PERMIT AMENDMENT APPLICATION

VOLUME 3 OF 5

Prepared for

Waste Management of Texas, Inc.

April 2012

Prepared by

BIGGS & MATHEWS ENVIRONMENTAL

1700 Robert Road, Suite 100 • Mansfield, Texas 76063 • 817-563-1144

TEXAS BOARD OF PROFESSIONAL ENGINEERS FIRM REGISTRATION NO. F-256

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PERMIT AMENDMENT APPLICATION

VOLUME 3 OF 5

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PART III FACILITY INVESTIGATION AND DESIGN

Attachment D - Waste Management Unit Design

PERMIT AMENDMENT APPLICATION

PART III – FACILITY INVESTIGATION AND DESIGN ATTACHMENT D WASTE MANAGEMENT UNIT DESIGN

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1 LANDFILL UNIT DESIGN

30 TAC §330.63(d)(4)

The landfill unit design includes all weather operation, landfilling methods, landfill design parameters, site life projection, landfill cross sections, and the liner and final cover quality control plans for the Skyline Landfill, as discussed below.

1.1 All Weather Operation

30 TAC §330.63(d)(4)(A)

The landfill interior access roads (see Attachment D1 – Landfill Unit Design – Site Layout Plan) are constructed of crushed stone, gravel, concrete rubble, masonry rubble, wood chips, or other similar materials to provide access to the disposal area during all weather conditions. To enhance operating efficiency during wet weather, a disposal area close to the all weather roads may be reserved for wet weather operations. The wet weather area will move as operations progress.

Site personnel will maintain the landfill access road for all weather access. Stockpiles of crushed stone, gravel, concrete rubble, masonry demolition debris, wood chips or other similar material will be available for use in maintaining passable access roads. Grading equipment or other appropriate equipment will be used as necessary to control or remove mud accumulations on the landfill access roads around the landfill and the landfill entrance road.

Tracking of mud onto public access roads is minimized by the all weather surfaces of the interior access roads and the landfill entrance road. The landfill entrance road is a 36-foot-wide concrete paved roadway and provides mud control for waste hauling vehicles prior to exiting the site and returning to public access roads. Additional mud control is provided by a mud grate facility.

1.2 Landfilling Methods

30 TAC §330.63(d)(4)(B)

The development method for the landfill is a combination of area-excavation fill followed by aerial fill to the proposed landfill completion height. The landfill will be developed in three phases with each phase containing multiple cells.

The drawings in Attachment D1 – Landfill Unit Design – Site Layout Plan depict existing site conditions, excavation, final fill height, drainage structures, and entrance facilities. Final excavation side slopes will not be steeper than 5H:1V, the aerial fill side slopes will vary from 5H:1V to 4H:1V, and the top slope will be 2.5 percent. Final cover placement will generally follow the sequence of development as shown in Part II, Appendix IIA - Maps

and Drawings, and will be ongoing as the site is developed. Sectors will be closed according to the closure plan provided in Attachment H – Closure Plan.

1.3 Landfill Design Parameters

30 TAC §330.63(d)(4)(C)

The 662 permitted acres will include 288.6 acres for waste disposal and 305 acres of buffer and other non-fill areas. The elevation of deepest excavation will be 377 feet msl and the maximum elevation of final cover will be 688 feet msl. The maximum elevation of disposed waste will be 683.5 feet msl.

1.4 Site Life Projection

30 TAC §330.63(d)(4)(D)

Once expanded, the total remaining landfill volume available for waste disposal is approximately 53,505,000 cubic yards (waste and daily cover), which will provide an estimated 32 years of site life. Calculations and assumptions for the waste volume and site life estimate are included in Attachment D4 — Site Life.

1.5 Landfill Cross Sections

30 TAC §330.63(d)(4)(E) and (F)

Cross sections of the landfill unit are provided in Attachment D2 – Cross Sections. These sections show the proposed excavation; bottom, side slope, and aerial fill elevations; the permitted fill elevations; the existing ground elevations; and the liner and cover system elevations. Soil borings, monitoring wells, and gas monitoring probes near the sections have been projected onto the sections. The section locations were selected to represent the conditions across the entire site.

1.6 Liner Quality Control Plan

30 TAC §330.63(d)(4)(G)

A quality control plan for the composite liner system prepared in accordance with §330.339 is provided in Attachment D7 – Liner Quality Control Plan. The components of the composite liner system are listed from top to bottom in Table D-1. Details of the composite liner system are provided in Attachment D3 – Construction Design Details.

Table D-1
Skyline Landfill
Components of the Composite Liner System

Liner System Component	Description	Thickness
Protective Cover	General earthfill	24 inches
Leachate Collection Layer	Single-sided geocomposite on floor Double-sided geocomposite on side slopes	0.2 inches
Geomembrane Liner	Smooth HDPE geomembrane on floor Textured HDPE geomembrane on side slopes	60 mil
Compacted Soil Liner	Compacted soil with a coefficient of permeability less than or equal to 1 x 10 ⁻⁷ cm/sec	24 inches

1.7 Final Cover Quality Control Plan

30 TAC §330.457

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A quality control plan for the final cover system is provided in Attachment D8 – Final Cover Quality Control Plan. Details of the final cover system are provided in Attachment D3 – Construction Design Details. The components of the final cover system are listed from top to bottom in Table D-2.

Table D-2
Skyline Landfill
Components of the Final Cover System

Cover System Component	Description	Thickness	
Erosion Layer	Soil that is capable of sustaining native plant growth	36 inches	
Drainage Layer	Double-sided geocomposite	0.2 inches	
Infiltration Layer	Compacted soil with a coefficient of permeability less than or equal to 1 x 10 ⁻⁷ cm/sec	18 inches	

2 STORAGE AND TRANSFER UNITS

30 TAC §330.63(d)(1)(A) and (B)

The storage and transfer units will be designed for the rapid processing and minimum detention of solid waste at the facility and will be managed to prevent nuisances and fire hazards. The design of the storage and transfer units will be sufficient to control and contain a worst-case spill or release from the units and the unenclosed areas associated with the units, and will account for precipitation from the 25-year, 24-hour rainfall event. The storage and transfer units include the large item storage area, reusable materials staging area, citizen's convenience area, leachate storage facility, bioremediation treatment pad, mud grate facility, and liquid stabilization area.

2.1 Large Item Storage

A storage area for large items and white goods may be provided near the active working face. Large items and white goods include ovens, dishwashers, freezers, air conditioners, and other large items. Any rainfall runon or runoff near the active working face will be contained within the active area and handled as contaminated water, as discussed in Part IV – Site Operating Plan. These items will be recycled every 180 days or less, or disposed at the active working face within 180 days of acceptance at the facility. Large items that are not recycled will be disposed of at the working face. The procedures for the acceptance, storage, processing, and disposal of large items are addressed in Part IV – Site Operating Plan.

