BRUCE W. HOLMES CERTIFIED ENGINEER OF RECORD COMMONWEALTH OF MASSACHUSETTS CIVIL No. 47462 10-10-2024

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Date : OCT. 2024

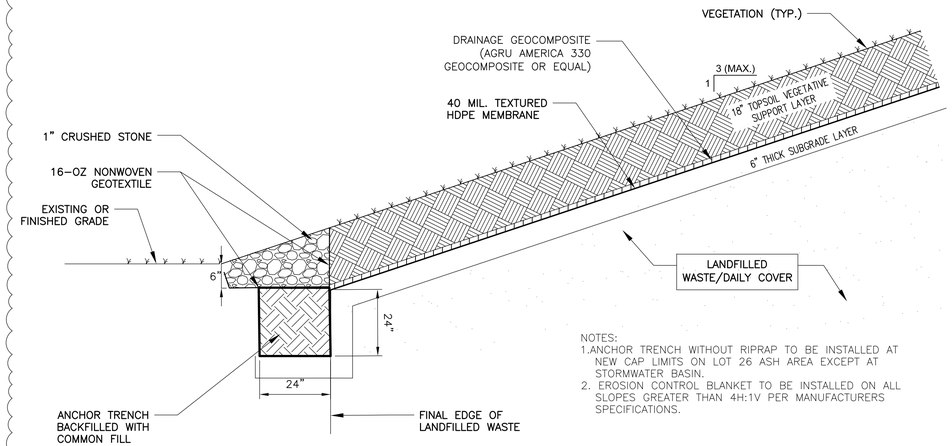
DETAILS VI

HAVERHILL LANDFILL–NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

D–6

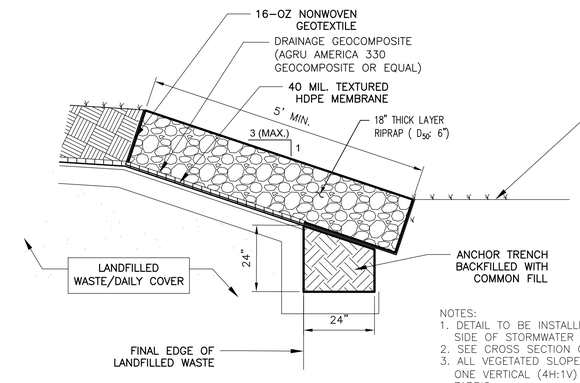


NOTES:
1. ANCHOR TRENCH WITHOUT RIPRAP TO BE INSTALLED AT NEW CAP LIMITS ON LOT 26 ASH AREA EXCEPT AT STORMWATER BASIN.
2. EROSION CONTROL BLANKET TO BE INSTALLED ON ALL SLOPES GREATER THAN 4H:1V PER MANUFACTURERS SPECIFICATIONS.

TYPICAL FINAL CAP SYSTEM TOE OF SLOPE ANCHORING–NON BASIN AREAS– LOT 26 ASH AREA

DETAIL 1 / D–7

SCALE: NTS

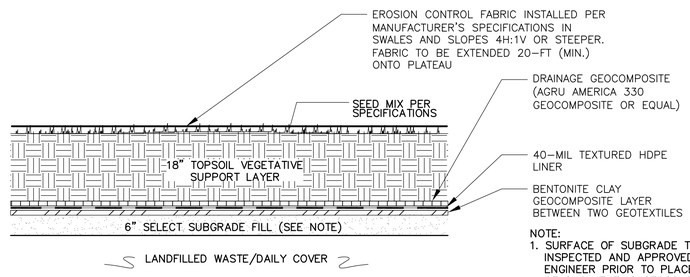


NOTES:
1. DETAIL TO BE INSTALLED AT WEST, NORTH AND SOUTH SIDE OF STORMWATER RETENTION BASIN.
2. SEE CROSS SECTION OF BASIN THIS SHEET.
3. ALL VEGETATED SLOPES STEEPER THAN 4 HORIZONTAL TO ONE VERTICAL (4H:1V) TO RECEIVE EROSION CONTROL FABRIC.

