Wastewater Treatment Systems

Oil/Water Separators
Oil/Sand Interceptors
Filtration Systems
Catch Basins

Highland Tank®

Highland Tank

A Family Business

Since 1946, Highland Tank has been on the leading edge of tank technology. Initially, Highland primarily fabricated fuel storage tanks. In 1986, we entered a new era of fabrication with the development of the Highland Tank Oil/Water Separator to meet more stringent environmental regulations to prevent oil spills and water pollution. As our core business of oil/water separator fabrication grew, we expanded our wastewater treatment systems product line to include Oil/Sand Interceptors, Advanced Filtration Systems, and Collection Catch Basins.

We put over 20 years of experience into every Highland Oil/Water Separator we build. Our separators are unparalleled in performance, ease of maintenance, structural strength, product compatibility, and corrosion resistance. With over 12,000 units in commercial operation worldwide, our patented oil/water separators have a proven record of reliability.

Highland engineers have designed a functional means of primary separation that meets and surpasses federal, state, and local oil and grease discharge limitation requirements. Our separators handle a wide range of oily discharges from oil storage and vehicle maintenance, fueling, and washing areas at petroleum, transportation, industrial, military, commercial, and municipal facilities.

Specifically, our high performance HTC UL-SU2215 approved separators greatly reduce the level of free oil, grease, and oily coated solids down to 10 ppm and remove free oil droplets down to 20 microns. Highland's cylindrical or rectangular separators are available in single and double-walled construction for aboveground, underground, or belowground vaulted installation.

Seated: Robert E. Jacob, Vincent J. Jacob Standing: Charles A. Frey, Jr., John W. Jacob, Michael VanLenten, Gregory G. Aymong

Our family owned and managed business formed a humble philosophy in our early years that continues to hold true: Manufacture a solid product at a competitive price and deliver it on time. Our hard work and dedication has helped to develop the high quality, dependability, and craftsmanship put into every product we manufacture. Now in our third generation of family ownership, Highland Tank leads the industry with innovative designs, quality materials, superior craftsmanship, and excellent customer service. As the nation's premier oil/water separator manufacturer, we continue our commitment to our products, employees, and customers. Trust us to help you find a solution for your wastewater treatment needs.

Our Mission:

To manufacture and deliver the highest quality products at competitive prices, provide innovative, engineered solutions to our clients, and maintain respect for the environment.

Highland Tank

Manufacturing Capabilities

STOYSTOWN, PA

Capability, Capacity, Commitment

Highland Tank has a national distribution network and six state-of-the-art fabrication facilities. Our production capabilities in the industry are unmatched to meet your storage and wastewater treatment tank needs.

Manufacturing Area:
255,000 total square feet

Lift Capacity:
65 cranes, 485 tons total

Steel Rolling:
Up to1-1/4" maximum thickness

Maximum Physical Fabrication Size:
14'-0" OD X 100'-0" Long

Product Transportation:
40 Class 8 tractors, 100 trailers

Building on an unrivalled commitment to environmental and quality standards extending over 60 years, Highland Tank is now the preferred supplier to many of the United State's leading petroleum and industrial companies.

We would appreciate the opportunity to discuss your plans for upcoming projects. Highland can provide:

- Comprehensive quotations
- AutoCAD drawings
- Product specifications

for inclusion into your project specifications.

Our professionals in sales, engineering, manufacturing, quality assurance, and delivery, as well as our courteous support personnel, are equipped to provide you with the highest quality products available.