2.2 Reusable Materials Staging Area

Inert materials such as brick, concrete, asphalt, shingles, etc., are often received and staged at the facility for use as roadbase materials for facility access roads and staging areas or erosion control in drainage structures. The reusable materials staging area will be located above existing lined areas and will be relocated periodically as the active working face moves. The size of the stockpiles may vary depending on the amount of inert materials received at any given time. Since these materials are inert, their storage will not create a public health hazard or nuisance and runon and runoff from rainfall will not be controlled in a special manner. Also, since these materials will continuously be reused for site operations, there is no time limit on the storage of these materials.

2.3 Citizen's Convenience Area

A citizen's convenience area for waste drop-off is located within the site entrance facilities, as shown in Attachment D1 – Landfill Unit Design – Site Layout Plan, Drawing D1.5 – Entrance Road and Entrance Facilities Plan. Thirty to forty cubic yard roll-off containers as well as containers for recycled goods may be provided. Roll-off

containers will be emptied at the active working face or covered with a tarp at the end of each day.

2.4 Leachate Storage Facility

Primary leachate storage will be provided by the leachate sumps, which are located within each landfill cell. Leachate will be pumped from the sumps through a leachate forcemain to a direct connection to publicly owned treatment works (POTW). Existing storage tanks provide a minimum of approximately 38 hours of temporary leachate storage in the event that the direct connection to the POTW is not functional. The storage tanks will be emptied from the tanks into tanker trucks for transport based on leachate production and storage needs in the event that they are used.

The leachate storage facility is located near the maintenance facility, as shown in Attachment D1 – Landfill Unit Design – Site Layout Plan, Drawing D1.5 – Entrance Road and Entrance Facilities Plan. The storage facility consists of one 24,500-gallon storage tank and one 17,000-gallon storage tank. The calculations in Appendix D6-D – Secondary Containment Volume Calculations demonstrate that the secondary containment area provides containment, with 6 inches of freeboard, for the storage tanks and precipitation from the 25-year, 24-hour storm event.

2.5 Bioremediation Treatment Pad

A bioremediation treatment pad for petroleum contaminated materials is located within the future waste fill area, as shown in Attachment D1 – Landfill Unit Design – Site Layout Plan, Drawing D1.5 – Entrance Road and Entrance Facilities Plan. The treatment pad is constructed with a minimum 18-inch-thick compacted clay liner and is surrounded by a compacted clay containment berm. The containment berm is sized for precipitation from the 25-year, 24-hour storm event. Water that comes into contact with the contaminated soils will be handled as contaminated water, as discussed in Part IV – Site Operating Plan. Tarps may be placed over the contaminated soils to minimize the volume of contaminated water. Treatment procedures, testing requirements and material disposal are described in Part IV – Site Operating Plan, Appendix IVD – Bioremediation Treatment Plan.

2.6 Mud Grate Facility

The mud grate is located along the entrance road, as shown in Attachment D1 – Landfill Unit Design – Site Layout Plan, Drawing D1.5 – Entrance Road and Entrance Facilities Plan. The mud grate is a concrete structure with a series of metal grates that function as mud removal devices. As vehicles drive across the mud grate, mud from tires drops through the grates into a mud box. The accumulated mud is periodically removed from the mud box and placed in the active working face.

2.7 Liquid Waste Stabilization Area

Sludges, grease trap waste, grit trap waste, Class 2 or Class 3 liquid industrial waste, liquid waste from drilling activities, or liquid wastes from municipal sources may be accepted at the Skyline Landfill. Refer to Part IV, Appendix IVB — Special Waste Acceptance Plan. The facility may perform on-site liquid processing/stabilization of sludges, grease trap wastes, grit trap wastes, Class 2 or Class 3 liquid industrial wastes, or liquids from municipal sources. The facility will provide a stabilization basin placed within an existing lined cell. The basin will be secured during waste placement operations and soil will be graded around the basin to ensure that stormwater runoff is directed away from the basin. The container will be placed so that a minimum of one foot of the container extends above the surrounding soil. The bottom of the container will be at least 10 feet above the top of the protective cover soil component of the lining system and founded in the waste.

Once the basin is in place, trucks will discharge directly into the basin. Lime, fly ash, cement kiln dust, Portland cement, sawdust, dirt, auto fluff, or any combination of these materials may be used for liquid stabilization. Mixing will be accomplished with a backhoe or other appropriate machinery. Each batch of stabilized material will be tested for free liquids in accordance with Method 9095 (Paint Filter Liquids Test), as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (EPA Publication Number SW-846), as amended. Upon verification of the stabilized material passing the paint filter test, the mixture will be removed from the basin and deposited in the active face for landfilling on the day it is received. The procedures for acceptance, processing, odor control, and stabilizing liquid wastes accepted at the facility are addressed in Part IV — Site Operating Plan, Appendix IVE — Liquid Stabilization Plan.

PERMIT AMENDMENT APPLICATION

PART III – FACILITY INVESTIGATION AND DESIGN ATTACHMENT D1 LANDFILL UNIT DESIGN – SITE LAYOUT PLAN

Prepared for

Waste Management of Texas, Inc.

April 2012



Prepared by

BIGGS & MATHEWS ENVIRONMENTAL

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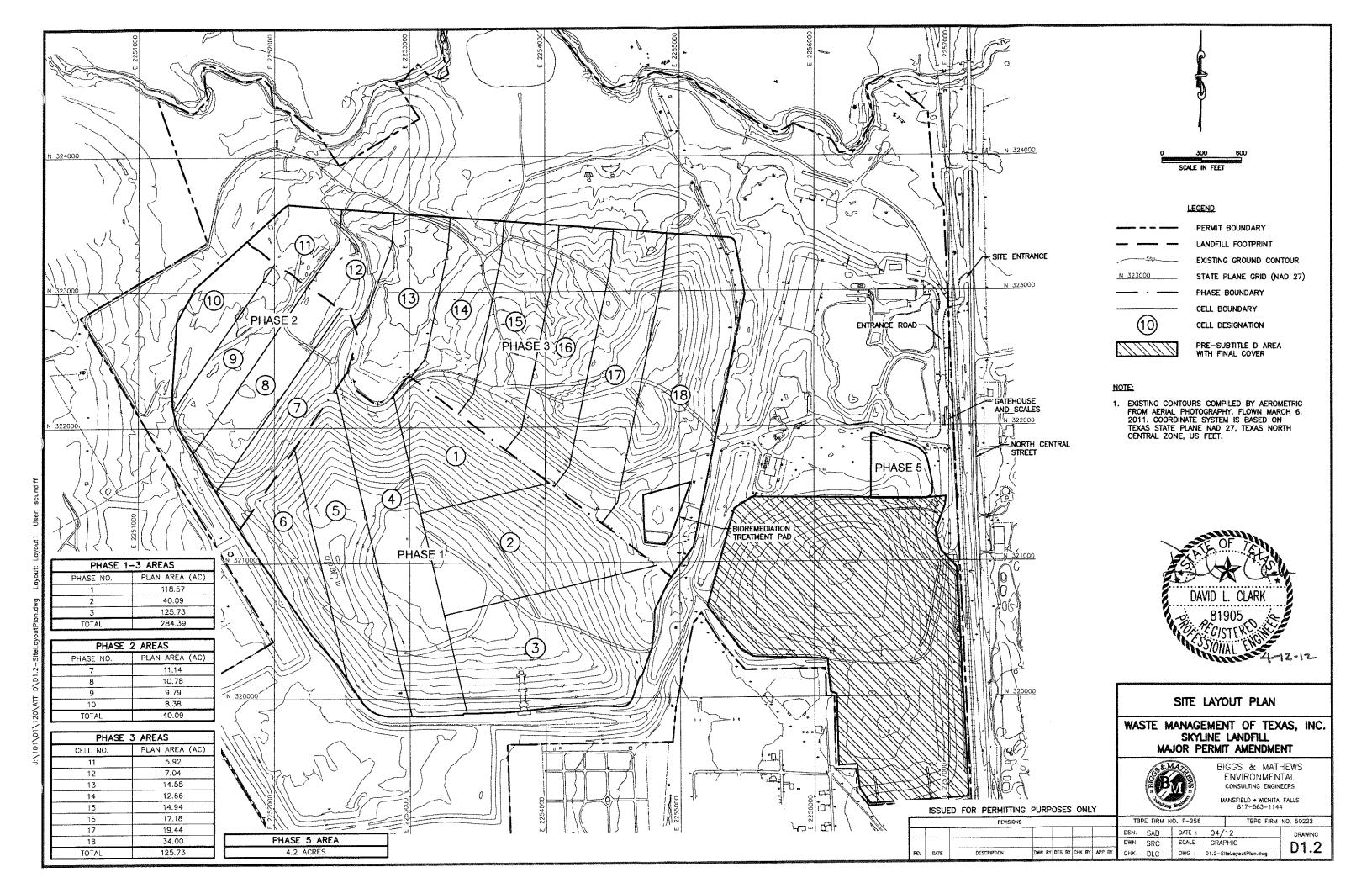
30 TAC §330.63(d)

