SUBMITTAL REVIEW

CLIENT NAME: Vails Gate Fire Department

PROJECT TITLE: Vails Gate FD - New Firehouse

SUBMITTAL No.: 221006-5 **H2M PROJECT No.:** VGFD2001

SUBMITTAL NAME: Oil Interceptor PD

SUBMITTAL REVIEW

REVIEW IS FOR GENERAL COMPLIANCE WITH CONTRACT DOCUMENTS.
NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS
OF DIMENSIONS OR DETAILS

- [x] NO EXCEPTIONS TAKEN
- [ ] SUBMIT SPECIFIED ITEM
- [ ] MAKE CORRECTIONS NOTED (RESUBMISSION NOT REQUIRED)
- [ ] NO ACTION TAKEN (REVIEW IS THE RESPONSIBILITY OF ANOTHER PARTY)
- [ ] REVISE & RESUBMIT
- [ ] NO ACTION TAKEN (THIS SUBMITTAL IS NOT REQUIRED BY THE CONTRACT)
- [ ] REJECTED - SEE REMARKS
- [ ] RECEIVED FOR RECORD

Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating their work with that of all other trades; and performing the work in a safe and satisfactory manner.

H2M architects + engineers

Date: 04/10/2023 By: KJE

Rev.: 2020-05-20

Comments:

CONTRACTOR'S COMPANY NAME
ADDRESS

SUBMISSION TRANSMITTAL FORM
CLIENT NAME: Vails Gate Fire District
PROJECT TITLE: VGFD2001-New Firehouse

H2M PROJECT NO.: VGFD2001

Product, Item, or System Submitted:	Oil Interceptor OS-1 Product Data		
Submission Date:	4/4/2023	Submission Log No.:	221006-5
Specification Section:	221006	Paragraph Reference:	1.04.B
Contract Drawing Reference(s):			
Manufacturer's Name:			
Manufacturer's Mailing Address:			
Manufacturer's Contact Information:	*Name*	( ) *Tel. no.*	*Email*
Supplier's Name:	Joseph Lombardo Plumbing & Heating		
Supplier's Mailing Address:			
Supplier's Contact Information:	*Name*	( ) *Tel. no.*	*Email*
This item is a substitution for the specified item:		☑ No	☐ Yes
KEY CONSTRUCTION SERVICES, LLC **Project No: VGFD2001** Reviewed for General Acceptance Only. This review does not relieve the Subcontractors or Suppliers of responsibility for making the work conform to the requirements of the contract. The Subcontractor and Suppliers are responsible for all dimensions, correct fabrication and accurate fit with the work of other trades. **SUBJECT TO ARCHITECT AND OR ENGINEER APPROVAL** **Signed** *Joseph Manfredi*(PM) **Date: 4/4/2023** Contractor's Approval Stamp with Signature & Date		Contractor's Brief Comments or Remarks (attach separate letter as needed): By making this submission, we represent that we have determined and verified all field measurements and dimensions, field construction criteria, site and building constraints in terms of limitations in moving the item into the enclosed space, materials, catalog and model numbers and similar data and that we have checked and coordinated this submission with other work at or adjacent to the installed location in accordance with the requirements contained in the Contract Documents.	

END OF SECTION 013300

Joe Lombardo

Plumbing & Heating of Rockland, Inc.

321 Spook Rock Road
Suffern, NY 10901
Ph. 845-357-6537 Fx 845-357-8529
E: info@josephlombardo.com
Website: www.josephlombardo.com

Rockland Cty. Plumbing #1000 *Rockland Cty. Cooling # 1468*
Westchester Cty. Plumbing #460 *New Jersey State Plumbing #12702*

LETTER OF TRANSMITTAL

DATE: 4-3-23	JOB NO.
ATTENTION: Joe Manfredi	
RE: Vails Gate Firehouse	

TO: Key Construction
4246 Albany Post Rd. Suite 1
Hyde Park, NY 12538

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐ _____

EMAIL	DATE	NO.	DESCRIPTION
1	4-3-23	221006	PLUMBING OIL INTERCEPTOR OS-1

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ No Exceptions Taken ☐ Resubmit _____ copies for review
☐ For your use ☐ Make Corrections Noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Rejected ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ 20___ ☐ PRINTS RETURNED AFTER LOAN TO US

COPY TO: Joe Manfredi

SIGNED: Ronald J. Lombardo

Petroleum, Chemical and Water Storage Tanks | Fleet and Retail Dispensing Equipment | Fuel Supply Systems
Oil/Water Separators and Filtration Systems | Storm Water Detention and Rainwater Harvesting Systems

Submittal

TO
Karen Joseph Lombardo Plumbing & Heating 321 Spook Rock Road Suite A-109 Suffern, NY 10901 **phone:** (845) 357-6537 **fax:** **e-mail:** karen@josephlombardo.com

PROJECT
Vails Gate Fire Department OS-1

SALESPERSON	DATE	REVISION
Brian Moog	Mar 31, 2023	-

We are pleased to provide this submittal for your use and approval. Please review, note any changes, sign, and return to release for fabrication.

Release and fabrication of equipment will not begin until approved submittals are returned. Lead-times begin when approved submittals are returned.

For questions, or if additional information is required contact:

Brian Moog
908-255-4351
brian@westendsupply.com

(908) 255-4351
westendsupply.com

Petroleum, Chemical and Water Storage Tanks | Fleet and Retail Dispensing Equipment | Fuel Supply Systems
Oil/Water Separators and Filtration Systems | Storm Water Detention and Rainwater Harvesting Systems

Bill of Materials

TO
Karen Joseph Lombardo Plumbing & Heating 321 Spook Rock Road Suite A-109 Suffern, NY 10901 phone: (845) 357-6537 fax: e-mail: karen@josephlombardo.com

PROJECT
Vails Gate Fire Department OS-1

SALESPERSON	DATE	REVISION
Brian Moog	Mar 31, 2023	-

QTY	ITEM NUMBER	DESCRIPTION
1		Model HTC 350 Gallon HighGuard Oil/Water Separator Application: Underground Material: Mild Carbon Steel Diameter: 3'6" Length: 6'0" Steel Thickness Per UL 58 Standard. Flow Rate: 35 GPM Inlet: 4" FLG 150# RFSO, Outlet: 4" FLG 150# RFSO Oil Pump Out Mount: 4" FNPT Vent Size: 2" FNPT Exterior Coating: Highguard (1) HighGuard Packet w/10-yr warranty/installation/maint instructions (1) Exterior Paint Touch Up Kit (1) Interior Coating - Polyurethane Lining - 350 Gallon SP-10 Blast Chemline 4200 (1) Interior Paint Touch Up Kit (1) Round Manway - 30" Dia. w/ 38" High Bolt On Extension

* Customer is Responsible for Confirming Elevations and/or Burial Depth prior to Production*
There will be an adder per foot of Manway Bolt-On Extension beyond 38"

(1) Parallel Corrugated Plate Coalescer, Corella PVC Plate (Installed)
- (3" Plate Spacing) OAD: 27" W x 27" H x 12" D (7) Corella PVC Plates 26" x 12"

(1) Removable Petroscreen Cartridge Coalescer (Installed)
OAD: 27" W x 27" H x 6" D (3) Petroscreen Coalescing Media Packs: 27" H x 8-3/4" W x 6" Thick

(1) Pull Rod For Petro Screen Cartridge Removal
(1) Pump Out Pipe - 4" MNPT x FNPT
(1) Level Sensor Pipe - 2" MNPT x FNPT
(1) Leak Detection Pipe - 2" MNPT x FPNT

(1) Alarm Panel
- High Oil Level
- Leak
(1) High Oil Float Interface Sensor
(1) Leak Sensor (Liquid Only - OWS)
(1) Cap

(1) Rectangular Grade Level Manway - 54" x 48"

(2) Polyester Holddown Straps - 42" w/Galv. TB, wire rope, 3 clamps

(2) Concrete Deadman (CDA-15)

(1) OWS ID Plate

GENERAL SPECIFICATIONS

NO. REQ'D: (1)
CAPACITY: 350 GALLONS
TYPE: HTC, HIGHGUARD, DOUBLE WALL
MATERIAL: MILD CARBON STEEL
FLOW RATE: 35 GPM
GAUGE: BASED ON 60" BURIAL

	INNER	OUTER
SHELL–	7 GA.	10 GA.
HEADS–	7 GA.	10 GA.

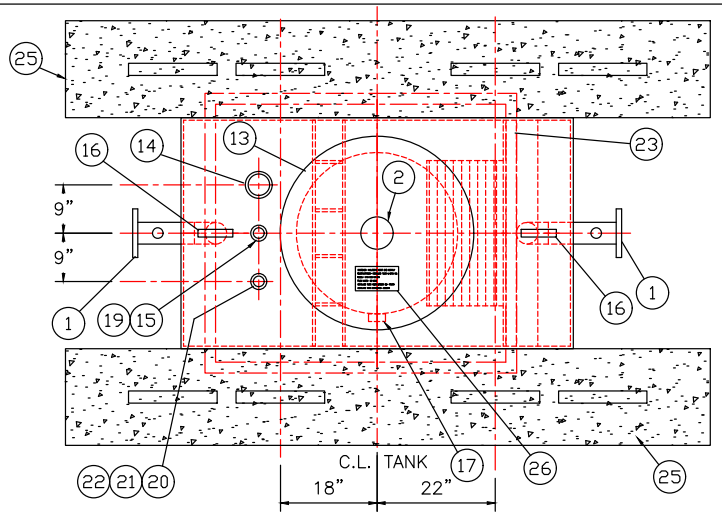
SURFACE PREP:
SSPC NO.6 BLAST ALL EXTERIOR SURFACES
SSPC NO.10 BLAST ALL INTERIOR SURFACES

COATING:	MATERIAL	THICKNESS
EXTERIOR–	HIGHGUARD	(75 MILS)
INTERIOR–	CHEMLINE 4200 PW	(15 MILS)

CONSTRUCTION :
LAP FIT & WELD ALL EXTERIOR SEAMS
OPERATING PRESSURE : ATMOSPHERIC

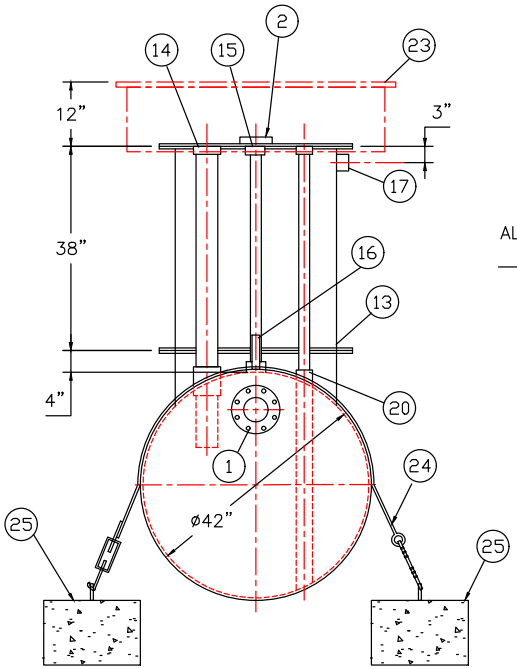
Fabrication Will Not Begin Until approved Drawing Is Received By Highland Tank

APPROVED:
Date:

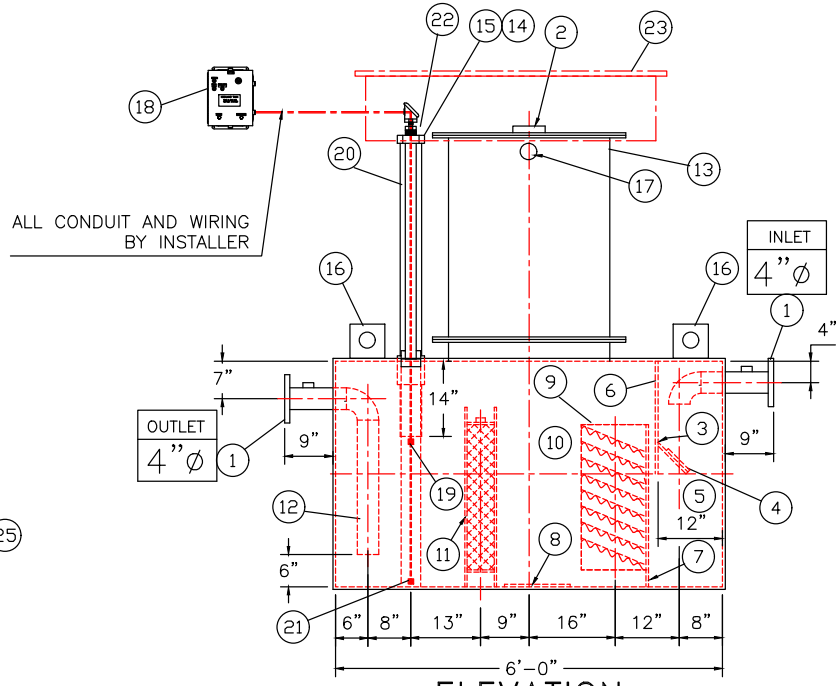


C.L. HOLD DOWN STRAPS (2) REQUIRED

PLAN



END VIEW



ELEVATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE + OR – 1'

