

District I  
1625 N French Dr, Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S St Francis Dr, Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources  
Department  
Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-144  
July 21, 2008

For temporary pits, closed-loop systems, and below-grade tanks, submit to the appropriate NMOCD District Office.  
For permanent pits and exceptions submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOCD District Office.

6244

Pit, Closed-Loop System, Below-Grade Tank, or  
Proposed Alternative Method Permit or Closure Plan Application

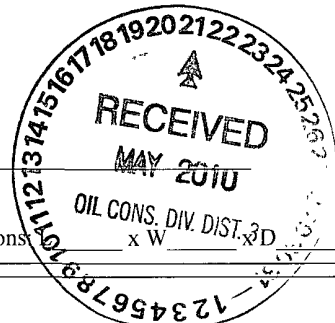
Type of action: ☐ Permit of a pit, closed-loop system, below-grade tank, or proposed alternative method  
☐ Closure of a pit, closed-loop system, below-grade tank, or proposed alternative method  
☒ Modification to an existing permit  
☐ Closure plan only submitted for an existing permitted or non-permitted pit, closed-loop system, below-grade tank, or proposed alternative method

**Instructions:** Please submit one application (Form C-144) per individual pit, closed-loop system, below-grade tank or alternative request

Please be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1.  
Operator: EnerVest Operating, LLC OGRID #: 143199  
Address: 1001 Fannin St. Ste 800 Houston, Texas 77002  
Facility or well name: Hunsaker 726 S  
API Number: 30-045-32567 OCD Permit Number: Pending  
U/L or Qtr/Qtr P Section 26 Township 31N Range 09W County: San Juan  
Center of Proposed Design: Latitude 36.864651 Longitude -107.744462 NAD: ☐ 1927 ☒ 1983  
Surface Owner: ☒ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.  
☐ **Pit:** Subsection F or G of 19.15.17.11 NMAC  
Temporary: ☐ Drilling ☐ Workover  
☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A  
☐ Lined ☐ Unlined Liner type: Thickness \_\_\_\_\_ mil ☐ LLDPE ☐ HDPE ☐ PVC ☐ Other \_\_\_\_\_  
☐ String-Reinforced  
Liner Seams: ☐ Welded ☐ Factory ☐ Other \_\_\_\_\_ Volume: \_\_\_\_\_ bbl Dimensions \_\_\_\_\_ x \_\_\_\_\_ W \_\_\_\_\_



3.  
☐ **Closed-loop System:** Subsection H of 19.15.17.11 NMAC  
Type of Operation: ☐ P&A ☐ Drilling a new well ☐ Workover or Drilling (Applies to activities which require prior approval of a permit or notice of intent)  
☐ Drying Pad ☐ Above Ground Steel Tanks ☐ Haul-off Bins ☐ Other \_\_\_\_\_  
☐ Lined ☐ Unlined Liner type: Thickness \_\_\_\_\_ mil ☐ LLDPE ☐ HDPE ☐ PVC ☐ Other \_\_\_\_\_  
Liner Seams: ☐ Welded ☐ Factory ☐ Other \_\_\_\_\_

4.  
☒ **Below-grade tank:** Subsection I of 19.15.17.11 NMAC PERMIT EXISTING BELOW - GRADE TANK  
Volume: 120 bbl Type of fluid: Primarily produced water w/ compressor skid precipitation & incidental lubricating oil  
Tank Construction material: Steel Open-top w/ expanded metal cover  
☐ Secondary containment with leak detection ☐ Visible sidewalls, liner, 6-inch lift and automatic overflow shut-off  
☒ Visible sidewalls and liner ☐ Visible sidewalls only ☒ Other \_\_\_\_\_ Visible sidewalls, liner, 6" lift & electronic monitoring \_\_\_\_\_  
Liner type: Thickness 20 mil ☒ HDPE ☐ PVC ☐ Other \_\_\_\_\_

5.  
☐ **Alternative Method:**  
Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

6.

**Fencing:** Subsection D of 19.15.17.11 NMAC (*Applies to permanent pits, temporary pits, and below-grade tanks*)

- ☐ Chain link, six feet in height, two strands of barbed wire at top (*Required if located within 1000 feet of a permanent residence, school, hospital, institution or church*)
- ☐ Four foot height, four strands of barbed wire evenly spaced between one and four feet
- ☒ Alternate. Please specify 42" Hog-wire fence with 2 strands barbed-wire on top \_\_\_\_\_

7.

**Netting:** Subsection E of 19.15.17.11 NMAC (*Applies to permanent pits and permanent open top tanks*)

- ☒ Screen ☐ Netting ☐ Other \_\_\_\_\_
- ☐ Monthly inspections (If netting or screening is not physically feasible)

8.

**Signs:** Subsection C of 19.15.17.11 NMAC

- ☐ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers
- ☒ Signed in compliance with 19.15.3.103 NMAC

9.

**Administrative Approvals and Exceptions:**

Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17 NMAC for guidance.

**Please check a box if one or more of the following is requested, if not leave blank:**

- ☒ Administrative approval(s): Requests must be submitted to the appropriate division district or the Santa Fe Environmental Bureau office for consideration of approval.
- ☐ Exception(s): Requests must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

10.

**Siting Criteria (regarding permitting):** 19.15.17.10 NMAC

**Instructions:** The applicant must demonstrate compliance for each siting criteria below in the application. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria may require administrative approval from the appropriate district office or may be considered an exception which must be submitted to the Santa Fe Environmental Bureau office for consideration of approval. Applicant must attach justification for request. Please refer to 19.15.17.10 NMAC for guidance. Siting criteria does not apply to drying pads or above-grade tanks associated with a closed-loop system.

|   |   |
|---|---|
| Ground water is less than 50 feet below the bottom of the temporary pit, permanent pit, or below-grade tank.  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells  |   |
| Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| - Topographic map; Visual inspection (certification) of the proposed site   |   |
| Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. ( <i>Applies to temporary, emergency, or cavitation pits and below-grade tanks</i> )  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image   | <input type="checkbox"/> NA   |
| Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. ( <i>Applies to permanent pits</i> )   | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image   | <input checked="" type="checkbox"/> NA                              |
| Within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site   |   |
| Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| - Written confirmation or verification from the municipality; Written approval obtained from the municipality   |   |
| Within 500 feet of a wetland.   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site  |   |
| Within the area overlying a subsurface mine.  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division   |   |
| Within an unstable area.  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map   |   |
| Within a 100-year floodplain.   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| - FEMA map  |   |

11.

**Temporary Pits, Emergency Pits, and Below-grade Tanks Permit Application Attachment Checklist:** Subsection B of 19.15.17.9 NMAC**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Hydrogeologic Report (Below-grade Tanks) - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC
- ☐ Hydrogeologic Data (Temporary and Emergency Pits) - based upon the requirements of Paragraph (2) of Subsection B of 19.15.17.9 NMAC
- ☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☒ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
- ☐ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

☒ Previously Approved Design (attach copy of design) API Number: 30-045-28314 or Permit Number: 6204

12.

**Closed-loop Systems Permit Application Attachment Checklist:** Subsection B of 19.15.17.9 NMAC**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Geologic and Hydrogeologic Data (only for on-site closure) - based upon the requirements of Paragraph (3) of Subsection B of 19.15.17.9
- ☐ Siting Criteria Compliance Demonstrations (only for on-site closure) - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☐ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
- ☐ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

☐ Previously Approved Design (attach copy of design) API Number: \_\_\_\_\_

☐ Previously Approved Operating and Maintenance Plan API Number: \_\_\_\_\_ (Applies only to closed-loop system that use above ground steel tanks or haul-off bins and propose to implement waste removal for closure)

13.

**Permanent Pits Permit Application Checklist:** Subsection B of 19.15.17.9 NMAC**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Hydrogeologic Report - based upon the requirements of Paragraph (1) of Subsection B of 19.15.17.9 NMAC
- ☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☐ Climatological Factors Assessment
- ☐ Certified Engineering Design Plans - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Dike Protection and Structural Integrity Design - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Leak Detection Design - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Liner Specifications and Compatibility Assessment - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Quality Control/Quality Assurance Construction and Installation Plan
- ☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
- ☐ Freeboard and Overtopping Prevention Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Nuisance or Hazardous Odors, including H<sub>2</sub>S, Prevention Plan
- ☐ Emergency Response Plan
- ☐ Oil Field Waste Stream Characterization
- ☐ Monitoring and Inspection Plan
- ☐ Erosion Control Plan
- ☐ Closure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

14.

**Proposed Closure:** 19.15.17.13 NMAC**Instructions:** Please complete the applicable boxes, Boxes 14 through 18, in regards to the proposed closure plan.

Type: ☐ Drilling ☐ Workover ☐ Emergency ☐ Cavitation ☐ P&A ☐ Permanent Pit ☒ Below-grade Tank ☐ Closed-loop System

☐ Alternative

Proposed Closure Method: ☒ Waste Excavation and Removal

☐ Waste Removal (Closed-loop systems only)

☐ On-site Closure Method (Only for temporary pits and closed-loop systems)

☐ In-place Burial ☐ On-site Trench Burial

☐ Alternative Closure Method (Exceptions must be submitted to the Santa Fe Environmental Bureau for consideration)

15.

**Waste Excavation and Removal Closure Plan Checklist:** (19.15.17.13 NMAC) **Instructions:** Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.

- ☒ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☒ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection F of 19.15.17.13 NMAC
- ☒ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings)
- ☒ Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☒ Re-vegetation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC
- ☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

16.

**Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only:** (19.15.17.13.D NMAC)**Instructions:** Please indentify the facility or facilities for the disposal of liquids, drilling fluids and drill cuttings. Use attachment if more than two facilities are required.

Disposal Facility Name: \_\_\_\_\_ Disposal Facility Permit Number: \_\_\_\_\_

Disposal Facility Name: \_\_\_\_\_ Disposal Facility Permit Number: \_\_\_\_\_

Will any of the proposed closed-loop system operations and associated activities occur on or in areas that *will not* be used for future service and operations?
☐ Yes (If yes, please provide the information below) ☐ No
*Required for impacted areas which will not be used for future service and operations:*

- ☐ Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC
- ☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

17.

**Siting Criteria (regarding on-site closure methods only):** 19.15.17.10 NMAC**Instructions:** Each siting criteria requires a demonstration of compliance in the closure plan. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria may require administrative approval from the appropriate district office or may be considered an exception which must be submitted to the Santa Fe Environmental Bureau office for consideration of approval. Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17.10 NMAC for guidance.