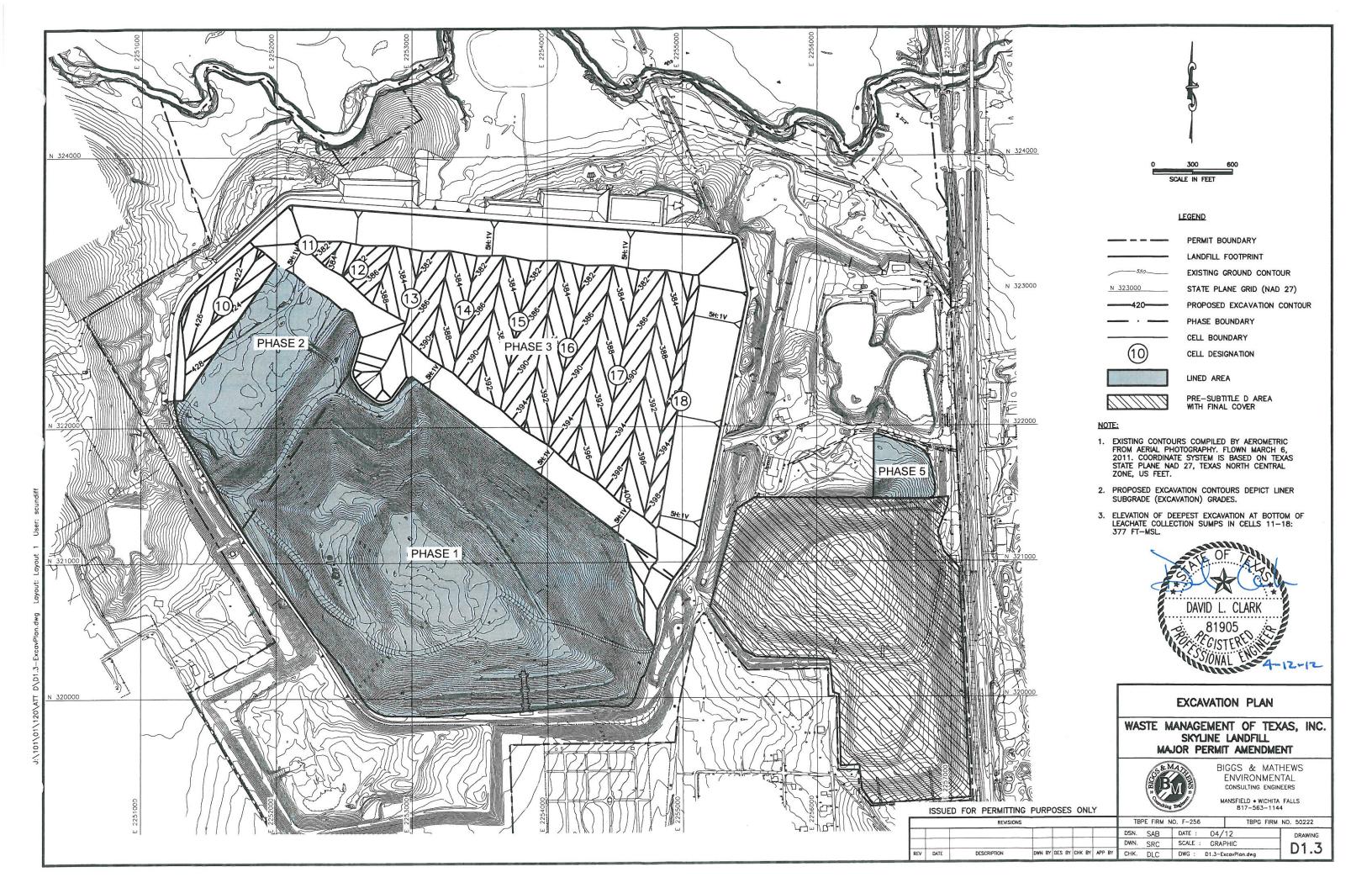
- D1.1 General Site Plan
- D1.2 Site Layout Plan
- D1.3 Excavation Plan
- D1.4 Landfill Completion Plan
- D1.5 Entrance Road and Entrance Facilities Plan
- D1.6 Landfill Road Details