REFERENCE SHEET–2 FOR RECTANGULAR GRADE MANWAY DETAILS

PROVIDED EQUIPMENT

1. 150# R.F.S.O. FLANGE W/ 2" FNPT FOR VENT
2. 4"ø FNPT FOR GAUGE WITH PLUG
3. VELOCITY HEAD DIFFUSION BAFFLE
4. WEAR PLATE
5. SEDIMENT CHAMBER
6. UNDERFLOW BAFFLE (REMOVABLE)
7. SLUDGE BAFFLE
8. STRIKER PLATES
9. PARALLEL CORRUGATED PLATE COALESCER. CORELLA PVC PLATES (3" PLATE SPACING)
10. OIL/WATER SEPARATOR CHAMBER
11. PETROSCREEN COALESCER MATERIAL INSTALLED W/ PULL ROD SHIPPED LOOSE–6" THICK
12. STEEL OUTLET DOWNCOMER
13. 30"ø MANWAY BOLT ON EXTENSION SHIPPED LOOSE
14. 4"ø FNPT FOR OIL PUMP–OUT WITH INTERNAL PVC PIPE INSTALLED & RISER PIPE SHIPPED LOOSE
15. 2"ø FNPT FOR LEVEL SENSOR WITH RISER PIPE SHIPPED LOOSE
16. LIFTING LUG
17. 2"ø FNPT FOR VENT
18. CC–HT–A1–LD ALARM PANEL 120V/60HZ/1PH
19. HTSF–1 FLOAT INTERFACE SENSOR W/ NEMA 4 CAP
20. 2"ø FNPT FOR LEAK SENSOR WITH RISER PIPE SHIPPED LOOSE
21. HTLP–1.5 LIQUID ONLY LEAK SENSOR W/ 15' CABLE
22. HTSC–2B NEMA 4 CAP FOR LEAK SENSOR
23. R–GLM–5448/2 RECTANGULAR H–20 RATED GRADE LEVEL MANWAY
24. POLYESTER HOLD DOWN STRAP W/ GALVANIZED TURNBUCKLE, WIRE ROPE AND CLAMPS
25. CDA–15 CONCRETE DEADMAN FOR ANCHORING (2) REQ.
26. STANDARD OWS ID PLATE (LASER MARKED 304 STAINLESS STEEL) ATTACHED BY ADHESIVE STRIPS

ANCILLARY PROVIDED EQUIPMENT

(2) 30" FIBREFLEX MANWAY GASKETS
(2) SETS OF NUTS/BOLTS/WASHERS FOR 30" MANWAY

NOTES

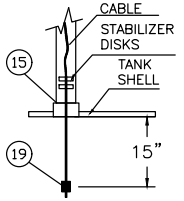
1. POLYURETHANE HIGHGUARD TANK IS NOT APPROVED FOR THE STORAGE OF HEATED PRODUCTS
2. ALL VENT PIPING BY INSTALLER
3. 15000 VOLT SPARK TEST PROVIDED AT FACTORY

26

CUSTOMER– WALTER'S WEST END SUPPLY
MANUFACTURER– HIGHLAND TANK & MFG. CO.
MODEL– HTC–350–HG–DW
FLOW RATE– 35 GPM
HIGHLAND TANK WORK ORDER NO– 98199
HIGHLAND TANK DRAWINGS– 123594

ID PLATE DETAIL
LASER MARKED 304 SS
NTS

TAG SIZE AS NEEDED APPROX SIZE OF 6"x8"



INTERFACE SENSOR FLOAT POSITION
HTSF 2A–57E/15

REVISIONS

Highland Tank

U.S. Patent #4,722,800 Canadian Patent # 1,296,263

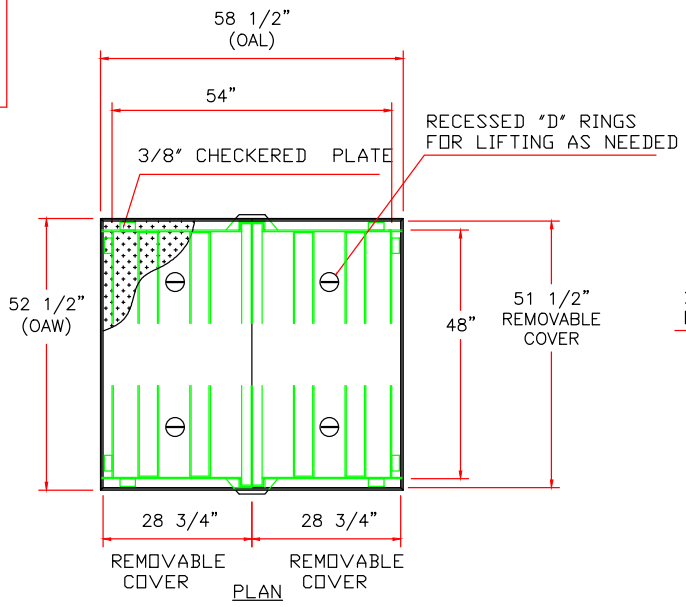
350 GALLON OIL WATER SEPARATOR
HTC, HIGHGUARD, DOUBLE WALL

CUSTOMER: WALTER'S WEST END SUPPLY INC
VAILS GATE FD
PROJECT: NEW FIRE STATION PHASE II
WINDSOR, NY

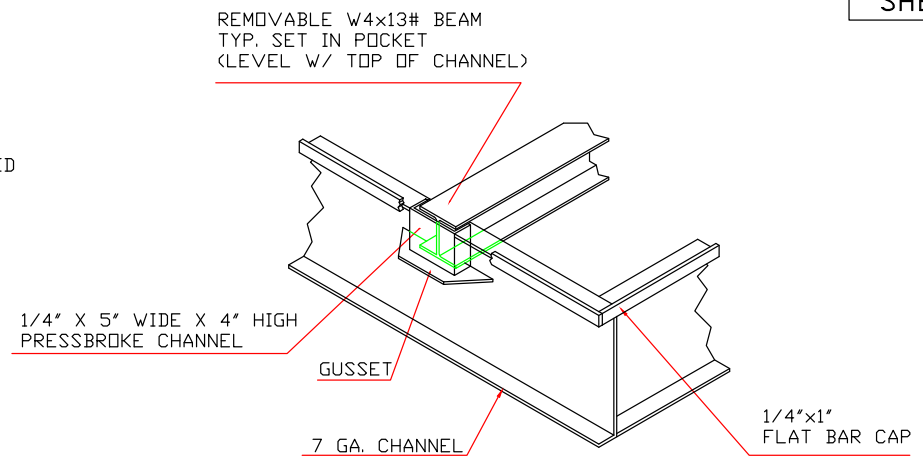
QUOTE NO: 526444

CHK'D BY:

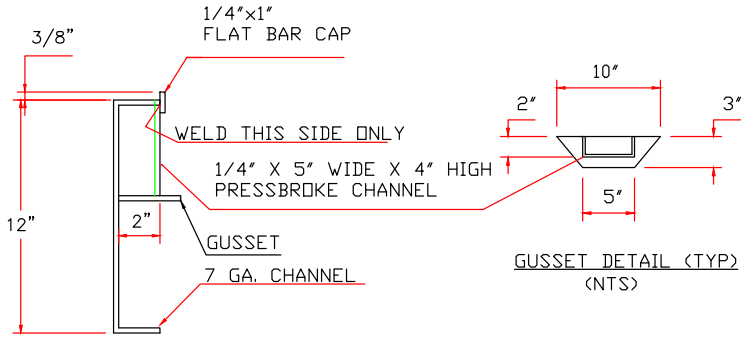
SCALE:	DATE:	DWG. BY:	DWG. NO.:
1/2"=1'–0"	3–28–23	REM	123594–1



PLAN

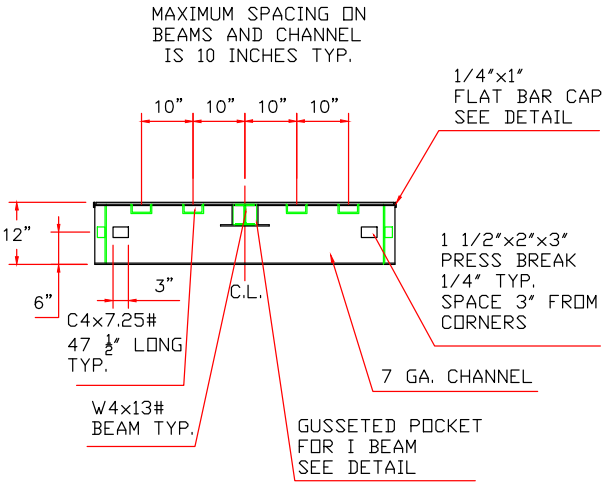


POCKET DETAIL (TYP)
(NTS)



END CAP DETAIL
(NTS)

GUSSET DETAIL (TYP)
(NTS)



ELEVATION

Fabrication Will Not Begin Until approved Drawing Is Received By Highland Tank

APPROVED:

Date:

REFERENCE SHEET-1 FOR DWS GENERAL ARRANGEMENT

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE + OR - 1"

Highland Tank®

RECTANGULAR H-20 RATED GRADE LEVEL
MANWAY R-GLM-5448/2

CUSTOMER: WALTER'S WEST END SUPPLY INC

PROJECT: VAILS GATE FD
NEW FIRE STATION PHASE II
WINDSOR, NY

QUOTE NO: 526444

CHK'D BY:

SCALE:	DATE:	DWG. BY:	DWG. NO:
1/2" = 12"	3-28-23	REM	123594-2

Highland Tank | count on our products. trust in our people.

oil/water separation

cylindrical underground

HT-2040

PRODUCT DETAILS

Highland Tank cylindrical underground oil/water separators are typically installed in industrial areas and receive oil waste- water generated during processes such as bulk petroleum storage and handling, aircraft and vehicle fueling, maintenance, washing and environmental remediation of petroleum contaminated sites.

The effluent from oil/water separators is typically discharged to either a storm or sanitary sewer system.

Our high-efficiency oil/water separators are recommended for a wide range of industrial applications, such as:

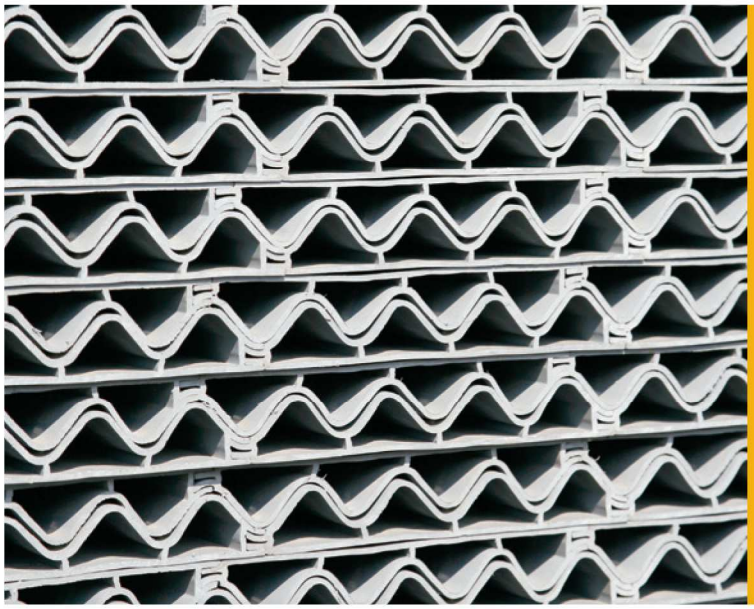
- Airports & Aircraft Services
- Electric Utilities & Power Plants
- Environmental Remediation
- Industrial Facilities
- Military & Government Facilities
- Municipalities
- Petroleum Production & Marketing Facilities
- Railroad Yards
- Transportation Companies

They are also located in vehicle service areas associated with each of these facilities:

- Fueling Facilities
- Repair & Maintenance Shops
- Wash Areas

Highland oil/water separators set the standard for reliability. Our separators are highly efficient - treating wastewater under a wide range of conditions.

Unlike other oil/water separators, they are easy to install, operate and maintain.



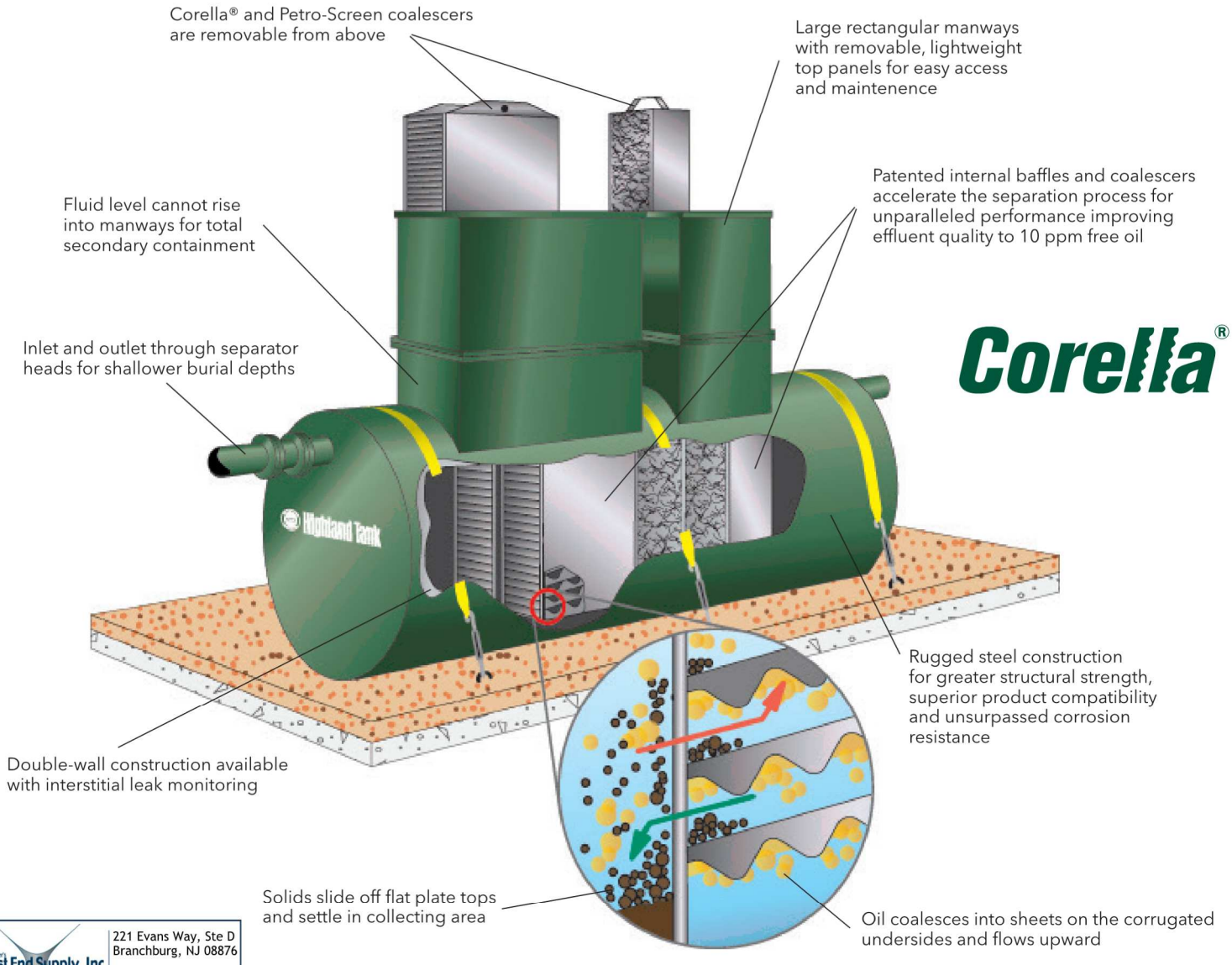
Corella® The Newest Advancement in Oil/Water Separation Technology

The Corella® Coalescer is a removable, inclined parallel, flat/corrugated plate coalescer that enhances separation of both oil and solids from all strata of the wastewater stream. It is individually engineered to specific application and job-site requirements to maximize utility.