RIPRAP TOE OF SLOPE & ANCHOR TRENCH AT BASIN–LOT 26 ASH AREA

DETAIL 2 / D–7

N.T.S.

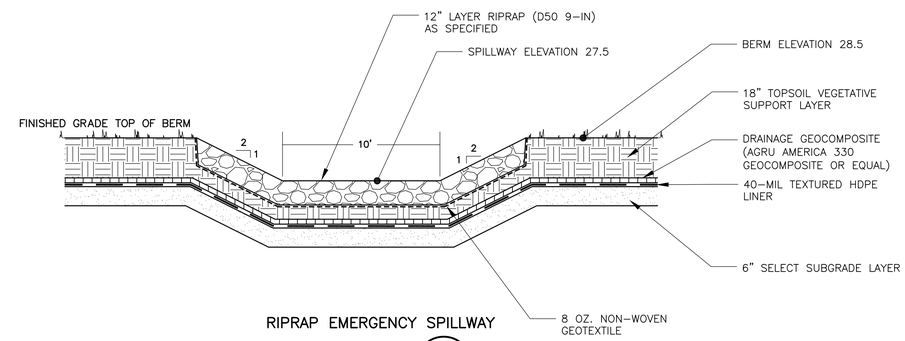


NOTE:
1. SURFACE OF SUBGRADE TO BE INSPECTED AND APPROVED BY ENGINEER PRIOR TO PLACEMENT OF GAS VENTING GEOCOMPOSITE.
2. SUBGRADE SHALL BE 1–INCH MINUS GRADATION.

TYPICAL CAP CROSS SECTION UNDER BASIN AND BIORETENTION SWALE–LOT 26 ASH AREA

DETAIL 3 / D–7

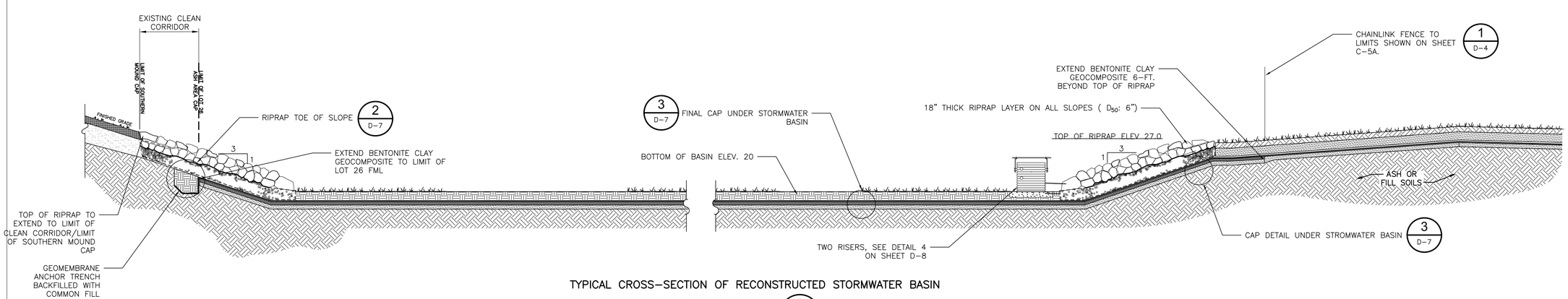
N.T.S.



RIPRAP EMERGENCY SPILLWAY

DETAIL 4 / D–7

N.T.S.



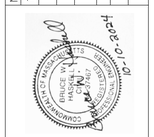
TYPICAL CROSS–SECTION OF RECONSTRUCTED STORMWATER BASIN

DETAIL 5 / D–7

N.T.S.