MANHEIM, PA

WATERVLIET, NY

LEBANON, PA

GREENSBORO, NC

FRIEDENS, PA

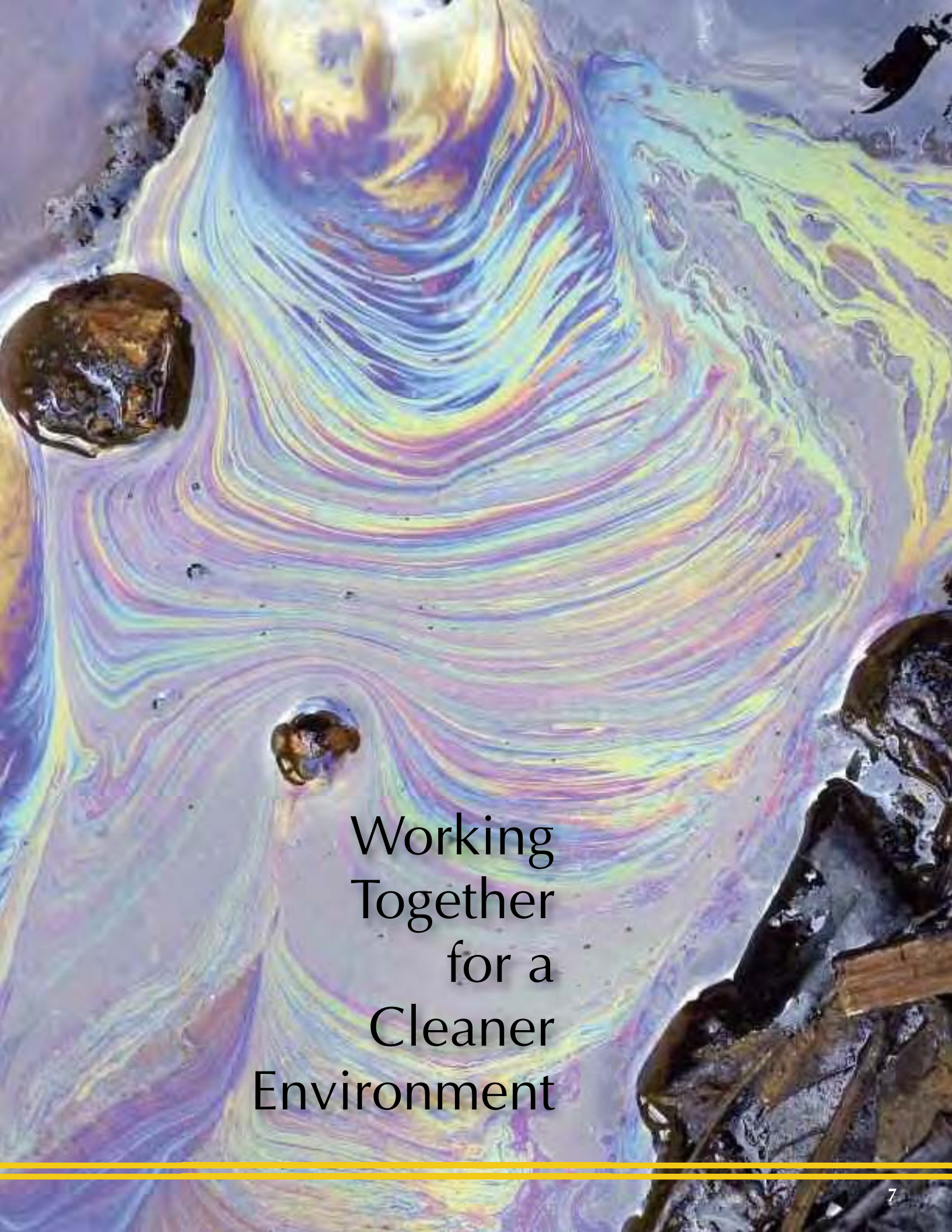
Saving Our Environment for Future Generations

The public's increasing interest in the conservation of the nation's water resources has directly affected industries worldwide. Pressure to control harmful oil spills and discharges from industrial facilities has resulted in increasingly more stringent regulations. Industries are now facing costly penalties for noncompliance.

Industrial facilities with oil storage and handling activities commonly produce wastewater containing oil, grease, floating debris, and settleable solids. Highland's extensive line of wastewater treatment systems helps these facilities comply with the EPA's NPDES regulations for the proper treatment and discharge of contaminated storm water runoff, and satisfy SPCC requirements for spill control and secondary containment.

