

Borrow Area Use Plan

Chaffee Facility – Area 7/8 Development

JULY 24, 2020, REV APRIL 29, 2022

208-190260

PRESENTED TO

Waste Management of New York

10860 Olean Road
Sardinia, New York 14030

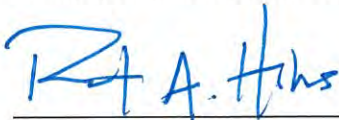
SUBMITTED BY

Cornerstone Engineering and Geology, PLLC
3136 S. Winton Road, Suite 303
Rochester, New York 14623

P +1.877.294.9070
F +1.877.845.1456
cornerstoneeg.com

REPORT CERTIFICATION

The material and data in this report were prepared under the supervision and direction of the undersigned.



Robert A. Holmes, P.E.
Client Manager

4/29/22
Date



TABLE OF CONTENTS

1.0	INTRODUCTION	1-1
1.1	PURPOSE	1-1
1.2	SCOPE	1-1
2.0	BORROW PLAN	2-1
2.1	INTRODUCTION	2-1
2.2	EXISTING CONDITIONS	2-1
2.2.1	Borrow History and Land Use.....	2-1
2.2.2	Existing Topography	2-2
2.2.3	Soils	2-2
2.2.4	Groundwater	2-3
2.2.5	Surface Water Drainage	2-4
2.2.6	Man Made Features.....	2-4
2.3	DESCRIPTION OF MINERAL AND BORROW OPERATIONS	2-4
2.3.1	Mineral Types	2-5
2.3.2	Borrow Sequence and Method	2-5
2.3.3	Grading and Setbacks	2-6
2.3.4	Processing	2-7
2.3.5	Haulageways and Site Access	2-7
2.3.6	Storage of Materials and Disposal of Wastes	2-7
2.4	POTENTIAL ENVIRONMENTAL IMPACTS.....	2-7
2.4.1	Control of Air Emissions	2-7
2.4.2	Control of Noise	2-8
2.4.3	Control of Water Quality and Quantity.....	2-8
2.4.4	Silt Control	2-8
2.4.5	Groundwater Management During Excavation.....	2-9
2.4.6	Traffic.....	2-9
3.0	RECLAMATION PLAN	3-1
3.1	LAND USE OBJECTIVE	3-1
3.1.1	Disposition of Materials	3-1
3.1.2	Haulageways & Access Locations.....	3-1
3.1.3	Drainage and Grading	3-1
3.1.4	Re-vegetation	3-2
3.1.5	Wetland Mitigation	3-2
3.1.6	Reclamation of Existing Gravel Borrow Area	3-2
3.2	RECLAMATION SCHEDULE	3-2

FIGURES

Figure 1	Overall Site Plan/Existing Conditions
Figure 2	Borrow Area C Plan and Sections
Figure 3	South Borrow Area Plan and Sections
Figure 4	Borrow Area C – Reclamation Plan
Figure 5	South Borrow Area – Reclamation Plan
Figure 6	South Borrow Area Sedimentation Basin Details
Figure 7	Erosion and Sediment Control Details

APPENDICES

Appendix A – Supporting Calculations

1.0 INTRODUCTION

1.1 PURPOSE

This Borrow Area Use Plan (BAUP) has been prepared in accordance with the requirements contained in Title 6 New York Code of Rules and Regulations (6 NYCRR) Part 363-4.3(g). This BAUP is being submitted in support of a Solid Waste Management Facility Permit Modification request for landfill development (Area 7/8) at the Chaffee facility, Town of Sardinia, Erie County, New York owned and operated by Waste Management of New York, L.L.C. (WMNY). The sole purpose of the soil borrow areas is to provide soils for the construction and operation of the permitted and proposed landfill operations at the Chaffee facility. Soil excavated from these borrow areas will not be sold commercially. The location of the Chaffee facility is shown on Figure 1. The Chaffee facility property, south and north of Hand Road, consists of approximately 500 acres.

The current soil borrow activities at the Chaffee facility are described in the report titled *Borrow Area Use Plan*, dated March 2009 and prepared by McMahon & Mann Consulting Engineering, P.C. and current 6 NYCRR Part 360 (Part 360) landfill permit (9-1462- 00001/00006).

This BAUP is part of the Area 7/8 Development application package and per Part 363 requirements addresses applicable requirements of 6NYCRR Part 422. The environmental impact of the proposed soil borrow area operations are also discussed in the *Draft Supplemental Environmental Impact Statement (DSEIS)* for the Area 7/8 Development (which is part of the same Area 7/8 Development application package). The DSEIS addresses potential impacts associated with the proposed borrow areas due to noise, dust and traffic as well as potential impacts to wetlands and wildlife and identifies any needed mitigation to ensure that there are no significant adverse impacts.

1.2 SCOPE

This BAUP has been developed in accordance with the applicable requirements of 6 NYCRR Part 422 and includes a Borrow Plan and the Reclamation Plan, each of which include a graphic portion and a written portion.

The graphic portion of the Borrow Plan consists of Figures 1, 2, 3, 6 and 7 that illustrate the following features:

- geographic location of the project site;
- location of adjacent topographic, cultural, and land-use features;
- land areas to be impacted during each phase of the Borrow Area development; and
- significant facility elements, including excavation areas, roads and haulageways, drainage control facilities, and visual and/or noise barriers.

The written portion of the Borrow Plan includes descriptions of the following:

- present use of the land and existing conditions (including whether any structures or buildings exist);
- description of proposed borrow operation;
- description of proposed borrow methods and progression of activities;
- proposed methods for prevention of pollution and soil erosion; and
- affected soils.

The graphic portion of the Reclamation Plan consists of Figures 4 through 7 that illustrate the following features:

- borrow area limits for the project;
- final, post-reclamation grading plan; and
- final stage of reclamation, including vegetated areas, drainage features, water bodies, roads, and other pertinent features.

The written portion of the Reclamation Plan includes descriptions of the following:

- proposed post-borrow land-use plan;
- proposed reclamation methods; and
- proposed reclamation schedule.

2.0 BORROW PLAN

2.1 INTRODUCTION

This BAUP describes development and reclamation of two proposed borrow areas at the WMNY Chaffee facility and is part of an application for the Area 7/8 Development at the Chaffee Landfill which will include approximately 30 +/- acres of new landfill liner area.

As shown on Figure 1, the proposed borrow areas consist of Borrow Area C and the South Borrow Area, approximately 13.8 and 10.0, acres in area, respectively. Borrow Area C is located north of the existing landfill on the opposite side of Hand Road. WMNY is planning to operate the borrow areas concurrently depending upon soil types available in the excavation areas and the specific construction and operational activities going on at the landfill site. The South Borrow Area is immediately east and adjacent to a former borrow area referred to as Clay Borrow Area B, south of the landfill facility, that has been reclaimed. Approximately 531,800 cubic yards and 201,500 cubic yards of material will be excavated from the Borrow Area C and the South Borrow Area, respectively. WMNY is proposing excavation of soils to a depth of up to approximately 45 feet below the existing surface elevation in Borrow Area C and up to approximately 30 feet in the South Borrow Area.

This section describes the existing conditions, the borrow operations and a brief discussion of the potential environmental impacts. The Proposed Borrow Areas will be reclaimed to open water, wildlife habitat and upland meadows, as discussed in Section 3.0.

2.2 EXISTING CONDITIONS

2.2.1 Borrow History and Land Use

The facility first obtained a mining permit in June of 1988. This permit addressed excavating soil in the Clay Borrow Area, the Settling Basin Excavation Area, and the Gravel Borrow Area. This permit was amended in August 1989 and renewed in May 1991, October 1994 and June 1999. The status of these borrow areas are summarized below:

- “Clay Borrow Area” (17.7 acres) – Located to the west of the existing landfill. Borrow activities have been completed and the area is now part of the Western Landfill footprint;
- “Settling Basin Excavation Area” (4 acres) – Located south of the Clay Borrow Area. Borrow activities have been completed and is now the location where the sedimentation basins are constructed; and
- “Gravel Borrow Area” (7.2 acres) – Located in the southern portion of the site as shown on Figure 1. The current mining permit has been extended pursuant to section 401(2) State Administrative Procedure Act (SAPA). This area will be reclaimed in accordance with the 1987 MLUP for the Grave Mine or any subsequent NYSDEC approved modifications to this plan.
- “Clay Borrow Area A” (10.6 acres) – Located south of the Clay Borrow Area. Borrow activities have been completed and the area is now part of the Leachate Tank Farm and Sedimentation Basin Pond #5 footprints; and
- “Clay Borrow Area B” (17.5 acres) – Located in the southwest corner of the property. Borrow activities have been completed and the area has been reclaimed.

The current Part 360 Permit (9-1462-00001/00006) references excavation of soil materials from two areas denoted as the East and West Borrow Areas. Each of these areas is also shown on Figure 1. The status of these borrow areas are summarized below:

- “East Borrow Area” (14.8 acres) – Located southeast of the existing landfill. Borrow activities are ongoing; and
- “West Borrow Area” (16.1 acres) – Located south of the existing landfill. Borrow activities have been completed and the area has been reclaimed. The area will be used for the new liner area of the Area 7/8 Development.

Most of the Town of Sardinia, including the Chaffee facility property, lies within Erie County Agricultural District Southeast #15. Land use near the proposed borrow areas are primarily agricultural. Except for the landfill operation, the properties surrounding the proposed borrow areas are wooded, farmland, and residential. The farming activity consists primarily of dairy farming, with hay, pasture, and corn the most common agricultural land uses. The Chaffee facility property is currently not used as active farmland or part of an active agricultural operation. Prior agricultural uses of the property included pasture and hay land.

The Chaffee facility property has two major land use categories at this time, wildlife habitat and municipal solid waste landfilling. The current facility contains the 51 acre Closed Landfill, 57.3-acre Western Landfill, and the more recently permitted 13.7-acre Valley Fill area that connects the Western Landfill to the Closed Landfill. The 13.7 acres of the Valley Fill includes some overlap (or overliner) area with the Closed Landfill and existing lined areas of the Western Landfill. The Area 7/8 Development, which has a lined footprint of 29.1 acres immediately south of the Western Landfill and Close Landfill, includes 5.0 acres of liner over the Closed Landfill. In addition to the landfill areas, there are approximately 160 acres of ancillary facilities on the site, including leachate storage tanks, sediment ponds, office/maintenance buildings, access roads, etc., as shown on Figure 1.

2.2.2 Existing Topography

The proposed borrow areas lie within the headwaters of Hosmer Brook (South Borrow Area), which is part of the Cattaraugus Creek drainage basin and within the headwaters of Cazenovia Creek (Borrow Area C).

Borrow Area C is dominated by a high point in the southwest corner of the site and the area slopes down from there to the northeast and northwest corners of the site. This area has elevations ranging from 1505 feet in the southwest corners of the site and along Hand Road, to an elevation of 1465 feet at the northwest corner of the site and an elevation of 1490 feet to the east and northeast.

The South Borrow Area can be described as an elongated ridge that is oriented north to south. This area has elevations ranging from 1475 feet along the ridge with gradual slopes down to the east to an elevation of 1450 feet along the property line and steeper slopes down to the west to meet the pond which is present in the former Clay Borrow Area B area.

2.2.3 Soils

Subsurface conditions at the site have been investigated as part of the landfill operations over approximately the past 30 years by drilling test borings and through observations made during borrow operations. The test boring locations can be seen on Figures 2 and 3. Two cross sections illustrating the soil conditions observed at the boring locations are included on each figure for each borrow area. Test boring logs are included in the Hydrogeologic Report for the Area 7/8 Development.

In general, soils at the site occur as a result of glacial deposition at the Lake Escarpment Moraine. The test borings across the site generally indicate that the soils consist of an Upper Silty Clay Till (clay till) having occasional discontinuous lenses of coarser grained materials which is underlain by a layer of coarser grained soils referred to as the Upper Silty Sand and Gravel. The clay till is classified as CL-ML (USCS classification) and

described as a uniform brown (becoming gray where deeper and less oxidized) silty clay with trace fine gravel having moderate plasticity. Occasional lenses or thin layers of silty sand and gravel are found to be interbedded in the clay till.

A laterally extensive layer of silty sand and gravel (Upper Silty Sand and Gravel unit) was identified in borings that completely penetrated the Upper Silty Clay Till. The silty sand and gravel is less cohesive and contains cobbles and boulders in a variable matrix of sand and gravel with relatively moderate percentages of fines (5 to 15%). A Lower Silty Clay Till was identified in borings that completely penetrated the Upper Silty Sand and Gravel. As noted in the Hydrogeologic Report, the total thickness of moraine deposits in the area of the Chaffee Facility is estimated to range between 400 and 600 feet to bedrock.

The test borings completed in the area of Borrow Area C indicated that the material is a brown silty clay similar to the material that has been utilized from the former Clay Borrow Area and Borrow Areas A and B. This material was observed to an elevation of approximately 1437 feet (MC-5) to 1448 feet (MC-1) at locations within the borrow area footprint and where penetrated by the test borings.

The test borings in the South Borrow Area indicate that the excavated materials will be primarily cohesive deposits consisting of clay till deposits consistent with those encountered in the original Borrow Area B. The clay till deposits generally extend to elevations of 1442 to 1447 feet (MB-2 and MB-4, respectively) and overlie a laterally extensive silty sand and gravel.

2.2.4 Groundwater

Groundwater is occasionally present in perched discontinuous lenses of course grained soils within the Upper Silty Clay soil matrix at the Chaffee Facility north of the Area 7/8 Development where the clay till is thicker (greater than 30 feet). Piezometers screened in these perched zones exhibit spatially variable groundwater elevations corresponding generally to the elevation of the saturated lenses encountered. This head distribution suggests a lack of continuity and little to no hydraulic interconnection between the identified perched zones. The Upper Water-Bearing zone is described as the occurrence of groundwater under water table or semi-confining conditions in the laterally extensive Upper Silty Sand and Gravel. The upper water-bearing zone is hydraulically isolated by the thick layer of clay till above the unit. In the northern portion of the site near Hand Road and WMNY property south of the Area 7/8 Development the upper water bearing zone occurs at approximately 1436 and 1438 and is seasonally dependent. The base of the upper water-bearing zone is bound by the Lower Silty Clay aquitard. These hydraulic relationships were investigated during hydrogeologic investigations completed in 2005 and 2020 and are described in the Hydrogeologic Report for the Area 7/8 Development.

In the area of Borrow Area C, perched groundwater is isolated from the first occurrence of laterally continuous groundwater occurring in the Upper Silty Sand and Gravel by approximately 60 feet of low permeability silty clay. Piezometers MC-1A through MC-5 were drilled and installed in 2001 to assess the geologic and hydrologic conditions in the Upper Silty Clay. The boring logs indicate damp soil conditions in the silty clay and piezometers were dry upon completion. Where saturated conditions occur, shallow lenses of course grained soils in the Upper Silty Clay are recharged by surface water present in the wetlands when standing water occurs. Standing water in the wetlands is primarily surface water runoff collecting in topographic lows as the low permeability soil of the Upper Silty Clay restricts vertical infiltration of surface water in this portion of the property.

2.2.5 Surface Water Drainage

Earth Dimensions, Inc.¹ (EDI) delineated wetlands located within and adjacent to Borrow Area C and adjacent to the South Borrow Area (see Figures 1 through 3). For Borrow Area C, the parcel for the proposed excavation area has several wetlands and ponds designated as Wetlands 6 through 10. Wetland 6 is also referred to as Pond 2 and Wetland 8 is also referred to as Pond 3. The wetland boundaries were submitted to the NYSDEC and USACE for review. Two wetlands, identified as Wetland 8/Pond 3 and Wetland 9 and the swale between these two wetlands were identified as NYSDEC jurisdictional wetlands and soil disturbance will not occur within 100 feet of those limits. Wetland 7 was identified as a USACE jurisdictional wetland and soil disturbance will not occur within those limits. EDI has indicated that the wetland designated Wetland 6/Pond 2 – which was a firefighting water source pond - and the associated outlet (Figure 1) are non-jurisdictional, which means that the pond and pond outlet channel can be removed without providing wetland mitigation for these areas.

The South Borrow area is bordered by manmade Ponds 4 and 5 to the west and northeast, respectively. The NYSDEC jurisdictional Wetland 11 and a wetland mitigation area are located to the north/northeast of the borrow area and soil disturbance will not occur within 100 feet of those limits.

Surface water from the Borrow Area C area flows from the south to the north. Runoff from Hand Road and the southern part of the site generally drains into the former firefighting pond which then overflows through a channel that exits the site to the northwest. Runoff from the eastern portion of the site and areas that are north of the existing pond drain to the north and into Wetlands 8/Pond 3 and Wetland 9.

The South Borrow Area is a clay till hill trending in a north-to-south orientation that remains following excavation of Borrow Area B to the west. Because the apex of the till hill is on the western edge of the borrow area, only a small portion of runoff flows to the west and into the existing pond. The vast majority of runoff flows to the east via overland flow to the adjacent properties.

2.2.6 Man Made Features

Borrow Area C lies on the north side and adjacent to Hand Road. The proposed borrow area currently contains the foundation of a former barn and two foundations from former buildings. These structures will be removed prior to beginning the soil borrow operations. A pond is located in the western portion of the proposed borrow area. This pond was excavated between 1982 and 1984 to provide a recreational area for the former residence, and provided soil for use at the landfill, and was more recently used as a potential water source for firefighting activities.

The South Borrow Area is in an undeveloped area and currently vegetated pasture. It is located on WMNY property immediately west of a previously reclaimed borrow area which had gravel road access.

2.3 DESCRIPTION OF MINERAL AND BORROW OPERATIONS

Excavation in the proposed borrow areas will consist of removing a majority of the cohesive deposits within the limits shown on Figure 1. In general, 2 to 4 feet of clay till will remain in each of the borrow areas and therefore borrow activities are not anticipated to occur within the underlying formation of silty sand and gravel.

¹ Wetland Delineation Report For the Area 7/8 Development, prepared by Earth Dimensions, Inc., April 2019.

2.3.1 Mineral Types

As discussed in Section 2.2.3, the borrow operation will be in the deposit of cohesive overburden deposits. The material will be used for landfill construction and operations.

2.3.2 Borrow Sequence and Method

This BAUP includes two borrow areas as described above. Borrow Area C is approximately 13.8 acres in area and will be excavated from the center of the site outward at the edges from elevations ranging from approximately 1505 to 1450 feet. The South Borrow Area is approximately 10.0 acres in area and will be excavated from west to east between elevations ranging from 1475 to 1444. A limited area of the South Borrow Area will be excavated below El 1444 to accommodate a sediment basin.

As shown in the cross-sections on Figures 2 and 3, activities within the proposed borrow areas have been designed to generally maintain the excavation within the clay till deposit. The base grades were developed using the bottom of clay till observed in the test borings. The bottom excavation base grades will be modified to maintain at least 2 feet of clay till above the Upper Silty Sand and Gravel if the unit is encountered at a depth shallower than 1444 ft. In such occurrence, and in the vicinity of the sediment basin in the South Borrow Area, the underlying Upper Silty Sand and Gravel will be over excavated and replaced with a minimum of 2 feet of compacted clay till soil.

The work sequence for Borrow Area C is described below.

