

June 10, 2005

**FINAL (100%) DESIGN**

**GRADING AREAS 1 AND 2  
FOR THE EAST PLANT AREA  
INTERIM MEASURE**

**GM POWERTRAIN BEDFORD FACILITY  
105 GM DRIVE  
BEDFORD, INDIANA**

**EPA ID# IND006036099**

**JUNE 10, 2005**

**REF. NO. 13968 (145)**

This report is printed on recycled paper.

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LIST OF ACRONYMS/SHORT FORMS

AAQMP	-	Ambient Air Quality Monitoring Plan
AOC	-	Administrative Order on Consent
AOI	-	Area of Interest
CA	-	Corrective Action
CCR	-	Current Conditions Report
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act
CMS	-	Corrective Measures Study
CRA	-	Conestoga-Rovers & Associates
cy	-	cubic yard
Facility	-	General Motors Corporation Powertrain Bedford Facility
GM	-	General Motors Corporation
HASP	-	Health and Safety Plan
IDEM	-	Indiana Department of Environmental Management
IM	-	Interim Measure
PCBs	-	Polychlorinated Biphenyls
PPE	-	personal protective equipment
RA	-	Removal Action
RCRA	-	Resource Conservation and Recovery Act
RFI	-	RCRA Facility Investigation
SOW	-	Scope of Work
SCC	-	Site Source Control
TSCA	-	Toxic Substances Control Act
TSP	-	Total Suspended Particulates
U.S. EPA	-	United States Environmental Protection Agency

## 1.0 INTRODUCTION

This Final (100%) Design for the Grading Areas 1 and 2 presents the Scope of Work (SOW) associated with the placement of grading fill to be completed as part of the Interim Measure (IM) for the GM Powertrain Bedford Facility (Facility) East Plant Area (IM Grading Plan). Conestoga-Rovers & Associates Inc. (CRA) has prepared this IM Grading Plan on behalf of General Motors Corporation (GM) in accordance with the Resource Conservation and Recovery Act (RCRA) Corrective Action (CA) Work conducted under the Performance Based Agreement (effective March 20, 2001, as amended October 1, 2002) between United States Environmental Protection Agency (U.S. EPA) and GM for the GM Powertrain Bedford Facility, the Administrative Order by Consent (AOC) under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (effective July 31, 2003), and also in accordance with the requirements of the Toxic Substances Control Act (TSCA).

This IM Grading Plan summarizes the procedures to be utilized for the placement of grading fill over the interim period prior to the completion and U.S. EPA approval of the final design for the East Plant Area Cover System.

## 2.0 REVIEW OF EXISTING CONDITIONS

A complete review of the Facility's conditions and setting are provided in the Current Conditions Report (CCR) (CRA, May 2001), the RCRA Facility Investigation (RFI) Work Plan and RFI Work Plan Addenda No. 1 through No. 8 (CRA, 2001 - 2005), the draft Corrective Measures Study (CMS) (CRA, 2005), and the Site Source Control (SSC) Work Plan and SSC Work Plan Addenda No. 1 through 3. (CRA, 2003 - 2004).

Specific to this IM Grading Plan, Plan C-01 identifies infrastructure including, utilities, SSC collection systems, parking lots, stormwater pond, and the Landfill Vault location. In addition, C-01 presents PCB impacted areas to be addressed by the IM or which have been addressed by the Removal Action (RA).

Plan C-02 presents the final Proposed Top of Grading Contours. The work in this IM Grading Plan is an interim activity in achieving the final grading of the East Plant Area. Some of the other major IM components include design and construction of the Landfill Vault, design and construction of the prescribed excavation of soil  $\geq 50$  mg/kg PCB, design and construction of the East Plant Area Perimeter Groundwater Collection System, design and construction of the East Plant Area Cover System, and although not a RCRA Interim Measure, completion of the RA excavation.

### 3.0 INTERIM MEASURE SCOPE OF WORK

The following presents the details of the proposed Scope of Work. The existing support plans or approach prepared as part of the RA activities will be utilized for the activities described in this IM Grading Plan.

This section presents the rationale and sequence of tasks for the IM Grading Plan. CRA will direct and generally oversee activities on behalf of GM during the implementation of the IM Grading Plan, including the collection and management of related data.

There are two proposed interim grading areas located north of the former North Disposal Area (Area of Interest (AOI) 4) and East of the Stormwater Pond (AOI 10), respectively. Plan C-03 shows the limits of these two interim proposed Grading Areas 1 and 2. The design capacities of Grading Areas 1 and 2 are approximately 70,000 cubic yards (cy) and 24,000 cy, respectively. Additional locations for subgrade placement will be submitted to U.S. EPA as part of additional detailed design for the Cover System which is currently being prepared.

### 3.1 SITE SECURITY

The work area will be fenced to control access during grading fill placement activities. Access gates into the work areas will be kept closed during non-working hours to prevent uncontrolled and/or unauthorized access to the work areas.

During active soil handling, security will be provided including:

- i) Limit vehicular access to the work areas to Project authorized vehicles and personnel only.
- ii) Provide review of all Site personnel and visitors before entry into the work area. A list of authorized personnel and the name of their employer and documentation of appropriate health and safety training will be available at the access locations for the East Plant Area Grading Areas.
- iii) Maintain a security log in which documentation is provided for all work area personnel, visitors and deliveries, and any security incidents. This log will include the date, name, address, company, time in and time out for each employee and visitor. If unauthorized personnel are observed near the work areas and refuse to vacate the premises, appropriate law enforcement officials will be contacted.

- iv) Maintain a visitor log at the access locations. Visitors will not be allowed to enter without the knowledge and approval of CRA. All visitors will be required to have completed health and safety training in accordance with the Health and Safety Plan (HASP) prior to gaining access to the secured areas.
- v) Check that all installations are secure and intact on a daily basis. If warning signs are removed, the situation will be brought to the attention of the GM Project Manager and will be rectified at the earliest possible opportunity.

### **3.2 CONSTRUCTION SUPPORT FACILITIES**

Existing construction support facilities at the Site will be utilized to the extent possible. Initial access roads will be constructed, as necessary, to allow for access and unloading of material into Grading Areas 1 and 2 as presented on Drawing C-03. Future additional roads will be constructed, as necessary, to complete other grading and Cover System requirements.

### **3.3 ENVIRONMENTAL CONTROLS**

#### **3.3.1 FUGITIVE PARTICULATE CONTROL**

The contractor will implement fugitive particulate control measures in accordance with the provisions of the Indiana Administrative Code Title 326 Article Rule 4 (Fugitive Dust Emissions) and the Ambient Air Quality Monitoring Plan (and U.S. EPA approved Amendments). Table 3.1 presents the air monitoring program to be implemented for the grading areas. The particulate control measures will be designed to limit the emissions of total suspended particulates (TSPs) and PCBs that are likely to remain airborne and be carried out of the work areas.