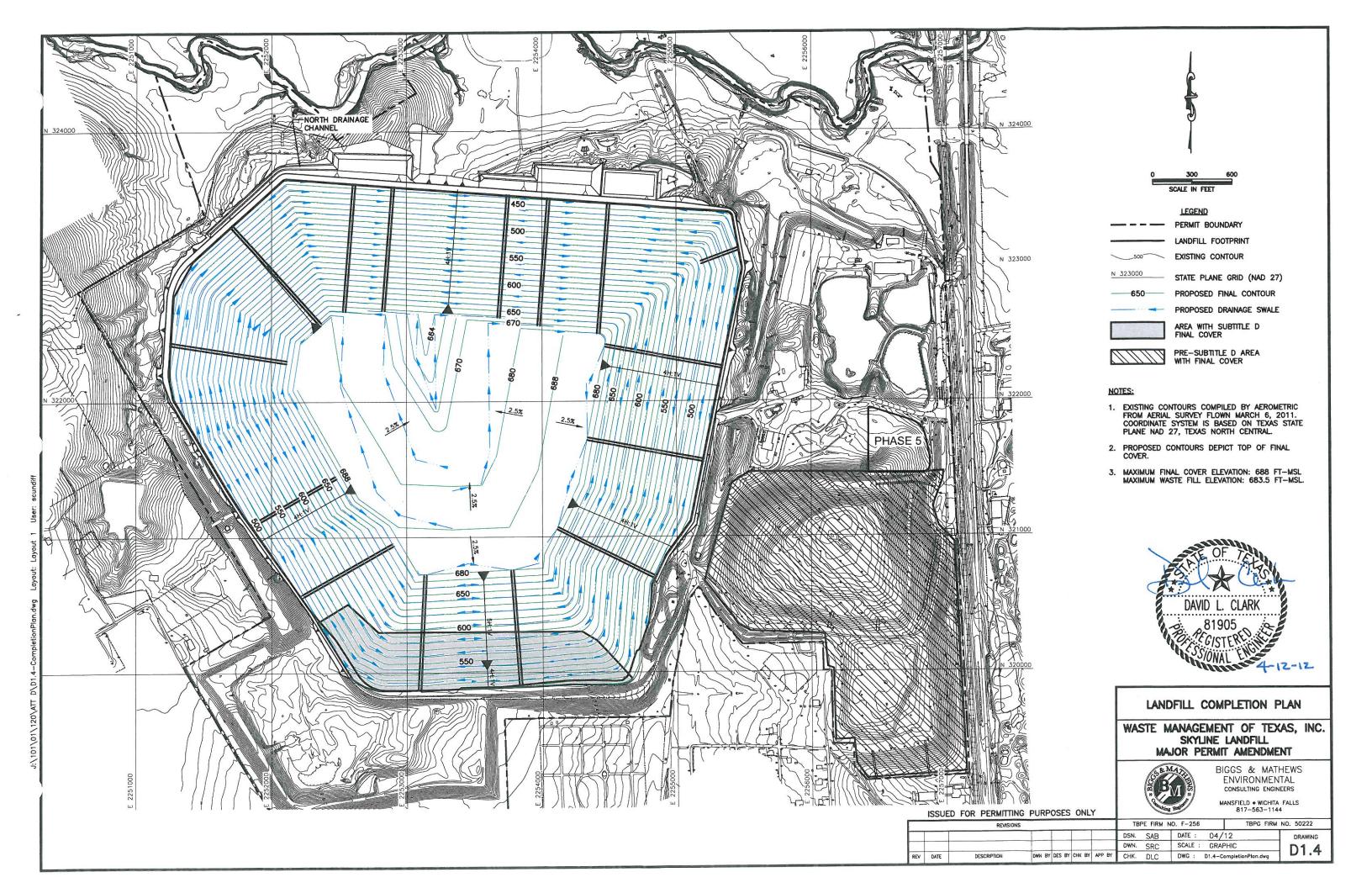


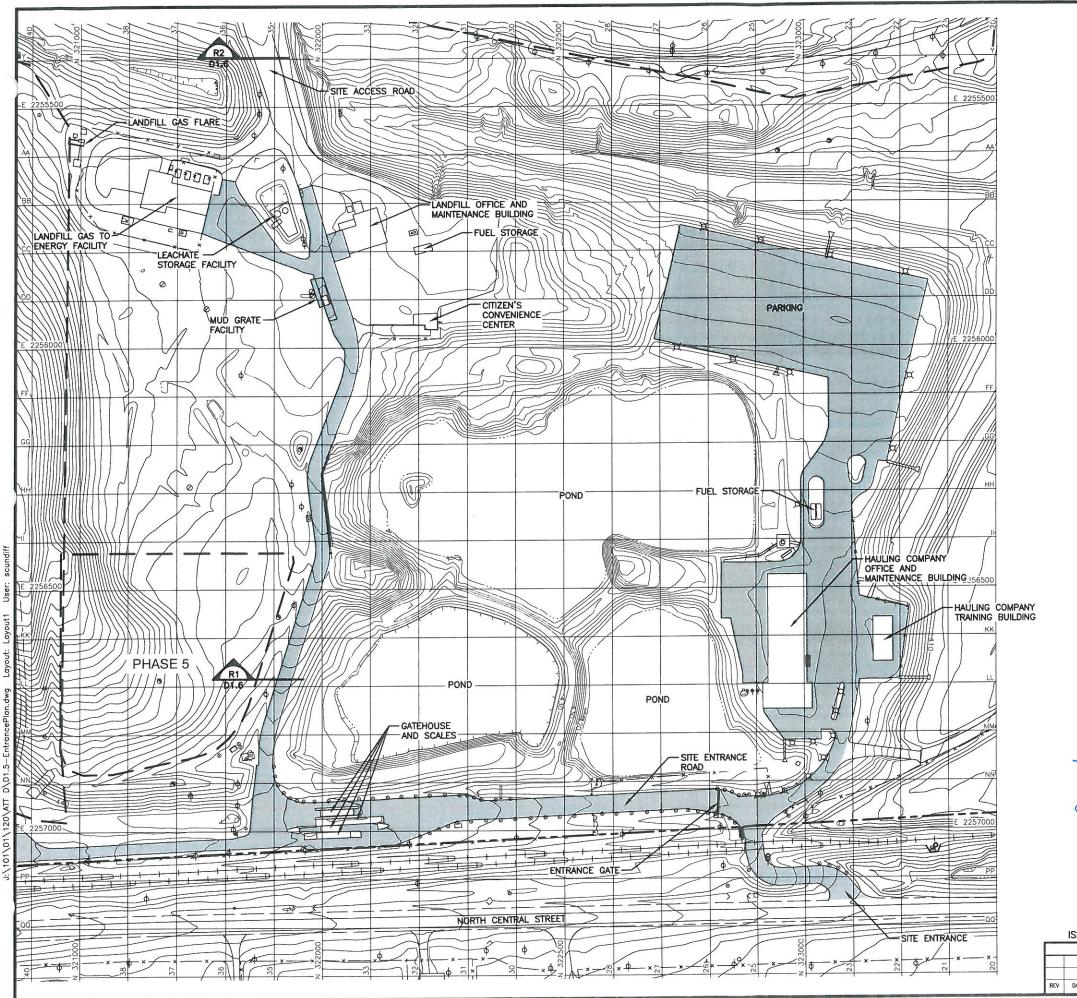
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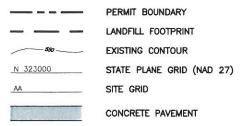








LEGEND



NOTES:

EXISTING CONTOURS COMPILED BY AEROMETRIC FROM AERIAL PHOTOGRAPHY. FLOWN MARCH 6, 2011. COORDINATE SYSTEM IS BASED ON TEXAS STATE PLANE NAD 27, TEXAS NORTH CENTRAL ZONE, US FEET.