1. Silt fence or other temporary erosion and sediment control structures will be placed downslope of the noise attenuation berm, along haul roads, and along the boundary between the proposed borrow area and the NYSDEC wetlands to prevent sediment discharge.
2. Operations in Borrow Area C will begin with the draining of the pond via pumping with discharge to the existing firefighting pond outlet. The discharge line for the pump will be on a float to keep the intake from taking in sediment at the bottom of the pond and the water quality will be observed during discharge.
3. Grade the haulageway that provides access to the excavation area so that surface water runoff is directed to a graded sump pit.
4. Excavate material to establish the sump and transport such material to the work area at the landfill.
5. Clear, grub and strip topsoil from the initial excavation area and interior haulageways and build the noise attenuation berm along the west and north side of the borrow area and store excess material for future reclamation (stockpiles and berms will be treated as described in Section 2.3.6).
6. Stripping will take place for the area required for each year's construction/operation.
7. When construction of the sump is complete, the working face shall be started from the base of the former pond and at a depth of approximately 15 to 20 feet and will work outward from the limits of the pond.
8. Subsequent excavations will go approximately 15 to 20 feet deeper in the same manner (new sump established, excavation will work outward from the sump).
9. Maintain drainage swales to direct surface water from the disturbed areas to the excavation and sump.
10. Excavate slopes to the required reclamation grades so that backfill is not required at a later time.
11. Temporary grading and seeding on the exposed side slopes that are not active (i.e., at final grade) will occur after each construction season and final reclamation will occur within one year after completing each excavation area. Areas that will be under water within one year of completion of excavation (i.e., the floor area and lower side slopes) will not be seeded and vegetated.
12. The three piezometers wells that were installed in 2005 will be decommissioned as they are encountered during excavation.
13. The non-jurisdictional Wetland 6/Pond 2 will be removed during operations in Borrow Area C.

The work sequence for the South Borrow Area is described below.

1. Silt fence or other temporary erosion and sediment control structures will be placed downslope of active excavations, along haul roads, and along the boundary between the proposed borrow area and the adjacent ponds, wetlands and property lines to prevent sediment discharge.
2. Excavation in the South Borrow Area will start at the lowest elevation (northwest corner of the site) by first creating a sedimentation basin that complies with the New York State Standards for Erosion and Sediment Control. The basin will be constructed with an outlet device and will be stabilized prior to continuing the borrow area excavation (see Figures 6 and 7).
3. Excavate material to construct the sedimentation basin and transport it to the work area at the landfill.
4. Clear, grub and strip topsoil from the initial excavation area and haulageway and build the noise attenuation/screening berm along the south and east sides of the borrow area and store excess material for future reclamation (stockpiles and berms will be treated as described in Section 2.3.6).
5. Grade the haulageway to direct surface water runoff to the proposed sedimentation basins or sump locations.
6. Maintain drainage swales and silt traps to direct surface water from the current excavation area to the sedimentation basin.
7. Stripping will take place for the area required for each year's construction/operation.
8. When erosion and sediment control features are installed, a 15-20 foot high working face will start on the northern side of the site and progress toward the south.
9. Subsequent excavations will go approximately 15 to 20 feet deeper in the same manner (start at the north end of the site and work to the south).
10. Excavate slopes to the required reclamation grades so that backfill is not required at a later time.
11. Temporary grading and seeding on the exposed side slopes that are not active (i.e., at final grade) will occur after each construction season and final reclamation will occur within one year after completing each excavation area. Reclamation of the floor will not occur until the entire floor area is excavated and graded.

Excavation within the proposed borrow areas, as shown on the figures, will not remove any portion of the NYSDEC jurisdictional wetlands, USACE jurisdictional wetland, or associated regulatory buffers. In addition, no vegetation removal, equipment access, or other disturbances to these regulated wetlands and buffers will occur during borrow activities. Additionally, silt fences, stormwater basins and other erosion and sediment control measures will be utilized as needed to protect the wetlands during soil borrow operations.

The work sequence for the existing Gravel Borrow Area shown on Figure 1 is that final reclamation of this area will be handled under the solid waste program and the permit issued for the Area 7/8 Development and will generally follow the reclamation plan approved under the mining permit and reclamation plan issued for the Gravel Borrow Area, unless a modification of the same is approved by DEC Staff. Reclamation of the Gravel Borrow Area must be completed and notification provided to the DEC prior to placing waste in the first cell of the Area 7/8 development.

2.3.3 Grading and Setbacks

The grading plan for the proposed borrow areas is as depicted in plan view on the Reclamation Plans, and on the cross sections shown on Figures 2 through 5. Grading and borrow area perimeter setbacks will be as follows.

- The perimeter slope of the excavation from water's edge to undisturbed adjacent land will be on a slope no greater than 1 vertical on 3 horizontal;
- A minimum set back of 25 feet from the top of slope of the borrow area to the property lines will be maintained;

- A 100-foot buffer will be maintained on areas bordering the NYSDEC designated wetlands. The wetland buffer will be demarcated with temporary construction fencing that will be maintained throughout the life of borrow activities; and
- The edge of the temporary borrow area floor will be a minimum of 25 plus 1.5 times the height of the excavation from the property lines.

Care will be taken during excavation operations to prevent the need for backfilling slopes at a later time. Excavations shall be made to the reclamation grades shown on Figures 4 and 5.

2.3.4 Processing

Material processing will not occur as part of this project.

2.3.5 Haulageways and Site Access

Haulageways will be used for employee access, equipment access, and for transporting soil material. The haulageways will be graded, stabilized, and maintained as necessary to provide safe, efficient operations and to minimize erosion and off-site sedimentation.

2.3.6 Storage of Materials and Disposal of Wastes

Topsoil from the Proposed Borrow Area will be stockpiled at the facility or used for the permitted berms called out on Figures 2 and 3. Temporary erosion and sediment controls will be placed around the topsoil piles or downslope of the berms. Material will be added to the stockpile as additional portions of the borrow areas are developed. Therefore, the topsoil stockpiles will have a working face where additional material will be placed in the future. Brush will be stored temporarily within each area. Prior to accessing the material beneath the pile, the brush will be chipped for placement either on temporary roads in the borrow areas or in operation of the landfill.

Seeding will be placed on areas of the stockpiles that will not receive additional material and on the noise attenuation/screening berms. The stockpiles will be seeded within 30 days of material placement. Additionally, seeding will be placed on the working face of stockpiles that are not planned to receive additional material or have material removed within the remainder of the current construction season.

The following seed mixture will be used as temporary revegetation on stockpiles.

Common white clover	8 lbs/acre
Tall fescue	20 lbs/acre
Perennial Ryegrass	10 lbs/acre

Non-hazardous solid waste that is produced during borrow area operations will be disposed of at the landfill.

2.4 POTENTIAL ENVIRONMENTAL IMPACTS

A complete discussion of the potential environmental impacts due to the creation of the proposed borrow areas is included in the Draft Supplemental Environmental Impact Statement (DSEIS) associated with Area 7/8 Development application. A brief discussion of air, noise and water pollution is included below.

2.4.1 Control of Air Emissions

As needed, roads, loading areas, and working faces will be sprayed with water to minimize airborne dust from the on-site basins. If water quantities from the basins are insufficient, water will be brought to the site from the large basin at the landfill. This spraying may be continuous, if necessary, during mid-summer, depending on weather

and the level of use. In any case, sufficient spraying will be conducted as needed to prevent off-site and on-site nuisances.

2.4.2 Control of Noise

As seen in the DSEIS for the proposed development, detailed noise analyses for the borrow areas and associated operational activity is presented in the reports titled *Noise Assessment - As Required By 6NYCRR Part 360 – Proposed Area 7/8 Development – Chaffee Landfill* and *Noise Assessment - As Required By State Environmental Quality Review Act – Proposed Area 7/8 Development – Chaffee Landfill*, both prepared by Martin Leonard, P.E.

For Borrow Area C, the distance needed to achieve the required Part 360 noise level of 57 dBA at the north, east and west property lines is 192 feet, assuming a berm is in place. The setback distance from the edge of the borrow area needed to achieve the required noise level of 57 dBA at the key compliance location, is 320 feet assuming there is no berm. A topsoil stockpile berm will be built around the west and north boundaries of Borrow Area C (topsoil will be retained for reclamation of the borrow area after soil excavation is completed) to provide mitigate of noise impacts, and a storage area for topsoil. See Figure 2. In addition, once initial topsoil stripping is completed, and excavation of subsoils is underway, an excavation face will be created that will function as a noise barrier, with or without the construction of a perimeter berm. Assuming excavation of soils in the borrow areas begins more than 320 feet from the property lines, the noise criteria will be met without the need for a perimeter berm. This will be the procedure for development of Borrow Area C. Initial excavation will occur in areas more than 320 from the property line. Before areas with less separation are excavated, the perimeter berm will be constructed. (Construction of the berm will not be subject to the Part 360 noise standards, since it is a “construction” activity.) In areas where a berm would encroach on the required 100-foot setback from the nearby New York State wetlands, an alternative barrier would be used, such as noise attenuation quilts hung on a support structure, or noise attenuation panels. The estimated impact level at the closest receptor locations on Route 16 from Borrow Area C activities would be less than 1 dBA above background which is within the 3dBA allowable threshold.

For the South Borrow Area, an offset of greater than 320 feet will be provided to meet the Part 360 noise level thresholds. However, the SEQR threshold (<3dBA increase at receptors) will not be achieved for the residence along Allen Road to the south based on distance alone. Therefore, a berm will be installed at the southeast corner of the borrow area to mitigate the impacts associated with noise. The berm along the eastern limits of the South Borrow Area is for stockpiling excess topsoil and will provide screening from activity inside the excavation areas. See Figure 3.

2.4.3 Control of Water Quality and Quantity

Surface water will be controlled within the borrow areas as described in Section 2.3.2.

The erosion and sediment control systems were developed in accordance with the New York State Stormwater Management Design Manual (NYSDEC, January 2015) and the New York State Standards and Specifications for Erosion and Sediment Control (NYSDEC, November 2016), commonly referred to as the Blue Book. The Blue Book contains guidance on the sizing of sedimentation control basins. Additionally, the facility maintains a Stormwater Pollution Prevention Plan (SWPPP) and Spill Prevention Control and Countermeasure Plan (SPCC), these documents provide details for training, record keeping, potential sources of pollution, best management practices and cleanup procedures.

2.4.4 Silt Control

As described above, both Borrow Area C and the South Borrow Area will contain sedimentation control features. These sedimentation control features will be used to remove sediments from water that collects as the remaining portion of the borrow area is developed.

In Borrow Area C, water from disturbed areas will be directed into the excavation where it will drain to a sump pit (Detail 3 on Sheet 6). The sump will consist of a perforated stand-pipe surrounded by filter fabric and grading stone. The basin will be sized according to the disturbed areas. Filtered water from the sump will be pumped to the existing pond outlet channel on the west side of the site. Accumulated sediments will be removed when 50 percent of the storage capacity is filled. Temporary erosion and sediment control structures will be placed between the excavation areas and the adjacent ponds and wetlands.

In the South Borrow Area, water will flow by gravity into a forebay and then into a permanent pool for eventual discharge into the pond formed by former Clay Borrow Area B. Aquatic plantings consisting of a mixture of floating and submerged stemmed species will be planted around the perimeter of the basin as shown on Figure 7.

Accumulated sediments will be removed when 50 percent of the storage capacity is filled. Temporary erosion and sediment control structures will be placed between the excavation areas and the adjacent ponds and wetlands.

Drainage along the existing access roads will continue to convey stormwater to the designated outflow points. If drainage patterns are altered as a result of excavation activities, flow will be directed into the borrow area and subsequently into the sedimentation basins.

Temporary stockpiles will be graded, stabilized, and maintained as necessary to minimize sediment transport. A silt fence will be placed downgradient of stockpiles. Stockpiles will be seeded within 30 days of material placement.

Erosion and sediment control measures will be inspected periodically and repaired as necessary, as indicated in the SWPPP for the facility. Accumulated sediment removed from sediment control features will be allowed to dry in an active portion of the borrow area then transported to the active area of the landfill and used as cover material.

2.4.5 Groundwater Management During Excavation

The floor areas for both borrow areas are anticipated to occur either above the water table or in low permeability cohesive deposits that will minimize seepage into the excavation. During excavation of the cohesive deposits, perched groundwater may be present in isolated areas and during the wet seasons of the year. In general, this groundwater will not generate large flows and can be directed to the sedimentation basins.

As assessment of the seepage from the wetland complex (AR-11) adjacent to Borrow Area C was performed indicating an insignificant flow from the wetland area would seep into the excavation. This flow is not anticipated to impact the wetland and can be handled as described above. This calculation is in Appendix A. The excavation for the South Borrow Area consists of removing an existing hill and will not extend below the adjacent wetland water levels. Therefore, there will be no additional flows from the adjacent wetlands to manage in the South Borrow Area.

2.4.6 Traffic

During the development of the Western Landfill approval documents, a borrow area was proposed for the same parcel on which Borrow Area C is currently proposed. That borrow area, also rereferred to as Borrow Area C, was a larger excavation and would have produced on the order of 900,000 cubic yards of soil throughout the Western Landfill project life. Soil borrow analyses and hauling traffic analysis performed for the Western Landfill indicated that the anticipated hourly rate of trucks transporting soil from Borrow Area C across Hand Road to the landfill site would range between 6 to 10 trucks per hour (Draft Environmental Impact Statement, Western Landfill Expansion, November 2006). Because the size of the currently proposed Borrow Area C is less than previously proposed, and the anticipated schedule for using currently proposed Borrow area C is shorter, the excavation rate is anticipated to be similar to that proposed in 2006. Therefore, the hourly rate of trucks crossing Hand Road from the currently proposed Borrow Area C is anticipated to be in the range of 6 to 10 trucks per hour.

3.0 RECLAMATION PLAN

Proposed reclamation plans for the areas of the Chaffee facility that were previously permitted are not modified by this application. These areas have been reclaimed as described in their respective Plans. The following sections discuss the reclamation of Borrow Area C and the South Borrow Area and the existing Gravel Borrow Area.

3.1 LAND USE OBJECTIVE

The land use objective for the proposed borrow areas will be either permanent open water, wildlife habitat, and upland meadows. The final base grades and basins are shown on Figures 4 and 5.

3.1.1 Disposition of Materials

Material from the site will be used for landfill construction and operations on a daily basis with little stockpiling, residue, or refuse. Topsoil will be replaced to a depth that is at least equivalent to the existing average topsoil thickness in each borrow area, and on areas of the excavations that will normally be above the water surface. Based on six historical borings within the Borrow Area C limits and vicinity, the existing topsoil thickness averages 6 inches, and based on seven historical borings within the South Borrow Area limits and vicinity, the existing topsoil thickness averages 12 inches. Prior to topsoil placement, disturbed areas should be scarified.

Oversized material, if encountered, will be buried to a compacted depth no less than 2 feet. Some boulders may be placed on the floor of the permanent pool of the South Borrow Area to serve as habitat.

Brush that remains will be chipped and used during in the operation of the landfill. The Proposed Borrow Areas will contain no permanent equipment or refuse and will be operated in a clean and orderly fashion on a daily basis.

Spoil and unused aggregate will be placed against the borrow area face or will be used to create irregular topography during reclamation. Spoil piles will not remain on the site after borrow operations are terminated.

Noise and visual attenuation berms used during excavation and construction with onsite topsoil, will be removed at the time of reclamation and the topsoil will be used for reclamation.

3.1.2 Haulageways & Access Locations

Access roads or haulageways will be constructed from the main site access road into each area. Temporary haul roads within each area will be constructed as necessary to allow for the excavation to proceed. The temporary haul roads will be removed during reclamation, the main haulageways will remain for site access to the newly formed basins for maintenance purposes. Gravel will be placed on the main permanent access road surface to aid in erosion control and provide a stable surface.

3.1.3 Drainage and Grading

The side slopes of the proposed borrow areas will be graded to a maximum slope of 3 horizontal on 1 vertical. The slopes will be created by excavating to the lines and grades indicated on Figures 4 and 5.

Following reclamation, runoff within Borrow Area C will be contained within the borrow area boundaries, the excavation area will fill with surface runoff. Flow from the pond will be through the existing surface swale at the northwest corner of the site at approximately El 1484. This is consistent with the current conditions at the site with the existing pond.

Drainage patterns outside the footprint of Borrow Area C will not be altered.

The proposed South Borrow Area floor will be graded to drain into the created basin. The basin will discharge into the pond formed by former Clay Borrow Area B (Pond 4). Discharge during operations from the basin will be through a

drainage pipe and surface spillways. During reclamation, the drainage pipe will be decommissioned, which will allow the basin area to form into a permanent pond with outflow through the surface spillway at an elevation of approximately El 1444 feet. The spillway will be graded and stabilized as indicated on Figures 5 through 7.

3.1.4 Re-vegetation

Topsoil will be placed on the reclaimed ground surface and slopes above the basin level. The topsoil will be seeded using the following mixture (Sheet 7).

Common white clover	8 lbs/acre
Tall fescue	20 lbs/acre
Perennial Ryegrass	10 lbs/acre

Wood fiber hydromulch applied at a rate of 2,000 pounds per acre, or other mulch applied in accordance with the current version of the New York State Standards and Specifications for Erosion and Sediment Control, will be applied.

Re-vegetation will restore the side slopes of the basins to a natural state. With prolonged exposure to saturation and inundation, the soils that are placed in and around the basins will become hydric in nature, which will promote the expansion of hydrophytic vegetation from the existing wetland into the newly created basin.

Animal species will not be introduced to the site, however a natural progression of animal habitation will occur due to the plant selections, the hydrogeology, the terrain/topography, and the proximity of the site to the wetlands and ponds.

3.1.5 Wetland Mitigation

No work will occur in the jurisdictional wetlands or buffer zones. As such, wetland mitigation is not required.

3.1.6 Reclamation of Existing Gravel Borrow Area

The reclamation of the existing Gravel Borrow Area will be performed as part of the Area 7/8 Development and therefore will be part of the solid waste permit issued for this Project. Unless a modification is approved by NYSDEC Staff, the reclamation will consist of primarily the restoration of slopes in the pond formed as part of the Gravel Borrow Area operations, as feasible, after obtaining, if necessary, an Article 24 wetlands permit from the DEC. In any event, all reclamation will be conducted in accordance with the previously approved Reclamation Plan (pages 25-33 of CID Landfill, Inc. Clay and Gravel Mine Mined Land Use Plan, prepared by Southern Tier Consulting, Amended 1987) for this area and appended to this BAUP; or in the absence of any specifications therein, in accordance with 6NYCRR Part 422.3 reclamation requirements, or as otherwise approved by the Department. To the extent there is disturbance to soils caused by such work, re-vegetation along the lines specified in Section 3.14 will take place.

3.2 RECLAMATION SCHEDULE

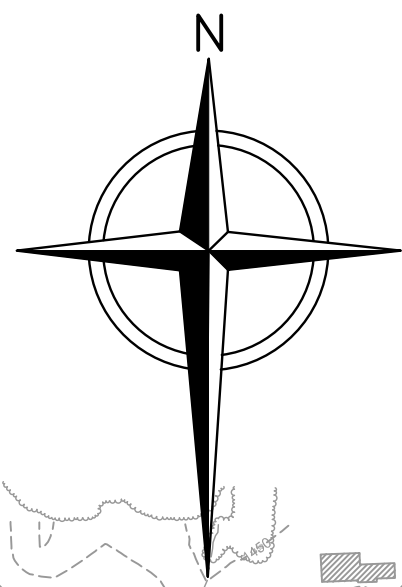
Borrow Area C has an approximate 45 foot deep excavation and the South Borrow Area has an approximate 30 foot deep excavation. It is anticipated that the borrow areas will be excavated in two to three 15-20 foot deep cuts. Temporary grading and seeding on the exposed side slopes that are not active (i.e., at final grade) will occur after each construction season and final reclamation will occur within one year after completing each excavation area.