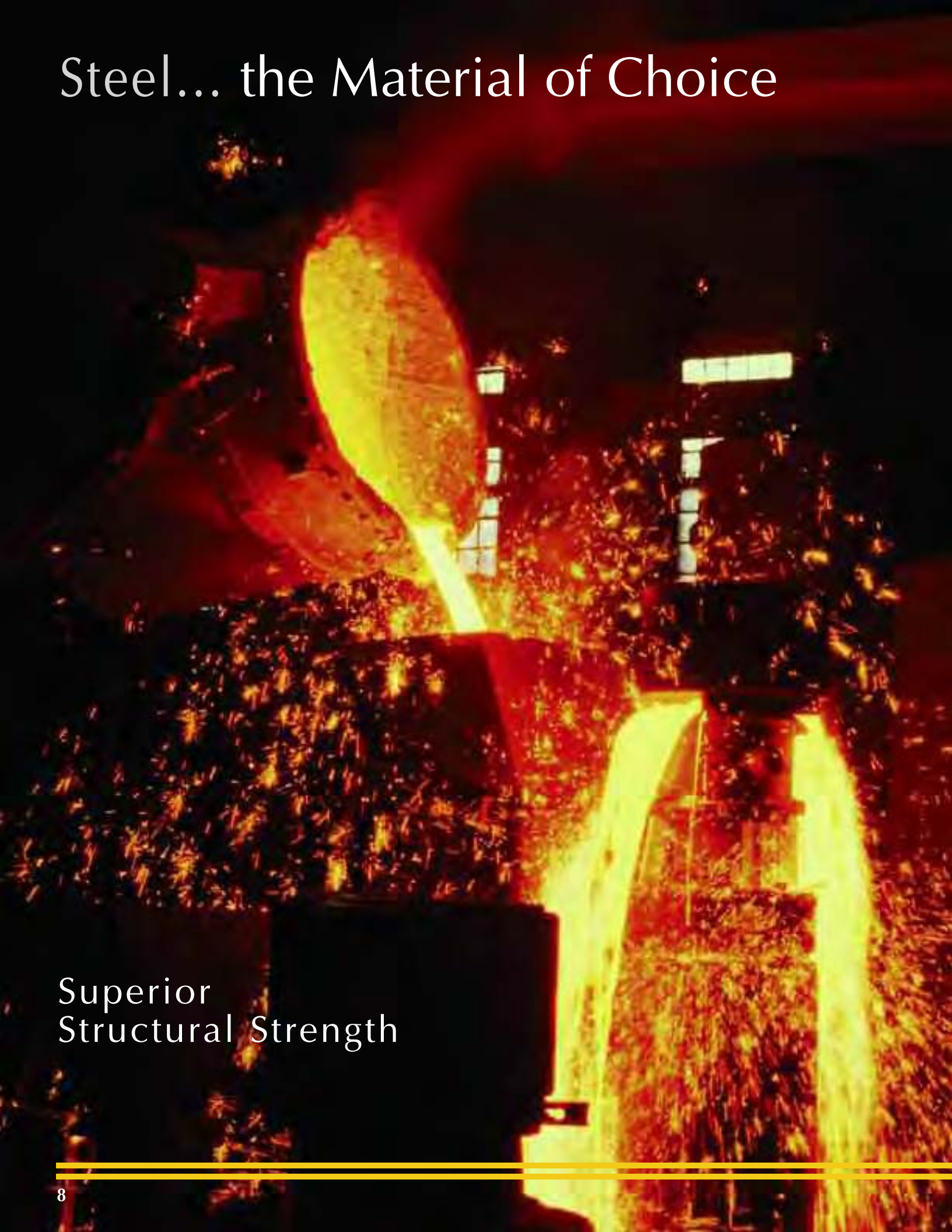
The method of treatment depends on the concentration, the type of contaminants in question, and the location of the discharge. The key to success for collecting, separating, and treating oily wastewater on-site is properly configuring the best available technologies to optimize performance and limit operational costs of the system.

A well designed drainage system equipped with a Highland Corella® Oil/Water Separator or Oil/Sand Interceptor as the primary step, frequently combined with an Advanced Filtration Systems (AFS) as a secondary step, can economically treat most wastewater flows to achieve nearly all discharge limitations and water quality standards for petroleum compounds.



Working Together for a Cleaner Environment

Steel... the Material of Choice



Superior Structural Strength

The Steel Advantage

Steel is the material of choice at Highland Tank because of its many advantages. As a construction material, steel is strong, affordable, reliable, product compatible, and environmentally friendly. Steel's unique combination of properties and characteristics enables it to achieve the performance levels required in today's storage and wastewater treatment tanks.

Specified for Strength!