◀ Patented **Corella® technology**

Corella® | cleaner. safer. smarter.

UL-2215 LISTED



Highland Tank Oil/Water Separators are listed and approved under one or more of the following patents and approvals:

Underwriters' Laboratories, Inc. UL-SU2215

U.S. Patents - 4,722,800; 5,520,825 & 6,605,224

Canadian Patents - 1,325,179; 1,296,263 & 2,389,065

City of New York, Board of Standards and Appeals under Calendar Number 1215-88-SA

Massachusetts Board of State Examiners of Plumber and Gas Fitters

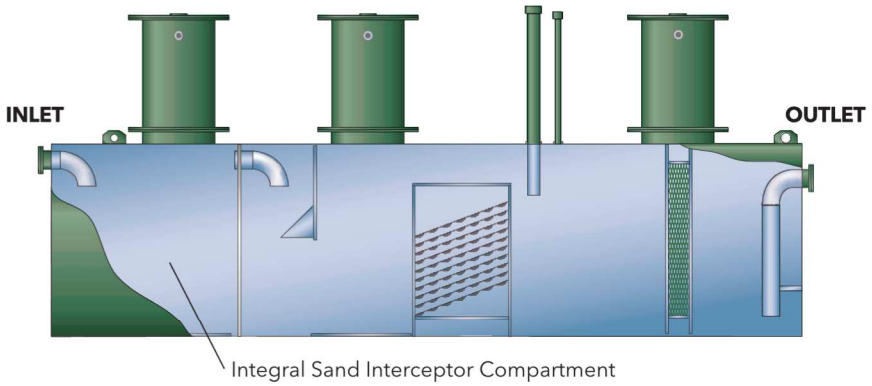
Approval Code P1-0594-25

Evaluated to DIN Parts 4 & 5, DIN 38-409 Part 18

pre-engineered design options

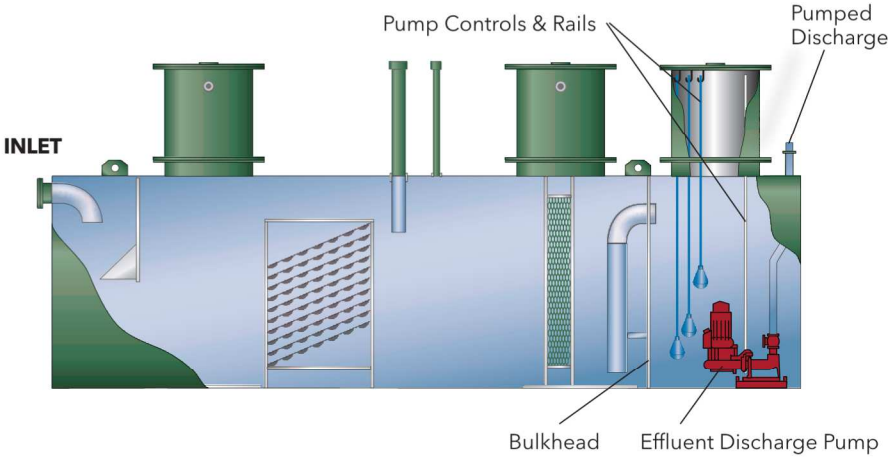
Series - G Oil/Water Separators

Feature an integral sand interceptor compartment to permit sand and gravel to settle out before the wastewater enters the separation chamber.



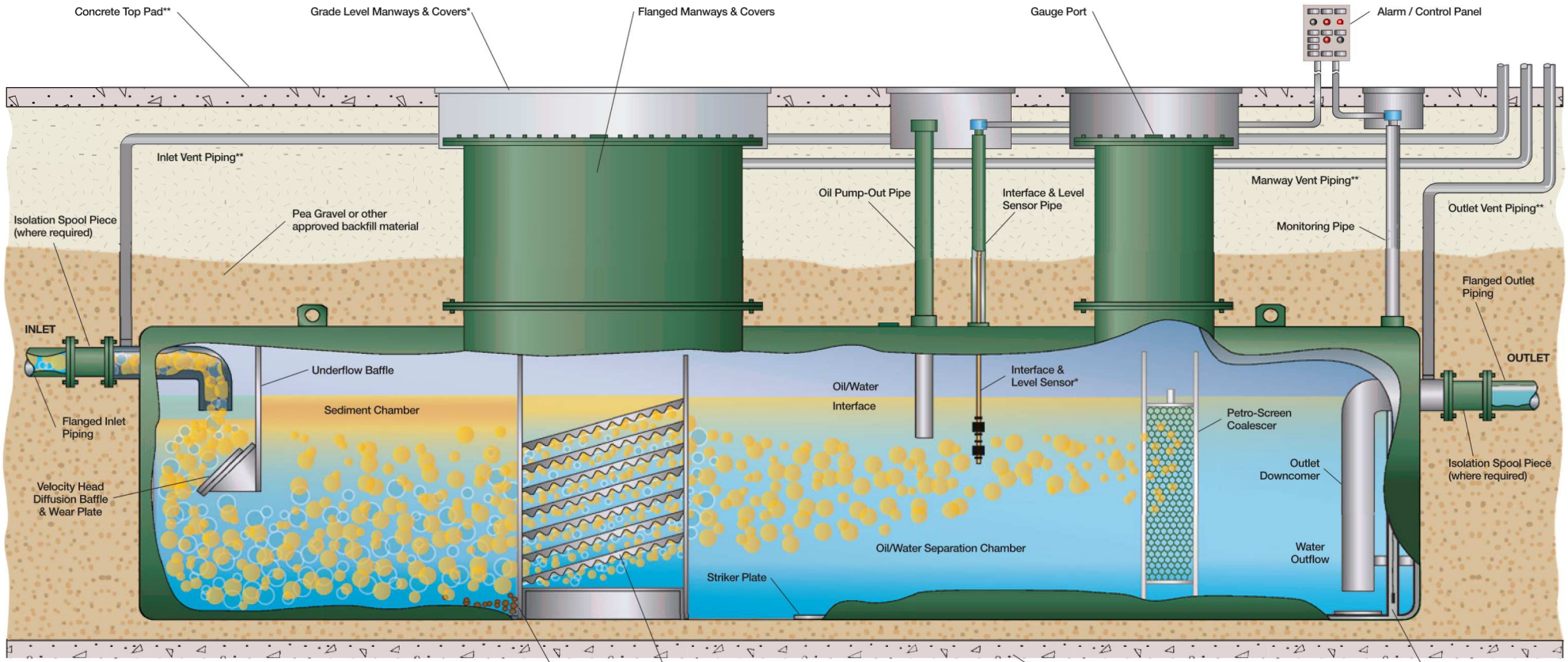
Series - J Oil/Water Separators

Feature an integral effluent pump-out compartment with level controls to operate a pump at prescribed levels. The pumped effluent can then be routed through Highland's Advanced Hydrocarbon Filtration System to further improve performance.



cylindrical oil/water separator

DISTRIBUTOR
Walter's West End Supply, Inc
221 Evans Way, Ste D
Branchburg, NJ 08876
tel 908-255-4351
westendsupply.com



Model HTC Oil/Water Separator with EZ Access option shown.

*Optional equipment available from Highland Tank.
**Installer supplied equipment

How It Works

Highland Tank's patented oil/water separators are stationary wastewater treatment tanks filled with water.

They contain specially designed internal baffles and coalescers to accelerate the separation process.

The tank is designed to allow convenient access for inspection and maintenance from above. Inlet flow is directed against the velocity head diffusion baffle to reduce flow turbulence and to distribute the flow evenly over the separator's cross-sectional area.

In the sediment chamber, heavy solids settle out and concentrated oil rises to the surface. The oily water then passes through the Corella® Coalescer, an inclined arrangement of stacked, parallel, flat and corrugated plates.

The corrugated underside of the Corella® plates causes the oil to coalesce into sheets. The oil globules then rise to the surface of the separation chamber, where the separated oil accumulates.

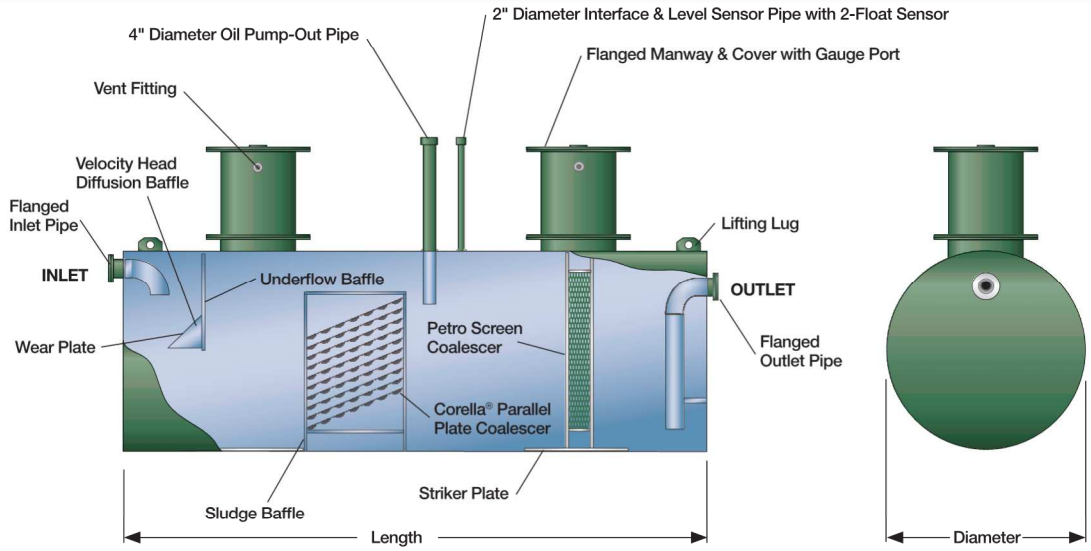
Any remaining solids sink to the top of the plates and slide off the plates to the solids collection area.

The effluent flows down and toward the outlet and is discharged by gravity displacement. A Petro-Screen polypropylene impingement coalescer (an encased bundle of layered oil-attracting fibers) is used to intercept droplets of oil that are too minute to be removed by the Corella® Coalescer.

Electronic oil level controls sound an alarm at high oil levels so that waste oil can be removed from the separator. Double-wall separators are monitored with electronic leak detection systems for the interstitial space.

cylindrical separator sizing guide

HT-2040



Model HT or HTC	Flow Rate Gal/Min	Total Volume Gallons	Recommended Oil Pump-Out Gallons	Dimensions Diameter	Dimensions Length	Inlet & Outlet Diameter
350	35	350	70	3'-6"	6'-0"	4"
550	55	550	110	3'-6"	7'-9"	4"
1,000	100	1,000	200	4'-0"	10'-9"	6"
2,000	200	2,000	400	5'-4"	12'-0"	6"
3,000	300	3,000	600	5'-4"	18'-0"	8"
4,000	400	4,000	800	5'-4"	24'-0"	8"
5,000	500	5,000	1,000	6'-0"	23'-10"	8"
6,000	600	6,000	1,200	6'-0"	28'-8"	10"
7,000	700	7,000	1,400	7'-0"	24'-4"	10"
8,000	800	8,000	1,600	7'-0"	28'-0"	10"
9,000	900	9,000	1,800	8'-0"	24'-0"	12"
10,000	1,000	10,000	2,000	8'-0"	26'-8"	12"
12,000	1,200	12,000	,400	8'-0"	32'-0"	12"
15,000	1,500	15,000	3,000	10'-0"	25'-6"	14"
20,000	2,000	20,000	4,000	10'-6"	31'-0"	16"
25,000	2,500	25,000	5,000	10'-6"	38'-9"	18"
30,000	3,000	30,000	6,000	10'-6"	46'-6"	20"
40,000	4,000	40,000	8,000	12'-0"	47'-3"	24"
50,000	5,000	50,000	10,000	12'-0"	59'-6"	24"
60,000	6,000	60,000	12,000	13'-0"	60'-6"	24"

Plate spacing and orientation may vary depending on site conditions. Custom sizing is available. Consult Highland Tank for Series G & J sizing information.