Equipment and stockpiles will be removed from Borrow Area C and South Borrow Area sites as part of the final reclamation. Reclamation of the Gravel Borrow Area must be completed and notification provided to the

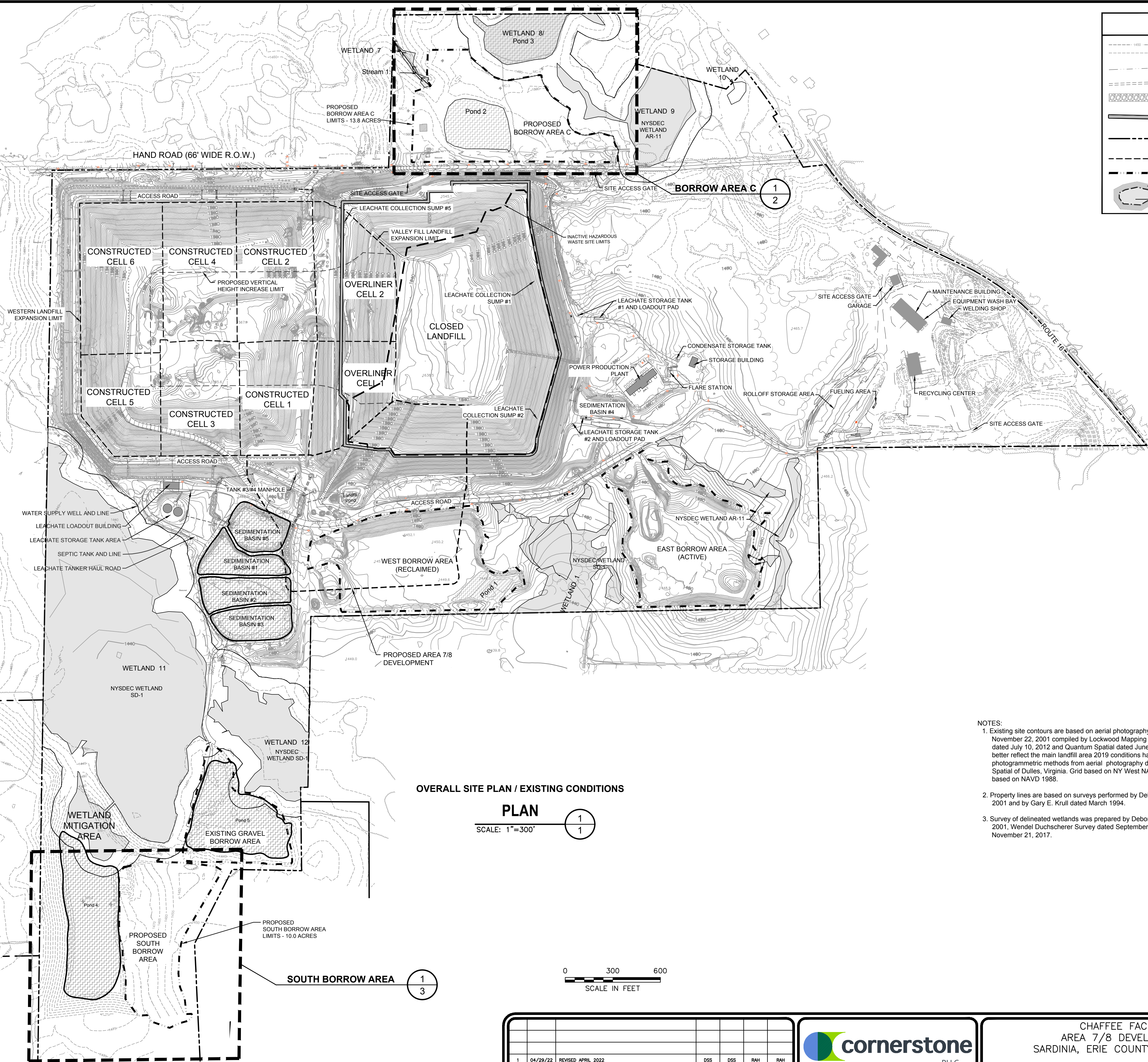
NYSDEC prior to placing waste in the first cell of the Area 7/8 development. The timing of the reclamation will be subject to the DEC first issuing an Article 24 wetlands permit since part of the reclamation and access by equipment to perform the reclamation could impact a New York State wetland and adjacent area.

FIGURES

Figure 1	Overall Site Plan/Existing Conditions
Figure 2	Borrow Area C – Plan and Sections
Figure 3	South Borrow Area – Plan and Sections
Figure 4	Borrow Area C – Reclamation Plan
Figure 5	South Borrow Area – Reclamation Plan
Figure 6	South Borrow Area Sedimentation Basin Details
Figure 7	Erosion and Sediment Control Detail

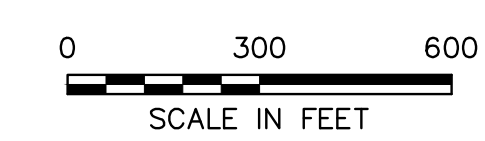


LEGEND	
	EXISTING CONTOURS (SEE NOTE 1 ON FIGURE 3)
	EXISTING STORMWATER BASIN
	EXISTING CULVERT
	EXISTING RIP-RAP
	CLOSED LANDFILL'S CLAY BERM
	PROPERTY LINE (SEE NOTE 2)
	APPROXIMATE CELL BOUNDARIES
	APPROXIMATE BORROW AREA LIMIT
	100' WETLAND BUFFER (STATE WETLANDS ONLY)
	DELINEATED JURISDICTIONAL WETLAND



OVERALL SITE PLAN / EXISTING CONDITIONS

PLAN
SCALE: 1"=300'



- NOTES:
- Existing site contours are based on aerial photography dated February 12, 2001 and November 22, 2001 compiled by Lockwood Mapping Inc. of Rochester, NY, Aero-Metric, dated July 10, 2012 and Quantum Spatial dated June 11, 2018. Additional topography to better reflect the main landfill area 2019 conditions has been incorporated and are based on photogrammetric methods from aerial photography dated 6/8/2019 compiled by Quantum Spatial of Dulles, Virginia. Grid based on NY West NAD83 Coordinate System Vertical datum based on NAVD 1988.
 - Property lines are based on surveys performed by Deborah A. Naybor, PLS, P.C. dated June 2001 and by Gary E. Krull dated March 1994.
 - Survey of delineated wetlands was prepared by Deborah A. Naybor, PLS, P.C. dated August 2001, Wendel Duchscherer Survey dated September 16, 2008 and by Wendel survey dated November 21, 2017.

File: R:\PROJECTS\190260 - SOUTHERN EXPANSION - TITLE - BORROW AREA PLAN\190260-SC-01 (OVERALL SITE PLAN).dwg
 User: dandsternum Apr 18, 2022 - 8:28am
 Layer: SHEET 1

This drawing represents intellectual property of Cornerstone Engineering, Geology and Land Surveying, PLLC. Any modification to the original by other than Cornerstone Engineering, Geology and Land Surveying, PLLC personnel violates its original purpose and as such is considered void. Cornerstone Engineering, Geology and Land Surveying, PLLC will not be held liable for any changes made to this document without express written consent of the originator.

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
1	04/29/22	REVISED APRIL 2022		DSS	DSS	RAH
	DATE OF ISSUE			DSS		RAH
	JULY 2020			DESIGNED BY	DSS	CHECKED BY RAH
						APPROVED BY RAH

cornerstone

 PLLC

PREPARED BY:
 CORNERSTONE ENGINEERING, GEOLOGY AND LAND SURVEYING, PLLC

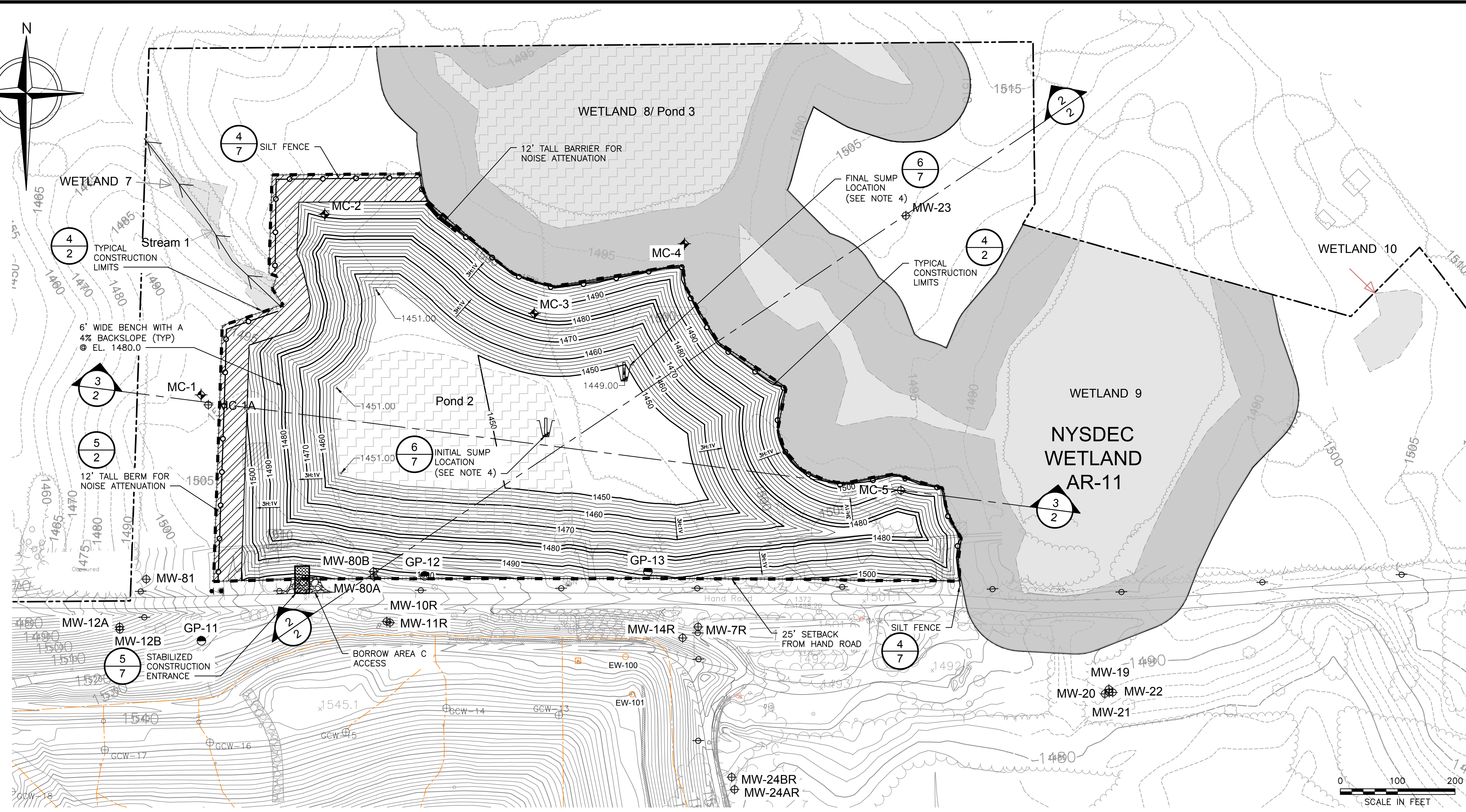
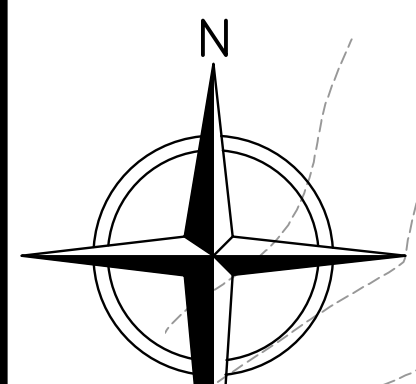
ALL PROFESSIONAL ENGINEERING WORK IS PERFORMED BY QUAL LICENSED PROFESSIONAL ENGINEERS UNDER THE APPROPRIATE STATE REGISTERED PROFESSIONAL ENTITY.

CHAFFEE FACILITY
 AREA 7/8 DEVELOPMENT
 SARDINIA, ERIE COUNTY, NEW YORK

BORROW AREA USE PLAN
OVERALL SITE PLAN / EXISTING CONDITIONS

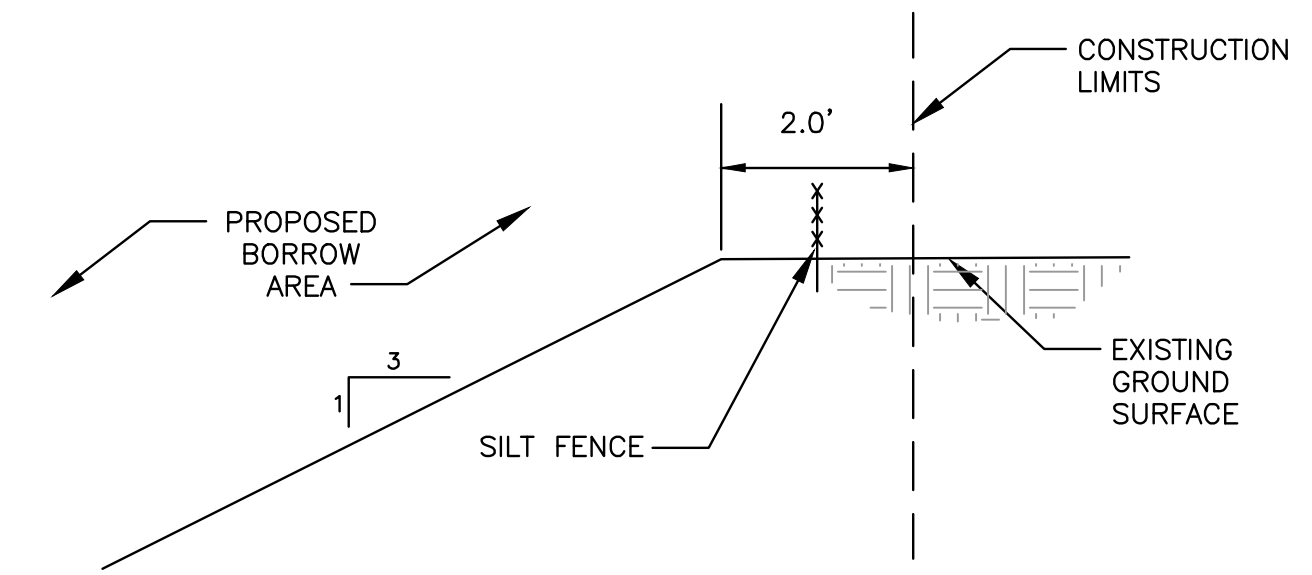
FIGURE NO.
1

PROJECT NO.
 190260

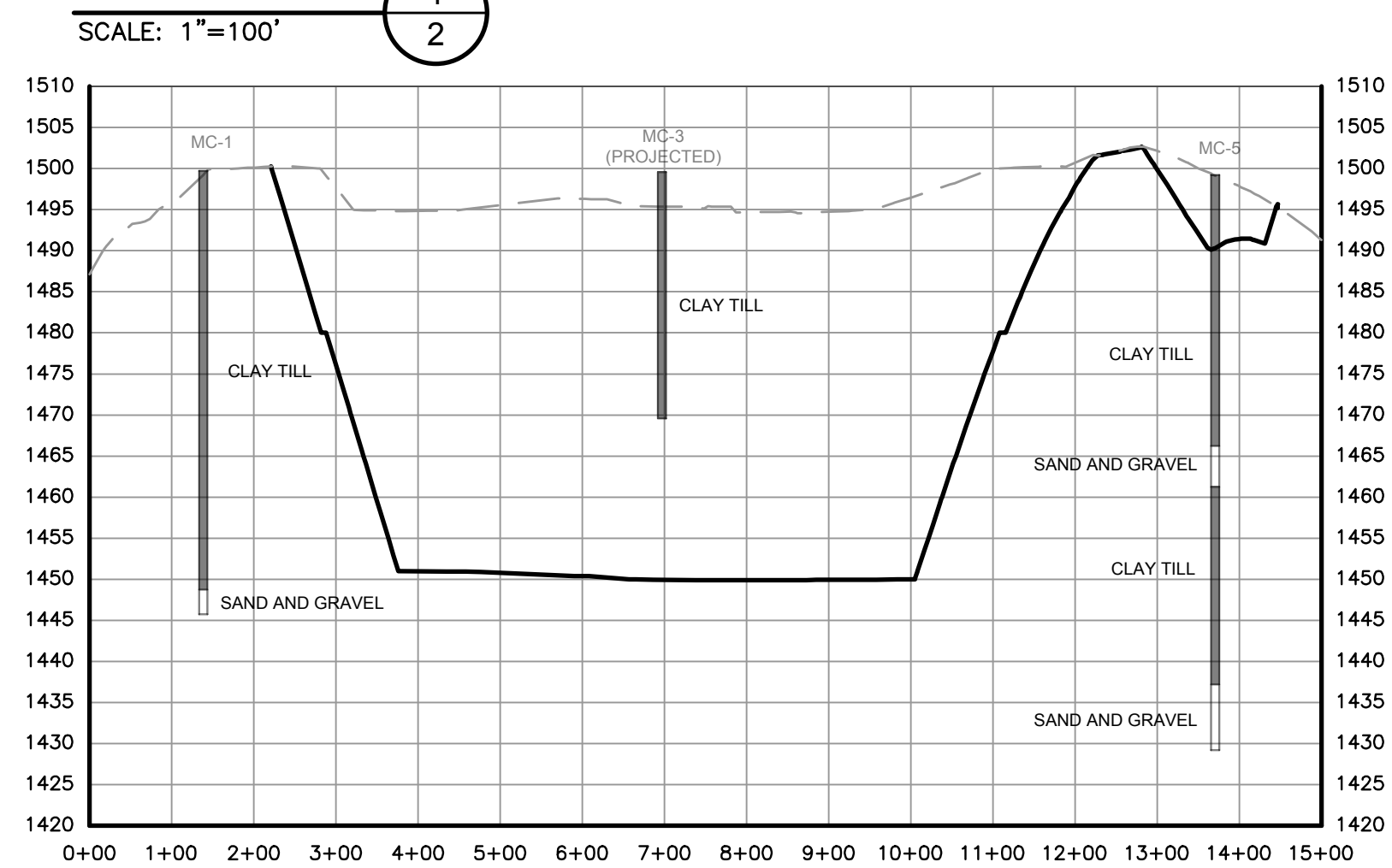


LEGEND	
	EXISTING CONTOURS (SEE NOTE 1 ON FIGURE 3)
	EXISTING STORMWATER BASIN
	EXISTING CULVERT
	EXISTING RIP-RAP
	CLOSED LANDFILL'S CLAY BERM
	PROPERTY LINE (SEE NOTE 2)
	APPROXIMATE CELL BOUNDARIES
	APPROXIMATE BORROW AREA LIMIT
	100' WETLAND BUFFER (STATE WETLAND ONLY)
	DELINEATED JURISDICTIONAL WETLAND
	SILT FENCE
	SUMP PIT
	STABILIZED CONSTRUCTION ENTRANCE
	MONITORING/PUMP/OBSERVATION/DRIVE POINT WELL LOCATION AND DESIGNATION
	BORE HOLE LOCATION AND DESIGNATION
	EXISTING GAS COLLECTION WELL
	GAS PROBE LOCATION AND DESIGNATION