During the performance of the IM, the contractor will be responsible for the control of fugitive particulates generated by excavation, transportation, and placement of grading fill. This will involve the following:

- maintaining fugitive air emissions control measures, as necessary, such as a water misting system to prevent the generation of fugitive air emissions;
- placement of temporary tarps over grading areas on a daily basis during inactive periods;



- placement of a reinforced tarp over the grading fill areas once material placement is complete unless final Cover System grading is to be immediately initiated. The re-inforced tarp shall be a Permalon Ply X-210, high density, 20-mil, cross-laminated liner, manufactured by Reef Industries, or equivalent. Specifications for the re-inforced tarp are included in Appendix A;
- no chemical means for dust and particulate control will be used without prior review and approval by the U.S. EPA;
- use of appropriate covers on trucks hauling impacted and non-impacted (clean) material; and
- in the event that the contractor's dust control is not sufficient to control dust from the Facility, work will be stopped and changes to the operations will be made prior to resuming work.

### 3.3.2 STORMWATER CONTROL

Stormwater controls will include perimeter berms, tarps, straw bales, and silt fences. The locations and details for these controls are presented on Drawings C-04 through C-07.

There are two objectives of the stormwater controls for the grading areas.

The first objective is to divert surface water from adjacent areas from entering the grading areas, and control this water as it is diverted around the grading areas. This will be achieved by the construction of the berms along the upslope side of the grading areas to divert the surface water, and the implementation of controls (silt fences, straw bales, etc.) to control erosion of areas outside the grading areas.

The second objective is to control and collect any water which contacts the grading fill in Grading Areas 1 and 2. All water which contacts the grading fill in these areas will be contained by the downhill berms and directed to collection sumps. Water will be pumped from these sumps to wet well #3 and treated at the on-Site treatment facility prior to discharge. The quantity of water requiring treatment will be minimized by the placement of tarps during inactive grading fill placement periods to minimize contact of precipitation with the grading fill.

These controls will be constructed or prepared prior to placing RA soils within the East Plant Area, and maintained until the East Plant Area Cover System is constructed.

### 3.4 SOIL HANDLING

The < 50 mg/kg PCB soil material from the RA will be characterized as required pursuant to the U.S. EPA approved RA Work Plans and associated Addenda.

One area of  $\geq 50$  mg/kg PCB soil requires excavation from each grading area prior to construction of the first two areas of subgrade placement. This material will be removed by a contractor utilizing the same controls approved by U.S. EPA for the RA. These areas will be excavated to the limits identified on Drawing C-03 based on the limits of  $\geq 50$  mg/kg PCB soil excavation identified in the draft CMS (CRA, 2005). The excavated areas will be backfilled with grading fill material. The  $\geq 50$  mg/kg PCB soil will be staged on the existing staging area in AOI 4 for future placement in the Landfill Vault. Staging of these materials is anticipated to be required for less than 180 days, which is consistent with TSCA regulations.

During grading fill placement, soil handling will be kept to a minimum to mitigate potential fugitive emissions. Grading fill will be graded in small lifts and wetted, as necessary, to prevent fugitive emissions while grading. Soil not being graded into position will be kept covered with tarps.

Tarps utilized for temporary cover of stockpiles in the RA areas may be placed as part of the grading fill placement activities. Care will be taken to ensure these tarps can not be blown out of the grading fill areas. Personal protective equipment (PPE) will be kept segregated from the grading fill material and properly disposed off-Site.

Upon commencement of the East Plant Area Cover System construction, the top of the fill material in the initial subgrade areas, Grading Areas 1 and 2, will be pushed out (uphill) to match final grades (prior to Cover System construction, the areas will be kept in a pile shape to better manage erosion and dust control). Grading fill movement will be limited to minimize the quantity of fill material disturbed. The placement of subgrade material in Grading Areas 1 and 2 will be scheduled such that Cover System construction over these areas can be completed as promptly as possible to control air emissions and possible erosion, and to ensure the expedited grading of stockpiled material.

#### 4.0 INSPECTIONS

During active grading fill placement activities, the grading areas will be inspected on a daily basis including all surface water and air emission control systems. The quantity of water in the collection sumps will be monitored daily. Staff will be on-call during weekends to monitoring collection sumps in the event of a heavy rainfall. Pumps will be maintained at both sumps to allow for removal of collected water from the collection sumps on an as needed basis. Collected water will be pumped to the existing Site Source Control Wet Well 3. From Wet Well 3, water is transferred to the temporary water treatment system located on Parcel 216 for treatment prior to discharge. Upon completion of construction of a new water treatment system to be located south of the storm pond, the water from Wet Well 3 will be re-directed to the new treatment system.

Following completion of placement of grading fill in the grading areas tarps will be placed over the graded layers until the first Cover System layer can be placed over the area. The grading and sumps will be inspected twice per week or as required based on dry or wet weather conditions. Any repairs to stormwater controls or tarps will be made and collected water removed from the collection sumps for treatment. Any vegetation observed on the grading areas will be broken-up during re-grading activities.

Once the volume of water from the grading fill, which collects in the sumps, is sufficiently reduced, the inspection frequency may be reduced with the concurrence of U.S. EPA.

## 5.0 REFERENCES

- CRA, May 25, 2001, Current Conditions Report (CCR).
- CRA, October 29, 2001, RCRA Facility Investigation Work Plan (RFI Work Plan).
- CRA, November 18, 2002, RFI Work Plan Addendum No. 1 (Addendum No. 1).
- CRA, May 22, 2003, RFI Work Plan Addendum No. 2 (Addendum No. 2).
- CRA, March 2004, RFI Work Plan Addendum No. 3 (Addendum No. 3).
- CRA, May 3, 2004, RFI Work Plan Addendum No. 4 (Addendum No. 4).
- CRA, July 26, 2004, RFI Work Plan Addendum No. 5 (Addendum No. 5).
- CRA, September 27, 2004, RFI Work Plan Addendum No. 6 (Addendum No. 6).
- CRA, September 2004, RFI Work Plan Addendum No. 7 (Addendum No. 7).
- CRA, March 14, 2005, RFI Work Plan Addendum No. 8 (Addendum No. 8).
- CRA, February 1, 2005, Draft - Corrective Measures Study East Plant Area (CMS).
- CRA, November 6, 2003, Site Source Control Work Plan (SSC Work Plan).
- CRA, May 4, 2005, SSC Work Plan Addendum No. 1 (SSC Addendum No. 1)
- CRA, July, 29, 2005, Draft - SSC Work Plan Addendum No. 2 (SSC Addendum No. 2).
- CRA, November 17, 2004, Draft - SSC Work Plan Addendum No. 3 (SSC Addendum No. 3).
- CRA, November 2004, Health and Safety Plan (HASP).