We buy steel according to our own strict guidelines and meet rigid ASTM specifications. All of our steel is low carbon and fine grain with superior toughness and surface quality that offers both weldability and improved corrosion resistance. The time-tested strength and performance of steel remains unparalleled.

- Superior strength and ductility
- Exceptional durability
- Excellent corrosion performance
- Abrasion resistant for high flow rates
- Ease of fabrication
- Ready availability in a wide range of forms
- Impermeable with zero leaching levels into water
- Full recyclability.

Steel's structural integrity can withstand even extreme weather conditions or natural disasters. Modern fabrication technology, welding, linings, and coatings reinforce the durability of Highland's mild carbon and stainless steel products.

Environmental Benefits

Steel is 100% recyclable and has the highest recycling rate of any durable material in the United States. Unlike concrete and plastic separators, even those reinforced with fiberglass, recycled steel separators ultimately keep a valuable commodity out of the nation's landfills. In addition, modern recycling processes drastically reduce industrial emissions over 70% to air and water, accompanied by a reduction of approximately 30% in the amount of energy required to produce our new steel.

"Green" Building and Buying

Highland Tank is the largest manufacturer of environmental friendly steel tank products in the United States. Even our corporate color is green!

Why is this important to our customers? Buying "green" is an opportunity to use our resources efficiently, build a better environment, and provide cost savings. The Environmental Protection Agency (EPA) has even proposed new federal procurement guidelines for recycled products.

As all of our steel tank products are 100% recyclable, Highland Tank will form an integral part of your "green building" and will provide contemporary architects and engineers with a forceful response to our society's sensitive, environmental concerns.

STEEL

100% Recyclable

According to the Steel Recycling Institute, "Many states and cities have instituted 'buy recycled' mandates that requires purchasing agents to buy products with recycled content whenever possible."

Leadership in Design & Quality

Uncompromising Craftsmanship

Engineering depth, state-of-the-art equipment, and skilled craftsmen with old-fashioned pride and traditional American work ethic have given us the tools needed to maintain our extreme dedication to quality production.

Tools of the Trade

- CSI Burn Tables
- Shell Bending Machines
- Shears
- Press Brakes
- Iron Workers
- Pipe Threaders
- Circular Shear
- Head Flangers
- Drill Presses
- Band Saws

Design Standards

We offer innovative steel fabrication, combined with a variety of specialty coatings designed to meet your specific needs, at a competitive price. Many of our products feature patented Highland technology and are constructed of mild carbon or stainless steel, meeting ASTM specifications. Separators are built to one or more of these standards: American Petroleum Institute API-421, Underwriters Laboratories, Inc. UL-58, 142, and 1746 standards and can be certified to the new UL-SU2215 construction and performance requirements. Highland and Steel Tank Institute specifications are followed to assure complete internal and external corrosion protection. We can supply a full range of equipment packages and we excel in custom fabrication for those unique situations.

Quality Assurance

All our products are backed by our helpful support staff to ensure quality throughout every phase of your project. Highland's team of professionals in design, engineering, fabrication, sales, delivery, and service provide you with outstanding solutions for your separation problems.
Our products are competitively priced and readily available from our strategically located regional distributors and manufacturing facilities. Our reputation for timely delivery by skilled drivers, experienced with large wastewater treatment tank handling, is second to none. We are the only tank manufacturer with a full-time service representative who will visit your site to troubleshoot any problems that may arise.

Standard Construction

Forming Steel

The fabrication process begins with the rolling of steel that meets ASTM specifications. Steel plates from 7 gauge to 1 ¼ inch are rolled to form the rigid shell of the vessel. Lap joints with a 2" overlap provide superior "ribbed" strength.

Single-walled Construction

Steel plates are formed, fitted, and welded, creating a separator of superior strength. Impervious bulkheads are added to create multiple compartments for fluid treatment, pump, and storage options. Flat-flanged heads are standard, as are continuous exterior welds on all joints.

Double-walled Construction

Double-walled separators are constructed by wrapping a secondary steel wall completely around the primary vessel. The space between the two walls, known as the *interstice*, can be electronically monitored to detect a leak.

Steel

"The three shapes are hypocycloids, symbols for the three materials used to make steel – yellow for coal, orange for iron ore, and blue for scrap steel."