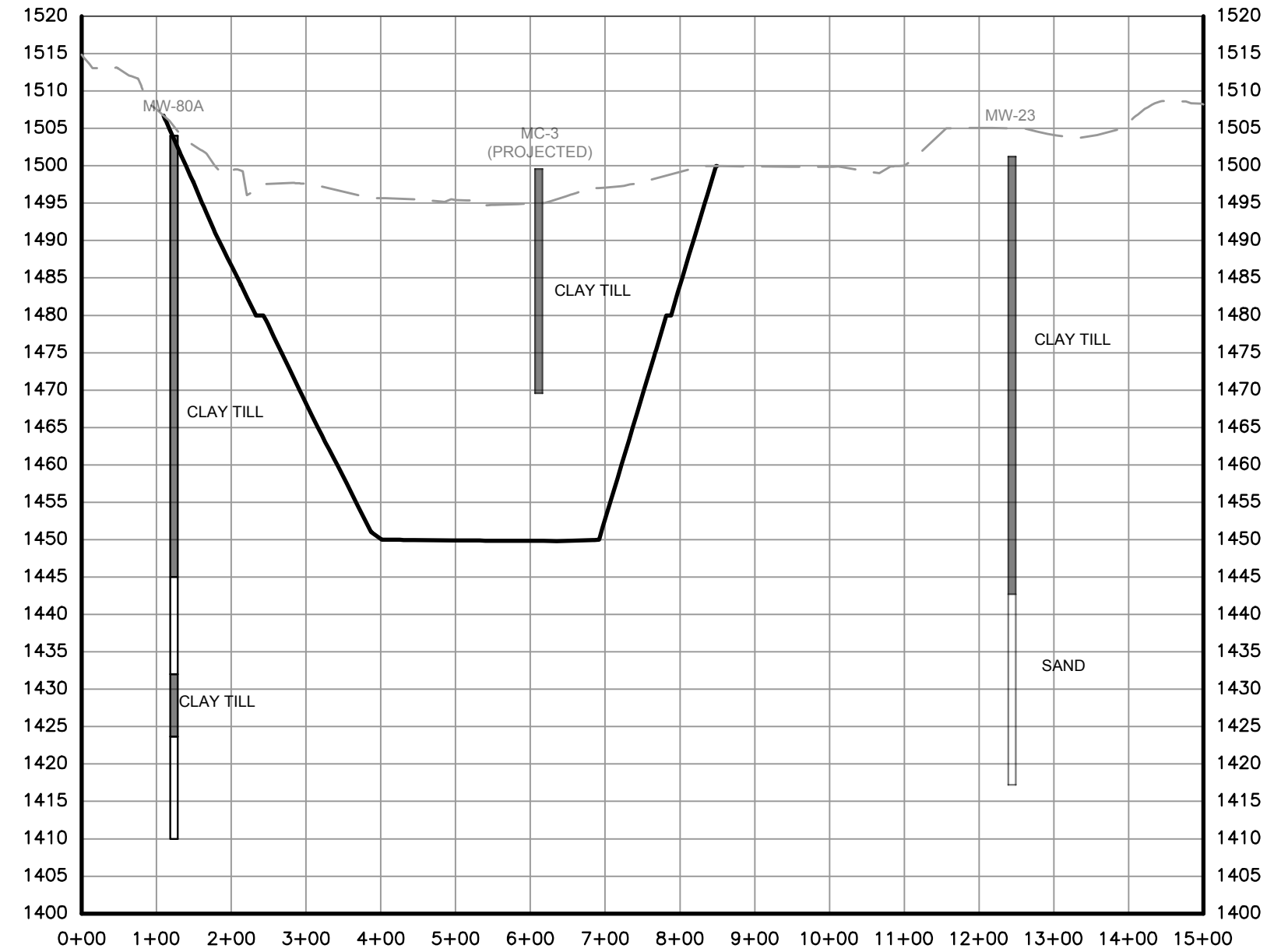
- NOTES:
- Existing site contours are based on aerial photography dated February 12, 2001 and November 22, 2001 compiled by Lockwood Mapping Inc. of Rochester, NY, Aero-Metric, dated July 10, 2012 and Quantum Spatial dated June 11, 2018. Additional topography to better reflect the main landfill area 2019 conditions has been incorporated and are based on photogrammetric methods from aerial photography dated 6/8/2019 compiled by Quantum Spatial of Dulles, Virginia. Grid based on NY West NAD83 Coordinate System datum based on NAVD 1988.
 - Property lines are based on surveys performed by Deborah A. Naybor, PLS, P.C. dated June 2001 and by Gary E. Krull dated March 1994.
 - Survey of delineated wetlands was prepared by Deborah A. Naybor, PLS, P.C. dated August 2001, Wendel Duchscherer Survey dated September 16, 2008 and by Wendel survey dated November 21, 2017.
 - Sump to discharge to stabilized outlet consisting of large stone, straw bales, or geosynthetics that prevents erosion at discharge point and immediately downstream of discharge point.



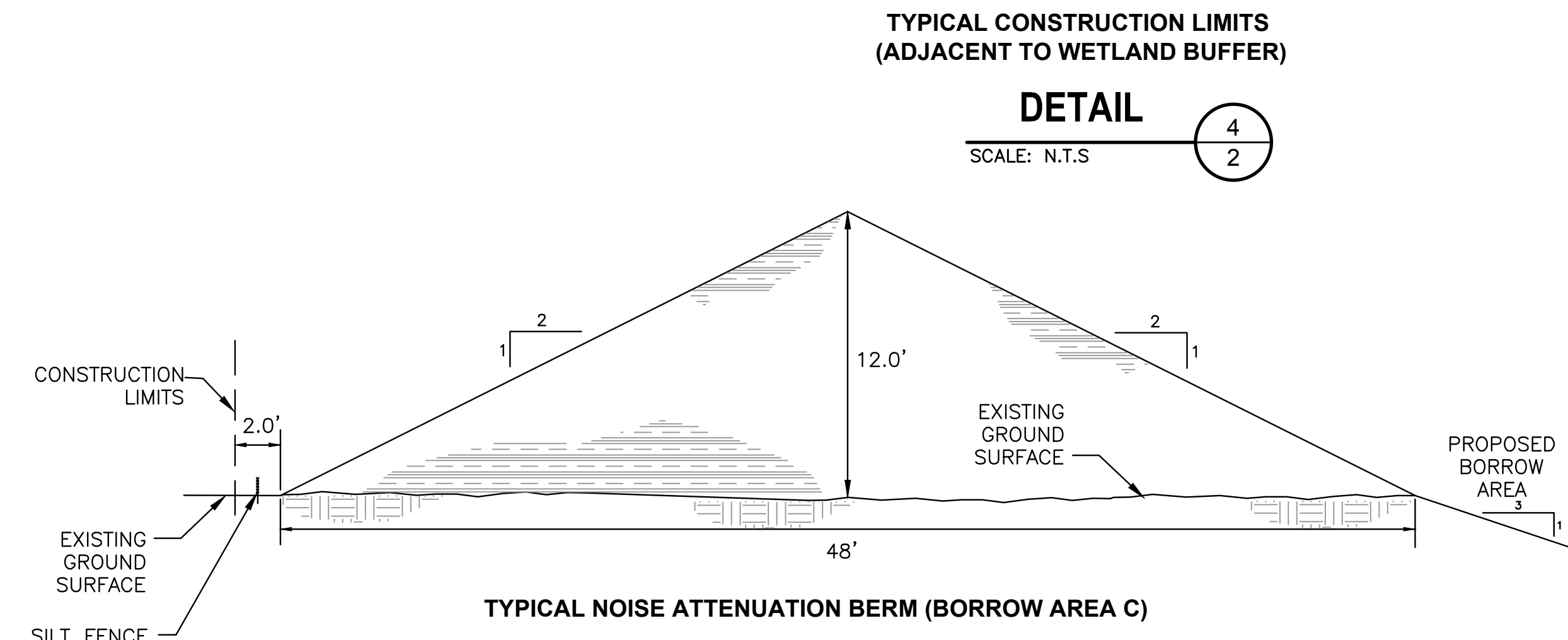
BORROW AREA C PLAN
SCALE: 1"=100'



BORROW AREA C SECTION
SCALE: VERT. 1"=20', HORZ. 1"=200'



BORROW AREA C SECTION
SCALE: VERT. 1"=20', HORZ. 1"=200'



DETAIL 5
SCALE: N.T.S.

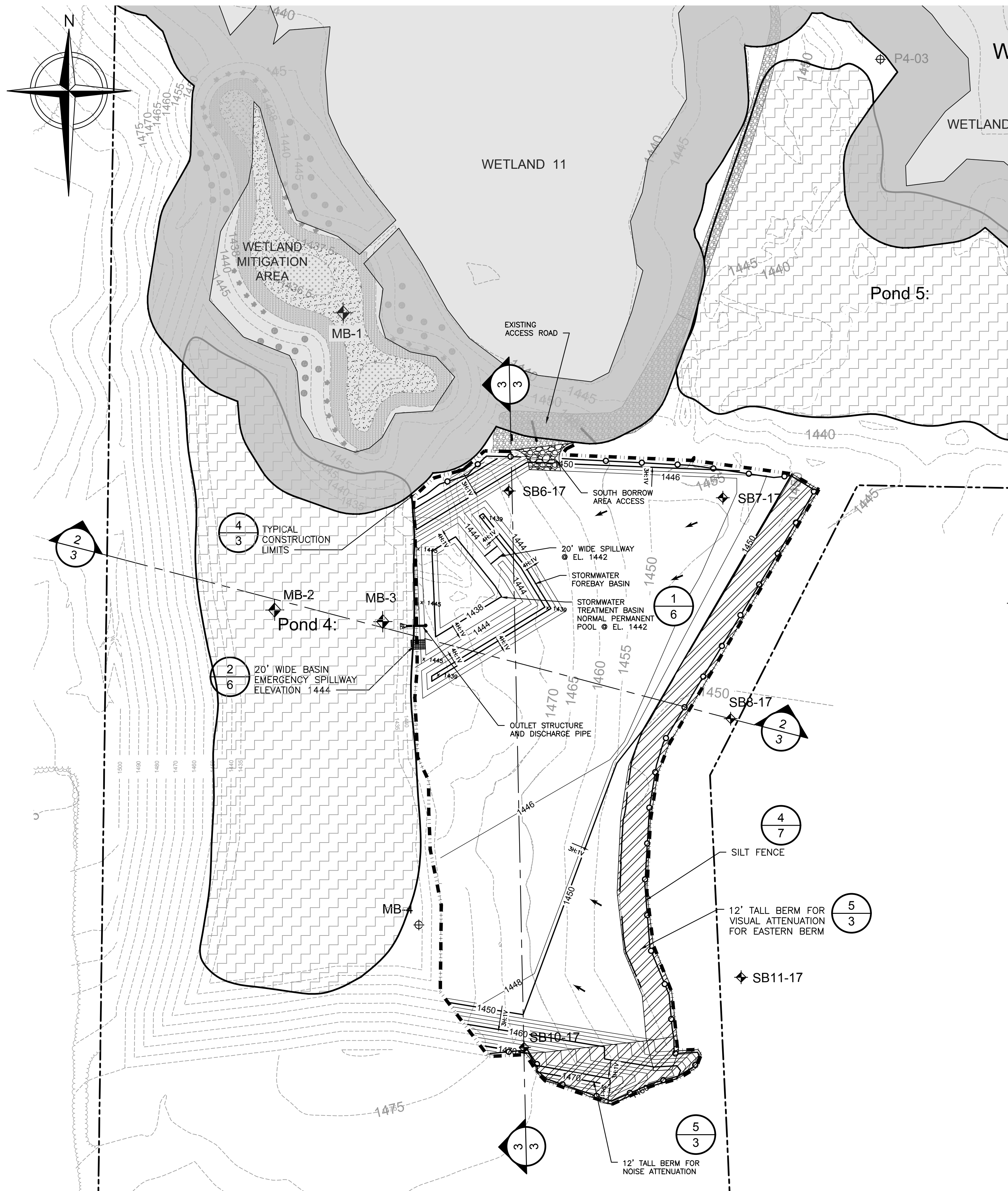
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
1	04/29/22	REVISED APRIL 2022	DSS	DSS	RAH	RAH
DATE OF ISSUE	JULY 2020	DRAWN BY	DSS	CHECKED BY	RAH	APPROVED BY

cornerstone
PLLC
PREPARED BY:
CORNERSTONE ENGINEERING, GEOLOGY AND LAND SURVEYING, PLLC
ALL PROFESSIONAL ENGINEERING WORK IS PERFORMED BY ONLY LICENSED PROFESSIONAL ENGINEERS UNDER THE APPROPRIATE STATE REGULATORY AUTHORITY.

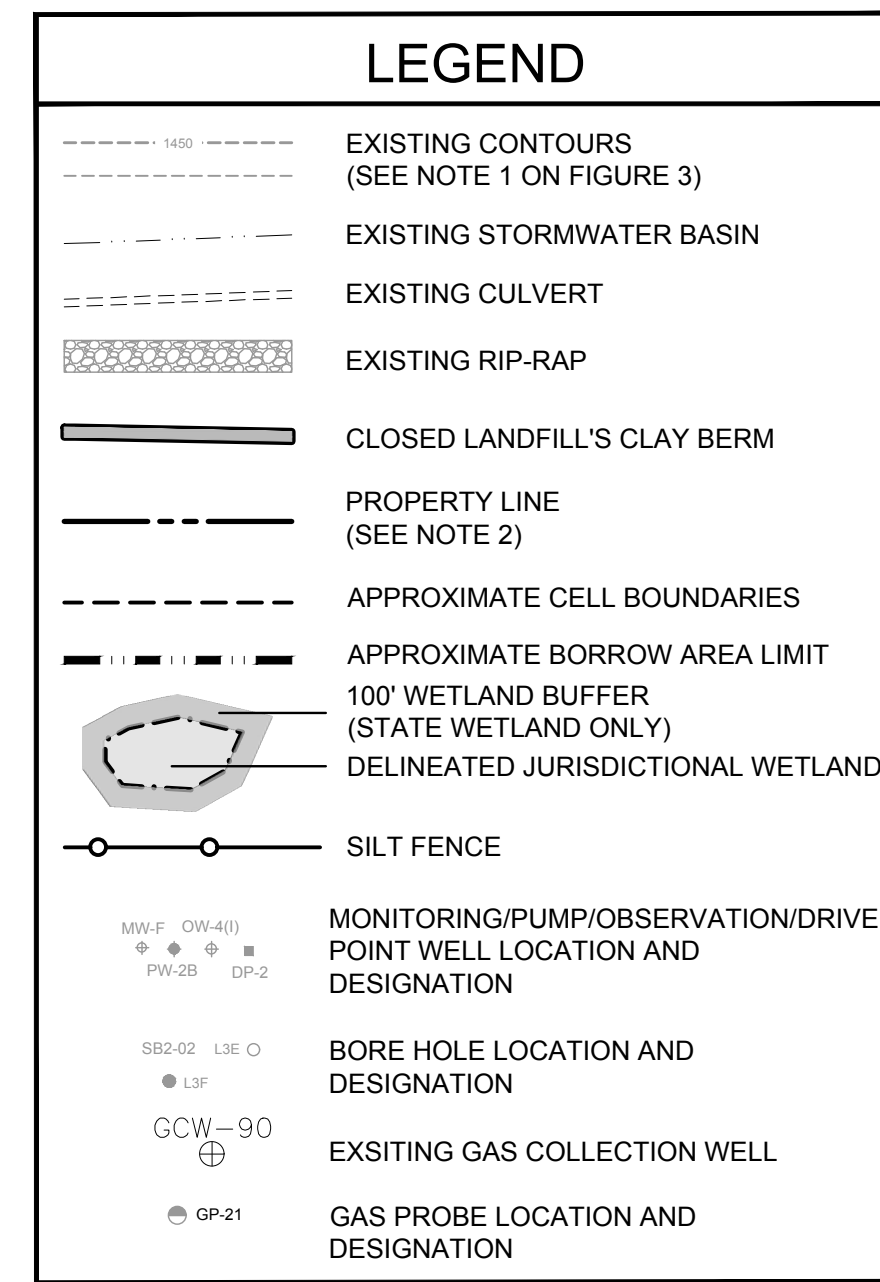
CHAFFEE FACILITY
AREA 7/8 DEVELOPMENT
SARDINIA, ERIE COUNTY, NEW YORK
BORROW AREA USE PLAN
BORROW AREA C PLAN AND SECTIONS

FIGURE NO.
2
PROJECT NO.
190260

File: R:\PROJECTS\W-CHIFFEE\190260 - SARDINIA - EXPANSION - TITLE - Project Drawings\BORROW AREA PLAN\190260-02 (BORROW AREA C PLAN).dwg Layout: SHEET 2 User: dss Date: 04/29/22 11:52:21 AM

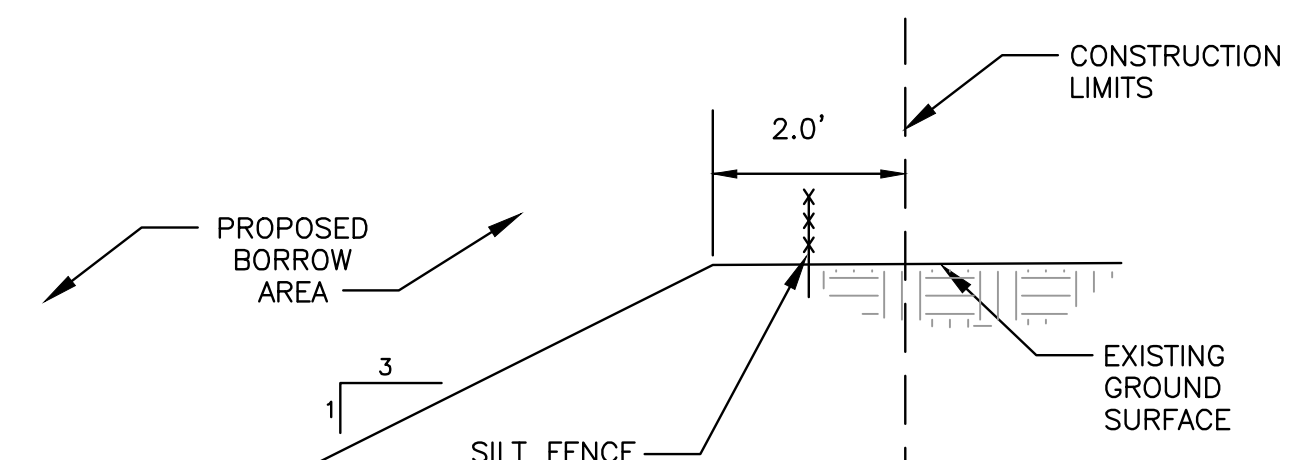


SOUTH BORROW AREA PLAN
SCALE: 1"=100'