TABLE 3.1

SUMMARY OF PERIMETER AIR MONITORING REQUIREMENTS  
EAST PLANT AREA COVER SYSTEM GRADING AREAS  
BEDFORD, INDIANA

<i>Excavation Areas</i>	<i>Parameters</i>	<i>Duration of Monitoring</i>	<i>Air Monitoring Locations</i>	<i>Air Monitoring Frequency</i>
East Plant Area Cover System Grading Areas	Compound Specific PCBs	Duration of IM	Four locations around perimeter	Daily for the first week from 1 upwind location and 3 downwind locations. Once per week thereafter.
East Plant Area Cover System Grading Areas	Compound Specific TSPs	Duration of IM	Four locations around perimeter	Daily from 1 upwind location and 3 downwind locations. Hourly measurements using handheld TSP meters during active loading/unloading.

Notes:  
PCBs - Polychlorinated Biphenyls  
TSPs - Total Suspended Particulates

APPENDIX A

RE-INFORCED TARP SPECIFICATION

## Product Information

### Permalon® Ply X-210®

- High density, cross-laminated polyethylene resists punctures and tears.
- UV stabilized to withstand prolonged exposure to sunlight.
- Ply X-210 is not prone to environmental stress-cracking (ESC) so it can endure repeated thermal expansion & contraction cycles.
- Meets ASTM standard D-3083 Soil Burial test performance requirements.

#### Physical Properties and Typical Values

Property		ASTM Test Method	US Value	Metric Value
Thickness		D-5199	20 mil	.50 mm
Weight		D-751	78 lb/1000 ft <sup>2</sup>	38.1 kg/100 m <sup>2</sup>
1" Load @ Yield	MD	D-882	32 lbf	142 N
	TD		33 lbf	147 Mpa
1" Load @ Break	MD	D-882	70 lbf	311 N
	PSI		3750 psi	26 Mpa
	TD		59 lbf	262 N
	PSI		3070 psi	21 Mpa
1" Elongation @ Break	MD		650 %	650 %
	TD		450 %	450 %
Tongue Tear	MD	D-2261	25 lbf	111 N
	TD		21 lbf	93 N
Trapezoidal Tear	MD	D-4533	35 lbf	156 N
	TD		41 lbf	182 N
PPT Resistance	MD	D-2582	41 lbf	182 N
	TD		40 lbf	178 N
Seam Integrity - 3"	Shear	D-4545	90 lbf	400 N
	Peel		45 lbf	200 N
Dart Impact Strength		D-1709	3.8 lbs	1.7 kg
Puncture Strength		D-4833	40.0 lbs	177.9 N
Hydraulic Burst Strength		D-3786	100 psi	>.779 Mpa

MD = Machine Direction

TD = Transverse Direction

The information provided herein is based upon data believed to be reliable. All testing is performed in accordance with ASTM standards and procedures. All values are typical and nominal and do not represent either minimum or maximum performance of the product. Although the information is accurate to the best of our knowledge and belief, no representation of warranty or guarantee is made as to the suitability or completeness of such information. Likewise, no representation of warranty or guarantee, express or implied, or merchantability, fitness or otherwise, is made as to product application for a particular use.

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# Fabrication and Installation Guidelines for PERMALON<sup>®</sup> containment liners

## Factory Seams

All factory seams are made using a thermal/pressure fusion technique performed under controlled conditions. Seams are subjected to inspection and testing by Quality Control personnel. This seaming method produces a two inch wide seam that is watertight and comparable in strength to the parent material.

## Field Seams

Field Seaming is greatly minimized due to Reef's ability to prefabricate customized and large liners. When necessary, multiple large liners can be seamed in the field using hand-held extrusion welders. Extrusion welding is performed using a welding rod material identical in composition to the base liner material.

## Subgrade

It is common practice to install the liner over a two inch layer of sand (or equivalent) or over a layer of geotextile. In addition to protecting the liner, the geotextile helps stabilize the slope subgrade. Liners installed over a subgrade which contains any sharp rocks, roots or other protrusions are subject to puncturing. Any rocks that are not smooth and are greater than ¼ inch in diameter should be removed before installing the liner.

## Installation

Permalon liners are specially folded at the factory to make deployment easier. Liners are accordion folded providing easy removal and placement along the edge of the pond area with a minimum of labor. The liner is then pulled across the pond where it is positioned and secured. Sufficient slack should remain after the liner is secured to allow for thermal cycling. The deployment process is repeated when multiple liner sections are required.

## Anchoring Methods

The recommended anchoring method is to dig an anchor trench, insert the perimeter of the liner material into the trench and anchor it by backfilling the trench (See attached "Backfill Instructions"). This is the preferred method because it completely prevents the ingress of water and wind under the liner. Water under the liner can erode the subgrade and undermine the liner support—leading to liner failure. If wind gets under an open edge, it can quickly convert the liner into a sail.

## Pipe Penetrations

Pipes and other penetrations through the liner can be sealed by using a pipe boot. This is a flanged tube fabricated at the factory using the liner material. The tube fits over the pipe and the flange is sealed to the liner with Fab tape. If required, the open end of the tube may be sealed with Fab tape or gasketed and mechanically sealed.

## Fab Tape

Fab tape is an asphaltic mastic used to form a durable water tight seal around penetrations through the liner.