Flange Fittings & Manway

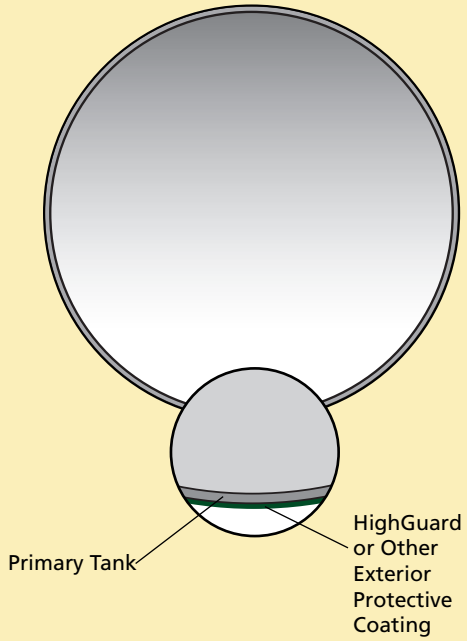
Fittings in various sizes and styles (NPT and flange) enable connection to external piping systems. 24" diameter or larger cylindrical, or large rectangular manways allow for convenient access for inspection and maintenance from above.

Factory Testing

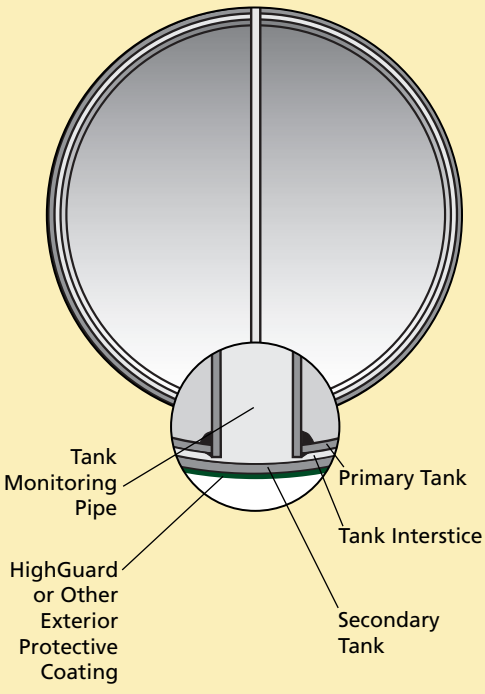
5 psi factory air test and seam inspection is conducted on every separator. All double-walled underground separators are shipped with a vacuum on the interstice for continuous testing until installation.