NO.	DATE	BY	CHECKED	DESCRIPTION
1	3/14/25	JC	BH	RESPONSE TO REGULATORY COMMENTS

REVISIONS



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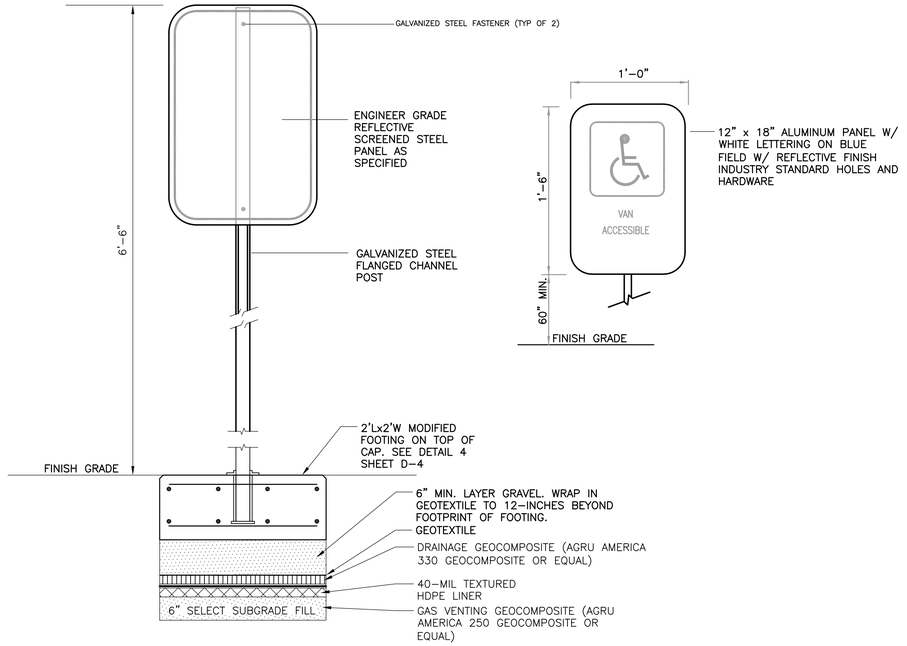
DETAILS VII