Highland Tank®
Stoystown, PA

DISTRIBUTOR
Walter's West End Supply, Inc
221 Evans Way, Ste D
Branchburg, NJ 08876
tel 908-255-4351
westendsupply.com

PROUDLY MADE IN AMERICA

Highland Tank | count on our products. trust in our people.

options & accessories

grade level manways

HT-1111

PRODUCT DETAILS

Highland Tank fabricates round and rectangular Grade Level Manways (GLM) in a variety of sizes to meet most job-site requirements with the AASHTO HS20-44 rating upon request.

Round GLMs are available in eight (8) standard sizes ranging from 12" to 48" diameter. Custom diameters and depths are available upon request. Rectangular GLMs are based on a modular design and custom fabricated to site-specific requirements.

Designed around a 1 to 5 door configuration, rectangular GLMs are available in widths from 48" to 72" and lengths from 48" to 150" in 6" increments. For example, a 48" by 90" rectangular GLM would have 3 doors or lids.

Each manway is constructed using A36 steel plate from 10 ga to 1/4" thick. Standard manways are fabricated with a 12" skirt depth. Each GLM is fitted with 1.5" x 2" x 3" steel concrete anchors seal welded to the manway skirt to ensure a secure installation.

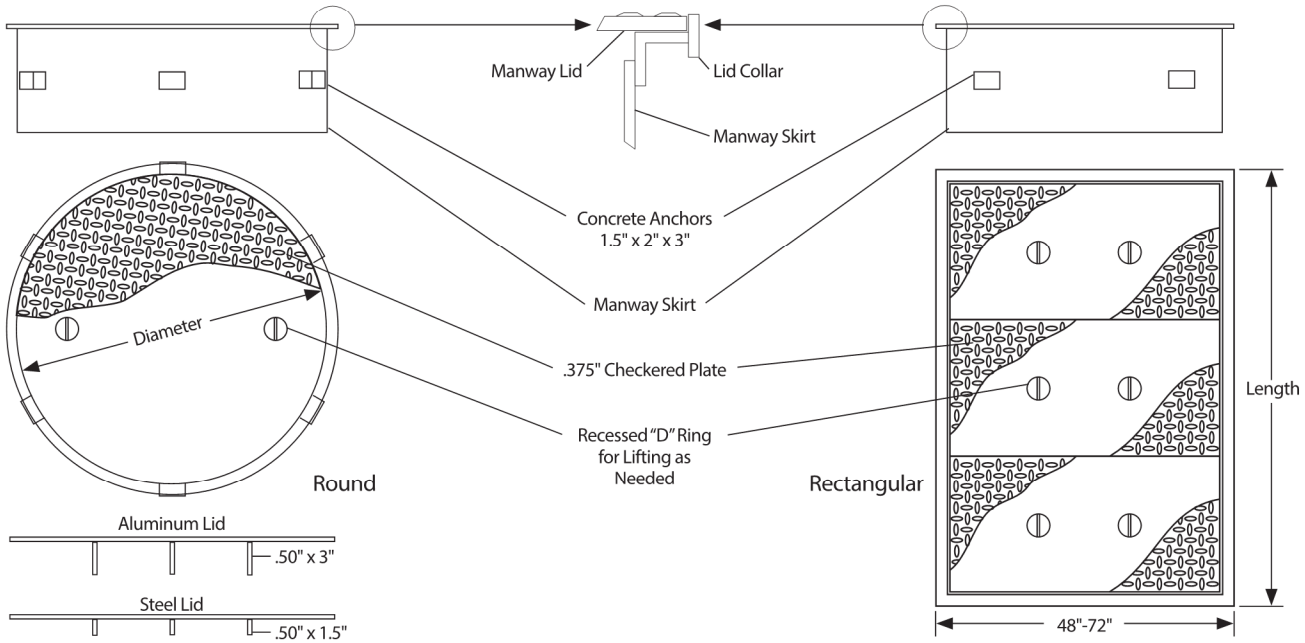
Standard manway lids are constructed of 3/8" reinforced checkered steel plate. Optional 3/8" checkered plate reinforced aluminum lids are available.

Steel components receive a brush blast and are coated with black enamel paint. Optional polyurethane or epoxy coatings are available.

Grade Level Manways

HT-1111

General Arrangement



Round

Model Number	Nominal Manway Diameters: Manway Skirt I.D. Inches	Manway Lid Collar I.D. Inches	Manway Lid O.D. Inches	Skirt Thickness
GLM-12	12"	14.5"	14"	10ga
GLM-18	18"	20.5"	20"	7ga
GLM-24	24"	26.5"	26"	7ga
GLM-30	30"	32.5"	32"	7ga
GLM-32	32"	34.5"	34"	7ga
GLM-36	36"	38.5"	38"	7ga
GLM-42	42"	44.5"	44"	.25"
GLM-48	48"	50.5"	50"	.25"

Rectangular

Model	Number of Doors	Maximum Overall Length	Skirt Thickness
R-GLM-48	1	48	.25"
R-GLM-60	2	60	.25"
R-GLM-90	3	90	.25"
R-GLM-120	4	120	.25"
R-GLM-150	5	150	.25"

Warranty

The subject manway is warranted by Highland Tank & Mfg. Co. to be free from defects in manufacturing, workmanship and materials. Highland Tank will repair or replace, at its sole discretion F.O.B. factory, within a period of one year after date of shipment, any item of our manufacture. All other items shall be warranted by their respective manufacturers. Liability hereunder is limited, as stated above, and does not include labor, installation costs, indirect or consequential damages of any kind. Manways must be returned to the factory and if found to be defective upon examination, will be repaired, replaced or credit will be issued at our option.

Approved Manufacturer

Tank to be manufactured by Highland Tank at one of the following locations: Stoystown, PA, Manheim, PA, Watervliet, NY, or Greensboro, NC.

Highland Tank

PROUDLYMADEINAMERICA

Highland Tank | count on our products. trust in our people.

deadman anchoring system

Highland Tank's Deadman Anchoring System is designed to secure tanks, separators and interceptors in underground installations.

Polyester or steel Hold-Down Straps and Concrete Deadman Anchors (CDA) are used to anchor underground vessels and counteract their natural buoyant forces.

economical and effective anchoring

HT-1113

PRODUCT DETAILS

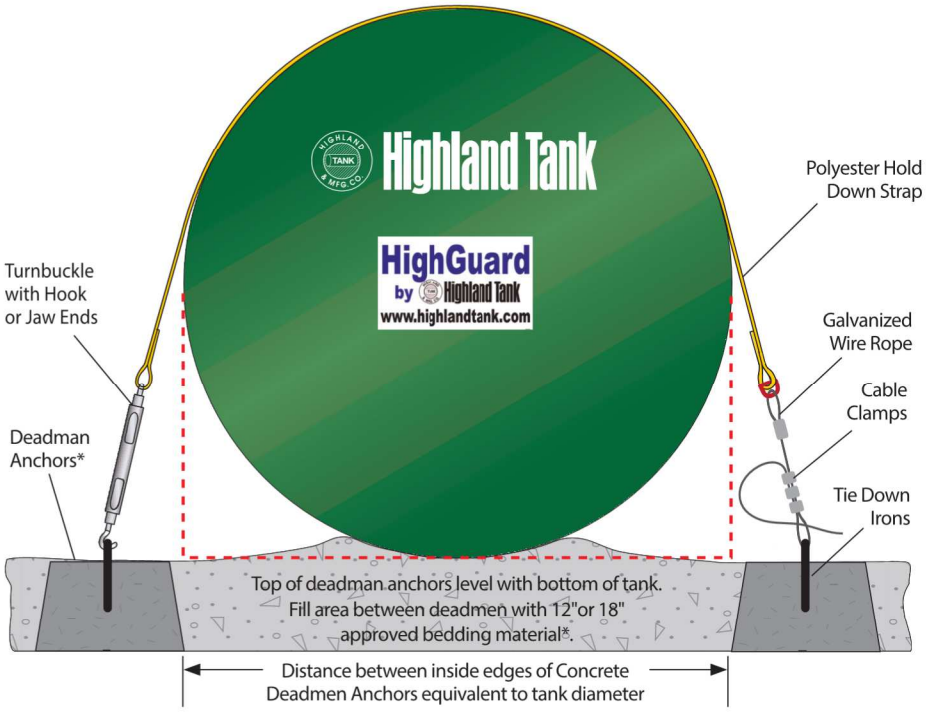
Highland Tank's Polyester Hold-Down Straps are intended for underground use only. They are made from 100% polyester webbing material with a large reinforced loop at each end for connecting to the CDA hardware. Wire rope and cable clamps connect the strap to the CDA on one side of the vessel. A hook-to-hook or jaw-to-jaw turnbuckle is employed for attaching the strap to the CDA on the other side of the vessel. Polyester straps are available for vessels up to 10'-6" in diameter.

Highland Tank's Steel Hold-Down Straps are available for all vessels from 3'-2" to 13'-0" in diameter. They are available in two designs to accommodate specific installation requirements; standard and deadman with an option to make them safety style.

Fabricated from mild-carbon steel they are coated for lasting protection underground.

Stainless and galvanized steel are also available. The steel strap designs each have their own tensioning system using adjustable turnbuckles.

Deadman straps are adjusted using supplied turnbuckles. Neoprene rubber liners for electrical isolation and tank protection are supplied with all steel hold-down straps.

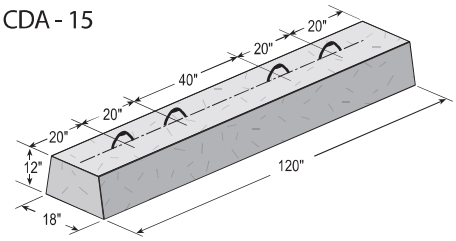


Highland Tank's preferred hold-down method combines our CDAs with Polyester straps to provide a faster, convenient installation. No strap liners are required because there are no metallic components in the strap system that can make contact with the vessel. Included here are details about both system components.

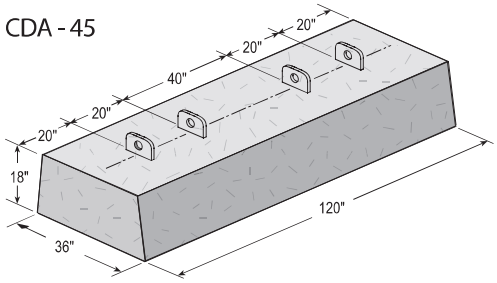
CDA Specifications

- Utilize a 4,000 psi concrete mix reinforced with #4 rebar
- Dimensions:
  CDA-15: 120" L, 18" W, 12" H
  CDA-45: 120" L, 36" W, 18" H
- Volume:
  CDA-15: 15 cubic feet (approx.)
  CDA-45: 30 cubic feet (approx.)
- Weight:
  CDA-15: 2,200 pounds (approx.)
  CDA-45: 6,500 pounds (approx.)

CDA - 15

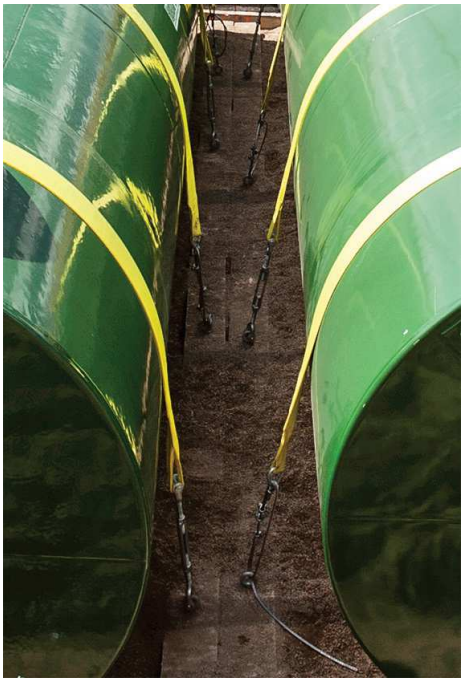


CDA - 45



Notes:
Recommendations assume a 36" burial depth to top of vessel, have only one access sump and are installed exclusively with Highland Polyester Hold-Down Straps.

Deadman Anchors must be installed on both sides and along the full length of the tank. They must be positioned so the edges of the deadmen are aligned outside the tank "shadow;" outside the tank diameter and below the tank bottom.



Polyester Strap Specifications

Tank Diameter	Turn-Buckle Diameter	Strap Length
3'2"	3/4"	73"
4'0"	3/4"	89"
5'4"	1-1/4"	124"
6'0"	1-1/4"	137"
7'0"	1-1/4"	172"
8'0"	1-1/4"	194"
10'0"	1-1/4"	242"
10'6"	1-1/4"	242"

Some vessel installations require the addition of supplemental methods of restraint, like grade-level reinforced concrete pad (see PEI RP 100).

Accuracy and/or correctness of tank installation is the responsibility of the Engineer of Record and the Installer. Other methods are readily available.

Information supplied here is for planning purposes. Hold-down systems should be specified by a licensed professional engineer.