- |   |  |
|---|--|
| Ground water is less than 50 feet below the bottom of the buried waste.   | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells  | <input type="checkbox"/> NA                              |
| Ground water is between 50 and 100 feet below the bottom of the buried waste  | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells  | <input type="checkbox"/> NA                              |
| Ground water is more than 100 feet below the bottom of the buried waste.  | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells  | <input type="checkbox"/> NA                              |
| Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).   | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| - Topographic map; Visual inspection (certification) of the proposed site   |  |
| Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.   | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image   |  |
| Within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application. | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| - NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site  |  |
| Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.  | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| - Written confirmation or verification from the municipality; Written approval obtained from the municipality   |  |
| Within 500 feet of a wetland.   | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site  |  |
| Within the area overlying a subsurface mine.  | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division   |  |
| Within an unstable area.  | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map   |  |
| Within a 100-year floodplain.   | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| - FEMA map  |  |

18.

**On-Site Closure Plan Checklist:** (19.15.17.13 NMAC) **Instructions:** Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☐ Proof of Surface Owner Notice - based upon the appropriate requirements of Subsection F of 19.15.17.13 NMAC
- ☐ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Construction/Design Plan of Temporary Pit (for in-place burial of a drying pad) - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☐ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection F of 19.15.17.13 NMAC
- ☐ Waste Material Sampling Plan - based upon the appropriate requirements of Subsection F of 19.15.17.13 NMAC
- ☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings or in case on-site closure standards cannot be achieved)
- ☐ Soil Cover Design - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC
- ☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

19.

**Operator Application Certification:**

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name (Print): Ronnie L. Young Title: Compliance Supervisor

Signature:  Date: 5.19.10

e-mail address: ryoung@enervest.net Telephone: 713-495-6530

20.

**OCD Approval:** ☒ Permit Application (including closure plan) ☐ Closure Plan (only) ☐ OCD Conditions (see attachment)

OCD Representative Signature:  Approval Date: 6/16/10

Title: Enviro Spec OCD Permit Number: \_\_\_\_\_

21.

**Closure Report (required within 60 days of closure completion):** Subsection K of 19.15.17.13 NMAC

*Instructions: Operators are required to obtain an approved closure plan prior to implementing any closure activities and submitting the closure report. The closure report is required to be submitted to the division within 60 days of the completion of the closure activities. Please do not complete this section of the form until an approved closure plan has been obtained and the closure activities have been completed.*

☐ Closure Completion Date: \_\_\_\_\_

22.

**Closure Method:**

☐ Waste Excavation and Removal ☐ On-Site Closure Method ☐ Alternative Closure Method ☐ Waste Removal (Closed-loop systems only)  
☐ If different from approved plan, please explain.

23.

**Closure Report Regarding Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only:**

*Instructions: Please identify the facility or facilities for where the liquids, drilling fluids and drill cuttings were disposed. Use attachment if more than two facilities were utilized.*

Disposal Facility Name: \_\_\_\_\_ Disposal Facility Permit Number: \_\_\_\_\_

Disposal Facility Name: \_\_\_\_\_ Disposal Facility Permit Number: \_\_\_\_\_

Were the closed-loop system operations and associated activities performed on or in areas that *will not* be used for future service and operations?

☐ Yes (If yes, please demonstrate compliance to the items below) ☐ No

*Required for impacted areas which will not be used for future service and operations.*

- ☐ Site Reclamation (Photo Documentation)  
☐ Soil Backfilling and Cover Installation  
☐ Re-vegetation Application Rates and Seeding Technique

24.

**Closure Report Attachment Checklist:** *Instructions: Each of the following items must be attached to the closure report. Please indicate, by a check mark in the box, that the documents are attached.*

- ☐ Proof of Closure Notice (surface owner and division)  
☐ Proof of Deed Notice (required for on-site closure)  
☐ Plot Plan (for on-site closures and temporary pits)  
☐ Confirmation Sampling Analytical Results (if applicable)  
☐ Waste Material Sampling Analytical Results (required for on-site closure)  
☐ Disposal Facility Name and Permit Number  
☐ Soil Backfilling and Cover Installation  
☐ Re-vegetation Application Rates and Seeding Technique  
☐ Site Reclamation (Photo Documentation)

On-site Closure Location: Latitude \_\_\_\_\_ Longitude \_\_\_\_\_ NAD: ☐ 1927 ☐ 1983

25.

**Operator Closure Certification:**

I hereby certify that the information and attachments submitted with this closure report is true, accurate and complete to the best of my knowledge and belief. I also certify that the closure complies with all applicable closure requirements and conditions specified in the approved closure plan.

Name (Print): \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

e-mail address: \_\_\_\_\_ Telephone: \_\_\_\_\_

EnerVest Operating, LLC (EV)

BELOW-GRADE TANK  
DESIGN AND CONSTRUCTION SPECIFICATIONS

Rule 19.15.17.11

- C. Enervest Operating is the official operator of record for all wells which have below-grade tanks to be addressed in this specification. All below-grade tanks are located on these leases and will be in full compliance with 19.15.16.8 regarding signage.
- D. EV will ensure a fence shall be constructed and maintained in good repair with gates that are closed and locked when responsible personnel are not on site. EV shall insure that all gates are closed and locked when responsible personnel are not on-site.

If the below-grade tank is located within 1,000 feet of a permanent residence, school, hospital, institution or church, the fence shall be a chain link security fence at least 6 feet in height with at least two strands of barbed wire on top.

If the below-grade tank is not within 1,000 feet of the above mentioned structures, the fence shall constructed to exclude livestock with at least four strands of barbed wire evenly spaced between one foot from the ground and four foot above the ground.

EV is requesting administrative approval to use a 42" Hog wire fence with 2 strands barbed-wire on top in lieu of the required four strand barbed wire fence. This will be supported with iron posting at the corners and 10 – 12 feet apart. EV believes this will offer better protection for wildlife in these tank areas. Please refer to Exhibit 2.1 of this Section.

- E. EV shall ensure an open top tank is screened with expanded 3/16" metal screen or a fully closed top, both of which are welded on the top of the tank. Such screening will be painted to blend with the below-grade tank. EV believes this is sufficient strength to protect migratory birds or other wildlife.
- I. EV will ensure all below-grade tanks will be constructed of 3/16" steel, resistant to the tank's contents and to damage from sunlight. Based on water production and road condition for access during the winter months there are a choice of three different sizes which could be used:

| CAPACITY | DIAMETER | HEIGHT |
|----------|----------|--------|
| 125 bbl  | 15'      | 4'     |
| 120 bbl  | 12'      | 6'     |
| 100 bbl  | 12'      | 5'     |

This tank will contain liquids and should prevent contamination of fresh water to protect the public health and environment.

The below-grade system will include a excavated area for the tanks which will be dependent upon the size of the tank used:

- 18' x 18' x 4' High Square excavated area
- 18' Diameter x 4' High Circular excavated area
- 18' Diameter x 5' High Circular excavated area

Most of our below-grade tank systems were installed prior to June 16, 2008 and are 16.5' x 16.5' x 4' square excavated area design. As tanks are retro fitted, this will be changed to one of the above. The particular area and well conditions will determine which design best for that particular well. EV will ensure that there will be room to walk around the tank inside the containment area which will better enable our field personnel to inspect for damage to liners or incidental leaks. Please refer to tank diagram under Exhibit 2.2 of this section for details.

All excavated areas will be reinforced with metal walls to prevent collapse. There will be sufficient open area on all sides of the tank to witness any incidental release that may occur. Please refer to tank diagram under Appendix 8.

EV will ensure the base of any excavated area containing a below-grade tank will be level and free of rocks, debris, sharp edges or irregularities to prevent punctures, cracks or indentations of the liner or tank bottom.

EV will ensure that any geomembrane liner used shall consist of 30-mil flexible PVC or 60-mil HDPE liner or equivalent liner material. The liner shall be composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salt and acidic and alkaline solutions and shall be resistant to ultraviolet light. The liner shall have a hydraulic conductivity no greater than  $1 \times 10^{-9}$  cm/sec. The liner shall be compatible with EPA SW-846 method 9090A. EV will install the liner in such a manner as to divert any possible leak for visual inspection. EV will demonstrate to the OCD that the liner complies with the specifications within Subparagraph (a) of Paragraph (4) of Section I of 19.156.17.11 NMAC and obtain approval from the division prior to the installation of the new design.

EV is requesting administrative approval to use an equivalent liner. The "Dura-Skirm J45 BB" is a 45-mil reinforced liner which we feels offers the same or better protection as the required 60-mil liner as indicated above. Please refer to Exhibit 2:3 of this Section for the specification sheets for this liner.

EV will ensure the fluid levels of tanks will be monitored by automatic high level alarms at 24" from the top and shut-off devise at 10 1/2 inches from the top of the

tank. The tanks will be also equipped with a manual shut-off valve in the event it is needed. Please see design specification sheet of this system in this section. The majority of our below-grade tanks are within the berm around our tank battery and as so are protected from run-on water. Those outside this berm will be protected with an earthen berm which will extend at least 6" above surface ground level to divert run-on around the tank. The side walls of the excavated area will extend at least 6" above the ground level to divert run-on water around the tank. Any possible leak will be diverted, on the liner, in such a way can be visually inspected. Please refer to Exhibit 2.4 of this Section for details of this automatic shut-off system.

EV tank design will be a single walled tank constructed to ensure that the side walls are open for visual inspection for leaks; the bottom will be elevated six inches above the ground surface and will contain a geomembrane liner, as described above, directly on the ground level of the containment area.

Once a below-grade tank which was installed prior to June 16, 2008 does not demonstrate integrity, EV shall promptly repair or remove that below-grade tank and close the tank or install a below-grade tank that is in full compliance with Paragraph 1 thru 4 of Section I of 19.15.17.11 NMAC. EV shall comply with the operational requirements of 19.15.17.12 NMAC. Please refer to tank diagram under Appendix 8 for details

Any single walled below-grade tank installed before June 16, 2008 where any portion of the tank sidewall is below the ground surface and not totally visible shall be closed, retrofited or replaced before June 15, 2013. EV will fully comply with Paragraph 1 thru 4 of Section I of 19.15.17.11 NMAC for all retrofitting or replacement of below-grade tanks.