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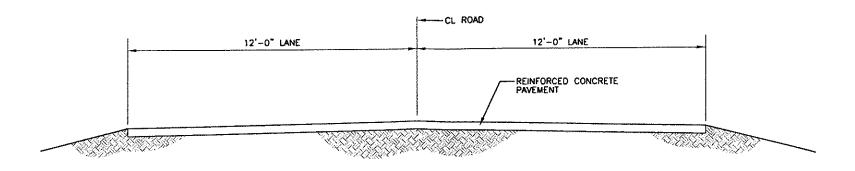
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ENTRANCE ROAD AND ENTRANCE FACILITIES PLAN

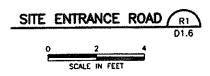
WASTE MANAGEMENT OF TEXAS, INC. SKYLINE LANDFILL MAJOR PERMIT AMENDMENT

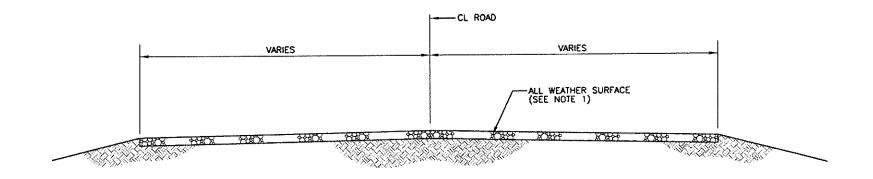
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NOTES:

- EXISTING SITE ENTRANCE ROAD SHALL BE MAINTAINED AS ALL WEATHER SURFACE (CONCRETE SURFACE).
- EXISTING LANE WIDTHS SHALL BE MAINTAINED. (12'-0" MINIMUM).

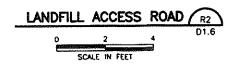






NOTES:

- EXISTING LANDFILL ACCESS ROAD SHALL BE MAINTAINED WITH ALL WEATHER SURFACE (CRUSHED STONE, GRAVEL, CONCRETE RUBBLE, MASONRY DEMOLITION DEBRIS, WOOD CHIPS, OR OTHER SIMILAR MATERIALS) WHERE USED AS ACCESS TO WORKING FACE BY WASTE HAUL VEHICLES.
- 2. PAVEMENT THICKNESS SHALL BE BASED ON TRAFFIC LOADINGS AND SOIL CONDITIONS.



LANDFILL ROAD DETAILS

WASTE MANAGEMENT OF TEXAS, INC. SKYLINE LANDFILL MAJOR PERMIT AMENDMENT



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PERMIT AMENDMENT APPLICATION

PART III – FACILITY INVESTIGATION AND DESIGN ATTACHMENT D2 CROSS SECTIONS

Prepared for

Waste Management of Texas, Inc.

April 2012



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30 TAC §330.63(d)(4)(E)