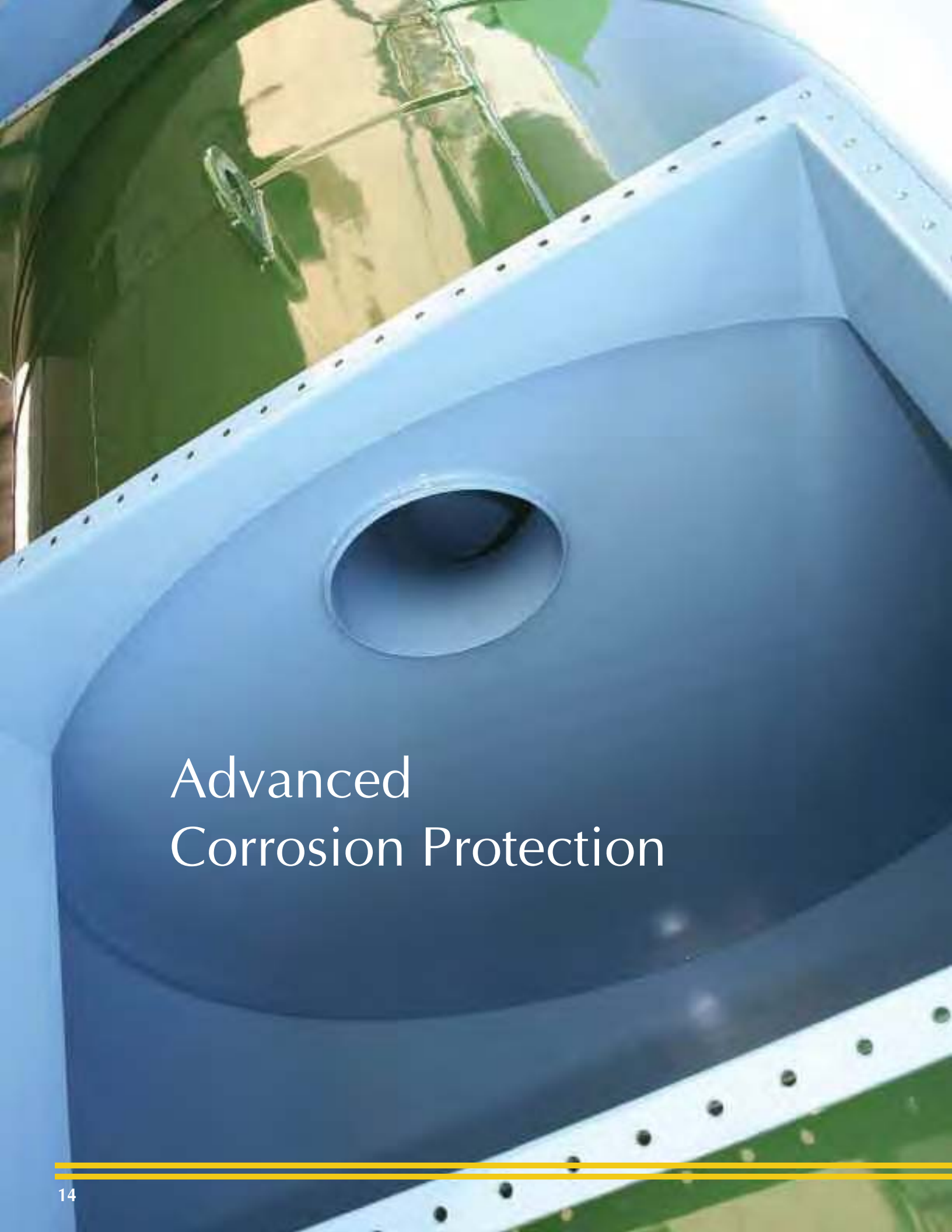
Few names in the field of oil/water separator manufacturing are as widely respected as Highland Tank. Our products are available in a vast range of sizes, of all types of construction, and with a variety of options.

Single-Walled Construction



Double-Walled Construction





Advanced Corrosion Protection

Performance Coatings

Proper surface preparation is the most important factor in any successful coating or lining. Quality assurance is maintained through Highland's complete in-house grit blast cleaning, finishing, and curing facilities. Our facilities are temperature controlled for year round application. Only qualified and experienced personnel, working under stringent guidelines, are used to apply our wide range of spray applied, high performance formulations, including epoxies and high-build polyurethanes. Exterior coatings and interior linings are selected to meet specific site conditions and service requirements.

Sample List of Exterior Coatings and Interior Linings

- High-solids polyurethane
- High-solids epoxy
- Cross-linked epoxy phenolic
- Gray alkyd shop primer

HighGuard

The HighGuard corrosion protection system is our latest innovation. This coating demonstrates an excellent balance of flexibility, impact strength, abrasion resistance, and corrosion resistance. This plural-component polyurethane has been approved by Underwriters Laboratories, Inc. under UL 1746 Part IV. Just 75 mils thickness of HighGuard will provide permanent and fully effective corrosion protection that can be measured in decades, rather than years.

Steel Tank Institute

Long before the government became concerned with underground storage of hazardous materials, Highland Tank addressed this issue with our quality Steel Tank Institute approved corrosion protection systems. Highland Tank offers several STI approved systems with, or without, pre-engineered cathodic protection.