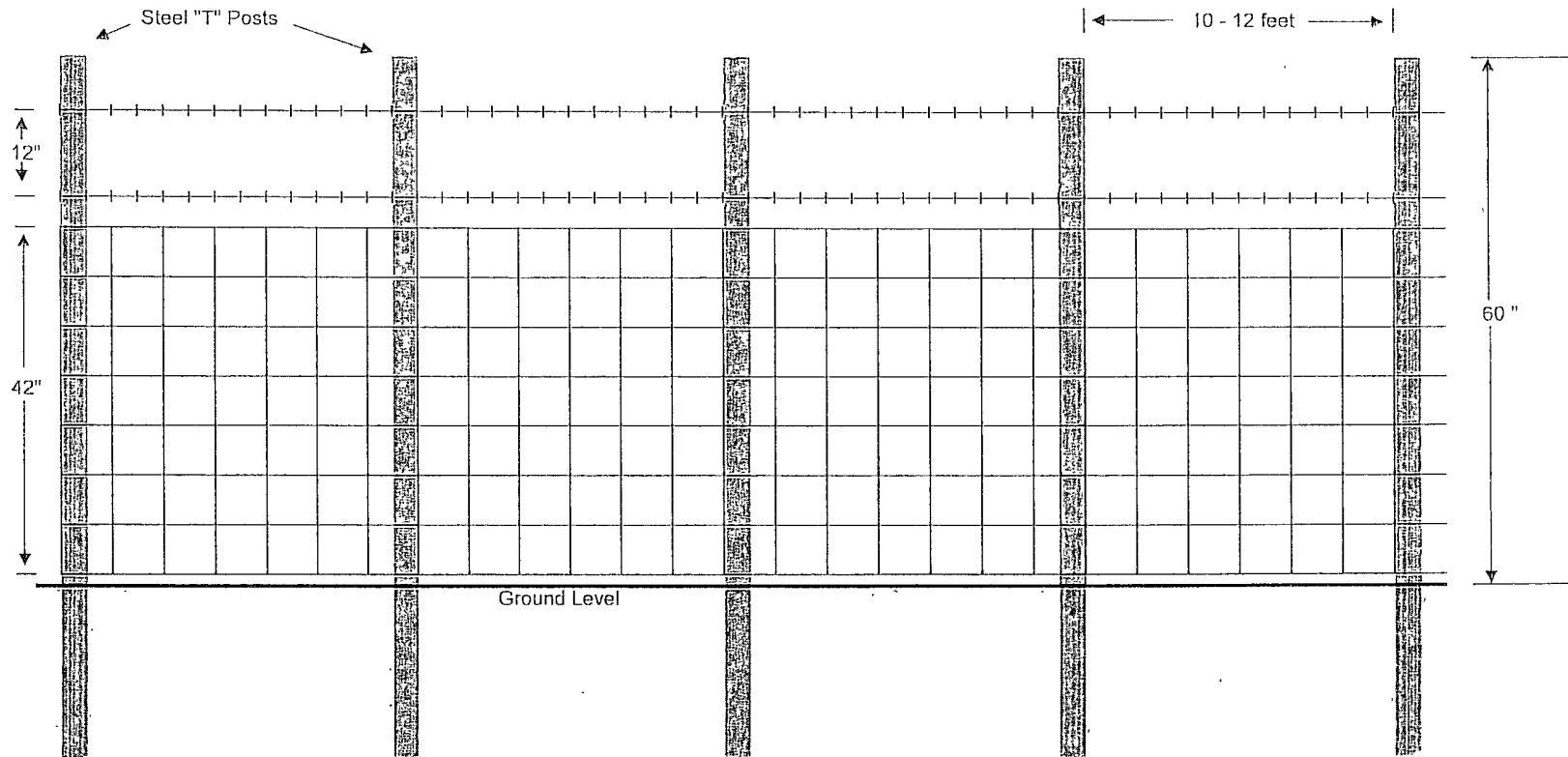


ENERVEST OPERATING, LLC

Proposed Alternative Fencing

Below-Grade Tank Construction

42" Hogwire Fence with 2 strands barbed-wire on top

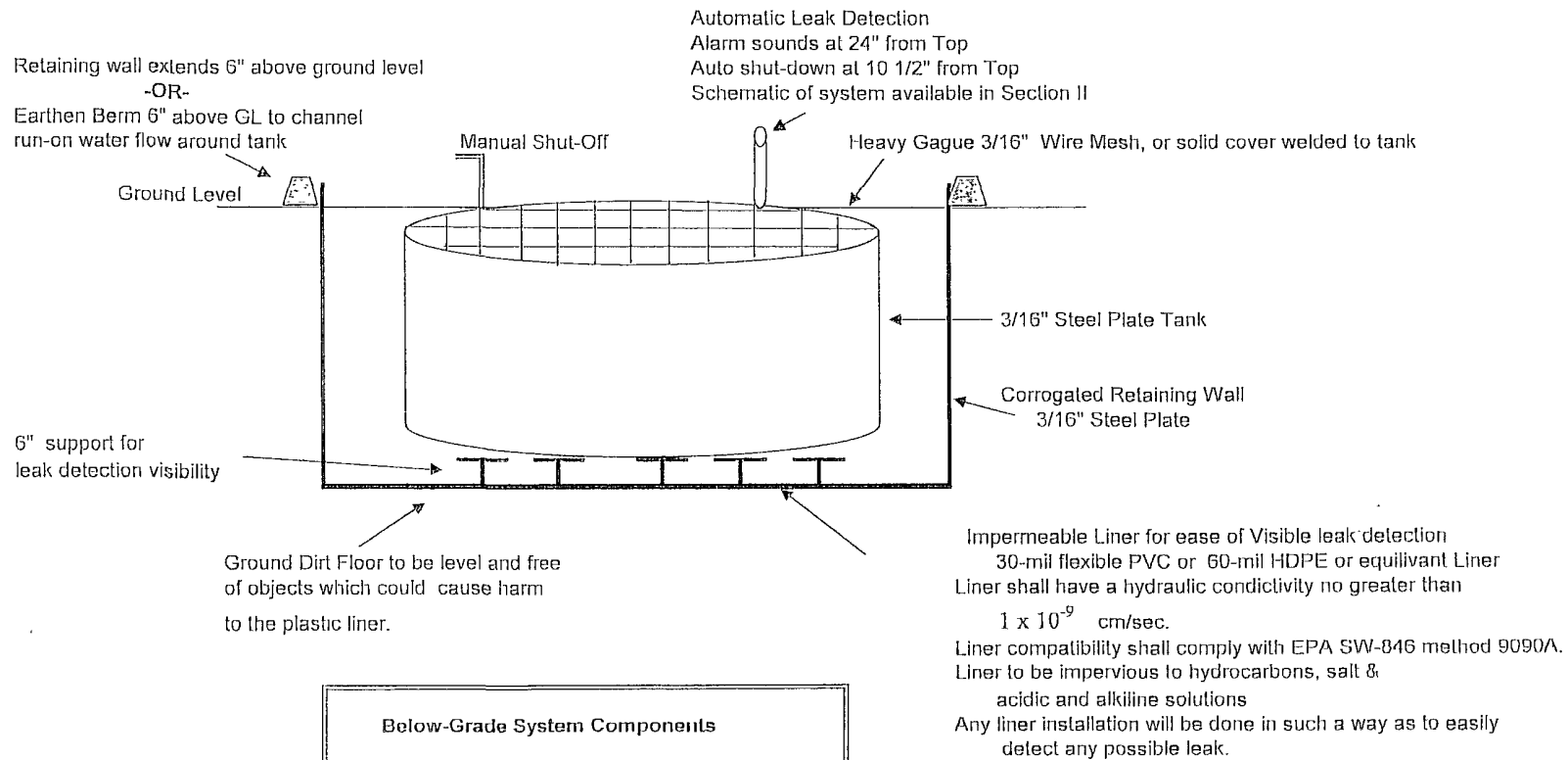




EnerVest Operating, LLC  
Western Division

## Below-Grade Tank System

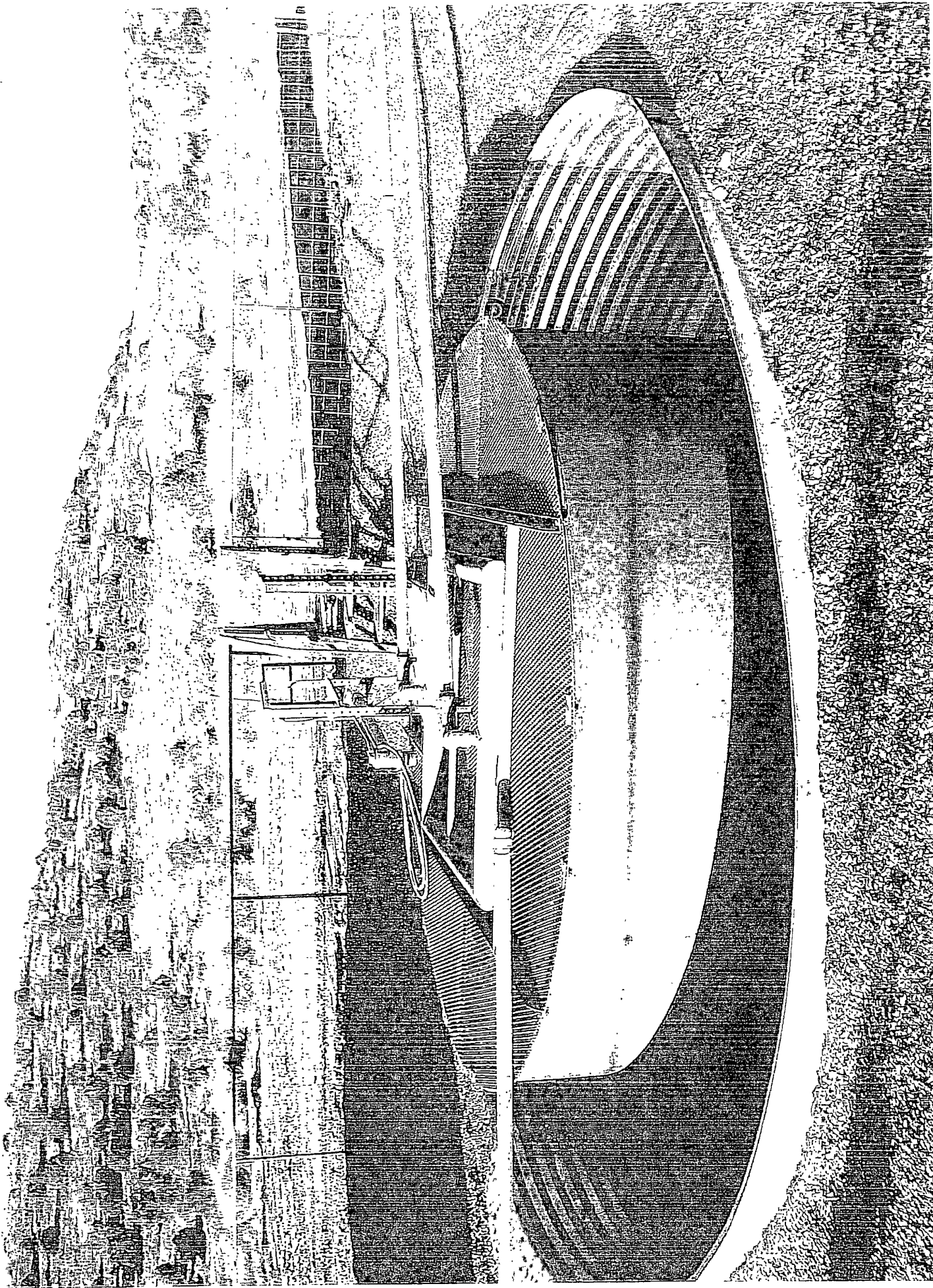
Gravity Fed - Produced Water

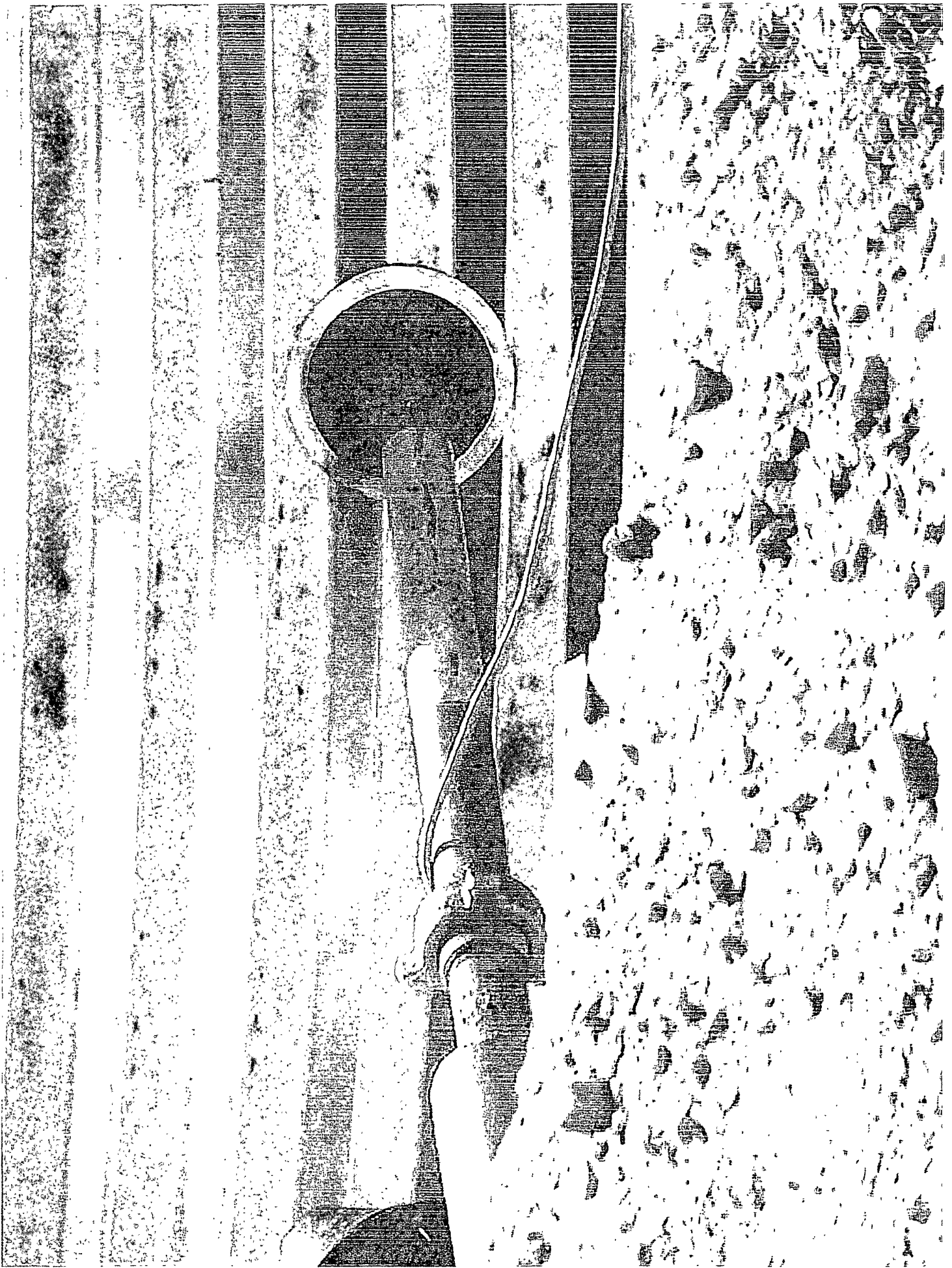


### Below-Grade System Components

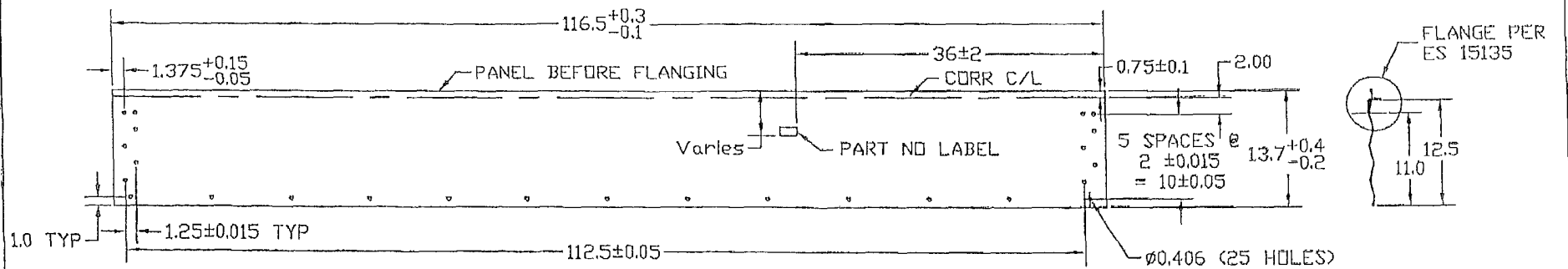
| Capacity | Tank Size<br>Dia x Height | Excavation Areas      |
|----------|---------------------------|-----------------------|
| 125 Bbl  | 15' x 4'                  | 18' x 18' x 4' Square |
| 120 Bbl  | 12' x 6'                  | 18' x 4' Circular     |
| 100 Bbl  | 12' x 5'                  | 18' x 5' Circular     |

Tank size dependent upon water production & road conditions  
Excavation Area size dependent upon tank size