D2.1 - Section Layout Plan

D2.2 - Typical Landfill Section 1

D2.3 - Typical Landfill Section 2

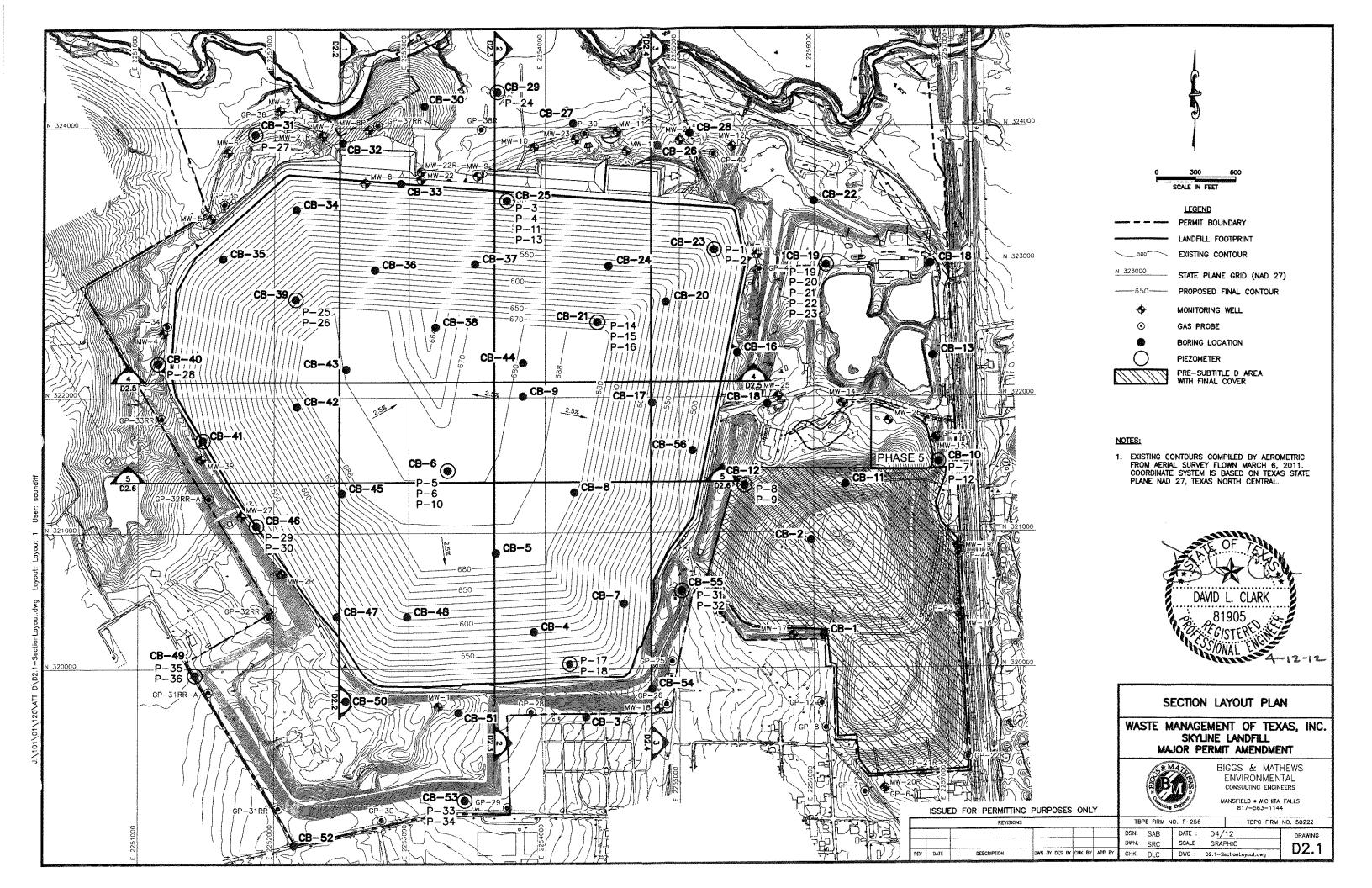
D2.4 - Typical Landfill Section 3

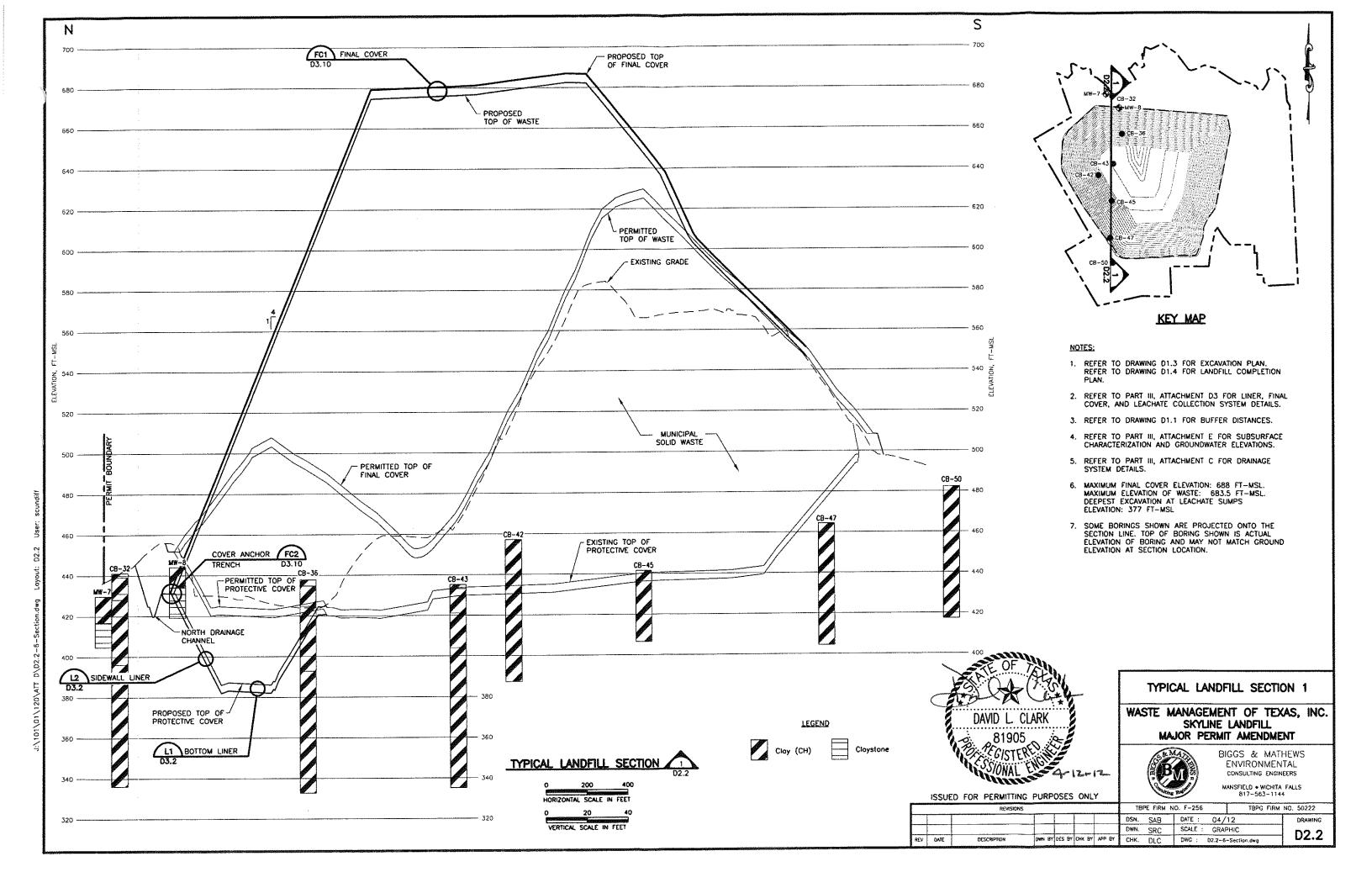
D2.5 - Typical Landfill Section 4

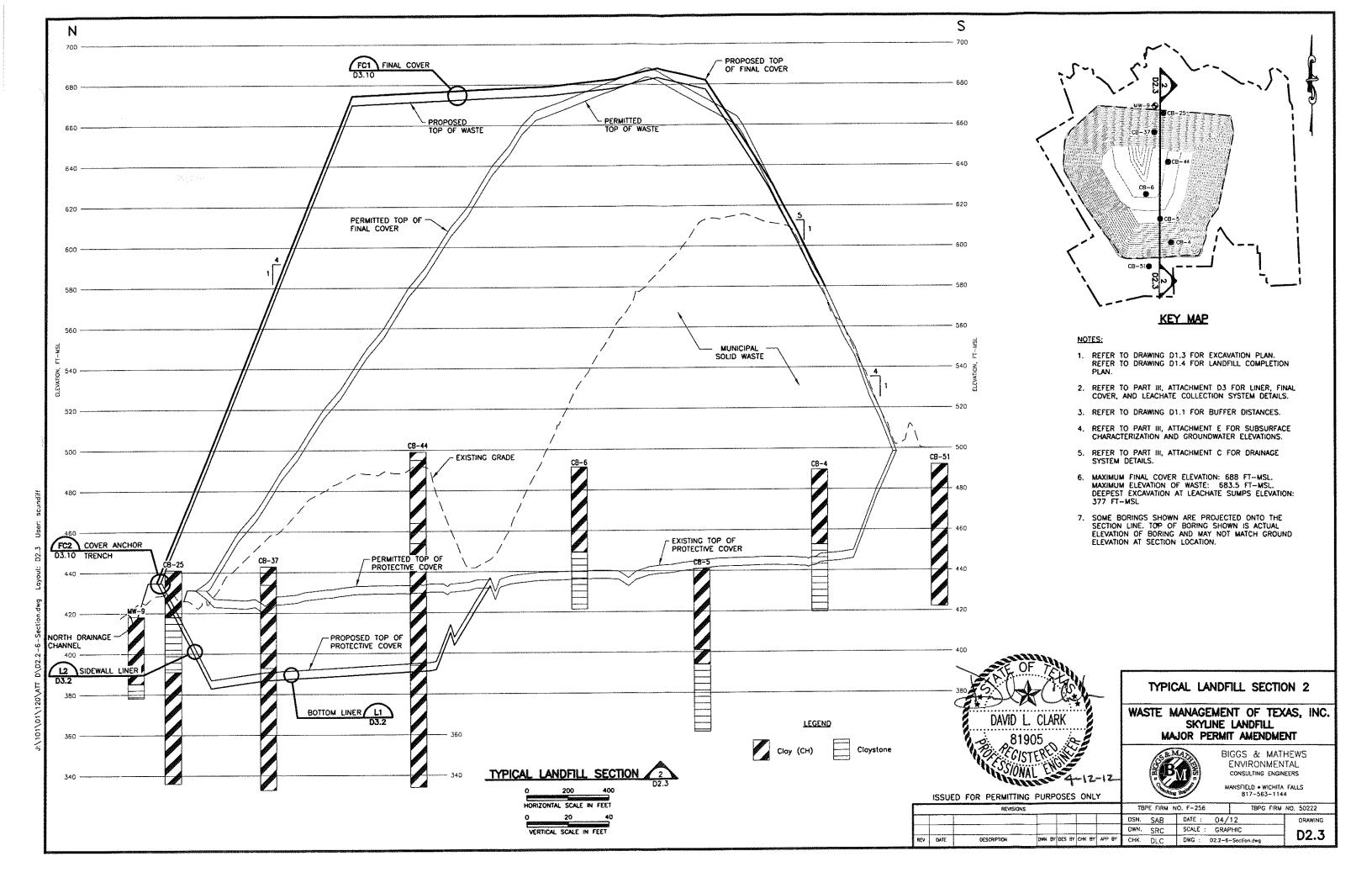
D2.6 - Typical Landfill Section 5