Highland Tank Vessel Information			Required Deadmen & Straps
Gallons	Dia.	Len.	
240	4'-0"	5'-5"	2
300	4'-0"	10'-9"	2
350	4'-0"	10'-9"	2
500	4'-0"	5'-5"	2
550	4'-0"	10'-9"	2
750	4'-0"	10'-9"	2
1,000	4'-0"	10'-9"	2
1,000	5'-4"	6'-0"	2
1,500	5'-4"	9'-0"	2
2,000	5'-4"	12'-0"	2
2,500	5'-4"	15'-0"	2
3,000	5'-4"	18'-0"	2
4,000	5'-4"	24'-0"	2
4,000	6'-0"	19'-0"	4
4,000	8'-0"	10'-8"	2
5,000	6'-0"	23'-10"	4
5,000	8'-0"	13'-4"	2
6,000	6'-0"	28'-8"	6
6,000	8'-0"	16'-0"	2
7,000	7'-0"	24'-4"	2
8,000	8'-0"	21'-4"	4
8,000	10'-0"	14'-0"	2
9,000	8'-0"	24'-0"	2
10,000	8'-0"	26'-8"	6
10,000	10'-0"	17'-0"	4
12,000	8'-0"	32'-0"	6
12,000	10'-0"	20'-6"	4
15,000	8'-0"	40'-0"	8
15,000	10'-0"	25'-6"	4
20,000	10'-0"	34'-0"	6
20,000	10'-6"	31'-0"	6
25,000	10'-6"	38'-9"	8
30,000	10'-6"	46'-0"	10
*40,000	12'-0"	47'-6"	10
*50,000	12'-0"	59'-6"	12
*60,000	13'-0"	60'-6"	12

*Polyester straps are not available for these sizes. Use one of the steel hold-down designs. Steel hold-down straps are available for all vessel sizes. Refer to HT-1063 for details. For all vessels 8'-0" in diameter and larger using steel hold-down straps, Highland Tank will supply one of the safety style designs.

Highland Tank

PROUDLY MADE IN AMERICA

Highland Tank | count on our products. trust in our people.

alarm/control panels & sensors

HT-1106

PRODUCT DETAILS

Alarm & Control Panels
To help provide for efficient operation and maintenance of your storage tank or process vessel, Highland Tank offers an extensive line of standard and customized alarm and control panels coupled with an array of sensors to monitor and manage even the most complex installations.

Liquid products can be monitored at any desired level with sensors and alarms alerting operators to condition changes. When employed in an oil/water separator or oil/sand interceptor application, sensors can also operate valves and pumps to remove accumulated oil or effluent water.

Double-wall tanks and oil/water separators can be monitored for tank integrity by placing sensors in the interstitial space to detect liquid infiltration.

All panels include audible alarms and/or visual warning lights to alert operators of system changes. Test buttons are included to monitor alarm panel functionality periodically.

Highland Tank alarm and control panels and sensors can electronically monitor or control a wide array of processes and conditions.

Sensors
Highland Tank's standard sensors include fixed-stem, suspended-stem, free-floating and a submersible continuous level transmitter. Sensors are used to identify liquid levels and detect hydrocarbon and/or water infiltration into the annular space of a double-wall vessel.

A single suspended-stem type sensor can support up to five magnetic floats each performing a separate level function.

Additional floats can be added for special applications. Free-floating, suspended sensors employ a mechanical micro-switch in a plastic case and are field-adjustable.

Each stem sensor offers custom cable lengths to connect directly to a control panel. Other sensor technologies are available upon request.

High-LINK®
In addition to the alarm and control panels and sensors, Highland Tank also provides electronic monitoring. High-LINK® is cloud-based monitoring and management software that provides in-depth views of day-to-day operations. It includes predictive maintenance tools, extensive alerting capabilities and automated, customizable reporting features that help you keep an eye on daily operations, from anywhere, at any time, on any device.

For more information on High-LINK®, visit https://www.highlandtank.com/high-link/

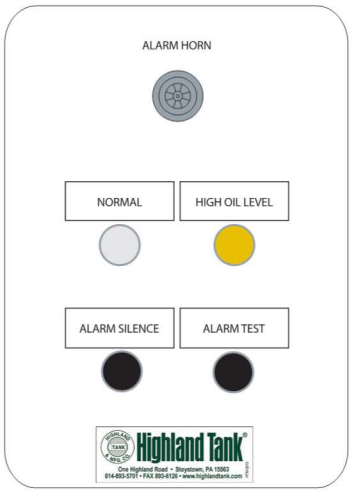
HT-A Alarm Panels

Highland Tank's standard HT alarm panels are available with up to four separate channels designed to monitor specific functions of oil/water separators and oil/sand interceptors. In addition, the AP-1 and AP-2 panels can be used in storage tank applications.

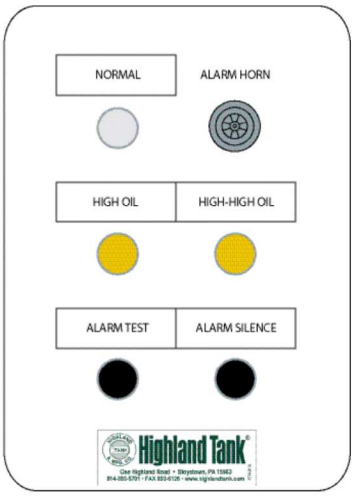
Standard panels include an audible alarm/horn, alarm test button and alarm silence button. HT panels are configured and labeled to perform the combination of functions shown.

Custom multi-channel control panels are also available and configured as required for specific applications such as valve control and pump operation. Please contact Highland Tank for additional information.

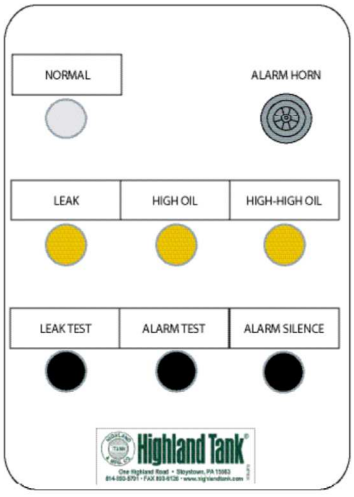
HT-A1 - Single-channel panel.
Performs one level monitoring function: High oil level with an alarm



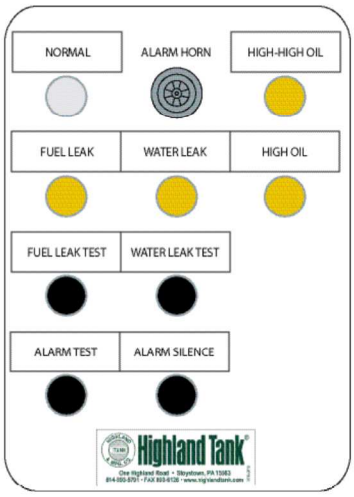
HT-A2 - Two-channel panel.
Performs High-Oil Level AND High-High-Oil Level sensing with specific alarms.



HT-A2-LD - Three-channel panel.
Performs High-Oil Level, High-High Oil Level sensing AND Liquid Only Leak Detection with specific alarms for oil levels only.



HT-A2-LDFW - Four-channel panel.
Performs High-Oil Level, High-High Oil Level sensing AND Leak Detection for Fuel or Water with specific alarms or each.



Light or button description and function for standard panels

NORMAL LIGHT (White)
Indicates that system is active in normal operating (non-alarm) mode.

TEST
Temporarily closes the control panel circuits to provide a system test.

ALARM HORN
Works in conjunction with yellow alarm lights. Emits audible (90-95 decibel) sound alerting operator that system has entered an alarm mode.

SILENCE
Silences the audible alarm temporarily for operator to perform service.
(Does not cancel alarm mode.)

ALARM #1
Alerts operator to any one of these conditions: high or low liquid level, leak detection or high-oil level in oil/water separator applications.

ALARM #2
Alerts operator to any one of these conditions: high or low liquid level, leak detection or high-oil level in oil/water separator applications for second channel on 2-channel panel.

HIGH-OIL
Alerts operator of High-Oil level. Oil has reached a predetermined level and must be pumped out as soon as possible.

HIGH-HIGH-OIL
Alerts operator of High-High-Oil level. Oil has reached a critical predetermined level and must be pumped out immediately.

ALARM TEST
Temporarily closes the control panel circuits to provide an audible and visual system test.

ALARM SILENCE
Silences the audible alarm temporarily for operator to perform service.
(Does not cancel alarm mode.)

LEAK
Alerts operator of a leak in either primary or secondary wall of tank. Does not discriminate if leak is fuel or water.

LEAK TEST
Temporarily closes the control panel's leak detection circuit to provide a system test.

FUEL LEAK
Alerts operator of a leak from primary tank wall into the interstice.

WATER LEAK
Alerts operator of a water leak from primary or secondary tank wall into interstice.

FUEL LEAK TEST
Temporarily closes the control panel's fuel leak detection circuit to provide a system test.

WATER LEAK TEST
Temporarily closes the control panel's water leak detection circuit to provide a system test.

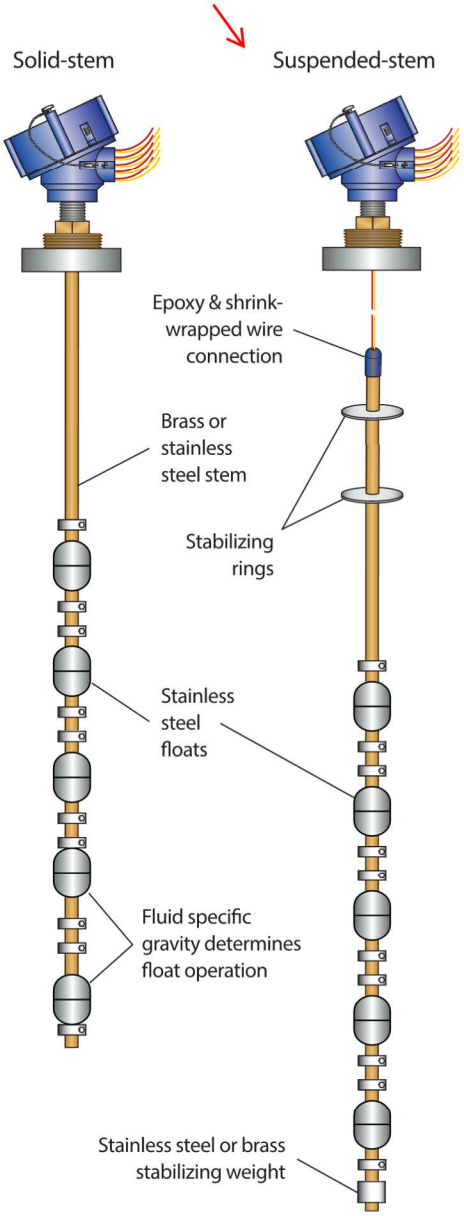
Level Sensors

Sensors are used to monitor liquid levels in storage tanks and vessels. Highland Tank offers solid-stem, suspended-stem, free-floating types and a submersible continuous level transmitter.

Stem Sensors

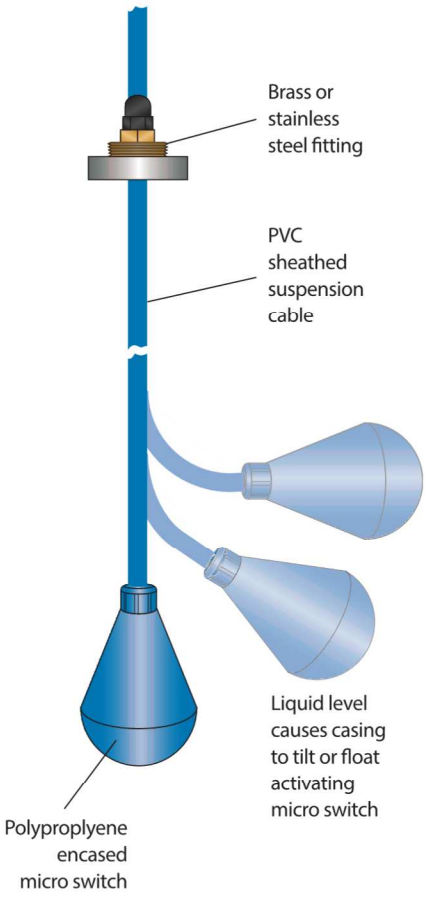
Solid and suspended float sensors can perform up to five separate level functions in a tank or vessel monitoring system.

Suspended-stem sensors are best suited for deep burial installations and are installed with a carrier pipe to grade.



Free-floating

Sensors control liquid levels with mechanical micro switches by either closing or breaking a circuit and can perform functions such as starting or stopping a pump.



Submersible Level Transmitter

The pressure transducer provides sustained performance over a wide range of operating conditions including continuous level readout, pump and valve control.

Standard features:

- ±1% FS Total Error Band
- Guaranteed lightning protection
- 2-year warranty
- Analog output simplifies interface
- Stainless steel construction

Leak Detection Sensors
Highland Tank offers two standard suspended leak detection sensors for monitorng the interstitial space of a double-wall storage or process tank.

HTLP - Liquid Only Leak Sensor
Used to monitor the interstitial space of double-wall tanks and detect infiltration of liquids (water or hydrocarbons) from either the primary or secondary tank. Sensors measure 1.5" diameter for use in 2" diameter monitoring pipe.

HTSP - Fuel/Water Leak Sensor
Used to monitor the interstitial space of double-wall tanks and detect infiltration of liquids (discerning water and hydrocarbons) from either the primary or secondary tank. Sensors measure 1.5" diameter for use in 2" diameter monitoring pipe.