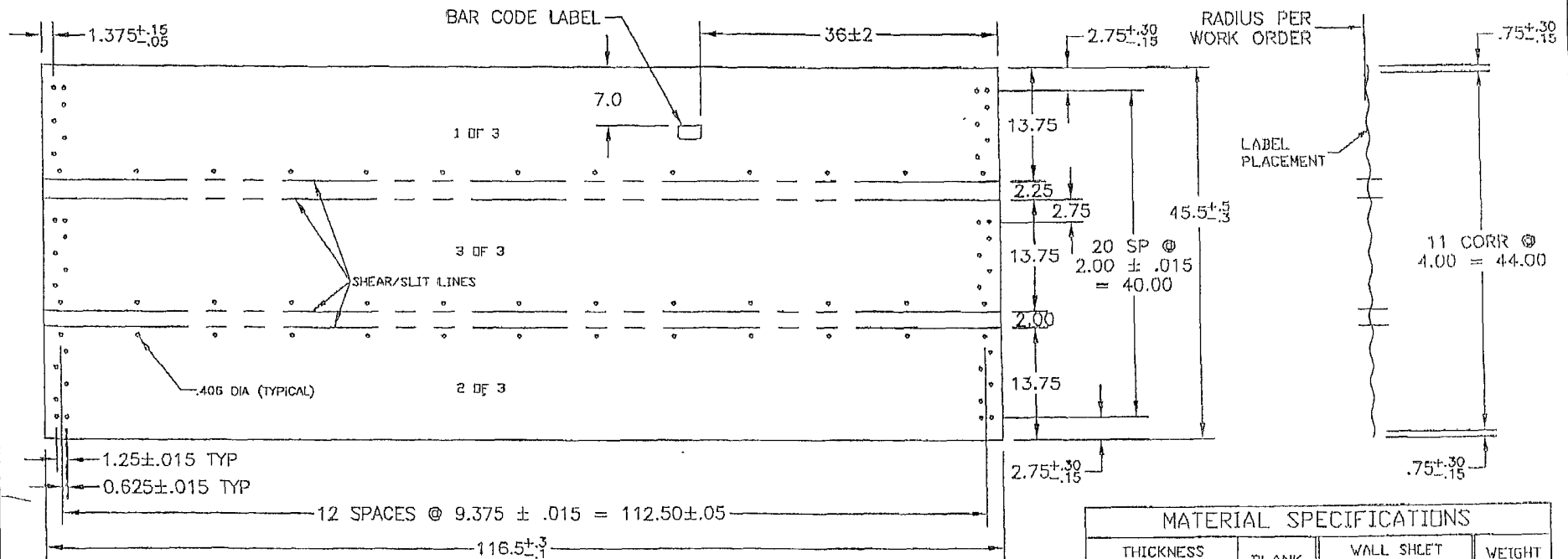








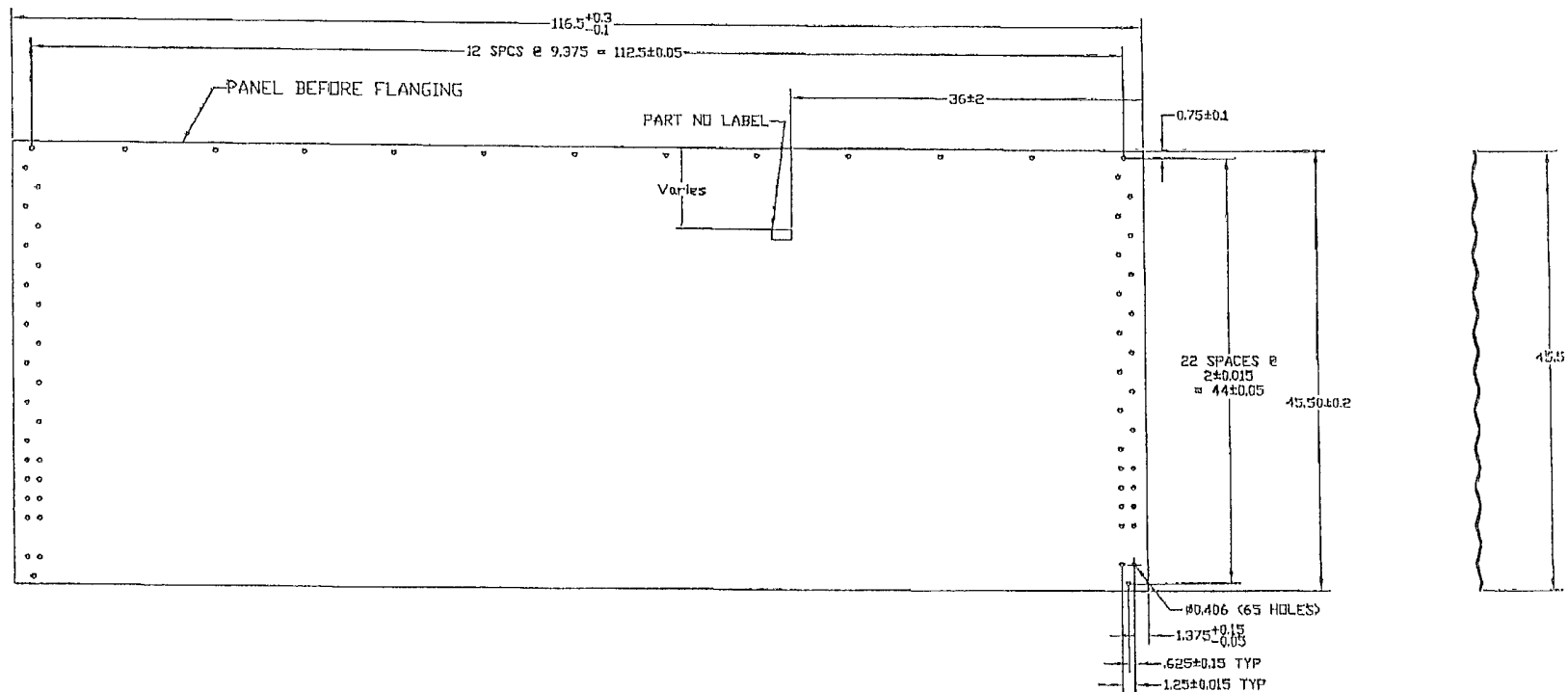
13 1/2" WALL PANEL LAYOUT BEFORE FLANGING



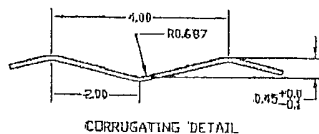
MANUFACTURING VIEW ONLY - TRIPLE PANEL AFTER  
CORR & PUNCH, BEFORE SLITTING & FLANGING

| MATERIAL SPECIFICATIONS |         |             |                    |
|-------------------------|---------|-------------|--------------------|
| THICKNESS               |         | BLANK WIDTH | WALL SHEET PART NO |
| NOMINAL                 | MINIMUM |             |                    |
| 0.066                   | 0.061   | 14.75       | CW1357F            |
|                         |         |             | WEIGHT (lbs)       |
|                         |         |             | 31.5               |

|    |  |      |  |  |  |               |  |  |  |  |  |                             |  |                             |  |                    |  |
|----|--|------|--|--|--|---------------|--|--|--|--|--|-----------------------------|--|-----------------------------|--|--------------------|--|
|    |  |      |  | MATERIAL   |  |               |  | BLANK SIZE   |  |  |  | WEIGHT (LBS.)               |  |                             |  |                    |  |
|    |  |      |  | SEE CHART - ASTM A653 SS GR50 G115 Q1L                 |  |               |  | 46.5x116.5 (3 pcs)   |  |  |  | 31.5                        |  |                             |  |                    |  |
|    |  |      |  | DESND.<br>BA   |  |               |  | THIS DRAWING IS THE EXCLUSIVE PROPERTY OF WESTEEL<br>AND ALL RIGHTS ARE RESERVED<br>NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN<br>ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM<br>Westeel Limited |  |  |  | SCALE<br>N.T.S.             |  | DWN. (Y.M.D.)<br>2004.11.30 |  | LOCATION<br>WPG    |  |
|    |  |      |  | DWN.<br>RF   |  |               |  |  |  |  |  | E.C.R.<br>A6834             |  | E.P. NO.<br>02-255          |  | DWN TYPE<br>A-2000 |  |
|    |  |      |  | CHKD.<br>BA  |  |               |  | DRAWING TITLE<br>13.5' FULL PANEL - 57" ONLY<br>CONTAINMENT RING   |  |  |  | SIZE<br>A                   |  | DRAWING NO<br>ES 15516      |  | REV. NO.<br>O      |  |
|    |  |      |  | APPD.<br>BA  |  |               |  | CUSTOMER<br>-  |  |  |  | PRINTING DATE (Y.M.D.)<br>- |  |                             |  |                    |  |
|    |  |      |  | DIMENSIONS SHOWN ARE IMP<br>MM UNITS SHOWN IN BRACKETS |  |               |  |  |  |  |  |                             |  |                             |  |                    |  |
|    |  |      |  | TOLERANCES<br>(UNLESS OTHERWISE NOTED)                 |  |               |  |  |  |  |  |                             |  |                             |  |                    |  |
|    |  |      |  | DIMENSIONS:  |  |               |  |  |  |  |  |                             |  |                             |  |                    |  |
|    |  |      |  | IMPERIAL (in) METRIC (mm)                              |  |               |  |  |  |  |  |                             |  |                             |  |                    |  |
|    |  |      |  | .X ? .1 X ? 2  |  |               |  |  |  |  |  |                             |  |                             |  |                    |  |
|    |  |      |  | .XXX ? .03 .X ? 1.0                                    |  |               |  |  |  |  |  |                             |  |                             |  |                    |  |
|    |  |      |  | .XXX ? .010 .XXX ? .50                                 |  |               |  |  |  |  |  |                             |  |                             |  |                    |  |
|    |  |      |  | ANGULAR: ± 1°  |  |               |  |  |  |  |  |                             |  |                             |  |                    |  |
| NO |  | DATE |  | REVISION   |  | E.C.R. BY CH. |  |  |  |  |  |                             |  |                             |  |                    |  |