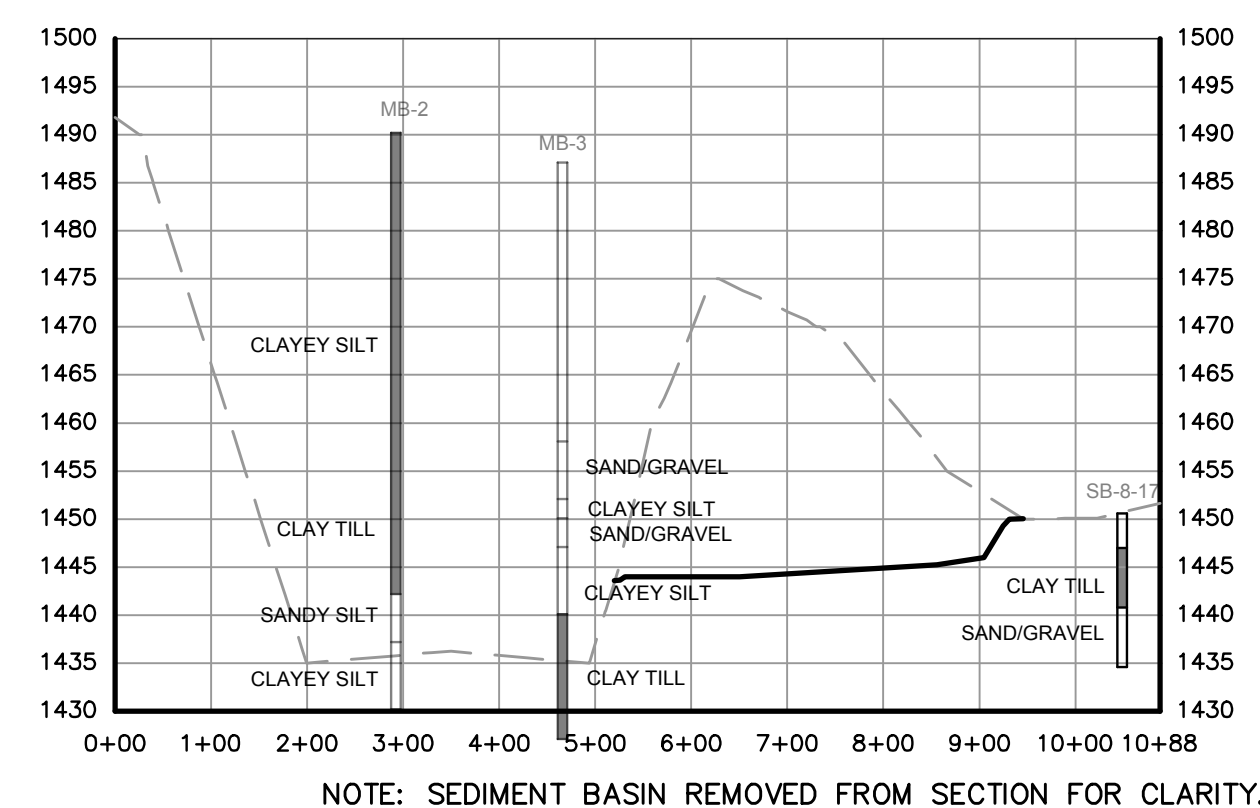


NOTES:

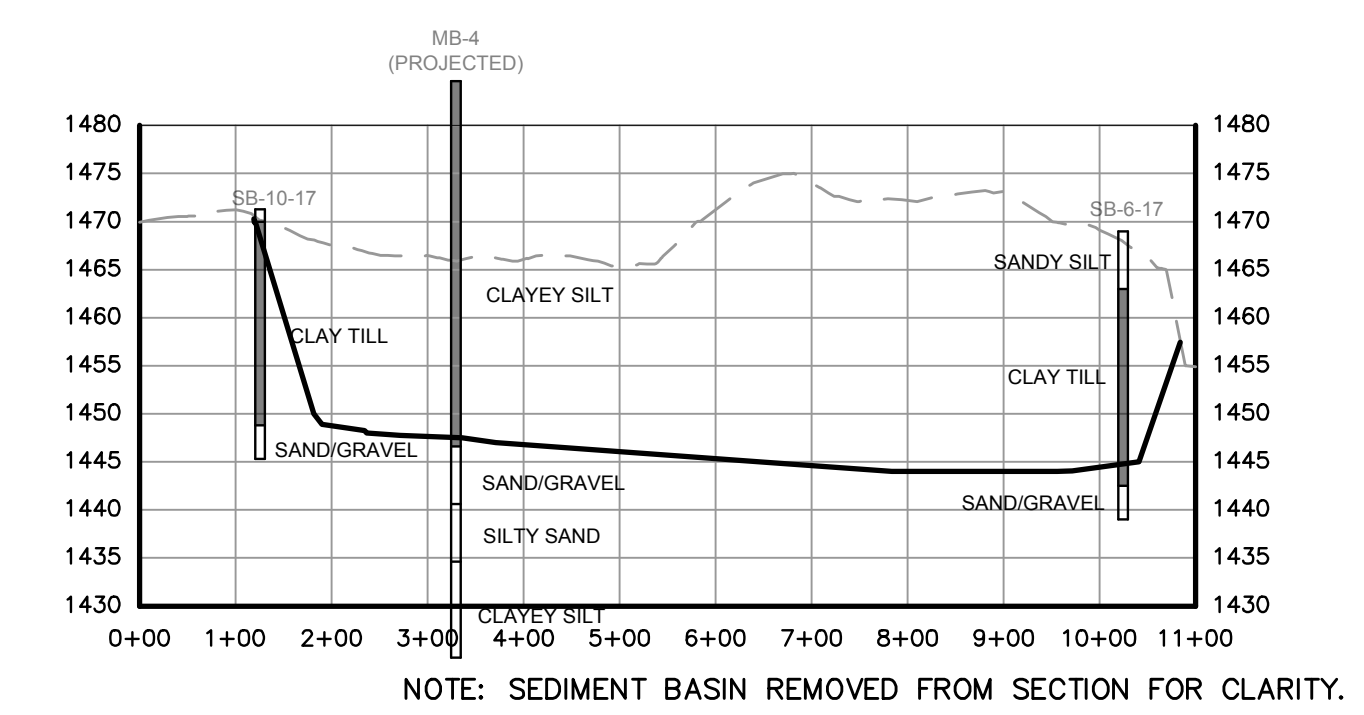
- Existing site contours are based on aerial photography dated February 12, 2001 and November 22, 2001 compiled by Lockwood Mapping Inc. of Rochester, NY. Aero-Metric, dated July 10, 2012 and Quantum Spatial dated June 11, 2018. Additional topography to better reflect the main landfill area 2019 conditions has been incorporated and are based on photogrammetric methods from aerial photography dated 6/8/2019 compiled by Quantum Spatial of Dulles, Virginia. Grid based on NY West NAD83 Coordinate System Vertical datum based on NAVD 1988.
- Property lines are based on surveys performed by Deborah A. Naybor, PLS, P.C. dated June 2001 and by Gary E. Krull dated March 1994.
- Survey of delineated wetlands was prepared by Deborah A. Naybor, PLS, P.C. dated August 2001, Wendel Duchscherer Survey dated September 16, 2008 and by Wendel survey dated November 21, 2017.



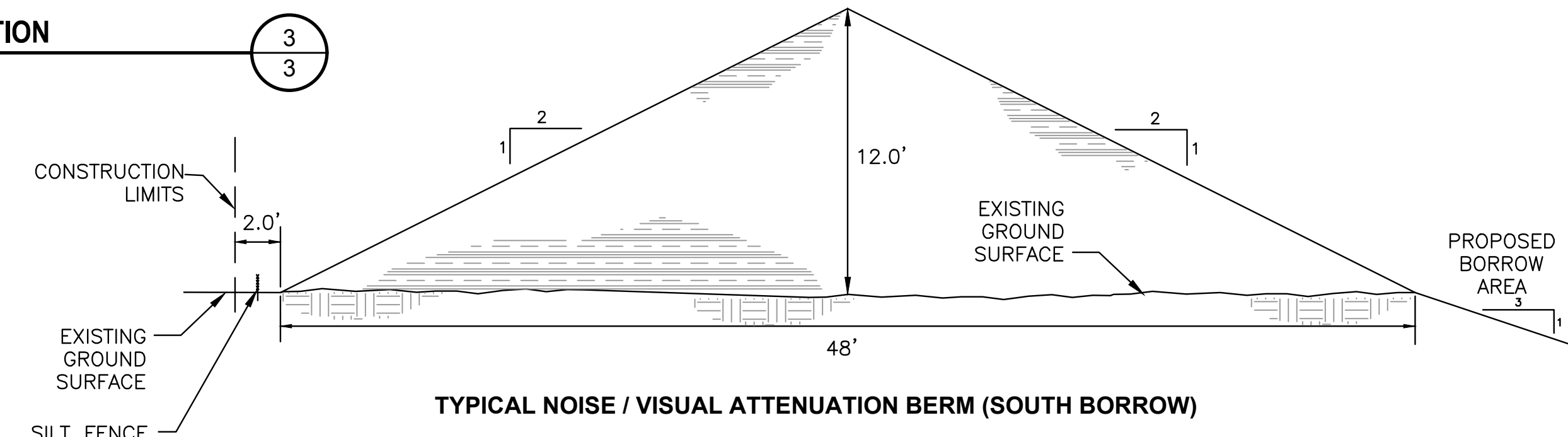
TYPICAL CONSTRUCTION LIMITS (ADJACENT TO WETLAND BUFFER) DETAIL
SCALE: N.T.S.



SOUTH BORROW AREA SECTION 2
SCALE: VERT. 1"=20', HORIZ. 1"=200'



SOUTH BORROW AREA SECTION 3
SCALE: VERT. 1"=20', HORIZ. 1"=200'



TYPICAL NOISE / VISUAL ATTENUATION BERM (SOUTH BORROW) DETAIL
SCALE: N.T.S.

File: R:\PROJECTS\W-CHUTEV\190260 - Southern Expansion Title - Project Drawings\Borrow Area Plans\190260-SC-03 (SOUTH BORROW AREA PLAN).dwg Layer: SHEET 3 User: david.stanham Apr 16, 2022 - 8:28am

Unauthorized alteration or addition to this plan bearing a licensed professional's seal is a violation of Section 7209, Sub-Section 2, of the New York Education Law. Only copies from the original of this plan, marked with an original professional's seal shall be considered to be valid true copies.

This drawing represents intellectual property of Cornerstone Engineering, Geology and Land Surveying, PLLC. Any modification of the drawing by other than Cornerstone Engineering, Geology and Land Surveying, PLLC personnel violates its original purpose and as such is prohibited. Cornerstone Engineering, Geology and Land Surveying, PLLC will not be held liable for any changes made to this document without express written consent of the originator.

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
1	04/28/22	REVISED APRIL 2022	DSS	DSS	RAH	RAH
DATE OF ISSUE	DRAWN BY		CHECKED BY		APPROVED BY	
JULY 2020	DSS		RAH		RAH	
	DESIGNED BY		APPROVED BY			
	DSS		RAH			

cornerstone
PLLC

PREPARED BY:
CORNERSTONE ENGINEERING, GEOLOGY AND LAND SURVEYING, PLLC

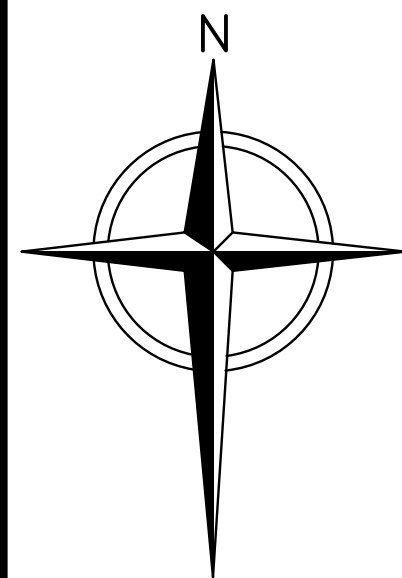
ALL PROFESSIONAL ENGINEERING WORK IS PERFORMED BY ONLY LICENSED PROFESSIONAL ENGINEERS UNDER THE APPROPRIATE STATE REGULATORY PROFESSIONAL ENTITY.

CHAFFEE FACILITY
AREA 7/8 DEVELOPMENT
SARDINIA, ERIE COUNTY, NEW YORK

BORROW AREA USE PLAN
SOUTH BORROW AREA PLAN AND SECTIONS

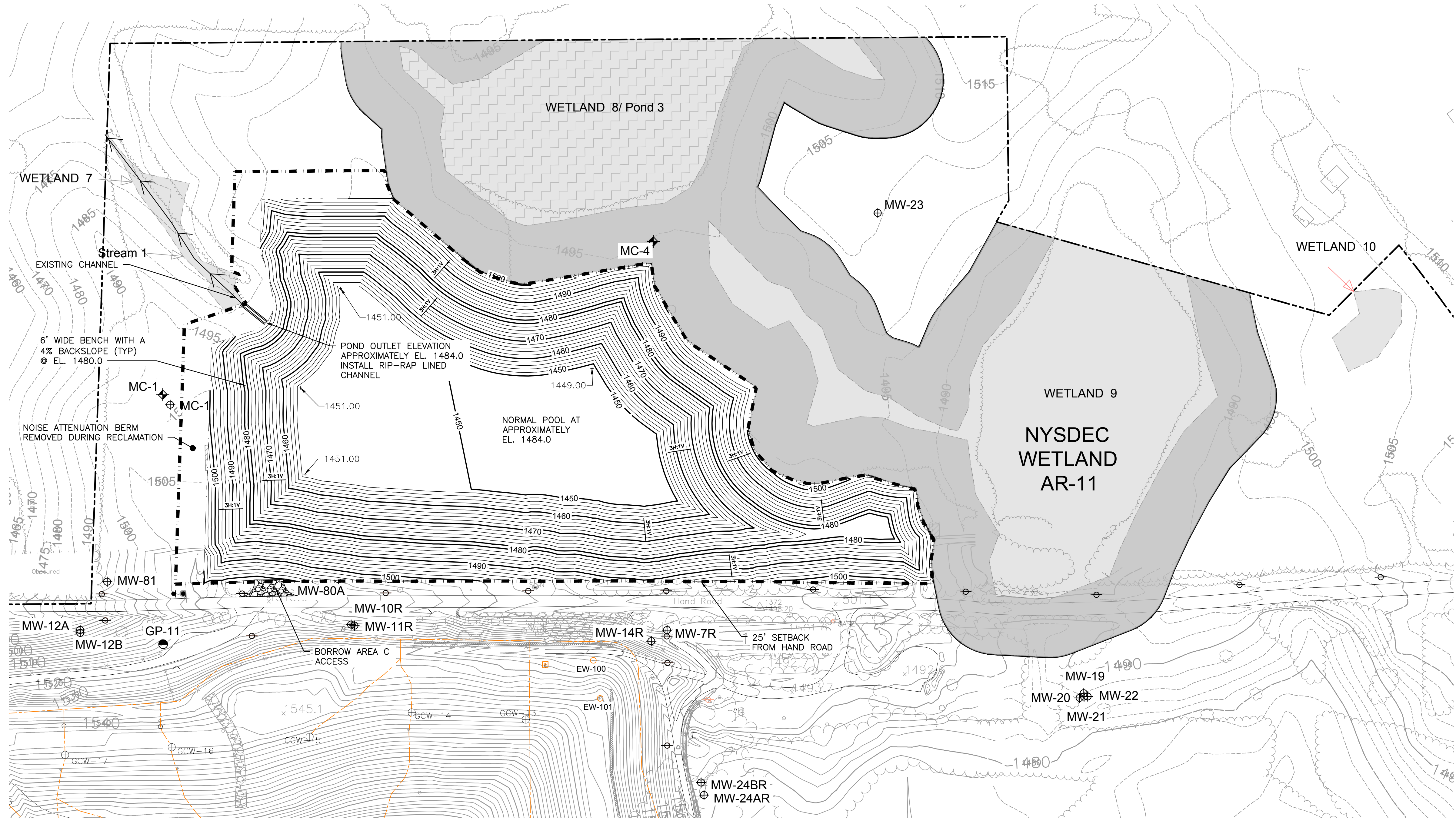
FIGURE NO.
3

PROJECT NO.
190260



LEGEND	
	EXISTING CONTOURS (SEE NOTE 1 ON FIGURE 3)
	EXISTING STORMWATER BASIN
	EXISTING CULVERT
	EXISTING RIP-RAP
	CLOSED LANDFILL'S CLAY BERM
	PROPERTY LINE (SEE NOTE 2)
	APPROXIMATE CELL BOUNDARIES
	APPROXIMATE BORROW AREA LIMIT
	100' WETLAND BUFFER (STATE WETLAND ONLY)
	DELINEATED JURISDICTIONAL WETLAND
	MONITORING/PUMP/OBSERVATION/DRIVE POINT WELL LOCATION AND DESIGNATION
	BORE HOLE LOCATION AND DESIGNATION
	EXISTING GAS COLLECTION WELL
	GAS PROBE LOCATION AND DESIGNATION

- NOTES:
- Existing site contours are based on aerial photography dated February 12, 2001 and November 22, 2001 compiled by Lockwood Mapping Inc. of Rochester, NY, Aero-Metric, dated July 10, 2012 and Quantum Spatial dated June 11, 2018. Additional topography to better reflect the main landfill area 2019 conditions has been incorporated and are based on photogrammetric methods from aerial photography dated 6/8/2019 compiled by Quantum Spatial of Dulles, Virginia. Grid based on NY West NAD83 Coordinate System Vertical datum based on NAVD 1988.
 - Property lines are based on surveys performed by Deborah A. Naylor, PLS, P.C. dated June 2001 and by Gary E. Krull dated March 1994.
 - Survey of delineated wetlands was prepared by Deborah A. Naylor, PLS, P.C. dated August 2001, Wendel Duchscherer Survey dated September 16, 2008 and by Wendel survey dated November 21, 2017.



BORROW AREA C - RECLAMATION

PLAN
SCALE: 1"=100'

1
4

- RECLAMATION PLAN NOTES:
- TOPSOIL WILL BE PLACED WITHIN THE BORROW AREA EXTENTS. GRASS WILL BE PLANTED TO ESTABLISH VEGETATIVE COVER.

File: R:\PROJECTS\190260\190260 - SOUTHERN EXPANSION\TITLE - Project Drawings\Borrow Area Plans\190260-SC-04 (BORROW AREA C REC PLAN).dwg Layout: SHEET 4 User: dand.sternham Apr 16, 2022 - 8:30am
 This drawing represents intellectual property of Cornerstone Engineering, Geology and Land Surveying, PLLC. Any modification to the original or other than Cornerstone Engineering, Geology and Land Surveying, PLLC personnel violates its original purpose and as such is prohibited. Cornerstone Engineering, Geology and Land Surveying, PLLC will not be held liable for any changes made to this document without express written consent of the originator.