HAVERHILL LANDFILL–NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

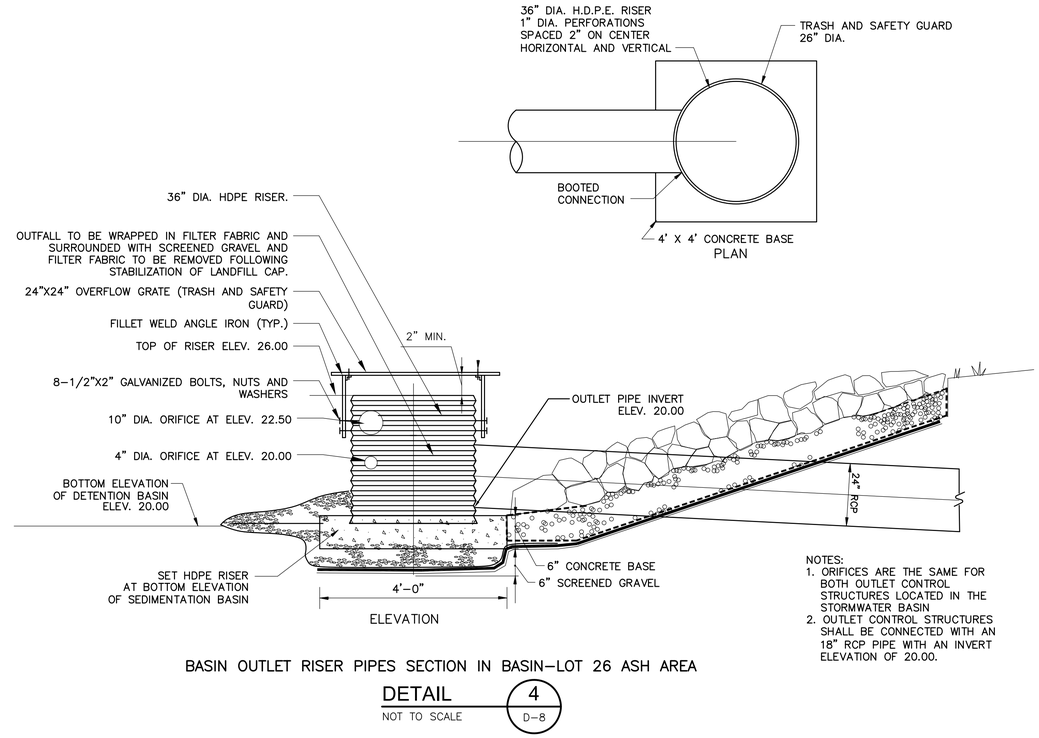
D–7



ACCESSIBLE PARKING SIGN ON MODIFIED FOOTING

DETAIL 1 / D-8

SCALE: NTS

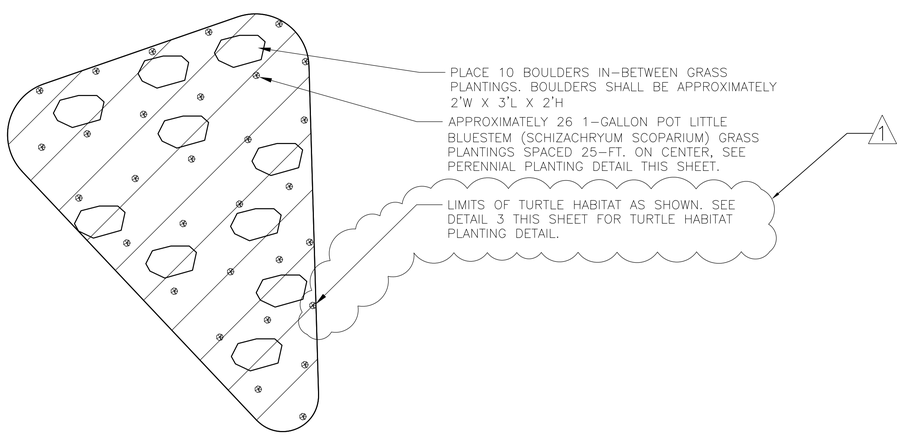


NOTES:
1. ORIFICES ARE THE SAME FOR BOTH OUTLET CONTROL STRUCTURES LOCATED IN THE STORMWATER BASIN
2. OUTLET CONTROL STRUCTURES SHALL BE CONNECTED WITH AN 18" RCP PIPE WITH AN INVERT ELEVATION OF 20.00.