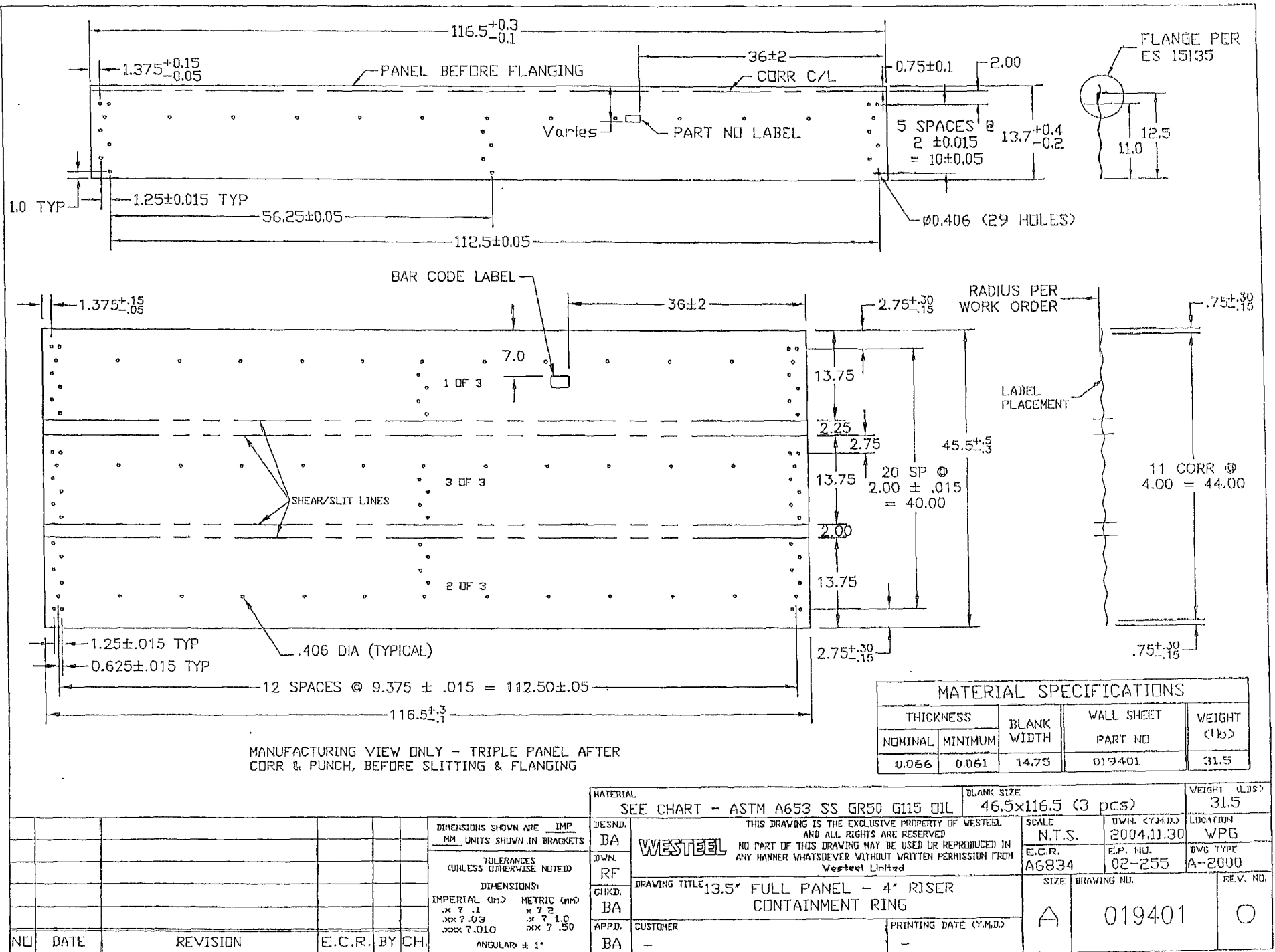
44" WALL PANEL AFTER CORRUGATING AND PUNCHING



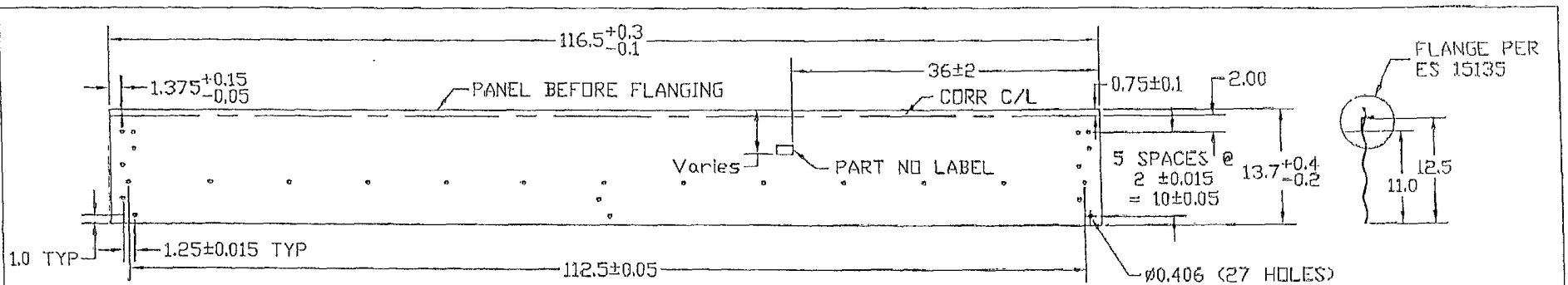
- MANUFACTURING NOTES:
1. CORRUGATION... SEE DETAIL
  2. HOLE OFF CENTER OF CORR... ± .05
  3. HOLE BURR MAX... .01
  4. CUT OFF BURR MAX... .01
  5. CORNER HOLE TO HOLE DIAGONAL ± .15

| MATERIAL SPECIFICATIONS |         |             |                    |              |
|-------------------------|---------|-------------|--------------------|--------------|
| THICKNESS               |         | BLANK WIDTH | WALL SHEET PART NO | WEIGHT (LBS) |
| NOMINAL                 | MINIMUM |             |                    |              |
| 0.066                   | 0.061   | 46.5        | CW445715F          | 97.7         |
| 0.139                   | 0.130   | 46.2        | CW445710F          | 208.5        |

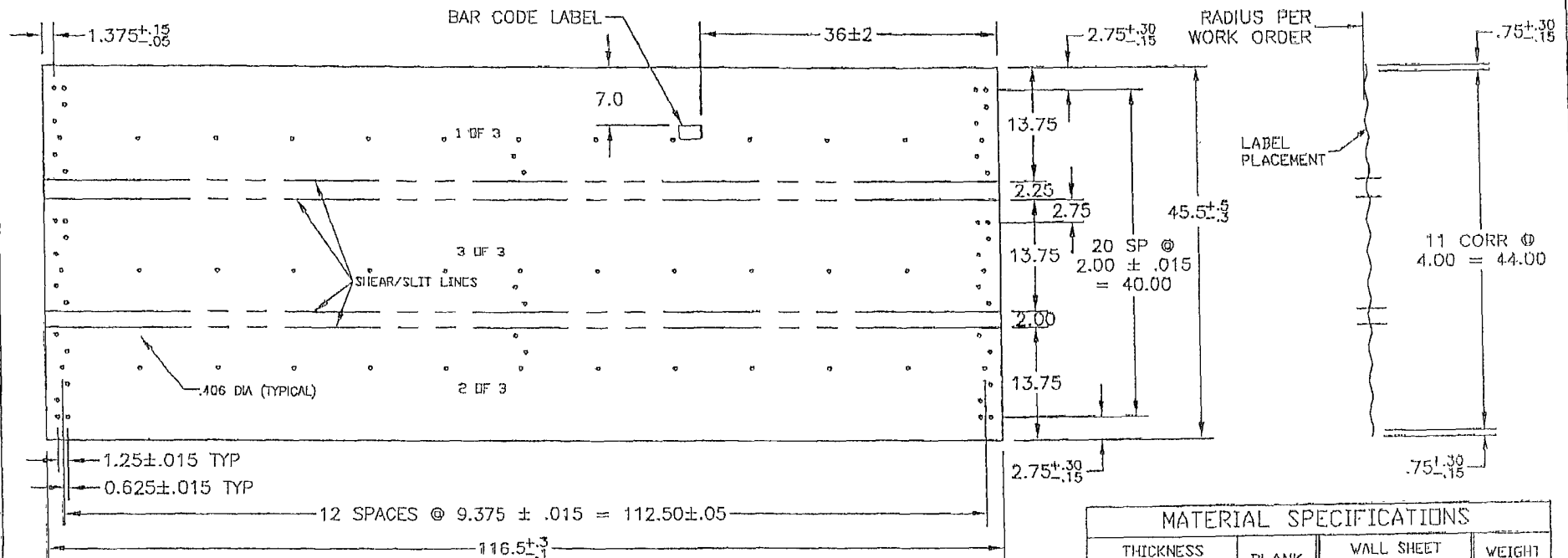
| DIMENSIONS SHOWN ARE IMPERIAL UNITS SHOWN IN BRACKETS |  |  |  |  | MATERIAL |  | BLANK SIZE   |  | SURFACE AREA  |  | WEIGHT (LBS) |  |
|---|--|--|--|--|----------|--|--|--|---------------|--|--------------|--|
| TOLERANCES (UNLESS OTHERWISE NOTED)                   |  |  |  |  | DESIGN   |  | SCALE  |  | DWN. (C.M.D.) |  | LOCATION     |  |
| DIMENSIONS:   |  |  |  |  | DWN.     |  | E.C.R.   |  | E.P. NO.      |  | TYPE         |  |
| IMPERIAL (in.) METRIC (mm)                            |  |  |  |  | CHG.     |  | DRAWING TITLE  |  | SIZE          |  | REV. NO.     |  |
| .XX ± .03 .XX ± .10 .XXX ± .010 .XX ± .50             |  |  |  |  | APPD.    |  | CUSTOMER   |  | PRINTING DATE |  |              |  |
| ANGULAR: ± 1°   |  |  |  |  | BA       |  | THIS DRAWING IS THE EXCLUSIVE PROPERTY OF VESTEL AND ALL RIGHTS ARE RESERVED. NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM VESTEL, A DIVISION OF JENISYS ENGINEERED PRODUCTS |  | A6834         |  | A-2000       |  |
|   |  |  |  |  | RF       |  | 44" FULL PANEL - 57" ONLY  |  | B             |  | ES 15518     |  |
|   |  |  |  |  | BA       |  | CONTAINMENT RING   |  |               |  | 0            |  |
| NO DATE REVISION E.C.R. BY CH                         |  |  |  |  |          |  |  |  |               |  |              |  |







13 1/2" WALL PANEL LAYOUT BEFORE FLANGING



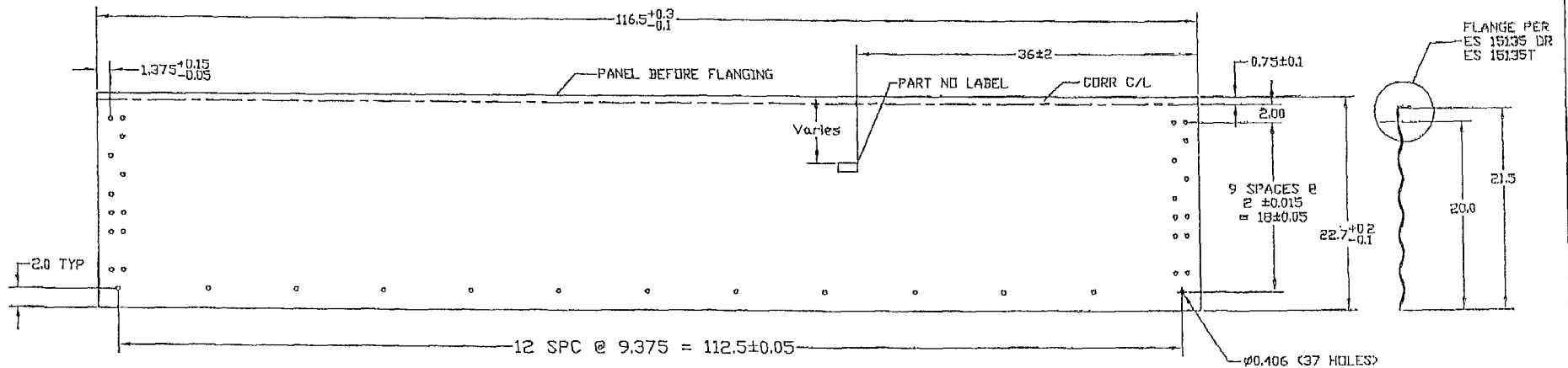
MANUFACTURING VIEW ONLY - TRIPLE PANEL AFTER  
CORR & PUNCH, BEFORE SLITTING & FLANGING

| MATERIAL SPECIFICATIONS |         |                |                       |                 |
|-------------------------|---------|----------------|-----------------------|-----------------|
| THICKNESS               |         | BLANK<br>WIDTH | WALL SHEET<br>PART NO | WEIGHT<br>(lbs) |
| NOMINAL                 | MINIMUM |                |                       |                 |
| 0.066                   | 0.061   | 14.75          | 019419                | 31.5            |