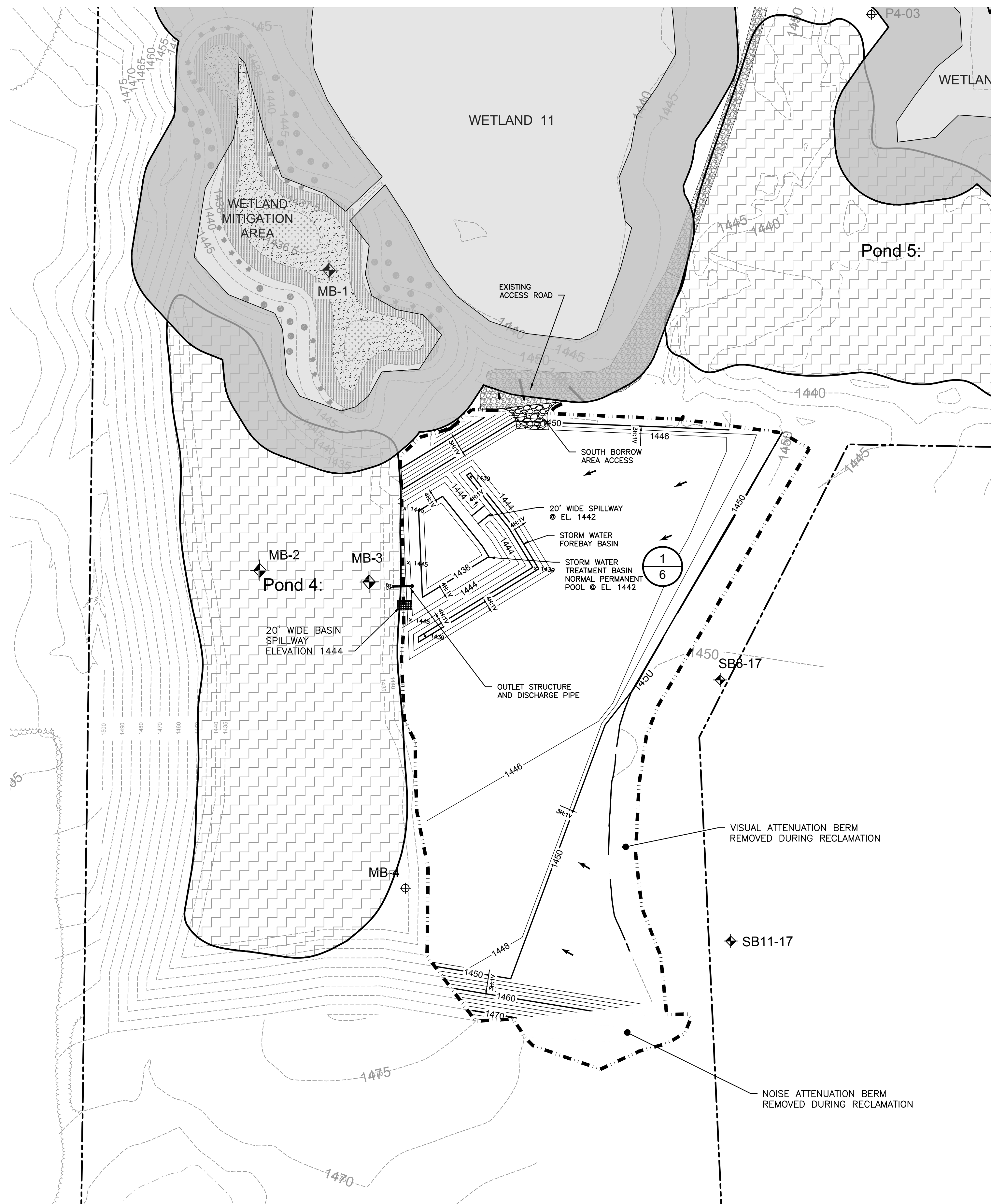
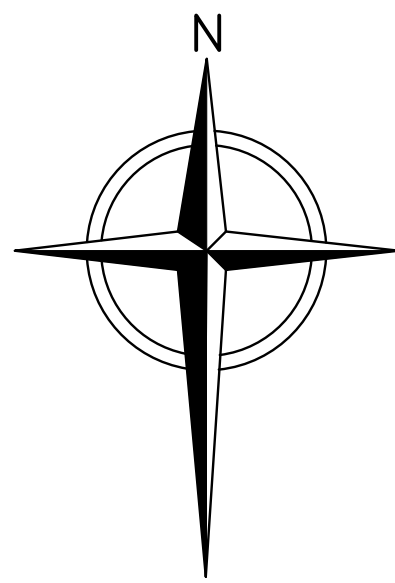
Unauthorized alteration or addition to this plan bearing a licensed professional's seal is a violation of Section 7209, Sub-Division 2, of the New York Education Law. Only copies from the original of this plan, marked with an original professional's seal shall be considered to be valid true copies.

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY	
1	04/29/22	REVISED APRIL 2022	DSS	DSS	RAH	RAH	
DATE OF ISSUE	JULY 2020	DRAWN BY	DSS	CHECKED BY	RAH	APPROVED BY	RAH

cornerstone
PLLC
CORNERSTONE ENGINEERING, GEOLOGY AND LAND SURVEYING, PLLC
ALL PROFESSIONAL ENGINEERING WORK IS PERFORMED BY ONLY LICENSED PROFESSIONAL ENGINEERS UNDER THE APPROPRIATE STATE REGULATED PROFESSIONAL ENTITY.

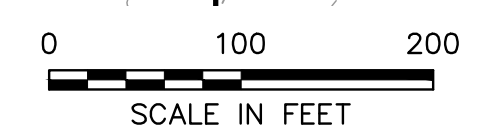
CHAFFEE FACILITY
AREA 7/8 DEVELOPMENT
SARDINIA, ERIE COUNTY, NEW YORK
BORROW AREA USE PLAN
BORROW AREA C - RECLAMATION PLAN

FIGURE NO.
4
PROJECT NO.
190260



LEGEND	
	EXISTING CONTOURS (SEE NOTE 1 ON FIGURE 3)
	EXISTING STORMWATER BASIN
	EXISTING CULVERT
	EXISTING RIP-RAP
	CLOSED LANDFILL'S CLAY BERM
	PROPERTY LINE (SEE NOTE 2)
	APPROXIMATE CELL BOUNDARIES
	APPROXIMATE BORROW AREA LIMIT
	100' WETLAND BUFFER (STATE WETLAND ONLY)
	DELINEATED JURISDICTIONAL WETLAND
	MONITORING/PUMP/OBSERVATION/DRIVE POINT WELL LOCATION AND DESIGNATION
	BORE HOLE LOCATION AND DESIGNATION
	EXISTING GAS COLLECTION WELL
	GAS PROBE LOCATION AND DESIGNATION

- NOTES:
- Existing site contours are based on aerial photography dated February 12, 2001 and November 22, 2001 compiled by Lockwood Mapping Inc. of Rochester, NY, Aero-Metric, dated July 10, 2012 and Quantum Spatial dated June 11, 2018. Additional topography to better reflect the main landfill area 2019 conditions has been incorporated and are based on photogrammetric methods from aerial photography dated 6/8/2019 compiled by Quantum Spatial of Dulles, Virginia. Grid based on NY West NAD83 Coordinate System Vertical datum based on NAVD 1988.
 - Property lines are based on surveys performed by Deborah A. Naybor, PLS, P.C. dated June 2001 and by Gary E. Krull dated March 1994.
 - Survey of delineated wetlands was prepared by Deborah A. Naybor, PLS, P.C. dated August 2001, Wendel Duchscherer Survey dated September 16, 2008 and by Wendel survey dated November 21, 2017.



SOUTH BORROW AREA - RECLAMATION

PLAN
SCALE: 1"=100'

- RECLAMATION PLAN NOTES:
- TOPSOIL WILL BE PLACED WITHIN THE BORROW AREA EXTENTS. GRASS WILL BE PLANTED TO ESTABLISH VEGETATIVE COVER.

File: R:\PROJECTS\190260\190260 - SOUTHERN EXPANSION TITLE - Project Drawings\BORROW AREA PLANS\190260-05 (SOUTH BORROW AREA REC PLAN).dwg Layer: SHEET 5 User: davis@stentor.com Apr 18, 2022 - 8:50am
 This drawing represents intellectual property of Cornerstone Engineering, Geology and Land Surveying, PLLC. Any modification to the drawing by other than Cornerstone Engineering, Geology and Land Surveying, PLLC personnel violates its original purpose and as such is prohibited. Cornerstone Engineering, Geology and Land Surveying, PLLC will not be held liable for any changes made to this document without express written consent of the originator.

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
1	04/29/22	REVISED APRIL 2022	DSS	DSS	RAH	RAH
DATE OF ISSUE			DRAWN BY		CHECKED BY	
JULY 2020			DSS		RAH	
DESIGNED BY			DESIGNED BY		APPROVED BY	
DSS			DSS		RAH	

cornerstone
PLLC

PREPARED BY:
CORNERSTONE ENGINEERING, GEOLOGY AND LAND SURVEYING, PLLC

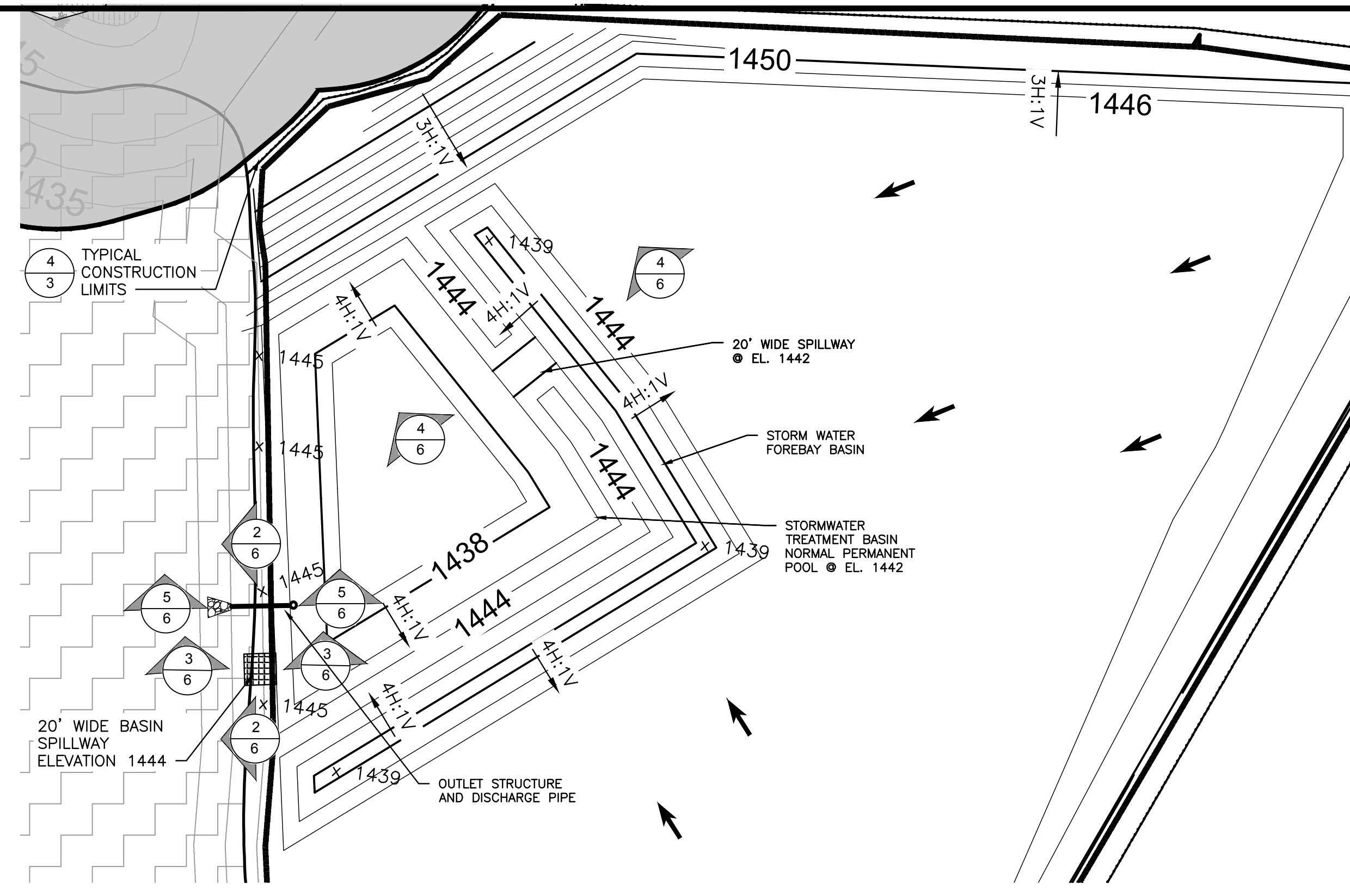
ALL PROFESSIONAL ENGINEERING WORK IS PERFORMED BY QUALIFIED LICENSED PROFESSIONAL ENGINEERS UNDER THE SUPERVISION OF A REGISTERED PROFESSIONAL ENGINEER.

CHAFFEE FACILITY
AREA 7/8 DEVELOPMENT
SARDINIA, ERIE COUNTY, NEW YORK

BORROW AREA USE PLAN
SOUTH BORROW AREA - RECLAMATION PLAN

FIGURE NO.
5

PROJECT NO.
190260



SOUTH BORROW AREA SEDIMENTATION BASIN

PLAN

SCALE: 1"=50'

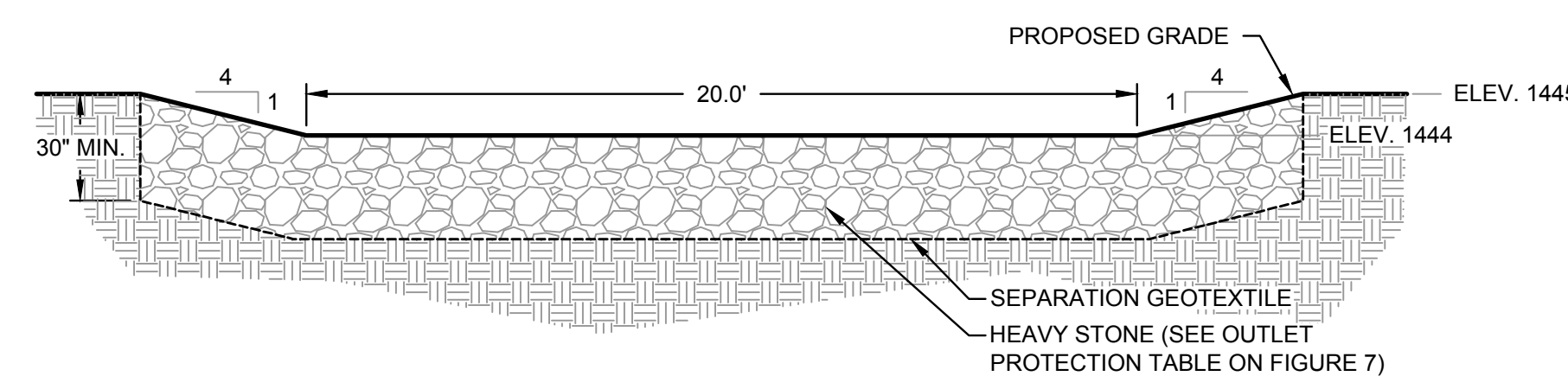
1
6

LEGEND

- EXISTING CONTOURS (SEE NOTE 1)
- EXISTING TREES
- PROPERTY LINE (SEE NOTE 2)
- 100' WETLAND BUFFER (STATE WETLAND ONLY)
- DELINEATED JURISDICTIONAL WETLAND
- PROPOSED RECLAMATION CONTOURS
- PROPOSED BORROW AREA LIMITS

NOTES:

- Existing site contours are based on aerial photography dated February 12, 2001 and November 22, 2001 compiled by Lockwood Mapping Inc. of Rochester, NY, Aero-Metric, dated July 10, 2012 and Quantum Spatial dated June 11, 2018. Additional topography to better reflect the main landfill area 2019 conditions has been incorporated and are based on photogrammetric methods from aerial photography dated 6/8/2019 compiled by Quantum Spatial of Dulles, Virginia. Grid based on NY West NAD83 Coordinate System Vertical datum based on NAVD 1988.
- Property lines are based on surveys performed by Deborah A. Naybor, PLS, P.C. dated June 2001 and by Gary E. Krull dated March 1994.
- Survey of delineated wetlands was prepared by Deborah A. Naybor, PLS, P.C. dated August 2001, Wendel Duchscherer Survey dated September 16, 2008 and by Wendel survey dated November 21, 2017.

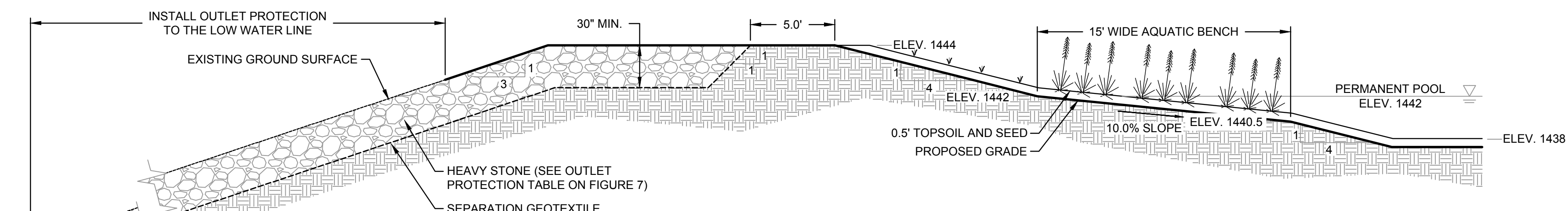


SPILLWAY CROSS SECTION

DETAIL

SCALE: 1"=4'

2
6

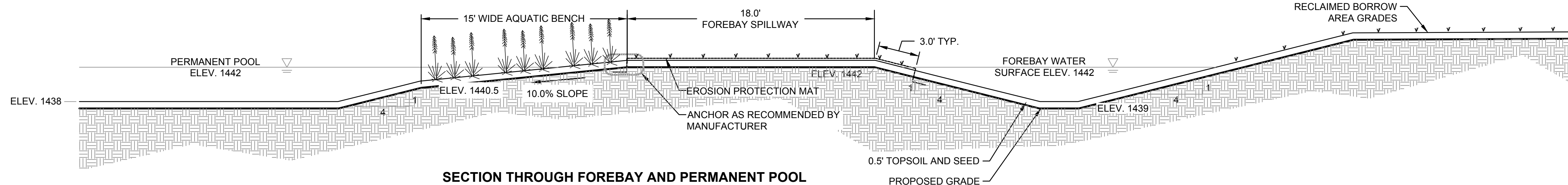


SPILLWAY SECTION

DETAIL

SCALE: 1"=5'

3
6

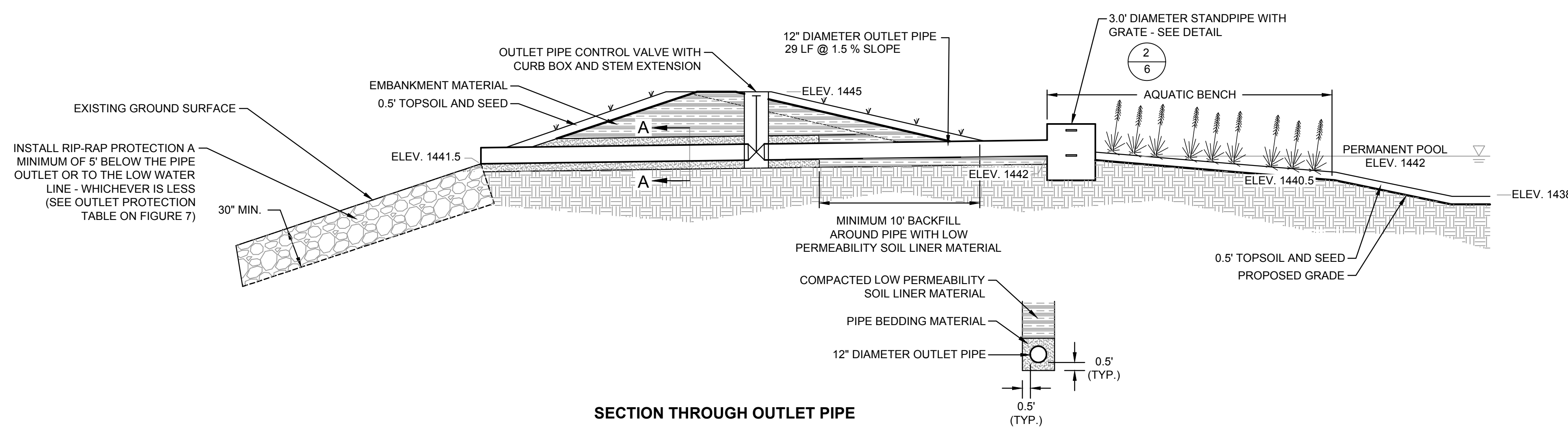


SECTION THROUGH FOREBAY AND PERMANENT POOL

DETAIL

SCALE: 1"=5'

4
6



SECTION THROUGH OUTLET PIPE

DETAIL

SCALE: 1"=5'

5
6

SECTION A-A

File: R:\PROJECTS\190260 - SOUTHERN EXPANSION TITLE - Project Drawings\Borrow Area\190260-SC-06-07 (DETAILS).dwg Layout: SHEET 6 User: dand.sternham Apr 16, 2022 - 8:38am

Unauthorized alteration or addition to this plan bearing a licensed professional's seal is a violation of Section 7209, Sub-Division 2, of the New York Education Law. Only copies from the original of this plan, marked with an original professional's seal shall be considered to be valid true copies.