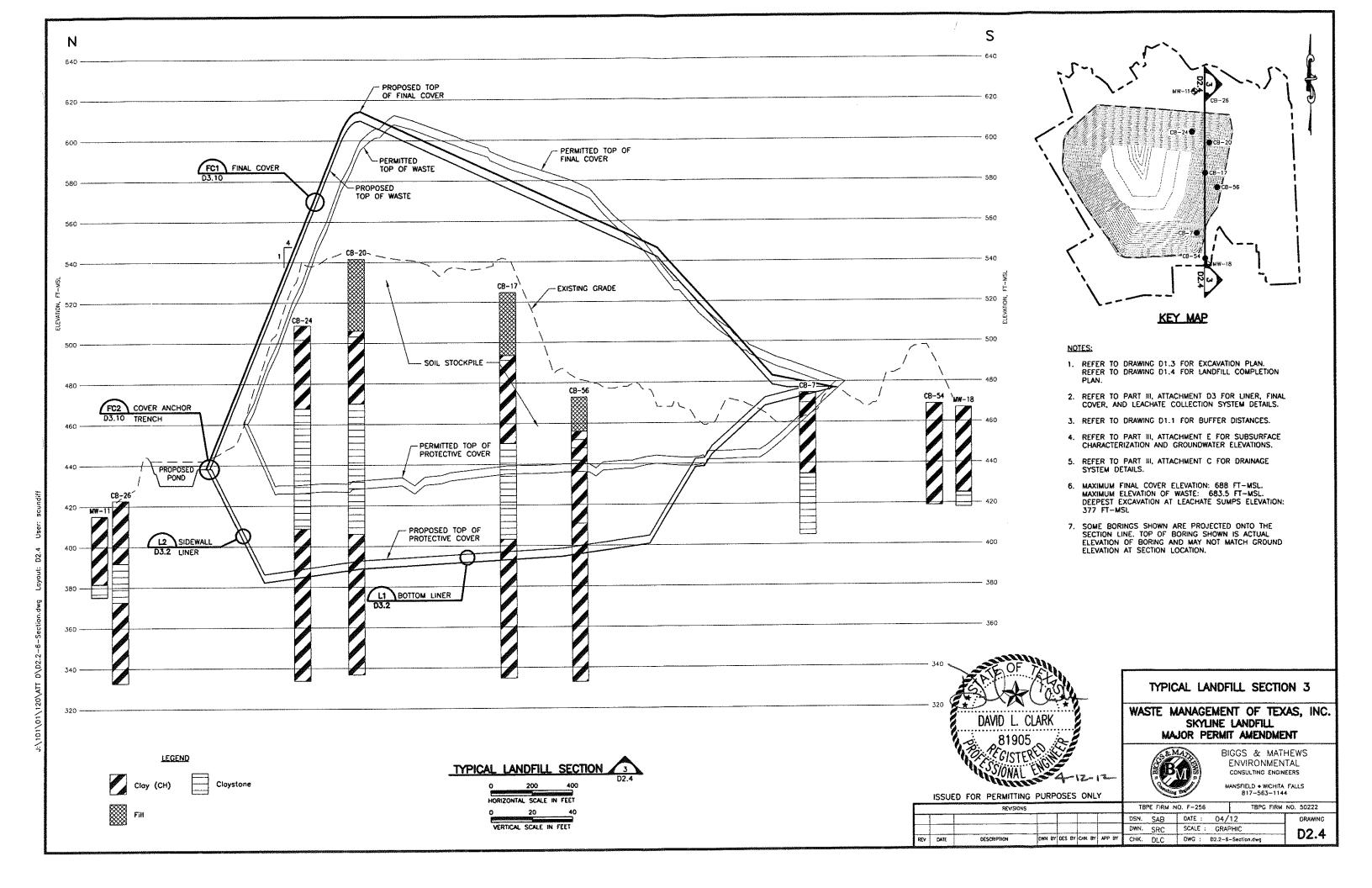
D2.7 - Typical Perimeter Section

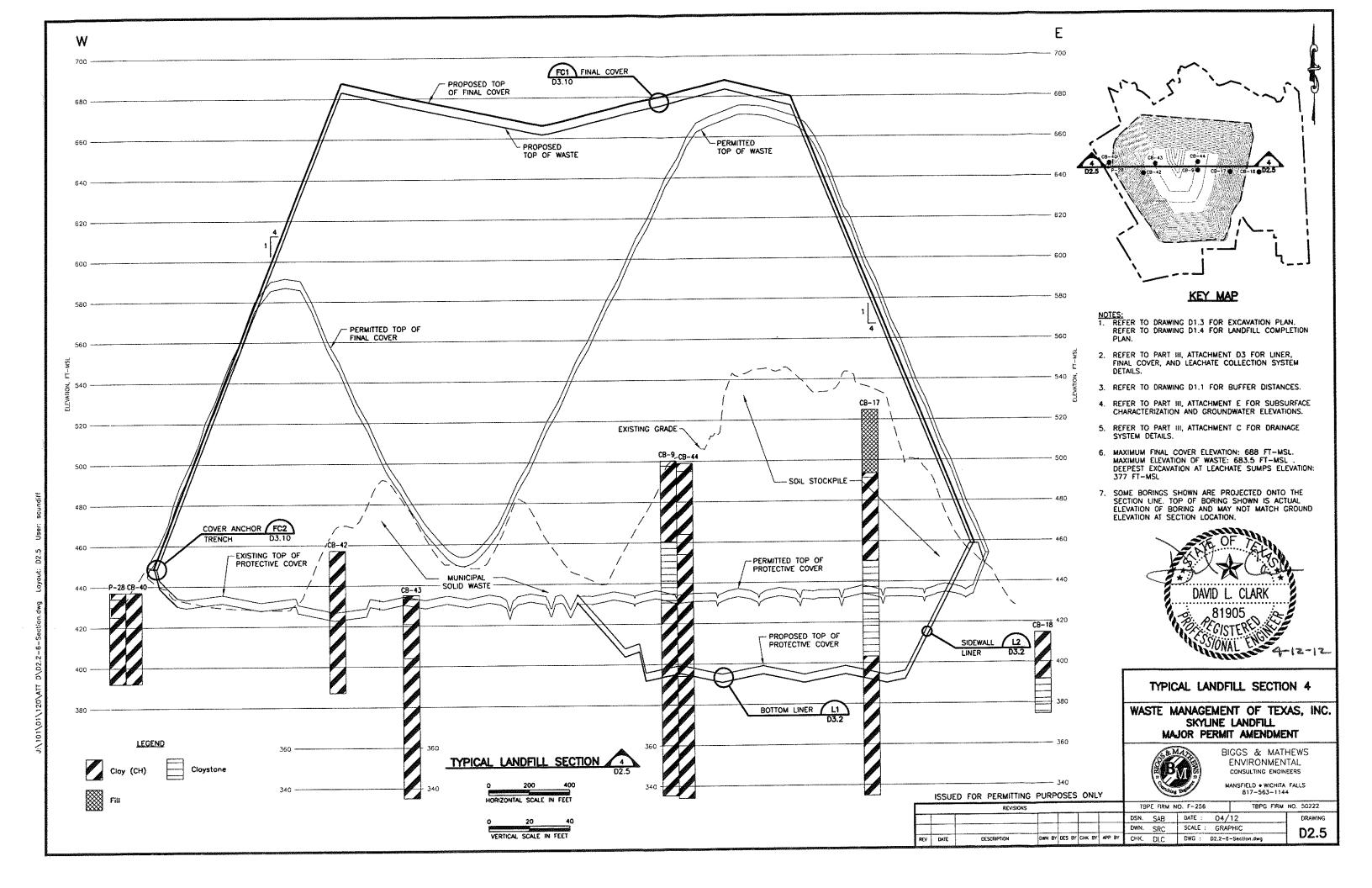


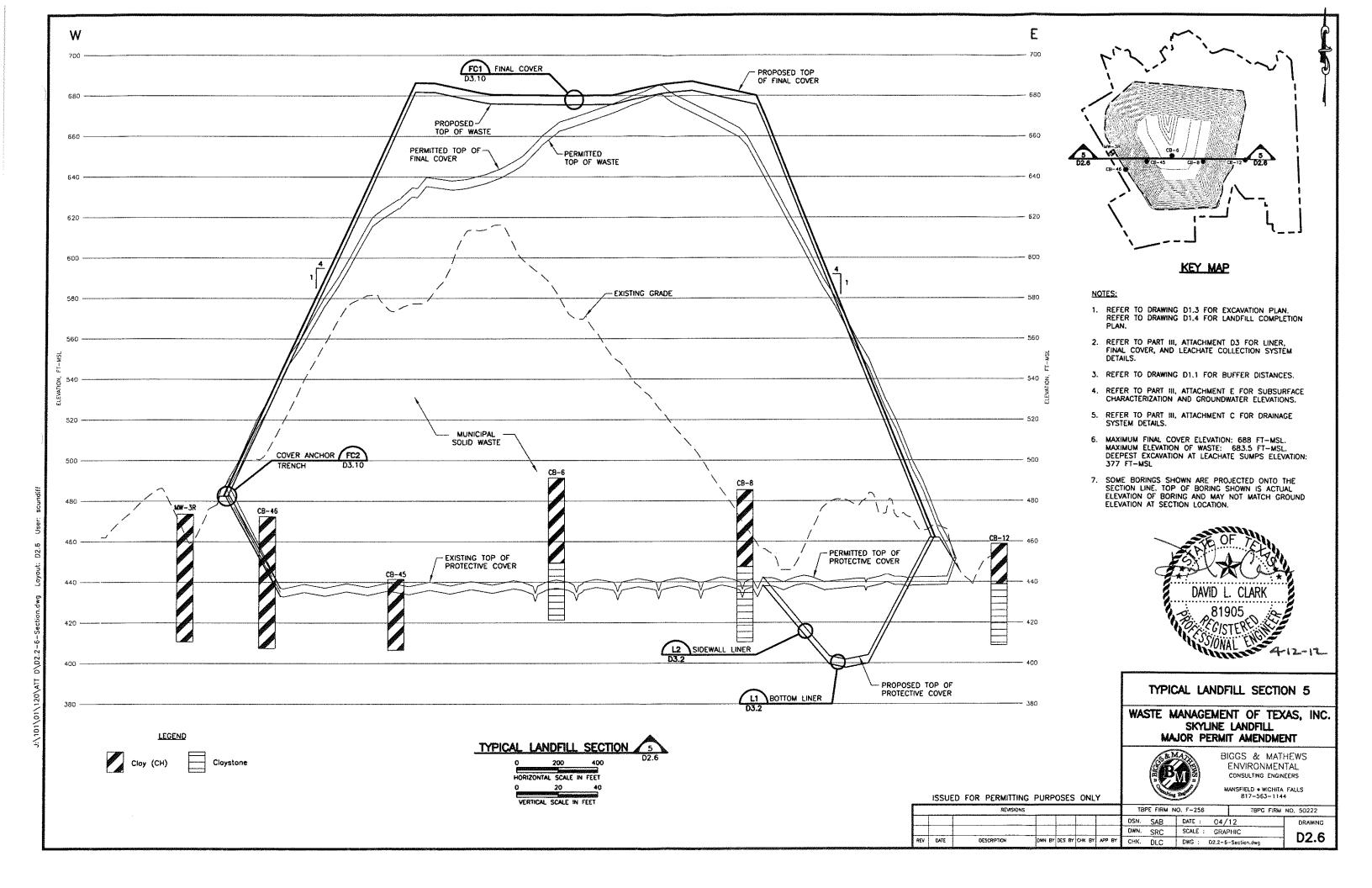


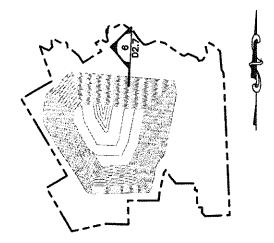




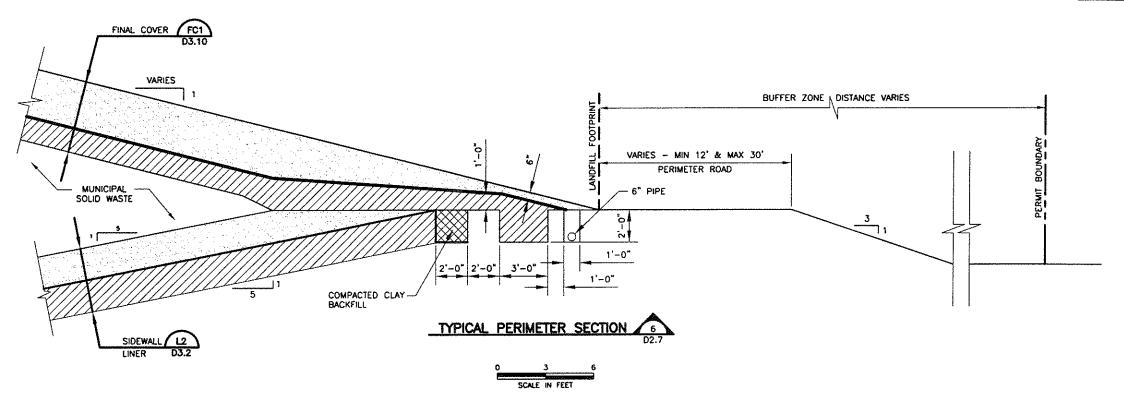








KEY MAP



NOTES:

- REFER TO DRAWING D1.3 FOR EXCAVATION PLAN, REFER TO DRAWING D1.4 FOR LANDFILL COMPLETION PLAN.
- REFER TO ATTACHMENT D3 FOR LINER, FINAL COVER, AND LEACHATE COLLECTION SYSTEM DETAILS.



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#### TYPICAL PERIMETER SECTION

## WASTE MANAGEMENT OF TEXAS, INC. SKYLINE LANDFILL MAJOR PERMIT AMENDMENT



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