BASIN OUTLET RISER PIPES SECTION IN BASIN-LOT 26 ASH AREA

DETAIL 4 / D-8

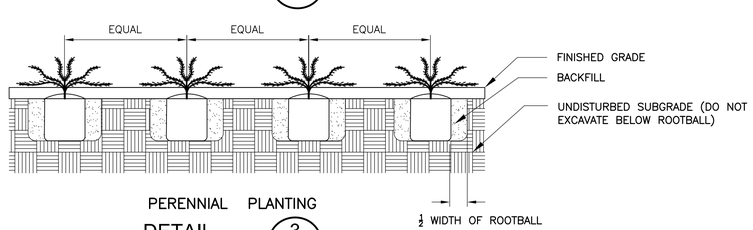
NOT TO SCALE



TURTLE HABITAT PLANTING PLAN

DETAIL 2 / D-8

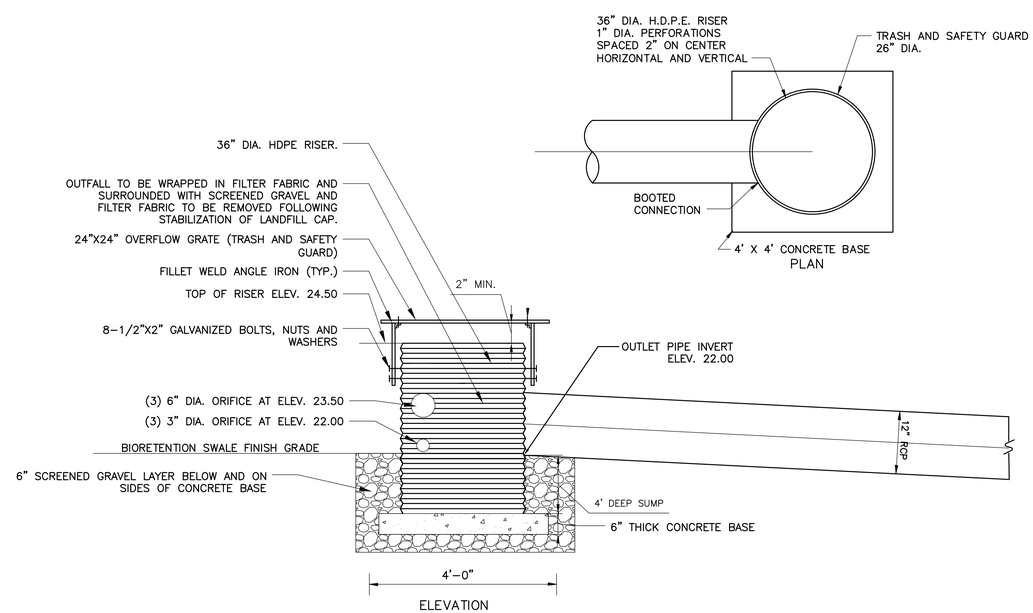
SCALE: NTS



PERENNIAL PLANTING

DETAIL 3 / D-8

NOT TO SCALE



BIORETENTION SWALE RISER PIPE SECTION-LOT 26 ASH AREA-OFF-CAP

DETAIL 5 / D-8

NOT TO SCALE

NO.	DATE	BY	CHECKED	DESCRIPTION
1	3/14/25	JC	BH	RESPONSE TO REGULATORY COMMENTS

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DETAILS VIII

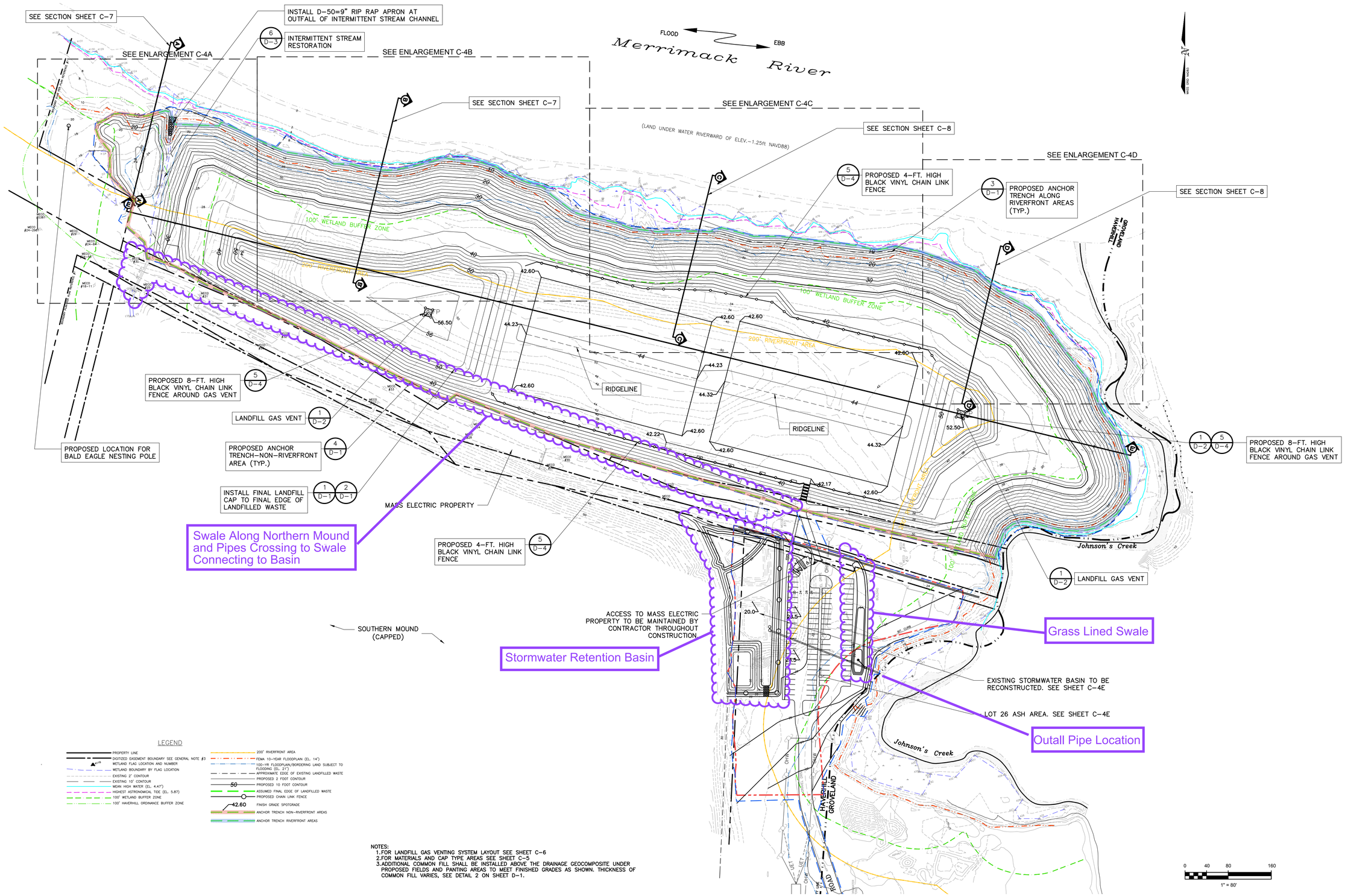
HAVERHILL LANDFILL-NORTHERN MOUND
& LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