This drawing represents intellectual property of Cornerstone Engineering, Geology and Land Surveying, PLLC. Any modification to the original by other than Cornerstone Engineering, Geology and Land Surveying, PLLC personnel violates its original purpose and as such is prohibited. Cornerstone Engineering, Geology and Land Surveying, PLLC will not be held liable for any changes made to this document without express written consent of the originator.

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY	
1	04/29/22	REVISED APRIL 2022	DSS	DSS	RAH	RAH	
DATE OF ISSUE	JULY 2020	DRAWN BY	DSS	CHECKED BY	RAH	APPROVED BY	RAH
		DESIGNED BY	DSS				

cornerstone
PLLC

PREPARED BY:
CORNERSTONE ENGINEERING, GEOLOGY AND LAND SURVEYING, PLLC

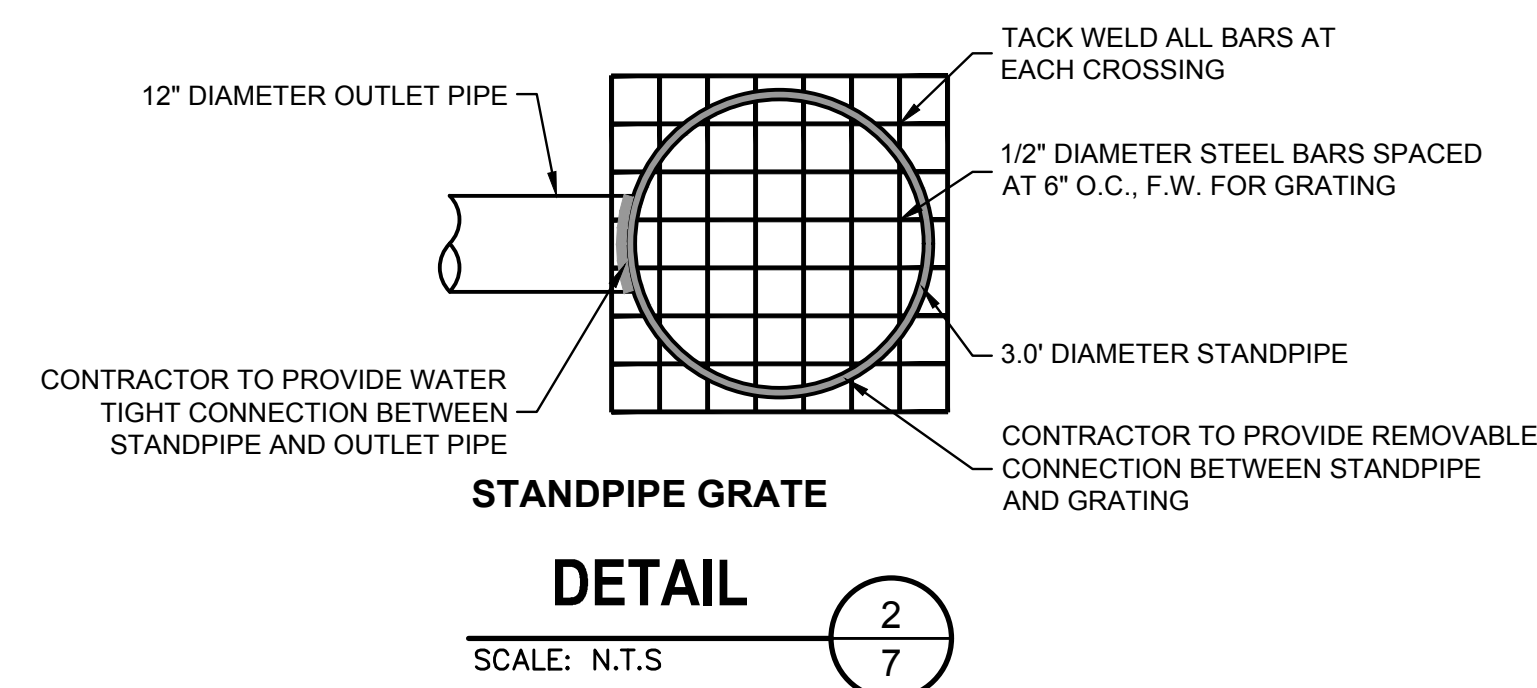
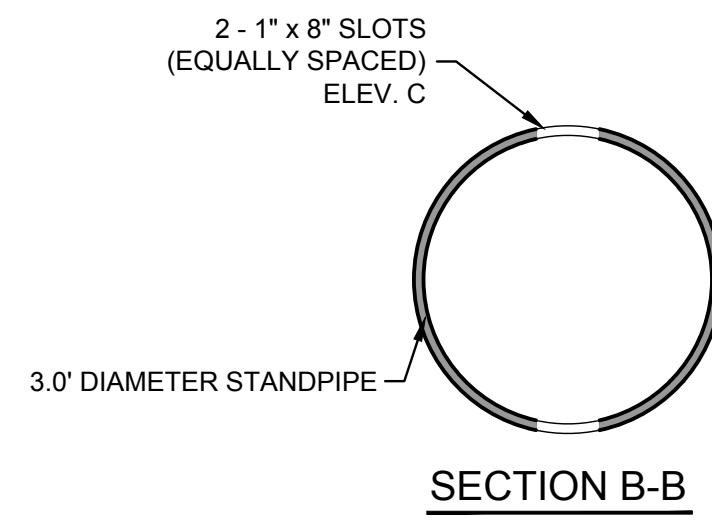
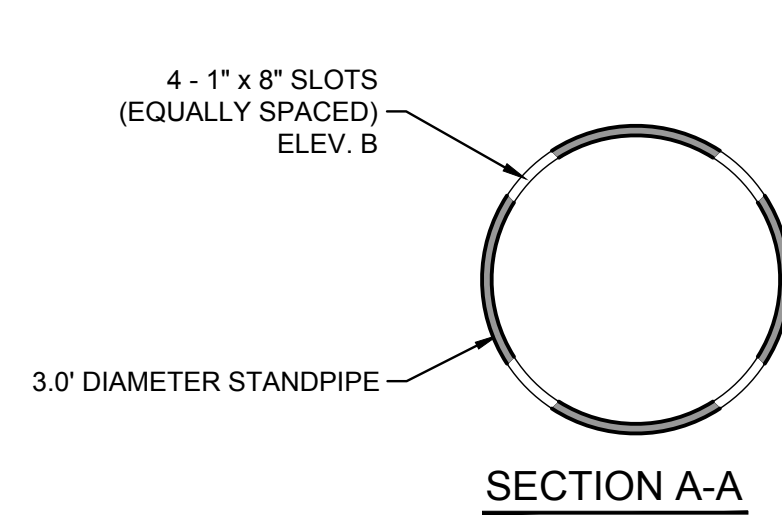
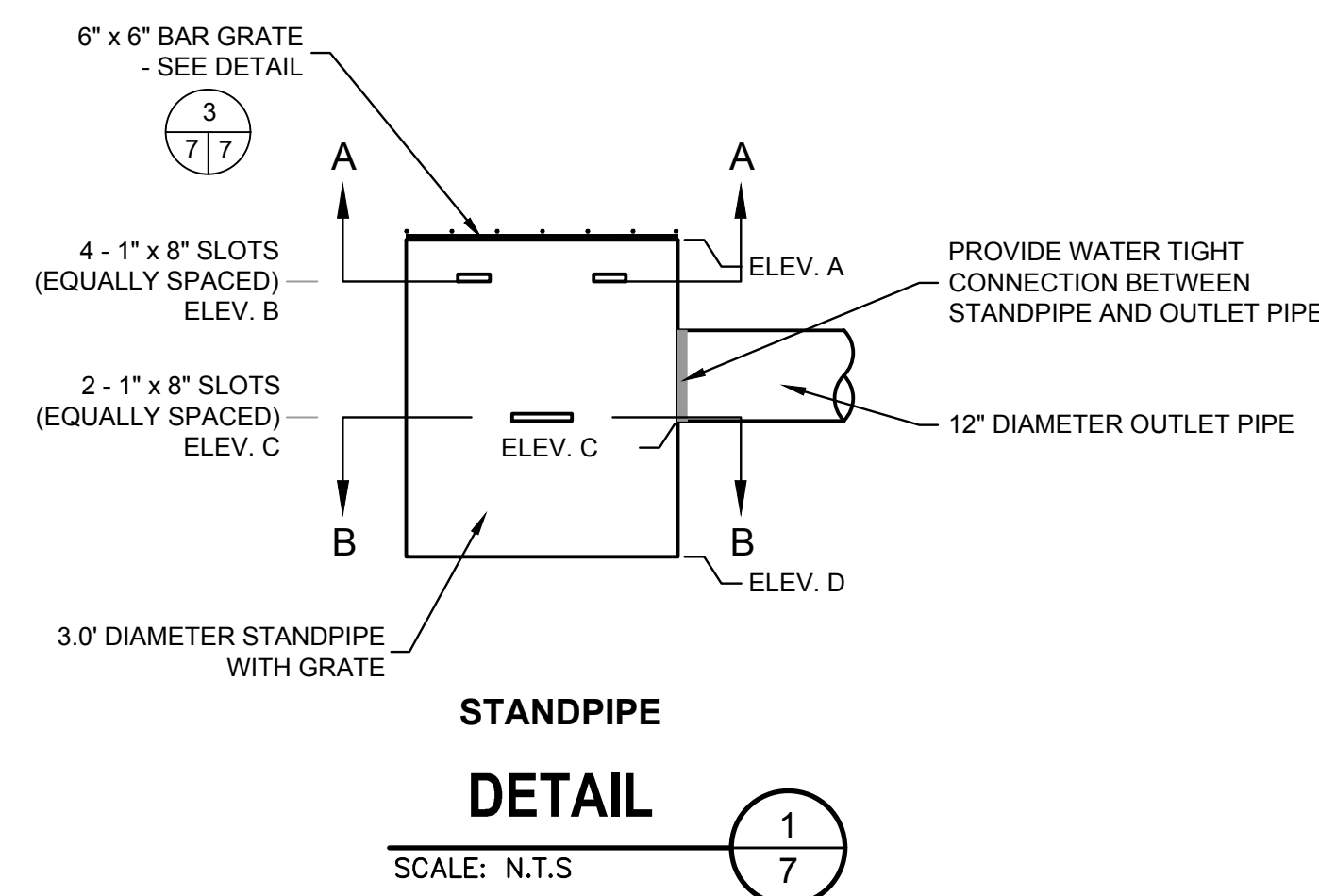
ALL PROFESSIONAL ENGINEERING WORK IS PERFORMED BY QUALIFIED PROFESSIONAL ENGINEERS UNDER THE APPROPRIATE STATE REGISTERED PROFESSIONAL ENTITY.

CHAFFEE FACILITY
AREA 7/8 DEVELOPMENT
SARDINIA, ERIE COUNTY, NEW YORK

BORROW AREA USE PLAN
SOUTH BORROW AREA SEDIMENTATION BASIN DETAILS

FIGURE NO.
6

PROJECT NO.
190260

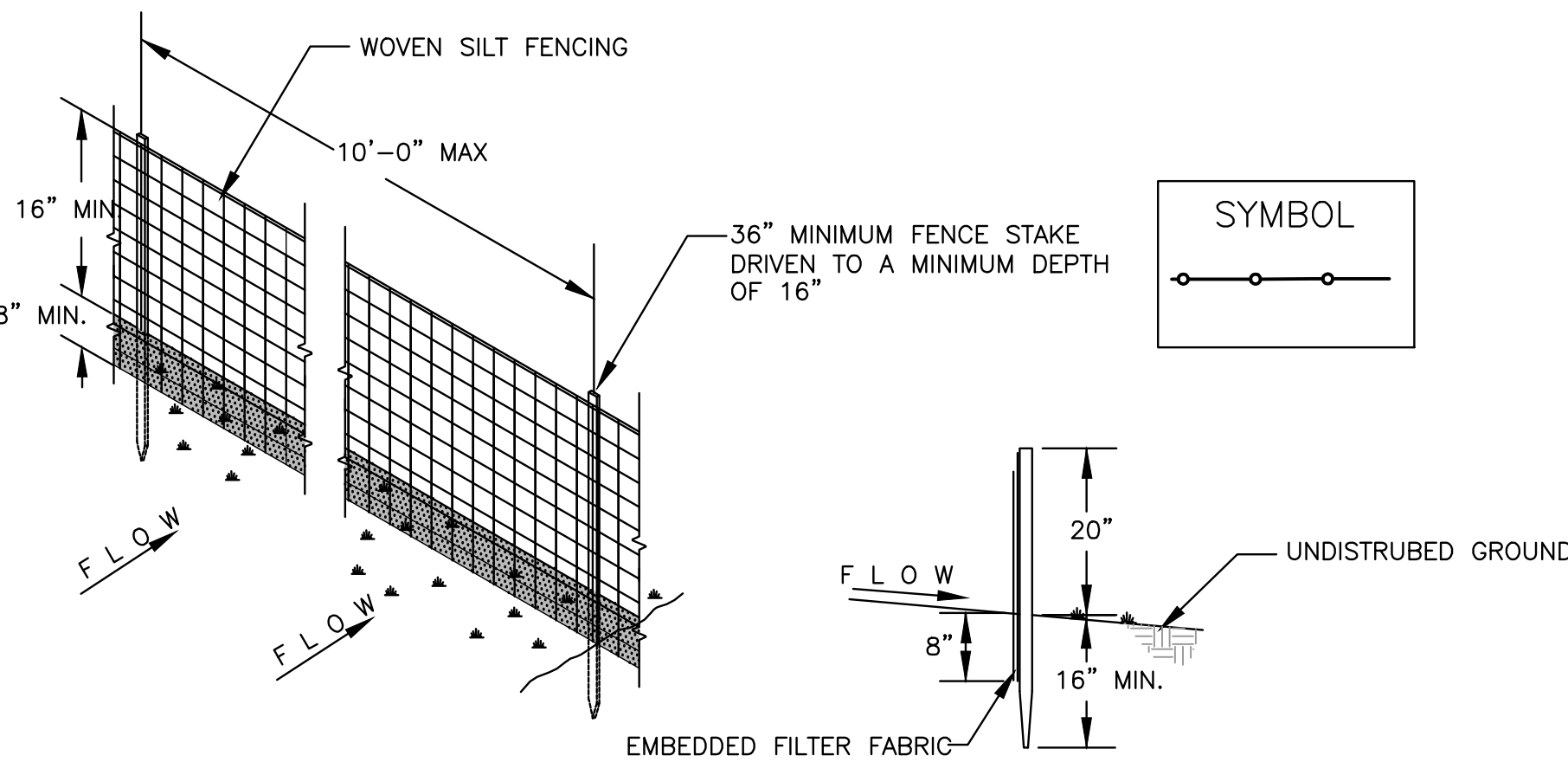
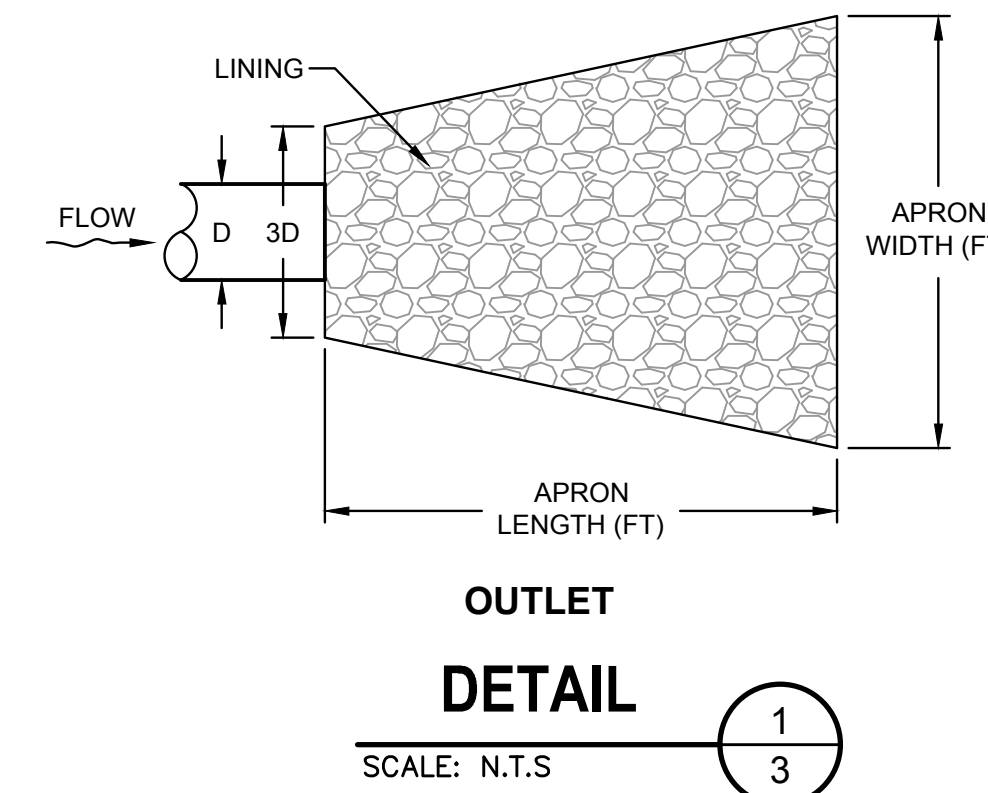


OUTLET PROTECTION TABLE (SEE DETAIL 3/7)

DESIGNATION	REQUIRED LINING	REVTMENT THICKNESS (INCHES)	APRON WIDTH (FT)	APRON LENGTH (FT)
12" SOUTH BORROW BASIN OUTLET PIPE	LIGHT STONE	9	10	AS SHOWN
EMERGENCY SPILLWAY	HEAVY STONE	30	AS SHOWN	AS SHOWN

STANDPIPE SLOT ELEVATION TABLE

ELEVATION LABEL	SOUTH BORROW AREA STANDPIPE ELEVATIONS
A	1444.0
B	1443.5
C	1442.0
D	1440.5



SILT FENCE APPLICATION NOTES:

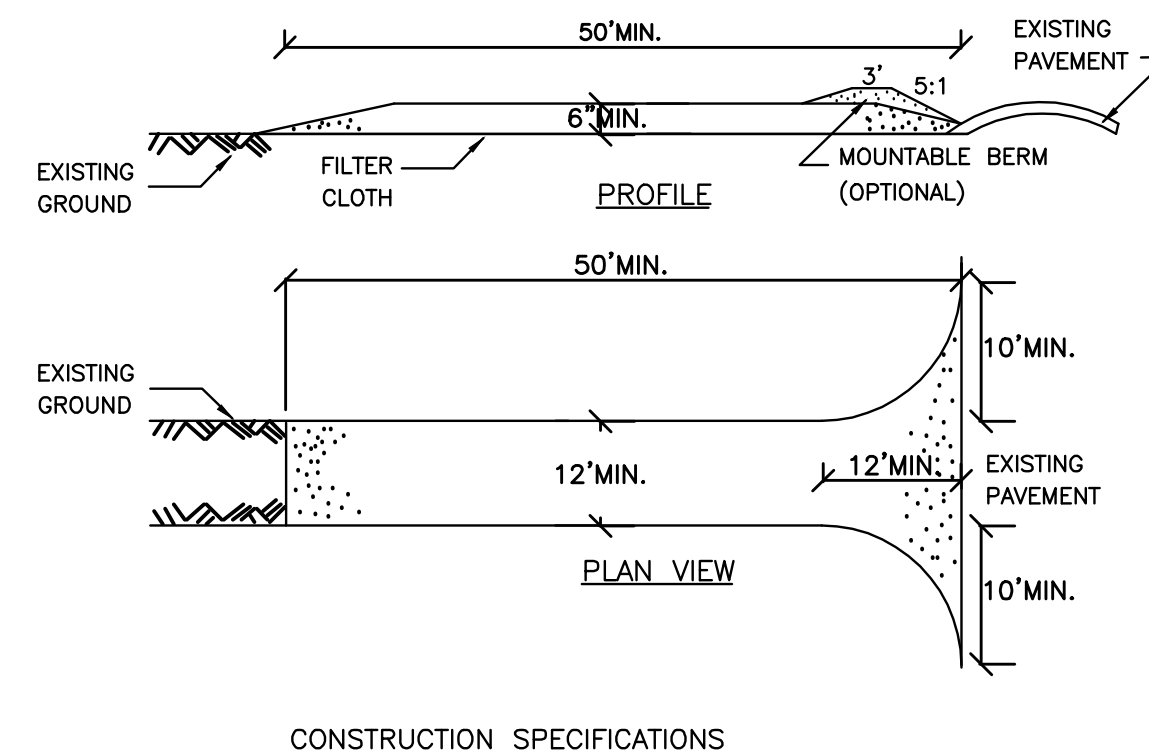
- MAXIMUM ALLOWABLE SLOPE LENGTHS CONTRIBUTING RUNOFF TO A SILT FENCE ARE:

SLOPE STEEPNESS	MAXIMUM SLOPE LENGTH (FT.)
2 : 1	50
3 : 1	75
4 : 1	125
- MAXIMUM DRAINAGE AREA FOR OVERLAND FLOW TO A SILT FENCE SHALL NOT EXCEED 1/2 ACRE PER 100 FEET OF FENCE.

SILT FENCE CONSTRUCTION NOTES:

- SILT FENCING SHALL BE PLACED ALONG A CONTOUR.
- WOVEN SILT FENCING TO BE FASTENED SECURELY TO FENCE STAKE WITH TIES OR STAPLES.
- FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
- WHEN TWO SECTIONS OF SILT FENCE ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

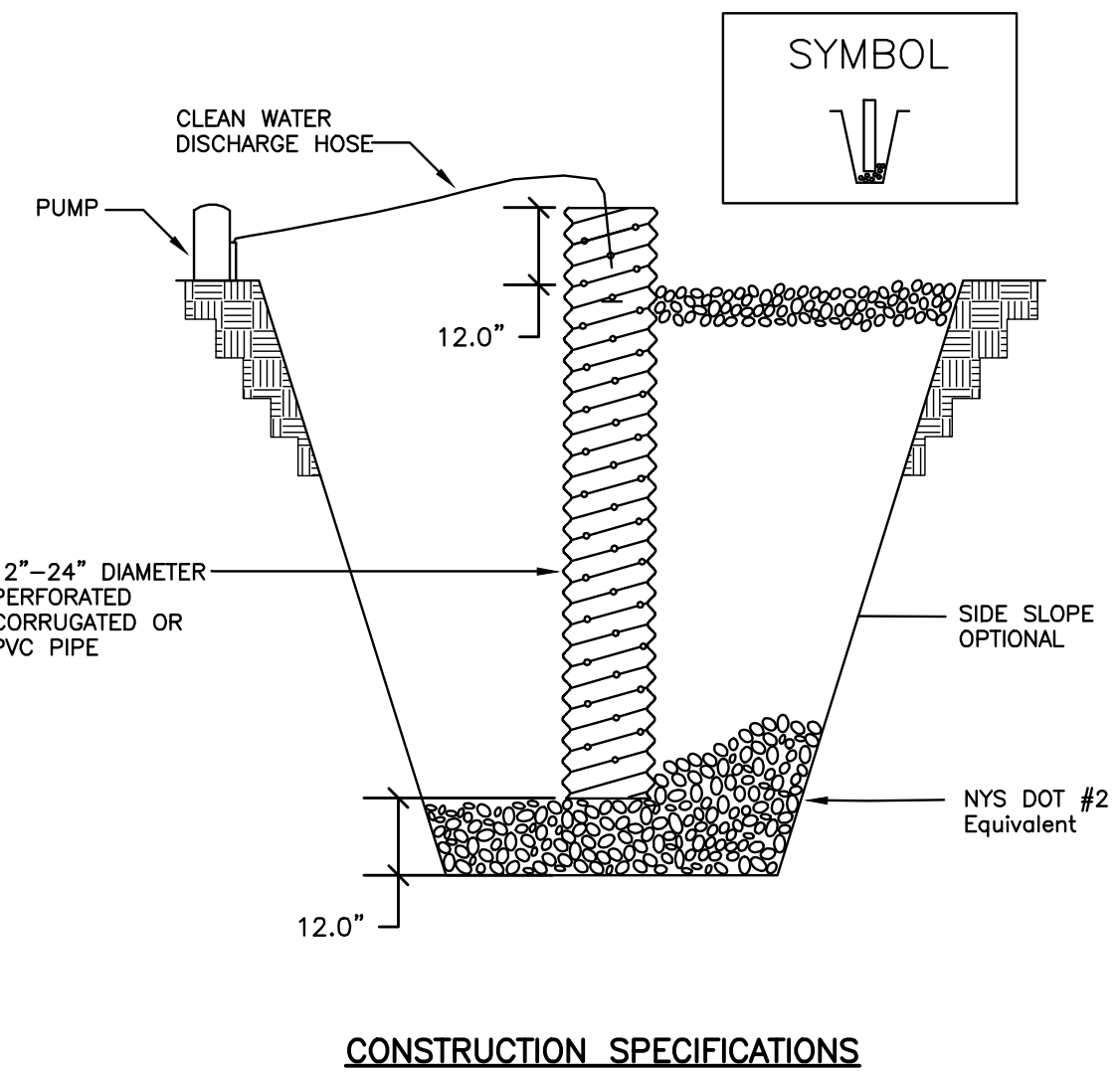
STRAW BALE DIKE



CONSTRUCTION SPECIFICATIONS

- STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
- LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
- THICKNESS - NOT LESS THAN SIX (6) INCHES.
- WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
- FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
- SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
- MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
- WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
- PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STABILIZED CONSTRUCTION ENTRANCE



CONSTRUCTION SPECIFICATIONS

- PIT DIMENSIONS ARE OPTIONAL.
- THE STANDPIPE SHOULD BE CONSTRUCTED BY PERFORATING A 12-24" DIAMETER CORRUGATED OR PVC PIPE.
- A BASE OF 2" AGGREGATE SHOULD BE PLACED IN THE PIT TO A DEPTH OF 12". AFTER INSTALLING THE STANDPIPE, THE PIT SURROUNDING THE STANDPIPE SHOULD BE BACKFILLED WITH 2" AGGREGATE.
- THE STANDPIPE SHOULD EXTEND 12-18" ABOVE THE LIP OF THE PIT.
- IF DISCHARGE WILL BE PUMPED DIRECTLY TO A STORM DRAINAGE SYSTEM, THE STANDPIPE SHOULD BE WRAPPED WITH FILTERCLOTH BEFORE INSTALLATION. IF DESIRED, 1/4"-1/2" HARDWARE CLOTH MAY BE PLACED AROUND THE STANDPIPE, PRIOR TO ATTACHING THE FILTERCLOTH.

SUMP PIT



CONSTRUCTION SPECIFICATIONS

GENERAL:

- Contractor to verify all dimensions and conditions prior to construction.
- The Contractor will be responsible for construction layout.
- The Contractor will be required to comply with all of the applicable Chaffee Facility Permits.

EXCAVATION AND BACKFILL:

- All excavations shall be performed in accordance with OSHA regulations.
- Excess excavated material shall be disposed of in locations designated by Waste Management of New York (WMNY).
- Unsuitable materials shall be legally disposed of, coordinate with WMNY for disposal locations.
- Existing underground utility locations are unknown and must be confirmed with WMNY and utility companies prior to any excavation.
- Low permeability soil liner material shall not contain material greater than 3 inches in size, organics, or other deleterious material. When placed and compacted, the material must have a permeability less than or equal to 1×10^{-5} cm/sec.
- Pipe bedding shall meet the requirements for subbase Type 4 stated in Section 3.04 of the NYSDOT Standard Specifications. Material shall be compacted to 90% of the Modified Proctor (ASTM D1557) maximum dry density.

STORMWATER DRAINAGE:

- Outlet pipes and standpipes shall be 12 inch diameter as shown on the drawings. Pipe shall be corrugated exterior polyethylene pipe with a smooth interior wall. Pipe shall meet the requirements stated in AASHTO M294 for type 5 pipe.
- Light stone rip-rap shall meet the requirements for light stone filling stated in Section 620-2 of NYSDOT Standard Specifications. Heavy stone rip-rap shall meet the requirements for heavy stone filling stated in Section 620-2 of NYSDOT Standard Specifications and Specifications. Installation shall be in accordance with Section 620-3 of the NYSDOT Standard Specifications.
- All disturbed areas shall be seeded and mulched, using the following seed mix:

Common White Clover	8 lbs. / acre
Tall Fescue	20 lbs. / acre
Perennial Ryegrass	10 lbs. / acre
- Separation Geotextile shall be a non-woven geotextile with a minimum mass per unit area of 6 oz. meeting the requirements of Geotex 701 or approved equivalent. Installation shall be in accordance with the Manufacturer's recommendations.
- Erosion Protection Mat shall consist of a polypropylene fiber mat specially designed for erosion control applications on steep slopes and vegetated waterways such as C350 permanent turf reinforcement manufactured by North American Green (NAG) or Engineer approved. Installation shall be in accordance with the Manufacturer's recommendation.
- Valves shall be flanged 12 inch quarter turn ball valves. The valves shall be either thermoplastic, HDPE or approved equivalent. The valves shall be equipped with valve stems and curb boxes to allow access at the elevations shown on the Contract Drawings. The curb boxes shall be installed with a removable cover capable of withstanding AASHTO HS-20 loads.

AQUATIC PLANTINGS:

- Aquatic bench will be planted with a combination of some or all of the following submerged or floating stemmed aquatics:

Submerged Aquatics: Coontail, Pond Weed, Water Weed, Lond-Leaved Pond Weed and Wild Celery.

Floating Stemmed Aquatics: Spatterdock, Duckweed, Watershield, Water Cress, Rice Cutgrass, Bay Forget Me Not, Swamp Smartweed, Water Smartweed, White Water Lily and Pale Mannagrass.

Other plantings may be allowed if the plants are capable of withstanding constant inundation of water to depths of 1 foot.

No one individual species of submerged or floating aquatics may exceed 10 percent of the total proposed for the project. Spacing of plantings shall be based on Manufacturer's recommendations. The plantings shall have a two year warranty.

Aquatic plantings shall not consist of any species the 6NYCRR Part 575 Prohibited and Regulated Invasive Species list, published September 10, 2014.

SOIL EROSION AND SEDIMENT CONTROL NOTES

- ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES TO BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
- ANY DISTURBED AREAS INCLUDING STOCKPILES THAT WILL BE LEFT EXPOSED MORE THAN 30 DAYS, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL BE STABILIZED WITHIN 7 DAYS AFTER INITIAL DISTURBANCE USING RYESEED, MULCH, OR EROSION CONTROL MATTING.
- PERMANENT VEGETATION TO BE ESTABLISHED WITH TOPSOIL AND SEED OR SOD ON ALL EXPOSED AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADING. MULCH TO BE USED AS NECESSARY FOR PROTECTION UNTIL SEEDING IS ESTABLISHED.
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH "NEW YORK STATE STANDARDS FOR EROSION AND SEDIMENT CONTROL".
- IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING, ALL CRITICAL AREAS SUBJECT TO EROSION (I.E., STEEP SLOPES AND ROADWAY EMBANKMENTS) SHALL BE STABILIZED.
- ANY STEEP SLOPES RECEIVING UTILITY INSTALLATION SHALL BE BACKFILLED AND STABILIZED DAILY, AS THE INSTALLATION PROCEEDS (I.E., SLOPES GREATER THAN 1.5:1).
- AMEND OR REPLACE TOPSOIL IF NECESSARY FOR VEGETATIVE ESTABLISHMENT.
- PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED IN ACCORDANCE WITH SWPPP REQUIREMENTS.
- REMOVE ANY SEDIMENT THAT MAY WASH OR TRACK OFF OF THE SITE. PAVED ROADS SHALL BE MAINTAINED IN A CLEAN, SWEEP CONDITION DAILY THROUGHOUT CONSTRUCTION.
- ACCESS TO SITE SHALL BE RESTRICTED TO AREAS HAVING A STABILIZED CONSTRUCTION ENTRANCE.
- AREAS WHERE SOIL IS SUBJECT TO BLOWING OFFSITE SHALL BE WET DOWN.

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY	
1	04/29/22	REVISED APRIL 2022	DSS	DSS	RAH	RAH	
DATE OF ISSUE	JULY 2020	DRAWN BY	DSS	CHECKED BY	RAH	APPROVED BY	RAH

cornerstone
 PLLC
 PREPARED BY:
 CORNERSTONE ENGINEERING, GEOLOGY AND LAND SURVEYING, PLLC
ALL PROFESSIONAL ENGINEERING WORK IS PERFORMED BY QUALIFIED PROFESSIONAL ENGINEERS UNDER THE APPROPRIATE STATE LICENSED PROFESSIONAL ENTITY.

CHAFFEE FACILITY
 AREA 7/8 DEVELOPMENT
 SARDINIA, ERIE COUNTY, NEW YORK

BORROW AREA USE PLAN
EROSION AND SEDIMENT CONTROL DETAILS

FIGURE NO.
7

PROJECT NO.
 190260

APPENDIX A

SUPPORTING CALCULATIONS

CALCULATION COVER SHEET

CLIENT Waste Management - Chaffee	DATE 20-May-21	PROJECT NUMBER 190260
PROJECT / CALCULATION NUMBER Area 7-8 Development	TITLE Borrow Area Excavation Seepage Analysis	
PREPARED BY L.Rohr	CHECKED BY R. Holmes	

Description and Purpose:

The purpose of this analysis is to assess the potential seepage from nearby wetlands into the excavation for proposed Borrow Area C.

Design Basis/References/Assumptions:

Darcy's Law (Freeze and Cherry, 1979) and available site data were utilized to calculate the potential flux of groundwater into the proposed borrow area excavations.

Current data indicates that the silty clays found on the site have permeability values ranging from 3×10^{-10} m/s and 8×10^{-10} m/s which are essentially impermeable.

Conservatively, for this analysis, a permeability of 1.5×10^{-9} m/s was used which is representative of the discontinuous saturated sand lenses encountered in portions of the site. This value is consistent with Table 7 from the 2005 Hydrogeologic Investigation Report. Supplemental testing of the sand lenses was not performed during the most recent Hydrogeologic investigation, thus the previously established value from the 2005 Report is still valid and applicable in this case.

The hydraulic gradient used for this analysis was calculated by first calculating the head difference (water elevation in wetlands minus the base elevation of the proposed borrow area), and then comparing that head to the lateral distance between the wetlands and borrow areas.

While a cross section of the excavation slope of the proposed borrow area would be a trapezoid with the base narrower than the top of the excavation, the cross-sectional area used in the analysis was conservatively assumed to be a rectangle (increasing the theoretical area where seepage could occur).

Remarks/Conclusions/Results:

Using Darcy's Law the calculated groundwater seepage from the wetlands into the proposed borrow areas is approximately 132,703 gallons per year.

The annual average precipitation rate for Arcade, NY is 42 inches per year (Western Regional Climate Center) . The annual precipitation that falls into the wetlands, not taking stormwater run-in from adjacent land, is 12,088,248 gallons per year.

Therefore, when comparing the groundwater seepage from the wetlands into the proposed borrow areas, to the average direct input from precipitation into the wetlands, the groundwater seepage represents only 1.1% of the precipitation.

If stormwater run-in from adjoining lands was included in this analysis, the groundwater seepage out of the wetlands would be even more insignificant.

Potential Seepage from Wetlands AR-11

Using Darcy's Law (Freeze and Cherry, 1979)

$Q = KiA$
Q = groundwater flux or seepage
K = hydraulic conductivity of clay till (cm/sec or m/sec)
I = hydraulic gradient (ft/ft)
A = cross sectional area through which flow will migrate

A = 60000 sf (1200' long excavation face times 50' depth of cut)
6667 m²
i = 0.16 ft/ft lateral distance from the water surface of the wetlands to the base of the borrow area = 250'
water el. of wetlands = 1490', base el. of borrow area = 1450', therefore 40' of head difference
i = 40'/250'
K 1.50E-08 m/sec geometric mean of 11 in-situ hydraulic conductivity tests within the clay till
(From Table 7 of 2005 Hydrogeologic Investigation Report)
Q = 1.60E-05 m³/sec
1.38 m³/day
505 m³/year
132,703 gallon per year

Potential Runoff into wetland

Approximate surface area of the wetlands = 461,736 sf (approx 10.6 acres from NYSDEC Enviromapper)
Average Annual Rainfall = 42 inches (For Arcade NY - from the Western Regional Climate Center)
Run on = 12,088,248 gallons per year

Potential Impact

Seepage into mine/Run-on into mine
132,703 / 12,088,248 = 1.1%

ARCADE, NEW YORK (300220)

1981-2010 Monthly Climate Summary

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	30.1	33.6	42.6	56.0	67.6	75.4	78.9	76.7	69.3	58.9	45.0	34.9	55.9
Average Min. Temperature (F)	14.2	15.5	22.1	33.2	42.6	51.5	56.2	54.3	47.8	38.3	29.0	20.4	35.6
Average Total Precipitation (in.)	2.56	2.54	2.89	3.01	3.52	4.17	4.33	3.89	3.94	3.92	3.81	3.46	42.06

Unofficial values based on averages/sums of smoothed daily data. Information is computed from available daily data during the 1981-2010 period. Smoothed 1981-2010 values to differ from official NCDC values. This table is presented for use at locations that don't have official NCDC data. No adjustments are made to these values. See the [normals](#) table for official data.

Western Regional Climate Center; wrcc@dri.edu

<https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ny0220>