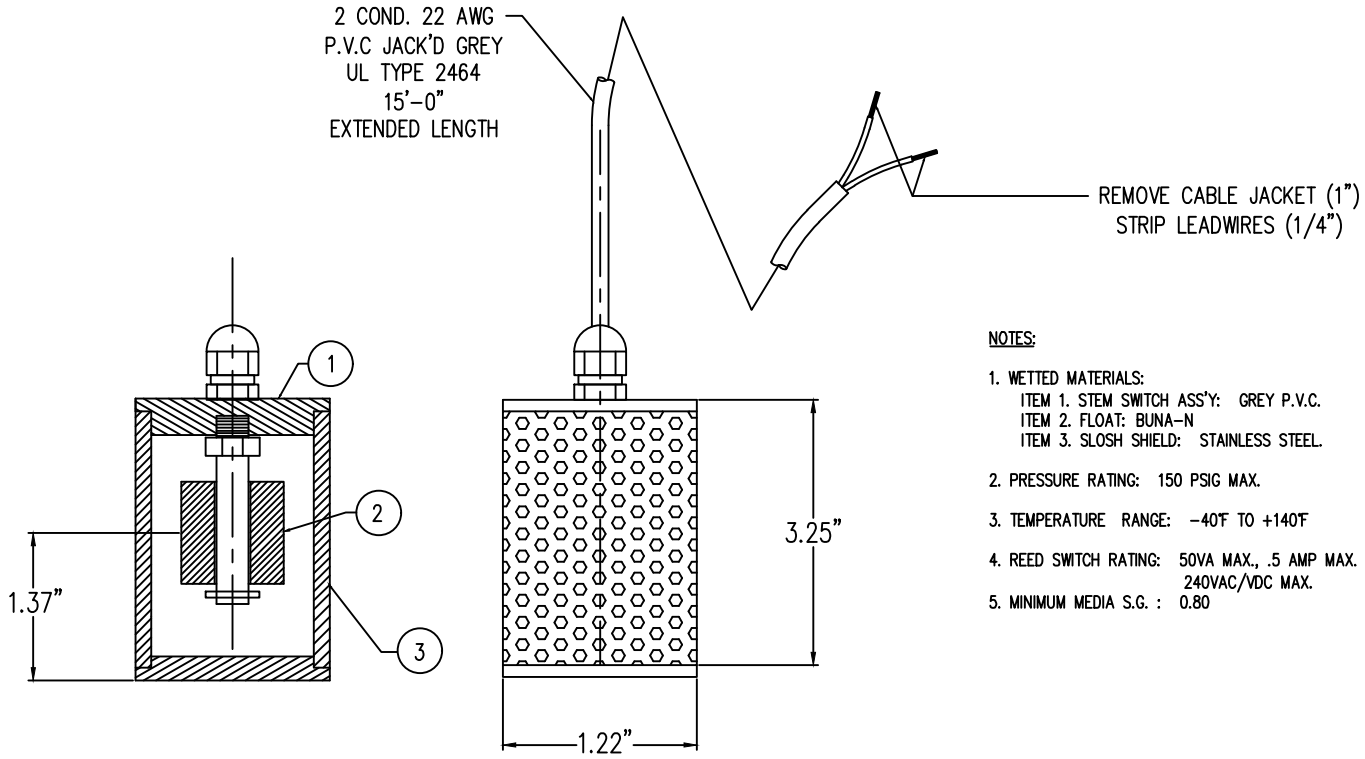
Series HTLP 1.5

1 1/2" LIQUID LEAK SENSOR

Highland Tank

Engineering Bulletin

One Highland Road, Stoystown Pa.15563
814-893-5701 - Fax 893-6126
www.Highlandtank.com
email: staff @ highlandtank.com

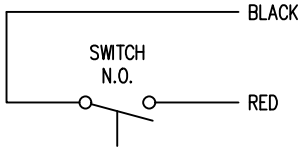


NOTES:

1. WETTED MATERIALS:
   ITEM 1. STEM SWITCH ASS'Y: GREY P.V.C.
   ITEM 2. FLOAT: BUNA-N
   ITEM 3. SLOSH SHIELD: STAINLESS STEEL.
2. PRESSURE RATING: 150 PSIG MAX.
3. TEMPERATURE RANGE: -40°F TO +140°F
4. REED SWITCH RATING: 50VA MAX., .5 AMP MAX. 240VAC/VDC MAX.
5. MINIMUM MEDIA S.G. : 0.80

WIRING DIAGRAM

NORMALLY OPEN "DRY"



3	1	0775C1832-0001	SLOSH SHIELD - 1.50ø MAX	SS
2	1	2010-1010-0013	1010 FLOAT ASS'Y	BUNA-N
1	1	5000C1832-0001	STEM/SWITCH ASS'Y	PVC

Series HTSC-2B

NEMA 4 X, WATERTIGHT HOUSING

Highland Tank

Engineering Bulletin

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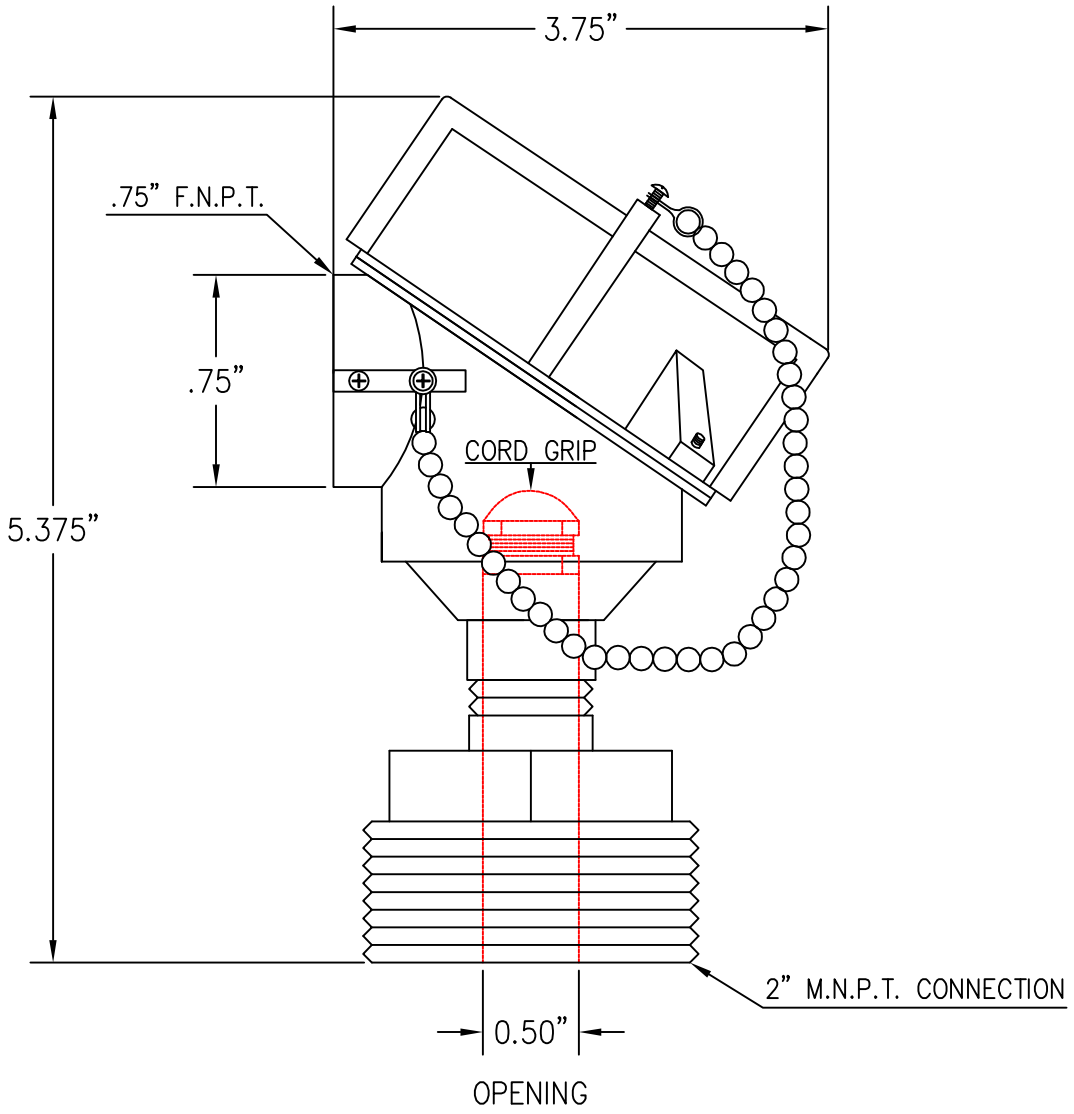
814-893-5701 - Fax 893-6126
www.Highlandtank.com
email: staff @ highlandtank.com



SPECIFICATIONS:
MATERIAL: COPPER-FREE ALUMINUM
NEMA 4X, WATERTIGHT HOUSING
SURFACE FINISHING: EPOXY COATED
O-RING: BUNA NITRILE
WEIGHT: 1.0 LB

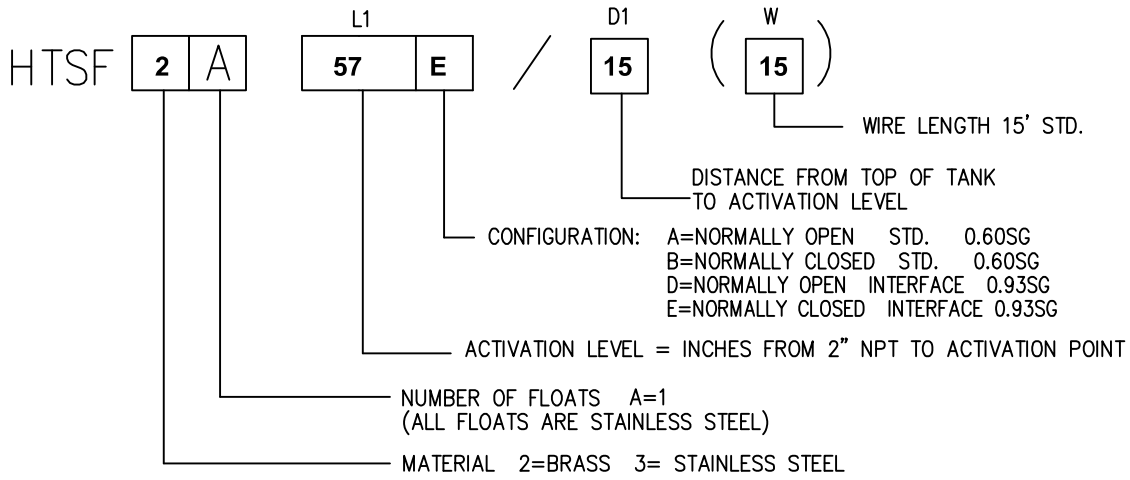
CUSTOMER APPROVAL
CHECKED BY:_____
APPROVED BY:_____
DATE:_____

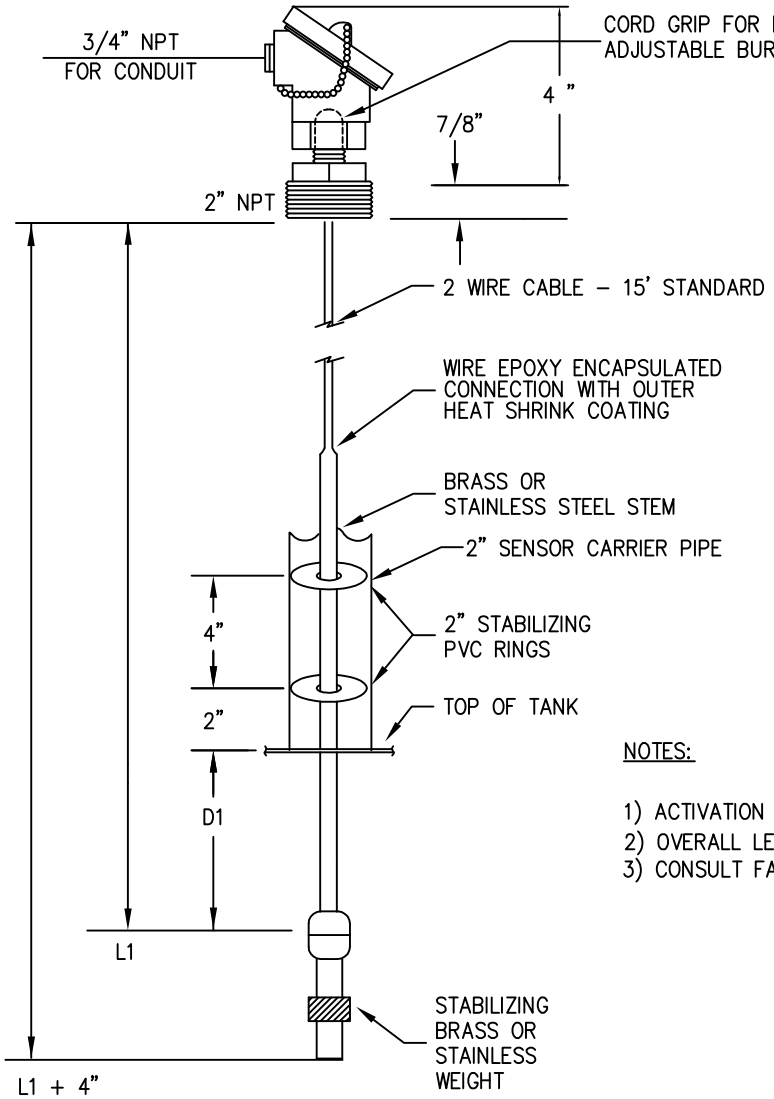
Series HTSF Suspended One Float Sensor

Highland Tank

Engineering Bulletin

One Highland Road, Stoystown Pa.15563
814-893-5701 - Fax 893-6126
www.Highlandtank.com
email: staff @ highlandtank.com