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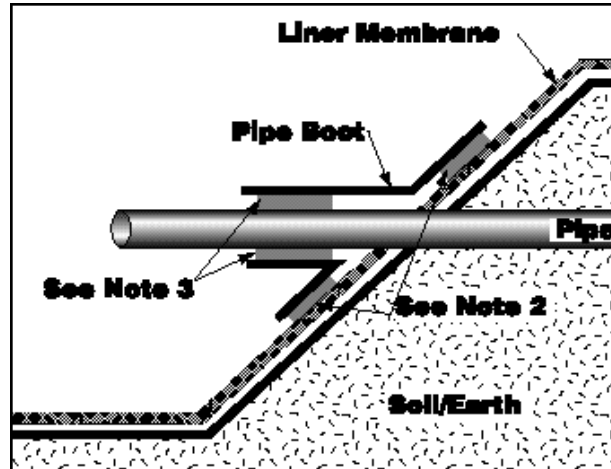
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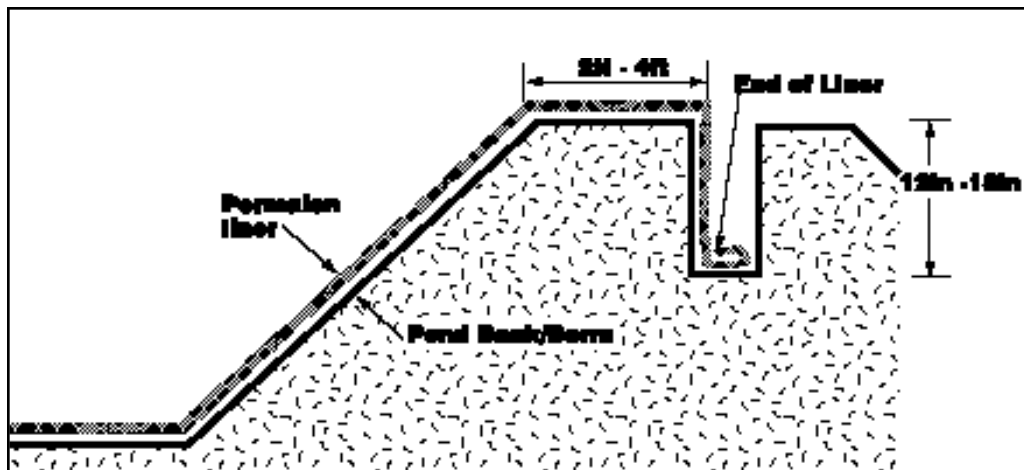
## Pipe Intrusion Through PERMALON® Liner Membrane



### Instructions

- 1 Place pipe intrusion through liner membrane.
  - 2 Affix liner membrane to pipe boot membrane using a compatible tape.
  - 3 Affix pipe boot membrane to pipe using compatible tape or clamps.
- Contractor must provide exact pipe diameter in order for Reef Industries to furnish pipe boots.

### Backfill Instructions



### Instructions

- 1 Backfill material should consist of sand or like material and should not contain rocks or hard clay.
- 2 Sides and base of pond should be clear of large rocks and other debris. Only smooth rocks less than 1/4 inch in diameter should remain.
- 3 Outer bank side of anchor trench should be slightly lower to prevent dirt from washing into canal or pond.
- 4 Liner should not be stretched in hot weather because it will contract when cool and cause stress points to occur.

# PERMALON® PERMEABILITY PERFORMANCE

WATER VAPOR PERMEABILITY				
MATERIAL	PERMEANCE (perms*)	WVTR** gm/hr/m <sup>2</sup>	WVTR** Grains/hr/ft <sup>2</sup>	WVTR cm/sec
PERMALON X-150	0.0636	0.0184	0.0264	1.23 x 10 <sup>-9</sup>
PERMALON X-210	0.0310	0.00884	0.0127	6.0 x 10 <sup>-10</sup>
VAPORGUARD	0.0142	0.0041	0.0059	2.74 x 10 <sup>-10</sup>
VAPORGUARD FR	0.0142	0.0041	0.0059	2.74 x 10 <sup>-10</sup>

\*perms= grains/hr/ft<sup>2</sup> in. Hg

\*\*Environment 73 +/- 3°F 50% Relative Humidity (ASTM E-96)

METHANE PERMEANCE	
	PERMEANCE#
PERMALON X 150	1.09 X 103
PERMALON X 210	.710 X 103

#ASTM D-1434 AT 25°C (ml/m<sup>2</sup> day)

RADON PROTECTION			
	THICKNESS CM (INCHES)	RADON DIFFUSION COEFFICIENT	% REDUCTION IN RADON FLUX THRU SLAB†
PERMALON X 150	0.021(.0085)	4.5 X 10 <sup>-7</sup>	47
PERMALON X 210	0.044 (.018)	4.2 X 10 <sup>-7</sup>	67

† 10 cm slab with 1 x 10<sup>-3</sup> cm<sup>2</sup>/s radon diffusion coefficient

grains/hr ft<sup>2</sup> x 0.696 = gm/hr m<sup>2</sup>  
 gm/hr m<sup>2</sup> x 6.45 x10<sup>-2</sup> = gm/hr 100 in<sup>2</sup>  
 gm/hr 100in<sup>2</sup> x 24 = gm/24 hr 100 in<sup>2</sup>  
 1 gram = 15.44 grains  
 1 in Hg = .491 psi  
 1 m<sup>2</sup> = 10.76 ft<sup>2</sup>

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## SOIL BURIAL Test

### Permalon® X-150®, X-210® and X-210G®

Permalon X-150, X-210 and X-210G materials were subjected to a 30 day soil burial test following standards and procedures as outlined in ASTM D-3083, Section 9.5. Results of this test are outlined below.

PERMALON X-150				
TEST METHOD		INITIAL VALUE	AFTER BURIAL TEST	% DECREASE
TENSILE @YIELD	MD	39 lbs	39 lbs	-
	TD	52 lbs	52 lb	-
TENSILE @BREAK	MD	67 lbs	64.5 lbs	3.7 %
	TD	83 lbs	83.5 lbs	-
ELONGATION	MD	900 %	900 %	-
	TD	810 %	810 %	-

PERMALON X-210				
PROPERTY		INITIAL VALUE	AFTER BURIAL TEST	% DECREASE
TENSILE @YIELD	MD	85 lbs	98 lbs	-
	TD	95 lbs	101 lbs	-
TENSILE @BREAK	MD	131 lbs	123 lbs	6 %
	TD	143 lbs	138 lbs	3.5 %
ELONGATION	MD	900 %	900 %	-
	TD	740 %	750 %	-

PERMALON X-210G				
PROPERTY		INITIAL VALUE	AFTER BURIAL TEST	% DECREASE
TENSILE @YIELD	MD	290 lbs	290 lbs	-
	TD	259 lbs	260 lbs	-
TENSILE @BREAK	MD	156 lbs	142 lbs	9 %
	TD	155 lbs	140 lbs	9 %
ELONGATION		900 %	900 %	-