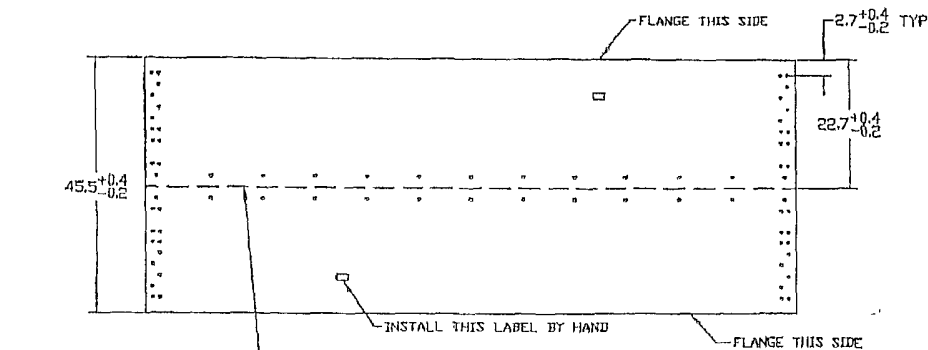
|  |  |                             |                 |                             |                    |
|--|--|-----------------------------|-----------------|-----------------------------|--------------------|
| MATERIAL                               |  | BLANK SIZE                  |                 | WEIGHT (LBS)                |                    |
| SEE CHART - ASTM A653 SS GR50 G115 OIL |  | 46.5x116.5 (3 pcs)          |                 | 31.5                        |                    |
| DESND.<br>BA                           | THIS DRAWING IS THE EXCLUSIVE PROPERTY OF VESTEEL.<br>AND ALL RIGHTS ARE RESERVED.<br>NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN<br>ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM<br>Vesteel Limited |                             | SCALE<br>N.T.S. | DWN. (Y.M.D.)<br>2006.08.08 | LOCATION<br>WPG    |
| DWN.<br>RF                             |  |                             | E.C.R.<br>A6834 | E.P. NO.<br>02-255          | DWG TYPE<br>A-2000 |
| CHKD.<br>BA                            | DRAWING TITLE<br>9.5" FULL PANEL - 52.5" ONLY<br>CONTAINMENT RING  |                             | SIZE<br>A       | DRAWING NO.<br>019419       | REV. NO.<br>O      |
| APPD.<br>BA                            | CUSTOMER<br>-  | PRINTING DATE (Y.M.D.)<br>- |                 |                             |                    |

| NO | DATE | REVISION | E.C.R. | BY | CH |
|----|------|----------|--------|----|----|
|    |      |          |        |    |    |
|    |      |          |        |    |    |
|    |      |          |        |    |    |
|    |      |          |        |    |    |

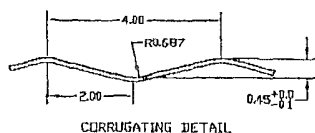
| DIMENSIONS SHOWN ARE IMP<br>MM UNITS SHOWN IN BRACKETS |             |
|--|-------------|
| TOLERANCES<br>(UNLESS OTHERWISE NOTED)                 |             |
| DIMENSIONS   |             |
| IMPERIAL (in.)   | METRIC (mm) |
| .X 2 .1  | X 7.2       |
| .XX 7 .03  | .X 7.10     |
| .XXX 7.010   | .XX 7.50    |
| ANGULAR ± 1°   |             |



21 1/2" WALL PANEL LAYOUT BEFORE FLANGING



MANUFACTURING VIEW ONLY - DOUBLE PANEL AFTER CORR & PUNCH, BEFORE SLITTING & FLANGING



CORRUGATING DETAIL

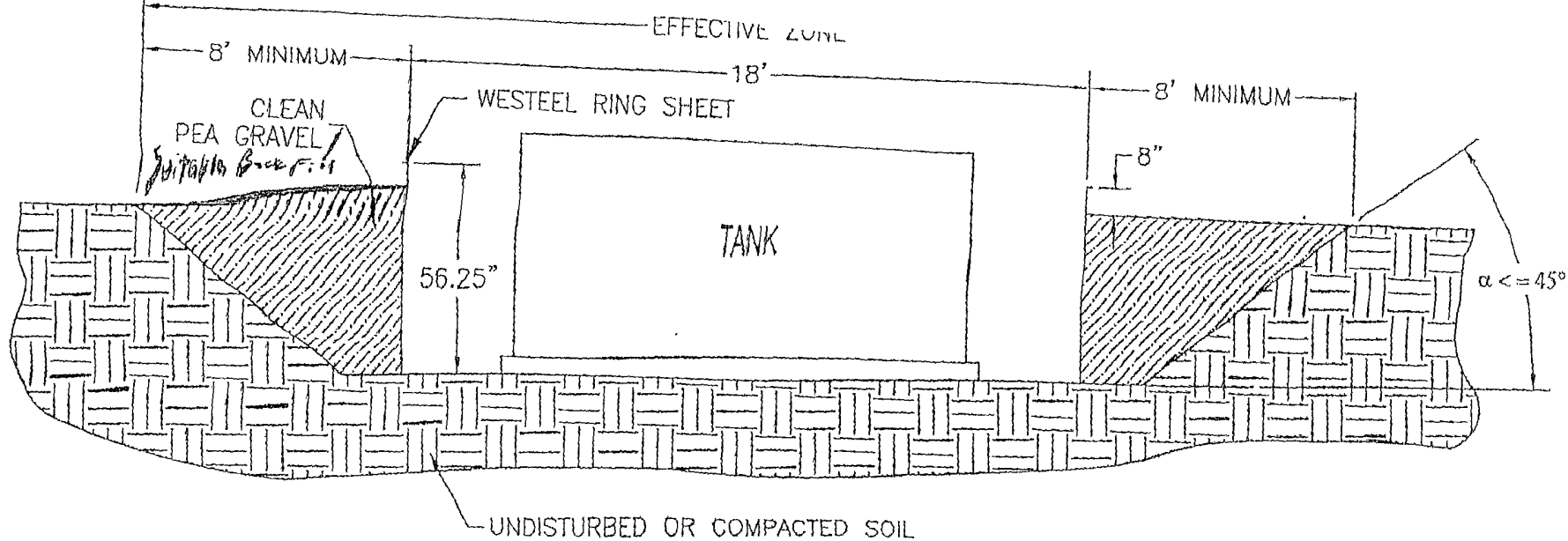
- MANUFACTURING NOTES:
1. CORRUGATION..... SEE DETAIL
  2. HOLE OFF CENTER OF CORR..... ± .05
  3. HOLE BURR MAX..... .01
  4. CUT OFF BURR MAX..... .01
  5. CORNER HOLE TO HOLE DIAGONAL. ± .15

| MATERIAL SPECIFICATIONS |         |             |                    |             |
|-------------------------|---------|-------------|--------------------|-------------|
| THICKNESS               |         | BLANK WIDTH | WALL SHEET PART NO | WEIGHT (lb) |
| NOMINAL                 | MINIMUM |             |                    |             |
| 0.066                   | 0.061   | 23.3        | C10514             | 49.4        |

| NO | DATE     | REVISION                               | E.C.R. | BY | CH |
|----|----------|--|--------|----|----|
| 1  | 06/12/06 | CORRECTED HOLE PATTERN ON BOTTOM BLANK | A6898  | RF | RF |

| DIMENSIONS SHOWN ARE IMPERIAL UNITS SHOWN IN BRACKETS |             |
|---|-------------|
| TOLERANCES UNLESS OTHERWISE NOTED                     |             |
| DIMENSIONS  |             |
| IMPERIAL (in)   | METRIC (mm) |
| IN ± .1   | IN ± .2     |
| MM ± .03  | MM ± .10    |
| MM ± .010   | MM ± .20    |
| ANGULAR ± 1°  |             |

| MATERIAL                               |        | BLANK SIZE         | SURFACE AREA | WEIGHT (LBS) |
|--|--------|--------------------|--------------|--------------|
| SEE CHART - ASTM A653 SQ GR50 GL15 DIL |        | 46.6x116.5 (2 pcs) |              | 49.4         |
| DESIGN                                 | SCALE  | DATE               | BY           | LOCATION     |
| RM                                     | nts    | 98.08.13           | WINNIPEG     |              |
| REVISION                               | E.C.R. | DATE               | BY           | LOCATION     |
| RM                                     | A 6428 | 98-197             | ACAD14       |              |
| DRAWING TITLE                          |        | SIZE               | DRAWING NO   | REV. NO      |
| CONTAINMENT RING 22" WALL PANEL        |        | B                  | C10514       | 1            |
| CUSTOMER                               |        | PRINTING DATE      |              |              |
|  |        |                    |              |              |



#### INSTALLATION INSTRUCTIONS & SITE REQUIREMENTS

1. EXCAVATE AS PER ABOVE
2. FOR BEST RESULTS, BACKFILL WITH CLEAN PEA GRAVEL (OR EQUIVALENT FREE FLOWING MATERIAL) EVENLY AROUND THE STRUCTURE, TAKING CARE NOT TO FILL IN ANY ONE AREA VERY HIGH RELATIVE TO OTHER AREAS, SO AS TO MAINTAIN THE STRUCTURE AS ROUND. WORKING AROUND THE STRUCTURE IN APPROXIMATELY 6" LIFTS IS RECOMMENDED. (NOTE: ALTERNATIVE MATERIALS CAN BE USED BUT CARE MUST BE TAKEN TO INSURE THAT THE EXTERNAL PRESSURES ACTING ON THE STRUCTURE REMAIN UNIFORM. IF NATIVE SOIL IS USED AS A BACKFILL MATERIAL, IT SHOULD BE UNIFORM IN CONSISTENCY, AND BE FREE OF LARGE ROCKS OR UNBROKEN CLUMPS, WHICH COULD RESULT IN UNEVEN LOADING).
3. THE COMPLETED STRUCTURE SHOULD EXTEND APPROXIMATELY 8" ABOVE GRADE
4. TO INSURE STRUCTURAL INTEGRITY, UNEVEN EXTERNAL WALL PRESSURE IS TO BE AVOIDED. NO VEHICLES OR OTHER SOURCES OF POINT LOADING SHOULD BE PERMITTED WITHIN THE EFFECTIVE ZONE (AS ILLUSTRATED).
5. WESTEEL IS NOT LIABLE FOR ANY DAMAGES OR INJURIES RESULTING FROM ANY FAILURE DUE TO IMPROPER INSTALLATION, IMPROPER SITE CONDITIONS, OR INADEQUATE MAINTENANCE OF THE SITE.

NOTE: THIS SYSTEM IS NOT DESIGNED FOR THE SECONDARY CONTAINMENT OF LIQUIDS, RATHER, TO ALLOW FOR INSPECTION OF THE TANK.

# DURA-SKRIM®

# J30, J36 & J45 BB

## PRODUCT DESCRIPTION

**DURA-SKRIM J30, J36 and J45** are Linear Low Density Polyethylene geomembranes reinforced with a heavy encapsulated 1300 Denier polyester reinforcement. In addition to excellent dimensional stability the tri-directional reinforcement provides exceptional tear and tensile strength.