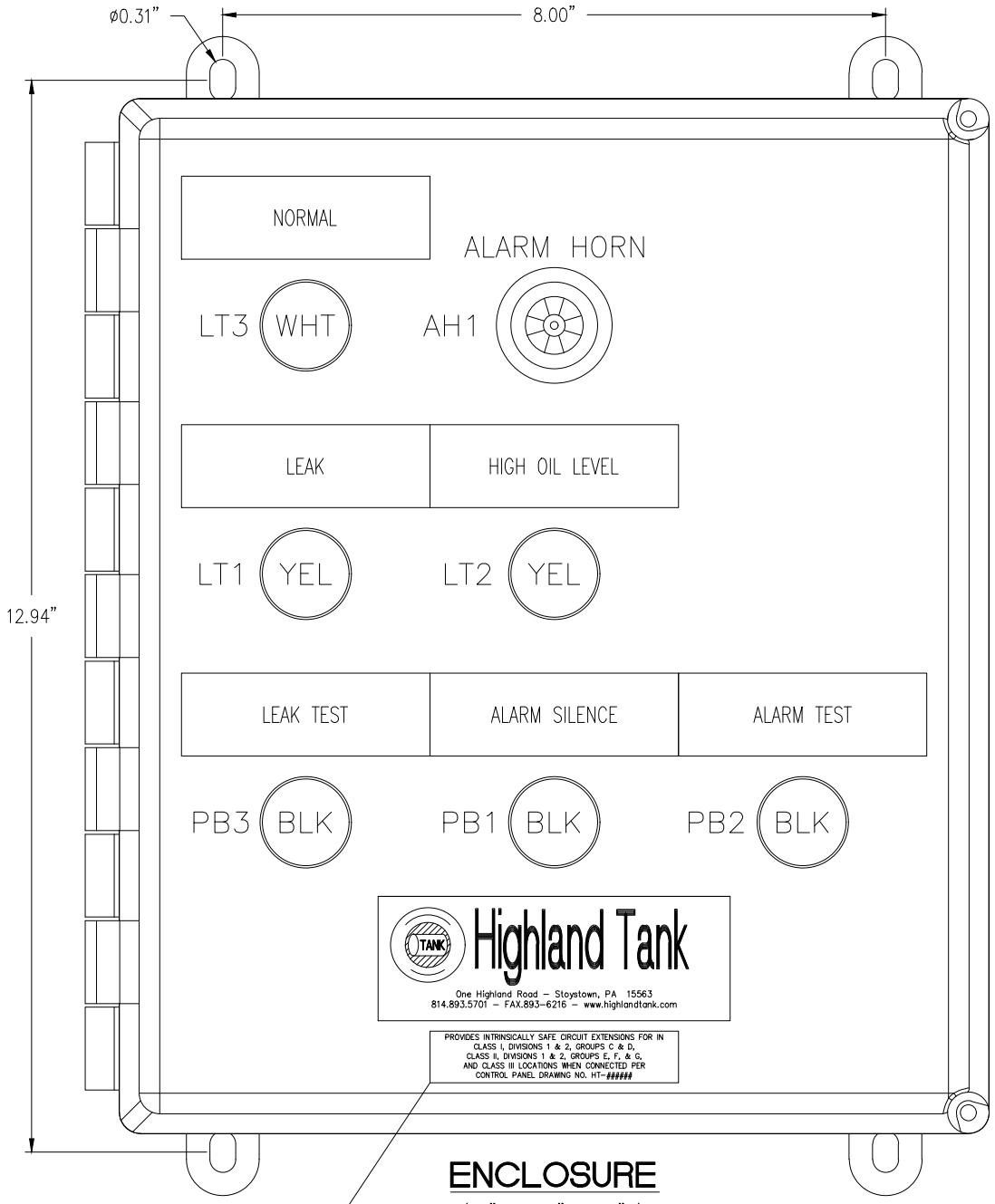


SPECIFICATIONS:

HOUSING:	CAST ALUMINUM NEMA 4X
FITTING:	BRASS OR STAINLESS STEEL
THREAD SIZE :	2" NPT
FLOAT SIZE:	1.85" DIA x 3.01" HIGH
CONTACT RATING:	FOR INTRINSICALLY SAFE CONTROL CIRCUT ONLY
STEM SIZE:	1/2"
SPECIFIC GRAVITY:	0.60 STANDARD 0.93 INTERFACE
WIRE COLOR CODE:	L1 = BLACK & RED

NOTES:

1) ACTIVATION LEVEL TOLERANCE +/- .125"
2) OVERALL LENGTH OF STEM IS L1 ACTIVATION POINT + 4"
3) CONSULT FACTORY FOR OPTIONAL MOUNTING APPLICATIONS



ENCLOSURE

(12"H x 10"W x 6"D)
NEMA 4X FIBERGLASS

PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR IN CLASS I, DIVISIONS 1 & 2, GROUPS C & D, CLASS II, DIVISIONS 1 & 2, GROUPS E, F, & G, AND CLASS III LOCATIONS WHEN CONNECTED PER CONTROL PANEL DRAWING NO. HT-######

US LISTED

MANUFACTURED IN ACCORDANCE TO UL 698A STANDARDS

REV	DESCRIPTION	DATE	APPROVED
0	INFO/FILES	##/##/##	BJH

HIGHLAND TANK & MFG. CO.
STOYSTOWN, PENNSYLVANIA

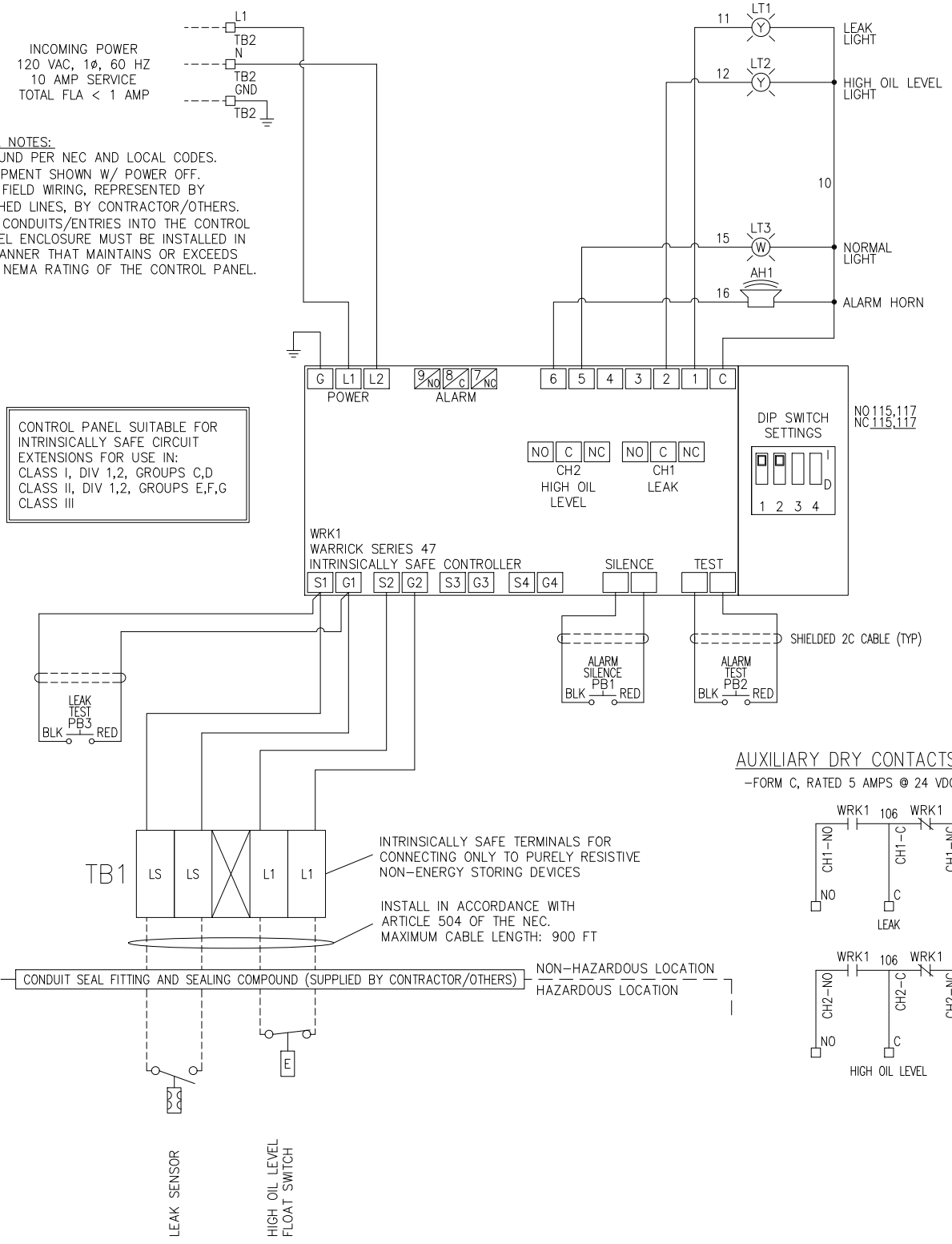
TITLE:
HIGH OIL LEVEL AND
LEAK DETECTION ALARM PANEL
WITH AUX. CONTACTS

HIGHLAND QT#: N/A	RAM QT#: N/A	DRAWN BY: BJH	SCALE: NONE
HIGHLAND W/O#: #####	ESTIMATOR: ------	DATE: ##/##/##	JOB NO. ####

PANEL STYLE ID: CC-HT-A1-LD

SHEET 1 OF 4

HT-######

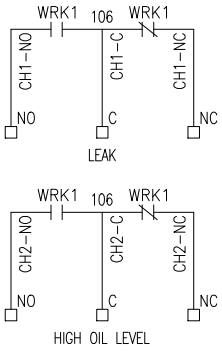


GENERAL NOTES:

1. GROUND PER NEC AND LOCAL CODES.
2. EQUIPMENT SHOWN W/ POWER OFF.
3. ALL FIELD WIRING, REPRESENTED BY DASHED LINES, BY CONTRACTOR/OTHERS.
4. ALL CONDUITS/ENTRIES INTO THE CONTROL PANEL ENCLOSURE MUST BE INSTALLED IN A MANNER THAT MAINTAINS OR EXCEEDS THE NEMA RATING OF THE CONTROL PANEL.

AUXILIARY DRY CONTACTS ON WRK1

-FORM C, RATED 5 AMPS @ 24 VDC / 120 VAC-



SENSOR NOTES:

1. HIGH OIL LEVEL FLOAT SWITCH (TYPE "E") RISES IN WATER (CONTACTS OPEN) AND SINKS IN OIL (CONTACTS CLOSE).
2. LEAK SENSOR RISES IN LIQUID (CONTACTS CLOSE).
3. REFILL OIL/WATER SEPARATOR WITH WATER AFTER OIL PUMP OUT.

US LISTED

MANUFACTURED IN ACCORDANCE TO UL 698A STANDARDS

REV	DESCRIPTION	DATE	APPROVED
0	INFO/FILES	##/##/##	BJH

HIGHLAND TANK & MFG. CO.
STOYSTOWN, PENNSYLVANIA

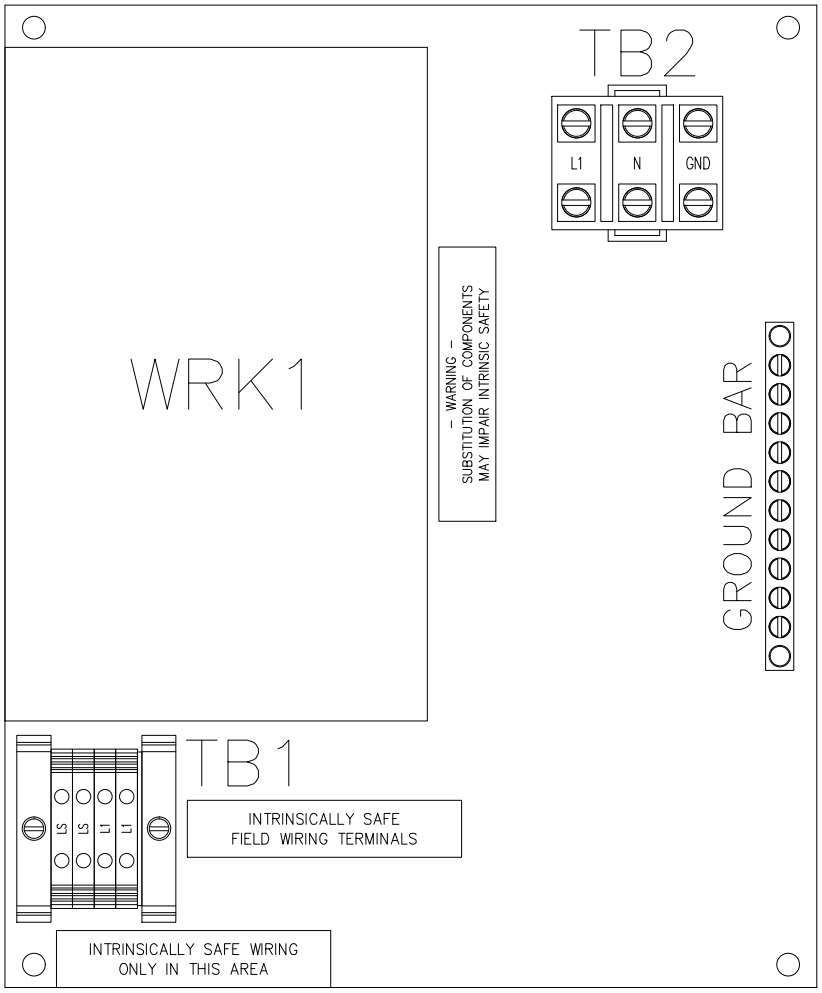
TITLE: HIGH OIL LEVEL AND LEAK DETECTION ALARM PANEL WITH AUX. CONTACTS

HIGHLAND QT#: N/A	RAM QT#: N/A	DRAWN BY: BJH	SCALE: NONE
HIGHLAND W/O#: #####	ESTIMATOR: -------	DATE: ##/##/##	JOB NO. ####