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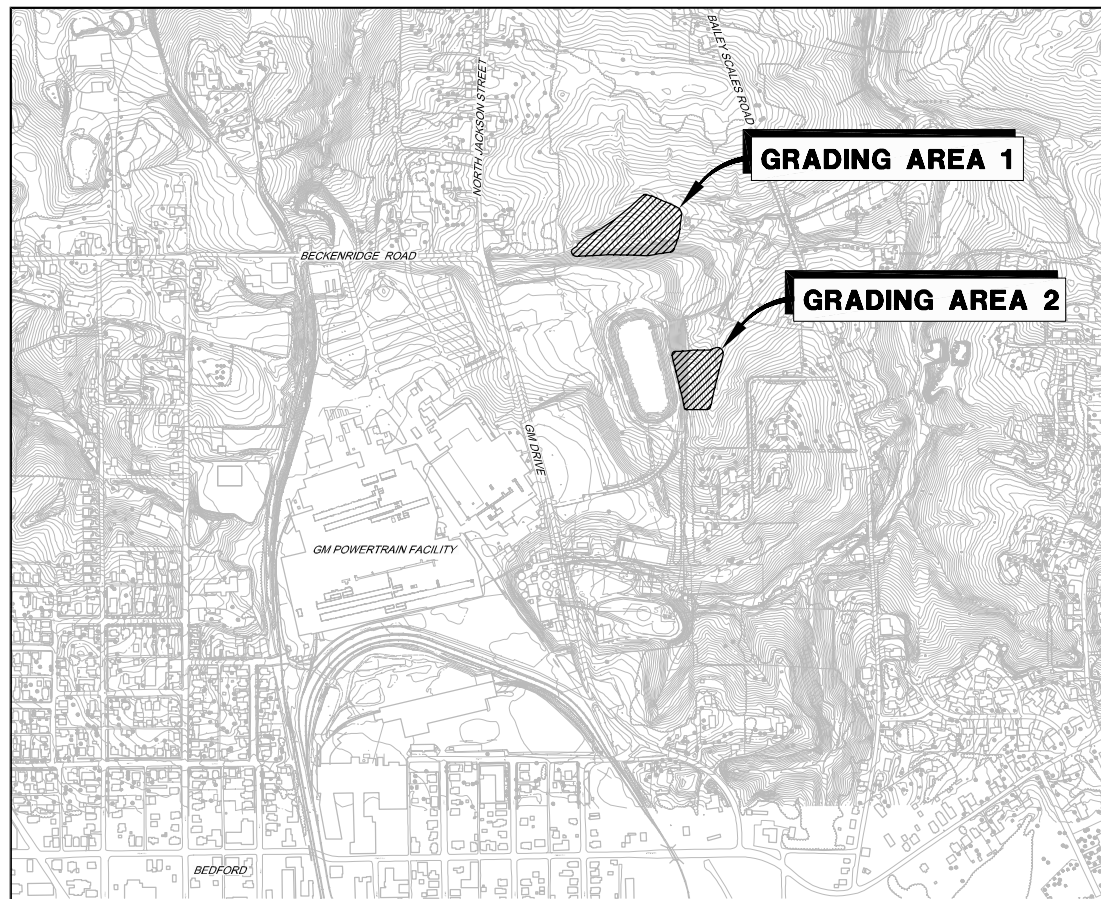
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KEY MAP

DRAWING INDEX

DWG. No.	REV. No.	DATE	TITLE
C-01	0	MARCH 2005	EXISTING CONDITIONS
C-02	0	MARCH 2005	PROPOSED TOP OF GRADING LAYER CONTOURS
C-03	2	JUNE 2005	SITE WORKS
C-04	2	JUNE 2005	GRADING AREA 1
C-05	2	JUNE 2005	GRADING AREA 2
C-06	1	JUNE 2005	CROSS-SECTIONS
C-07	0	MARCH 2005	DETAILS

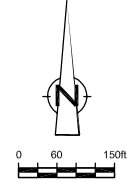
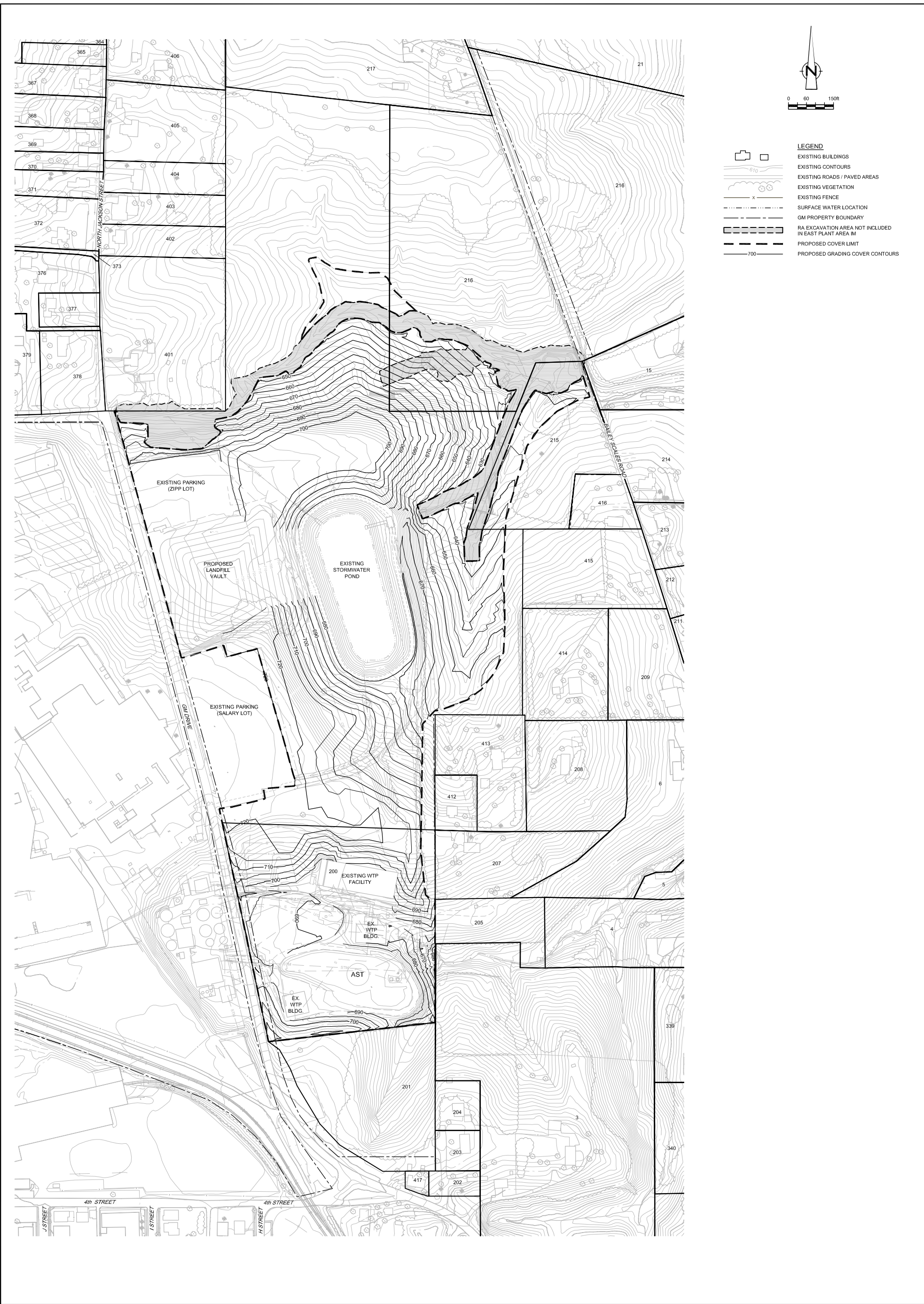
# FINAL (100%) DESIGN