**DURA-SKRIM J-Series** membranes are formulated with thermal and UV stabilizers to assure a long service life. Custom colors are available based on minimum volume requirements.

## PRODUCT USE

**DURA-SKRIM J30, J36 and J45** are used in applications that require exceptional outdoor life and demand high tear strength and resistance to thermal expansion.

**DURA-SKRIM J30, J36 and J45** are manufactured from a very chemical-resistant, Linear Low Density Polyethylene with excellent cold crack performance.

## SIZE & PACKAGING

**DURA-SKRIM J30, J36 and J45** are available in a variety of widths and lengths to meet the project requirements. Large diameter mill rolls are available to assure an efficient seaming process. Factory welded panels are accordion folded and tightly rolled on a heavy-duty core for ease of handling and time saving installation.



**RAVEN**  
INDUSTRIES  
Engineered Films Division

| PRODUCT              | PART NUMBER |
|----------------------|-------------|
| DURA-SKRIM J30 ..... | J30BB       |
| DURA-SKRIM J36 ..... | J36BB       |
| DURA-SKRIM J45 ..... | J45BB       |

## COMMON APPLICATIONS

- Waste Lagoon Liners
- Floating Covers
- Daily Landfill Covers
- Modular Tank Liners
- Tunnel Liners
- Remediation Liners
- Earthen Liners
- Interim Landfill Covers
- Remediation Covers
- Landfill Caps
- Erosion Control Covers
- Radon Retarder
- Canal Liners
- Disposal Pit Liner
- Water Containment Ponds
- Heap Leach Liner



# DURA-SKRIM®

# J30, J36 & J45 BB



| PROPERTIES                                      | TEST METHOD | DURA-SKRIM J30BB  |                          | DURA-SKRIM J36BB         |                          | DURA-SKRIM J45BB         |                          |
|---|-------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|   |             | Min. Roll Averages  | Typical Roll Averages    | Min. Roll Averages       | Typical Roll Averages    | Min. Roll Averages       | Typical Roll Averages    |
| APPEARANCE                                      |             | Black/Black   |                          | Black/Black              |                          | Black/Black              |                          |
| THICKNESS, NOMINAL                              | ASTM D5199  | 27 mil  | 30 mil                   | 32 mil                   | 36 mil                   | 40 mil                   | 45 mil                   |
| WEIGHT <small>(lbs/MSF)<br/>(oz/ft²)</small>    | ASTM D5261  | 126 lbs<br>(16.14)  | 140 lbs<br>(20.16)       | 151 lbs<br>(21.74)       | 166 lbs<br>(24.19)       | 189 lbs<br>(27.21)       | 210 lbs<br>(30.24)       |
| CONSTRUCTION                                    |             | **Extrusion laminated with encapsulated tri-directional scrim reinforcement |                          |                          |                          |                          |                          |
| PLY ADHESION                                    | ASTM D413   | 16 lbs  | 20 lbs                   | 19 lbs                   | 27 lbs                   | 25 lbs                   | 33 lbs                   |
| 1" TENSILE STRENGTH                             | ASTM D7003  | 88 lbf MD<br>63 lbf DD  | 110 lbf MD<br>79 lbf DD  | 90 lbf MD<br>70 lbf DD   | 113 lbf MD<br>87 lbf DD  | 110 lbf MD<br>84 lbf DD  | 138 lbf MD<br>105 lbf DD |
| 1" TENSILE ELONGATION @<br>BREAK % (FILM BREAK) | ASTM D7003  | 550 MD<br>550 DD  | 750 MD<br>750 DD         | 550 MD<br>550 DD         | 750 MD<br>750 DD         | 550 MD<br>550 DD         | 750 MD<br>750 DD         |
| 1" TENSILE ELONGATION @<br>PEAK % (SCRIM BREAK) | ASTM D7003  | 20 MD<br>20 DD  | 33 MD<br>33 DD           | 20 MD<br>20 DD           | 30 MD<br>31 DD           | 20 MD<br>20 DD           | 36 MD<br>36 DD           |
| TONGUE TEAR STRENGTH                            | ASTM D5884  | 75 lbf MD<br>75 lbf DD  | 97 lbf MD<br>90 lbf DD   | 75 lbf MD<br>75 lbf DD   | 114 lbf MD<br>107 lbf DD | 100 lbf MD<br>100 lbf DD | 125 lbf MD<br>127 lbf DD |
| GRAB TENSILE                                    | ASTM D7004  | 180 lbf MD<br>180 lbf DD  | 218 lbf MD<br>210 lbf DD | 180 lbf MD<br>180 lbf DD | 295 lbf MD<br>294 lbf DD | 220 lbf MD<br>220 lbf DD | 341 lbf MD<br>337 lbf DD |
| TRAPEZOID TEAR                                  | ASTM D4533  | 120 lbf MD<br>120 lbf DD  | 146 lbf MD<br>141 lbf DD | 130 lbf MD<br>130 lbf DD | 189 lbf MD<br>172 lbf DD | 160 lbf MD<br>160 lbf DD | 193 lbf MD<br>191 lbf DD |
| DIMENSIONAL STABILITY                           | ASTM D1204  | <1  | <0.5                     | <1                       | <0.5                     | <1                       | <0.5                     |
| PUNCTURE RESISTANCE                             | ASTM D4833  | 50 lbf  | 64 lbf                   | 65 lbf                   | 83 lbf                   | 80 lbf                   | 99 lbf                   |
| MAXIMUM USE TEMPERATURE                         |             | 180°F   | 180°F                    | 180°F                    | 180°F                    | 180°F                    | 180°F                    |
| MINIMUM USE TEMPERATURE                         |             | -70°F   | -70°F                    | -70°F                    | -70°F                    | -70°F                    | -70°F                    |

MD = Machine Direction  
DD = Diagonal Directions



Note: Minimum Roll Averages are set to take into account product variability in addition to testing variability between laboratories.

\*Dimensional Stability Maximum Value

\*\*DURA-SKRIM J30BB, J36BB and J45BB are a four layer reinforced laminate. The outer layers consist of a high strength polyethylene film manufactured using virgin grade resins and stabilizers for UV resistance in exposed applications.

DURA-SKRIM J30BB, J36BB and J45BB are reinforced with a 1300 denier tri-directional scrim reinforcement.

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. NO WARRANTIES ARE MADE AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage.



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P.O. Box 5107 • Sioux Falls, SD 57117-5107  
Ph: (605) 335-0174 • Fx: (605) 331-0333  
Toll Free: 800-635-3456



ISO 9001:2000  
CERTIFIED MANAGEMENT SYSTEM

www.ravengeo.com

6/09 EFD 1126

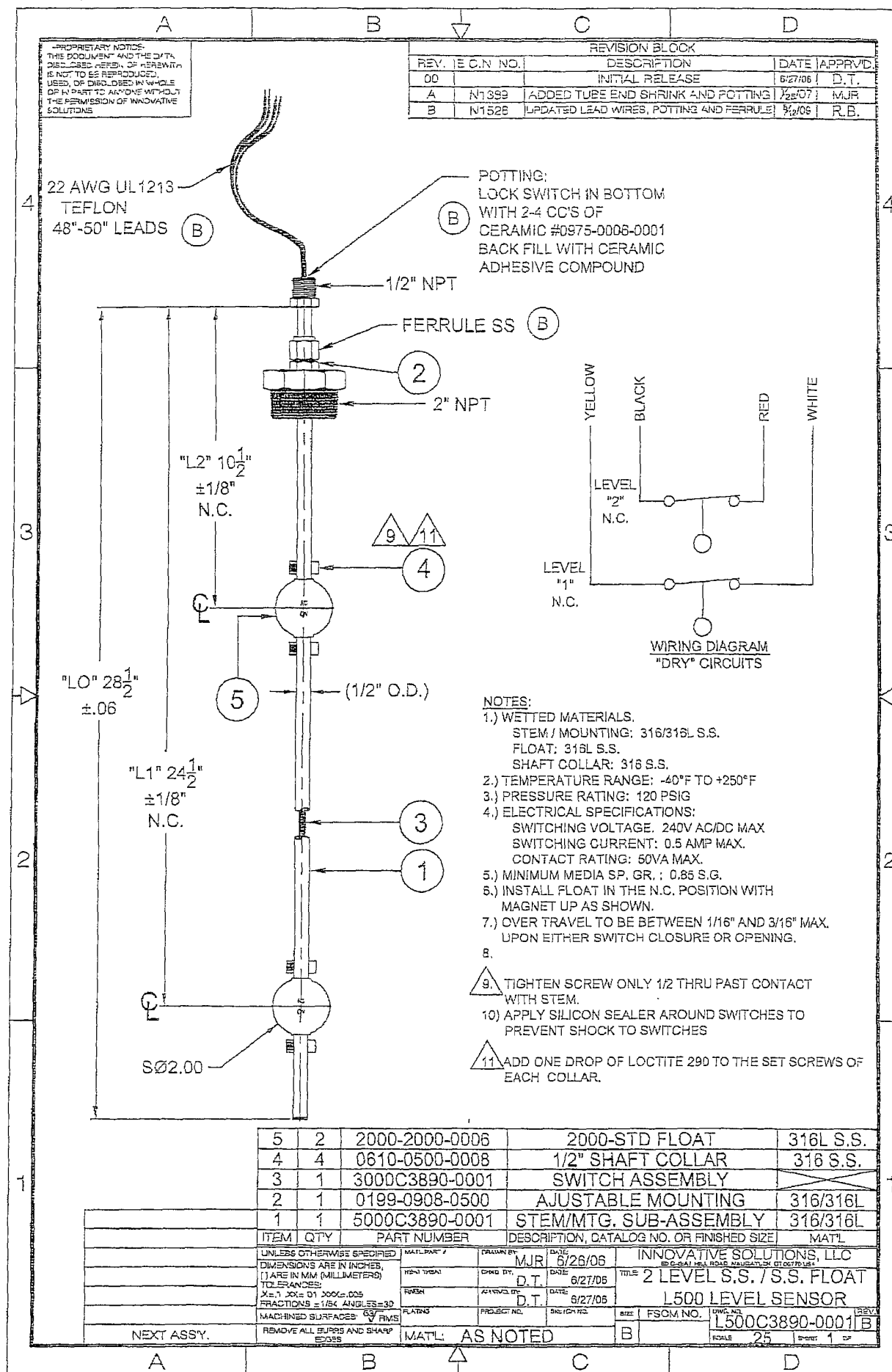


Exhibit 2.4