PANEL STYLE ID: CC-HT-A1-LD

SHEET 2 OF 4

HT-######



BACK PANEL

US LISTED

MANUFACTURED IN ACCORDANCE TO
UL 698A STANDARDS

REV	DESCRIPTION	DATE	APPROVED
0	INFO/FILES	##/##/##	BJH

HIGHLAND TANK & MFG. CO.
STOYSTOWN, PENNSYLVANIA

TITLE:
HIGH OIL LEVEL AND
LEAK DETECTION ALARM PANEL
WITH AUX. CONTACTS

HIGHLAND QT#: N/A	RAM QT#: N/A	DRAWN BY: BJH	SCALE: NONE
HIGHLAND W/O#: #####	ESTIMATOR: ------	DATE: ##/##/##	JOB NO. ####

PANEL STYLE ID
CC–HT–A1–LD

SHEET 3 OF 4

HT–######

BILL OF MATERIALS HT-###### UL698A

QUANTITY	PART NUMBER	DESCRIPTION
AUTOMATION DIRECT		
4	KN-T10GRY	Terminal Block, 1P, 30A, 10-26 AWG, 600V
8	KN-L6X-BLNK	Terminal Block Marking Label, Blank
1	KN-ECT6GRY	Terminal Block End Cover
2	KN-EB7	Terminal Block End Bracket
BRUMALL		
1	4-12,1,12	Ground Bar, 10 Holes, 4-14 AWG, Aluminum
BUSSMANN		
1	NDN111	Terminal Block, 3P, 90A, 2-18 AWG, 600V
CUTLER HAMMER		
1	M22-L-W-230W	Pilot Light Assembly, White, LED, 85-264 VAC
2	M22-L-Y-230W	Pilot Light Assembly, Yellow, LED, 85-264 VAC
3	M22S-D-S-K10	Pushbutton Assembly, Flush, Momentary, Black, 1NO
FLOYD BELL		
1	MC-09-201-QG	Alarm Horn, 120 VAC, NEMA 4/4X
GEMS SENSORS		
1	47D1A2A2	Warrick Series 47 Intrinsically Safe Controller, 2-Channel, 120 VAC
HOFFMAN		
1	A12106CHSCFG	Single-Door Wall-Mount Enclosure, Screw Cover, NEMA 4X/12, Fiberglass, Size: 12"H x 10"W x 6"D
1	A12P10	Back Panel, Painted Mild Steel

US LISTED
MANUFACTURED IN ACCORDANCE TO UL 698A STANDARDS

REV	DESCRIPTION	DATE	APPROVED
0	INFO/FILES	##/##/##	BJH

HIGHLAND TANK & MFG. CO.
STOYSTOWN, PENNSYLVANIA

TITLE: HIGH OIL LEVEL AND LEAK DETECTION ALARM PANEL WITH AUX. CONTACTS

HIGHLAND QT#: N/A	RAM QT#: N/A	DRAWN BY: BJH	SCALE: NONE
HIGHLAND W/O#: #####	ESTIMATOR: ------	DATE: ##/##/##	JOB NO. ####

PANEL STYLE ID: CC-HT-A1-LD

Highland Tank® Technical Data Sheet HT-5001

HighGuard Polyurethane Tank Coating

Polyurethane Corrosion Coating 100% Solids,
Two-Component, Fast-Cure Complies with UL 1746 Part IV

Description

HighGuard is a solvent free, tar-free, two- component polyurethane corrosion coating (1:1 ratio by volume). This product has a very short reaction time and is therefore spray applied using plural component spray equipment.

This coating has been approved by Underwriters Laboratories for the application of underground steel tanks under UL 1746 HighGuard Parts IV.

Application of this product is made directly to surface prepared steel. Primers are not necessary. Unlimited film builds may be achieved in a single coat multi-pass application.

Cured films are free of pores. This coating demonstrates an excellent balance of flexibility, impact strength, abrasion resistance and corrosion resistance.

Cured films that are a minimum of 75 mils in thickness will provide permanent and fully effective corrosion protection for many years.

Properties

Solids, by volume	100%
VOC	None
Components	Two (2)
Curing Mechanism	Chemical Reaction
Color Availability	Unlimited
Weight per mixed gallon	9.5 lbs/gallon (4.3kg/gallon)
Theoretical Coverage	1604 sq. ft. per gallon per mil (149 sq. m/gal per mil)
Primer Requirement	None Required
Adhesion to Steel	Excellent
Application Temperature Range	35°F-120°F(1°F-49°C)
Hardness (ASTM D 2240)	70 Shore D
Impact Strength	>40 in lbs
Flexibility	15 mils bent 180 over 1/8” (3mm) mandrel
Abrasion Resistance	110 mg (C17, 1kg, 1000 cycles)
Chemical Resistance	Excellent

Cure Times

Cure to the Touch	6-8 minutes @ 75°F (24°C)/50% relative humidity (15 mils/0.37mm)
Cure to Handle	30-45 minutes @ 75°F (24°C)/50% relative humidity (15 mils/0.37mm)
Time to Recoat	1 hour @ 75°F (24°C)/50% relative humidity (15 mils/0.37mm)

Packaging, Storage & Shelf Life

HighGuard is supplied in two 55-gallon tight top drums: Components: A and B. Drums are tightly sealed until ready for use to prevent atmospheric moisture from contaminating material. HighGuard material is stored at temperatures between 50-80°F (10-27°C) in a dry well-ventilated area.

HighGuard material is stored too ensure that component materials do not freeze. Material has a shelf life of 12 months after the date of manufacture if properly stored. Refer to Batch Number on product label for date of manufacture.

Safety Precautions

HighGuard is for Industrial Use Only

Avoid contact with eyes, and skin; do not inhale or ingest. When working with this material wear goggles, rubber gloves and a respirator. When spraying in a confined area, also wear a fresh air hood and make provision for forced ventilation. Refer to MSDS regarding individual components.

Application Instructions

A. Surface Preparation

1) Ensure that surface is clean, dry and uncontaminated. Proceed only if the substrate temperature is more than 3° C (5° F) above the dew point temperature during surface preparation and coating application.

2) Abrasive blast clean with sand or grit (G40 or coarser). DO NOT USE steel shot or non-angular media.

For steel surfaces, blast to a Near White Blast (SSPC-SP10; NACE 2; SA 2.5):
- minimum 2.5 mil (65 microns) profile for immersion;
- minimum 2.0 mil (51 microns) profile for buried;
- minimum 1.5 mil (38 microns) profile for atmospheric service.

For concrete surfaces, abrasive blast to remove any latiance.

B. Application of Coating

1) Roll or agitate individual components thoroughly before use to disperse pigments and assure homogeneity. Do not thin.

Do not mix “A” and “B” together.

2) Spray apply using a plural component, 1:1 mix ratio, heated airless spray unit.

3) Unlimited film thickness can be obtained in one continuous coating operation, using one of several techniques. Typical applied thickness is 75 mils as per SSPC PA2. Contact Highland Tank for detailed instructions.

4) A second coat may be applied over the first, if it is applied within the re-coat window. Otherwise, it may be necessary to roughen the surface to ensure good inter-coat adhesion.

5) Allow coating to cure completely before putting into service. Follow decontamination procedure to remove any dirt and debris.

C. Clean-Up and Storage

1) This material will react with humidity and moisture. Keep containers tightly sealed and store upside down.

For clean-up, use MEK or a 50:50 blend of MEK and Xylol.

Other solvents may react with product.

2) Store between 10° C (50° F) and 27° C (80° F). DO NOT FREEZE. Use product within 6 months of receiving.

D. Repair and Touch-up

Unlikely minor scratches and surface damage due to impact or abrasion that may occur during transportation can be easily repaired or touched-up in the field.

Contact Highland Tank for detailed application instructions

Health and Safety

HighGuard Polyurethane Tank Coating is intended for industrial use only. It contains no monomeric isocyanates but may nevertheless cause respiratory distress in some people. Provide ample ventilation.

Wear a fresh air respirator when using in confined areas or when spraying. Wear rubber gloves, safety goggles and protective clothing. If swallowed, DO NOT induce vomiting as this will cause additional throat irritation; contact physician.

If splashed on skin, remove immediately with rubbing alcohol and then wash with soap and water. If splashed in eyes, wash liberally with clean water and contact physician; temporary irritation of eyes may last several days.

Contains trace amounts of ingredients which may cause skin cancer following prolonged direct skin contact. Therefore commonly used skin protection is recommended.

See MSDS for more information. The finished product is completely inert.

The information contained herein is believed to be accurate as of the date of publication. Highland Tank reserves the right to change product specifications without notice.

Highland Tank & Mfg. Co. — Highland Tank®

248.625.8700

PROUDLY MADE IN AMERICA

Internal Polyurethane Tank Lining

The Product and its Uses

A high performance protective coating with unique handling and performance characteristics, it is a two component, 1:1 format product that can be applied in one coat, without a primer, to an unlimited build.

This coating is available with a choice of setting times ranging from 1 to 30 minutes and a choice of high build or low viscosity versions.

It cures at subfreezing temperatures and can be used with various equipment configurations. Internal polyurethane is highly resistant to corrosion, abrasion, immersion, waterborne chemicals and cathodic disbondment. It contains absolutely no solvent, tar, styrenes or isocyanate monomers, to totally inert when cured and nonflammable. Polyurethane is environmentally friendly and extremely safe to use.

End uses encompass applications where epoxies or coal tar polyurethanes might be used, but the applicator or specifier wishes to avoid the health and environmental hazards associated with these products. Specific applications include above and below ground storage tanks, oil/water separators as well as concrete structures.

Approvals and Listings

Underwriters Laboratories: UL 2215

Technical Information

Property	Test Description	Results
Applications Temperatures	N/A	-20˚ C(0˚F) to 48˚ C (120˚F)
Viscosity	Brookfield Viscometer	1000+/- 300 cps (HB); 400 +/- 200 cps (LV)
Initial Setting Time	@ 20˚ C/70˚ F	Four choices from 1 to 30 minutes
Curing Time Before Handling	@ 20˚ C/70˚ F	Three times initial set time
Ultimate Cure	@ 20˚ C/70˚ F	4-7 days
Recoat Time	@ 20˚ C/70˚ F	60 minutes
Solids Content	ASTM D-1259	99 +/- 1%
Volatile Organic Compounds (VOCs)	ASTM D-2369	Less than 8.1 grams/litre (0.07 lbs/US gal)
Theoretical coverage	N/A	39m_/litre/25 microns (1605 ft_/US gal/mil)
Adhesion to steel	ASTM D-4541 (SSPC-SP5)	Greater than 1200 p.s.i.
Adhesion to concrete	ASTM D-4541	Greater than cohesive strength of concrete
Hardness	ASTM D-2240 Shore D	70 +/- 5
Flexibility	ASTM D-522 (20 mils)	180˚ over 2" mandrel
Chemical Resistance	ASTM D-543	See chemical resistance chart
Impact Resistance	ASTM D-2794 (20 mils)	60 in. lbs.
Abrasion Resistance	ASTM D-4060 (Taber CS-17)	75 mg loss @ 1 kg per 1000 cycles (standard version)
25 mg loss (CM version)		
Resistance to Cathodic Disbondment	ASTM G-8 (STP, 28 days 20 mils)	Excellent, 10 mm average radius
Ultraviolet Resistance	ASTM G-53	Some colors are suitable for outdoor use
Service Temperature	ASTM D-870	-40˚ C (-40˚ F) to 49˚ C (120˚ F) Wet
Colors	20 stock choices; custom colors available	

NOTE: All statements, technical information and recommendations contained herein are typical of results obtained under laboratory conditions and are not intended to be used as contract specifications. For specification guidelines please contact Highland Tank.

Application Instructions

A. Surface Preparation

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2) Abrasive blast clean with sand or grit (G40 or coarser). DO NOT USE steel shot or non-angular media. For steel surfaces, blast to a Near White Blast (SSPC-SP10; NACE 2; SA 2.5):
   - minimum 2.5 mil (65 microns) profile for immersion;
   - minimum 2.0 mil (51 microns) profile for buried;
   - minimum 1.5 mil (38 microns) profile for atmospheric service.

   For concrete surfaces, abrasive blast to remove any laitiance.

B. Application of Coating

1) Roll or agitate individual components thoroughly before use to disperse pigments and assure homogeneity. Do not thin. Do not mix “A” and “B” together.

2) Spray apply using a plural component, 1:1 mix ratio, heated airless spray unit.

3) Unlimited film thickness can be obtained in one continuous coating operation, using one of several techniques. Typical applied thickness is 15 mils (375 microns) as per SSPC PA2. Contact Highland Tank for detailed instructions.

4) A second coat may be applied over the first, if it is applied within the re-coat window. Otherwise, it may be necessary to roughen the surface to ensure good inter-coat adhesion.

5) Allow coating to cure completely before putting into service. Follow decontamination procedure to remove any dirt and debris.

C. Clean-Up and Storage

1) This material will react with humidity and moisture. Keep containers tightly sealed and store upside down. For clean-up, use MEK, or a 50:50 blend of MEK and Xylol.

   Other solvents may react with product.

2) Store between 10˚ C (50˚ F) and 27˚ C (80˚ F). DO NOT FREEZE.

   Use product within 6 months of receiving.

Contact Highland Tank if more detailed application instructions are required.

Health and Safety

Internal Polyurethane Tank Lining is intended for industrial use only. It contains no monomeric but may nevertheless cause respiratory distress in some people. Provide ample ventilation. Wear a fresh air respirator when using in confined areas or when spraying. Wear rubber gloves, safety goggles and protective clothing.

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