## GRADING AREAS 1 AND 2 FOR THE EAST PLANT AREA INTERIM MEASURE

# GM POWERTRAIN BEDFORD FACILITY BEDFORD, INDIANA







- LEGEND**
- EXISTING BUILDINGS
  - EXISTING CONTOURS
  - EXISTING ROADS / PAVED AREAS
  - EXISTING VEGETATION
  - EXISTING FENCE
  - SURFACE WATER LOCATION
  - GM PROPERTY BOUNDARY
  - RA EXCAVATION AREA NOT INCLUDED IN EAST PLANT AREA M
  - PROPOSED COVER LIMIT
  - PROPOSED GRADING COVER CONTOURS

N2	Revision	Date	Initial
	PRE-FINAL (95%) DESIGN	MARCH 22, 2005	C.R.H.
	FINAL (100%) DESIGN	JUNE 9, 2005	C.R.H.

**SCALE VERIFICATION**

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved \_\_\_\_\_

**GM POWERTRAIN BEDFORD FACILITY  
BEDFORD, INDIANA**

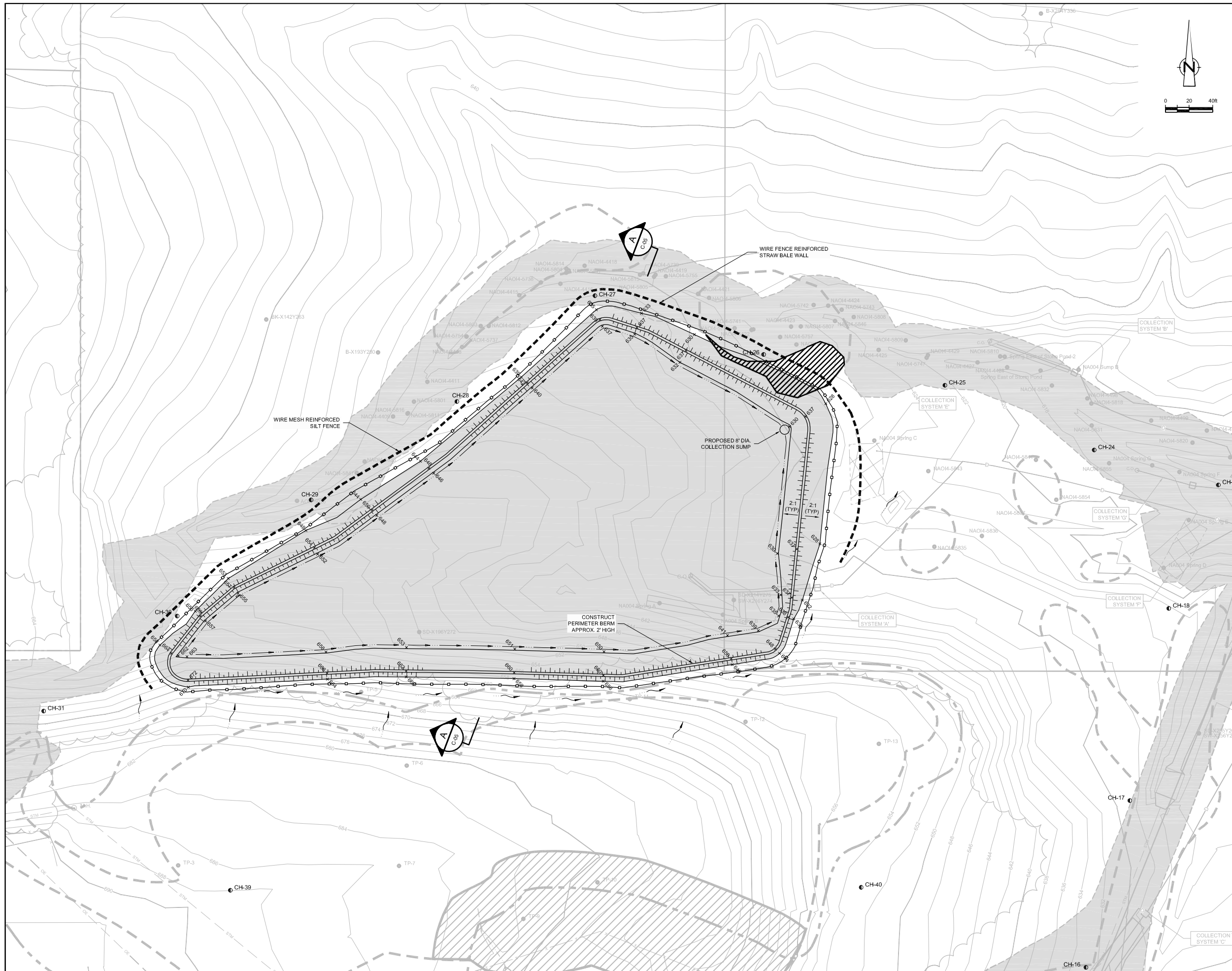
GRADING AREAS 1 AND 2-EAST PLANT AREA INTERIM MEASURE

**PROPOSED TOP OF GRADING  
LAYER CONTOURS**

Source Reference:  
BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.  
AND CRA SURVEY DATED MARCH 8 2005.

Project Manager: J.M.	Reviewed By: J.D.	Date: MARCH 2005
Scale: 1" = 150'	Project NR: 13968-00	Report NR: 145
		Drawing NR: C-02





№	Revision	Date	Initial
1	SHOW LIMIT OF ≥ 50 mg/kg EXCAVATION	MAY 9, 2005	J.D.
2	REVISED TOE OF BERM IN SOUTHWEST CORNER / REVISED TOP OF BERM ELEVATIONS	JUNE 9, 2005	C.R.H.