D-8

Attachment C – Stormwater BMP Figure



LEGEND

- PROPERTY LINE
- DIGITIZED EASEMENT BOUNDARY SEE GENERAL NOTE #3
- WETLAND FLAG LOCATION AND NUMBER
- WETLAND BOUNDARY BY FLAG LOCATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- MEAN HIGH WATER (EL. 4.47')
- HIGHEST ASTRONOMICAL TIDE (EL. 5.87)
- 100' WETLAND BUFFER ZONE
- 100' HAVERHILL ORDINANCE BUFFER ZONE
- 200' RIVERFRONT AREA
- FEMA 10-YEAR FLOODPLAIN (EL. 14')
- 100-YR FLOODPLAIN/BORDERING LAND SUBJECT TO FLOODING (EL. 21')
- APPROXIMATE EDGE OF EXISTING LANDFILLED WASTE
- PROPOSED 2 FOOT CONTOUR
- 50 PROPOSED 10 FOOT CONTOUR
- ASSUMED FINAL EDGE OF LANDFILLED WASTE
- PROPOSED CHAIN LINK FENCE
- 42.60 FINISH GRADE SPOTGRADE
- ANCHOR TRENCH NON-RIVERFRONT AREAS
- ANCHOR TRENCH RIVERFRONT AREAS

NOTES:
1. FOR LANDFILL GAS VENTING SYSTEM LAYOUT SEE SHEET C-6
2. FOR MATERIALS AND CAP TYPE AREAS SEE SHEET C-5
3. ADDITIONAL COMMON FILL SHALL BE INSTALLED ABOVE THE DRAINAGE GEOCOMPOSITE UNDER PROPOSED FIELDS AND PANTING AREAS TO MEET FINISHED GRADES AS SHOWN. THICKNESS OF COMMON FILL VARIES, SEE DETAIL 2 ON SHEET D-1.

Figure: Stormwater Best Management Practice (BMP) Locations Schematic - Northern Mound of Haverhill Landfill and Lot 26 Ash Area

REVISIONS

BRUCE W. HILL CERTIFIED WETLAND SCIENTIST CWS 10-10-2024

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FINISH GRADING PLAN-NORTHERN MOUND

HAVERHILL LANDFILL-NORTHERN MOUND & LOT 26 ASH AREA
HAVERHILL MASSACHUSETTS

Proj. No.

Dwg. No.

C-4