**LEGEND**

- EXISTING BUILDINGS
- EXISTING CONTOURS
- EXISTING ROADS / PAVED AREAS
- EXISTING VEGETATION
- EXISTING FENCE
- SURFACE WATER LOCATION
- GM PROPERTY BOUNDARY
- MANHOLE
- SEEP SAMPLE LOCATION
- SPRING SAMPLE LOCATION
- 42" DIA. CORRUGATED HDPE STORM SEWER
- GRAVITY UNDERDRAIN (HDPE PERFORATED PIPE)
- GRAVITY DRAIN (HDPE SOLID WALL PIPE)
- SSC OVERBURDEN EXTRACTION TRENCH
- SSC BEDROCK EXTRACTION TRENCH
- SPRING CONTAINING DNAPL SUMP STRUCTURE
- APPROXIMATE LOCATION OF GRAVEL BLANKET
- CLEANOUT
- WET WELL
- PRESCRIPTIVE SOIL EXCAVATION (≥ 50 mg/kg PCBs)
- MATERIAL WHICH IS IMPRACTICAL TO REMOVE
- APPROXIMATE LIMIT OF EXCAVATION AT GROUND SURFACE
- RA EXCAVATION AREA
- PROPOSED GRADING AREA
- PROPOSED SILT FENCE
- PROPOSED STRAW BALE WALL
- FLOW DIRECTION WITHIN GRADING AREA BERM
- GENERAL SURFACE WATER FLOW DIRECTION
- PORTION OF ≥ 50 mg/kg PCB MATERIAL TO BE REMOVED PRIOR TO CONSTRUCTING GRADING AREAS

**SCALE VERIFICATION**

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

**DRAWING STATUS**

Status	Date	Initial
FINAL (100%) DESIGN	JUNE 9, 2005	C.R.H.
PRE-FINAL (95%) DESIGN	MARCH 22, 2005	C.R.H.

**GM POWERTRAIN BEDFORD FACILITY  
BEDFORD, INDIANA**

GRADING AREAS 1 AND 2-EAST PLANT AREA INTERIM MEASURE

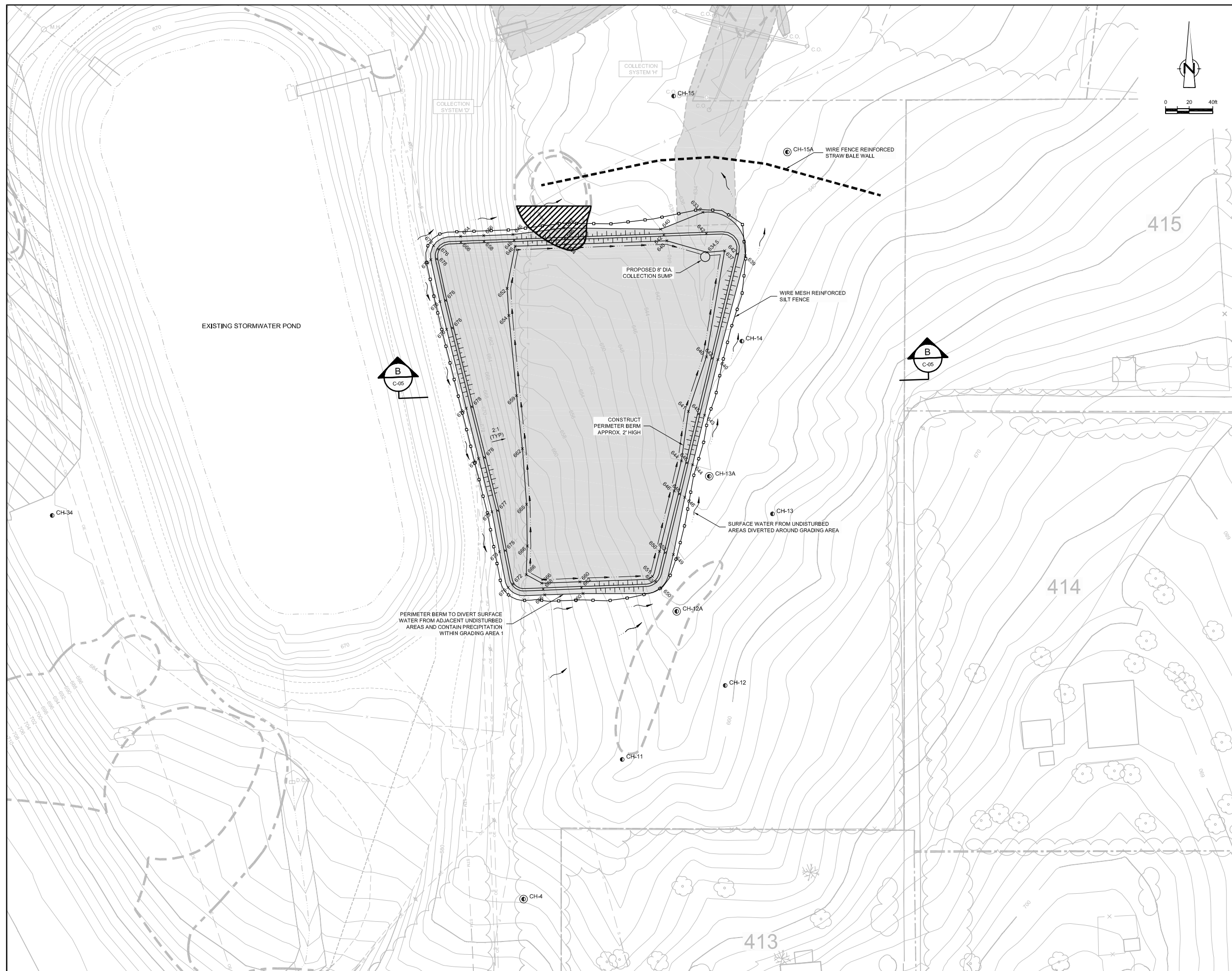
**GRADING AREA 1**

**CONESTOGA-ROVERS & ASSOCIATES**

Source Reference:  
BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001  
AND CRA SURVEY DATED MARCH 8 2005.

Project Manager: J.M.	Reviewed By: J.D.	Date: MARCH 2005
Scale: 1" = 40'	Project №: 13968-00	Report №: 145
		Drawing №: C-04





№	Revision	Date	Initial
1	SHOW LIMIT OF ≥ 50 mg/kg EXCAVATION	MAY 9, 2005	J.D.
2	REVISED BERM LAYOUT AND TOP OF BERM ELEVATIONS	JUNE 9, 2005	C.R.H.

LEGEND	
	EXISTING BUILDINGS
	EXISTING CONTOURS
	EXISTING ROADS / PAVED AREAS
	EXISTING VEGETATION
	EXISTING FENCE
	SURFACE WATER LOCATION
	GM PROPERTY BOUNDARY
	MANHOLE
	SEEP SAMPLE LOCATION
	SPRING SAMPLE LOCATION
	42" DIA. CORRUGATED HDPE STORM SEWER
	GRAVITY UNDERDRAIN (HDPE PERFORATED PIPE)
	GRAVITY DRAIN (HDPE SOLID WALL PIPE)
	SSC OVERBURDEN EXTRACTION TRENCH
	SSC BEDROCK EXTRACTION TRENCH
	SPRING CONTAINING DNAPL SUMP STRUCTURE
	APPROXIMATE LOCATION OF GRAVEL BLANKET
	CLEANOUT
	WET WELL
	PRESCRIPTIVE SOIL EXCAVATION (≥ 50 mg/kg PCBs)
	MATERIAL WHICH IS IMPRACTICAL TO REMOVE
	APPROXIMATE LIMIT OF EXCAVATION AT GROUND SURFACE
	RA EXCAVATION AREA
	PROPOSED LANDFILL VAULT FOR ≥ 50 mg/kg PCB MATERIAL
	PROPOSED GRADING AREA
	PROPOSED SILT FENCE
	PROPOSED STRAW BALE WALL
	FLOW DIRECTION WITHIN GRADING AREA BERM
	GENERAL SURFACE WATER FLOW DIRECTION
	PORTION OF ≥ 50 mg/kg PCB MATERIAL TO BE REMOVED PRIOR TO CONSTRUCTING GRADING AREAS

SCALE VERIFICATION	
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.	

Approved

DRAWING STATUS		
FINAL (100%) DESIGN	JUNE 9, 2005	C.R.H.
PRE-FINAL (95%) DESIGN	MARCH 22, 2005	C.R.H.
Status	Date	Initial

**GM POWERTRAIN BEDFORD FACILITY  
BEDFORD, INDIANA**

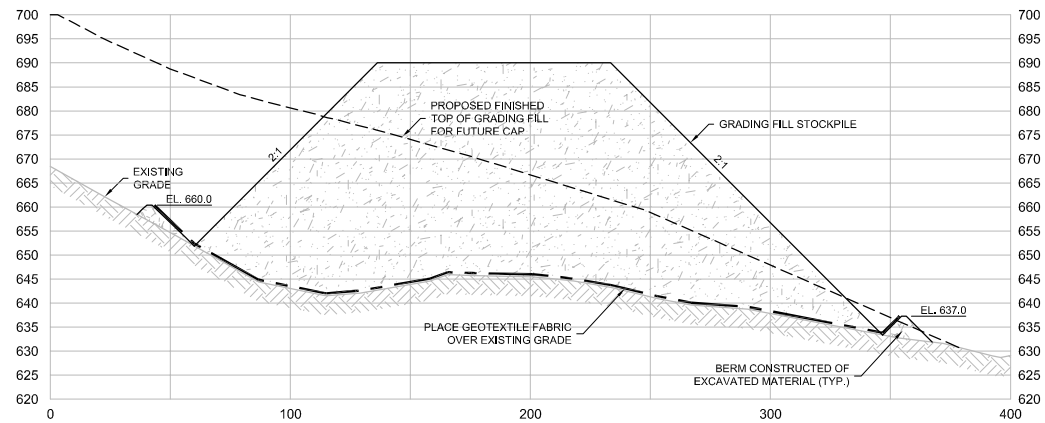
GRADING AREAS 1 AND 2-EAST PLANT AREA INTERIM MEASURE

**GRADING AREA 2**

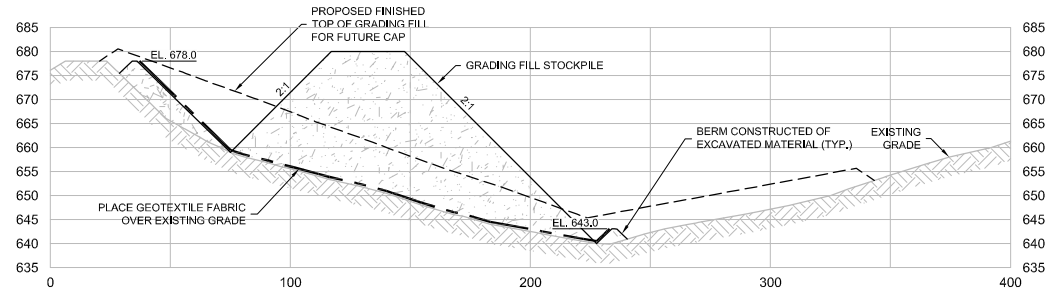
**CONESTOGA-ROVERS & ASSOCIATES**

Source Reference:  
BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001  
AND CRA SURVEY DATED MARCH 8 2005.

Project Manager: J.M.	Reviewed By: J.D.	Date: MARCH 2005
Scale: 1" = 40'	Project №: 13968-00	Report №: 145
		Drawing №: C-05



**SECTION A GRADING AREA 1**  
 HOR. 1" = 40'  
 VER. 1" = 20'



**SECTION B GRADING AREA 2**  
 HOR. 1" = 40'  
 VER. 1" = 20'

No	Revision	Date	Initial
1	REVISED IN ACCORDANCE WITH DRAWINGS C-04 AND C-05	JUNE 9, 2005	C.R.H.

- NOTE:**
- MATERIAL PLACED IN GRADING AREAS SHALL BE COVERED ON A DAILY BASIS WITH TEMPORARY TARPS OR SPRAY ON COVER. COLLECTED WATER WHICH CONTACTS GRADING FILL WILL BE COLLECTED AND TREATED.
  - FOLLOWING COMPLETION OF PLACEMENT, COVERED AREAS WILL BE COVERED WITH A REINFORCED POLYETHYLENE TARP. CLEAN RUNOFF WILL BE DIRECTED OFF SITE.

**SCALE VERIFICATION**  
 THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

**DRAWING STATUS**

Status	Date	Initial
FINAL (100%) DESIGN	JUNE 9, 2005	C.R.H.
PRE-FINAL (95%) DESIGN	MARCH 22, 2005	C.R.H.

**GM POWERTRAIN BEDFORD FACILITY  
 BEDFORD, INDIANA**  
 GRADING AREAS 1 AND 2-EAST PLANT AREA INTERIM MEASURE  
 CROSS-SECTIONS



Source Reference:

Project Manager: J.M.	Reviewed By: J.D.	Date: MARCH 2005
Scale: HOR. 1" = 40' VER. 1" = 20'	Project N <sup>o</sup> : 13968-00	Report N <sup>o</sup> : 145 Drawing N <sup>o</sup> : C-06