ACT-100-U®

STI P3® UNDERGROUND STORAGE TANKS

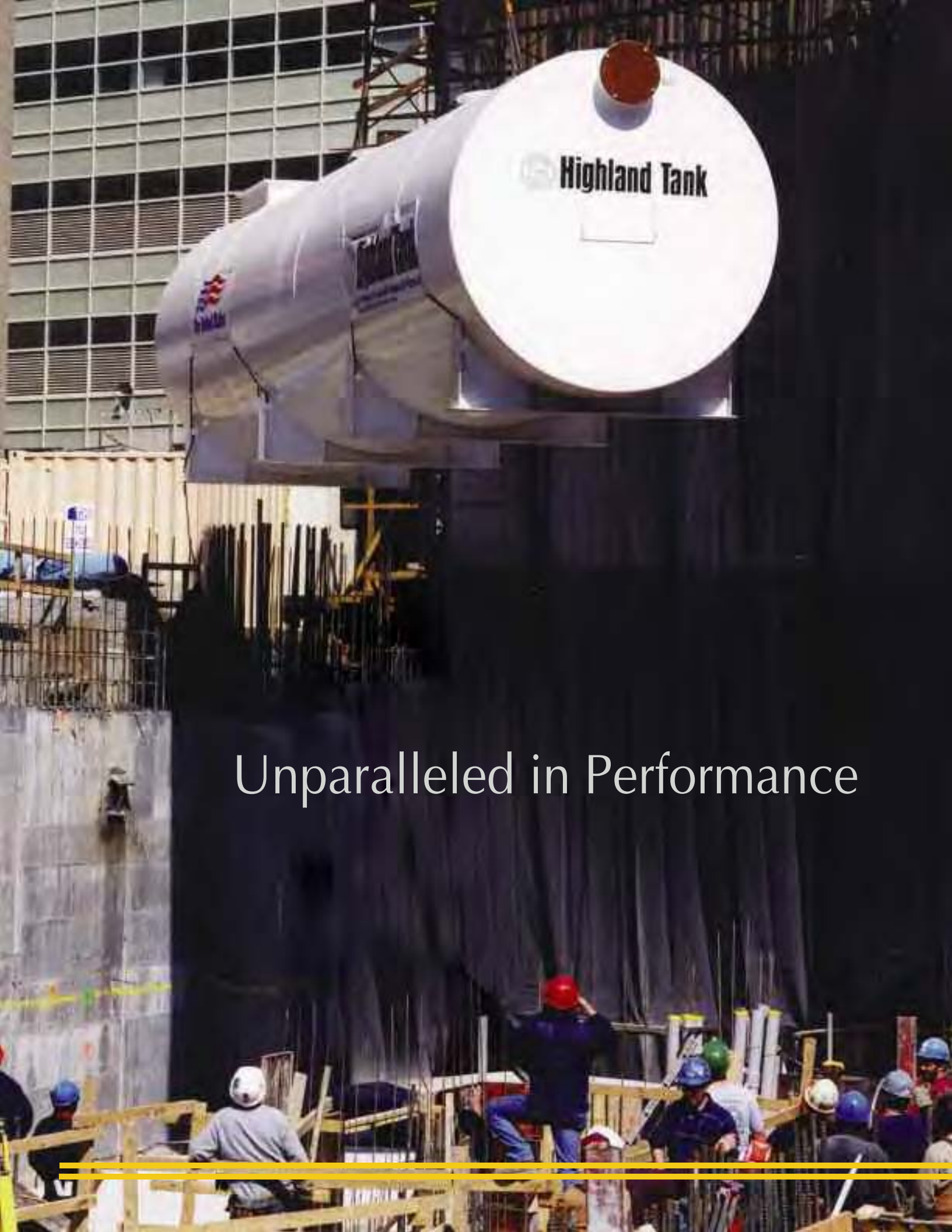
Stainless Steel

Highland manufactures our oil/water separators and interceptors of 304, 304L, 316 or 316L stainless steel. In many cases stainless steel is preferred because of its attractiveness - it does not stain, rust, or corrode.

Other advantages include:

- Ease of cleaning
- Durability
- Longer life expectancy
- Low cost

The use of stainless steel insures a high-quality, virtually maintenance-free separator. Highland's process and application engineers can assist you in selecting just the right combination of features and options needed to meet your individual preferences.



Unparalleled in Performance

Oil/Water Separators

Highland Tank provides you with the strongest and most reliable oil/water separators in the industry.

Our separators are designed to remove oil, grease, light petroleum products, and oily coated solids from a variety of wastewater discharges. They are typically installed in industrial areas and receive oily wastewater 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 and Power Plants
- Environmental Remediation
- Industrial Facilities
- Military & Government Facilities
- Municipalities
- Petroleum Production & Marketing Facilities
- Railroad Yards
- Transportation Companies

One of the first pieces of capital equipment installed during the rebuilding of New York City's World Trade Center was a Highland Tank Oil/Water Separator.

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

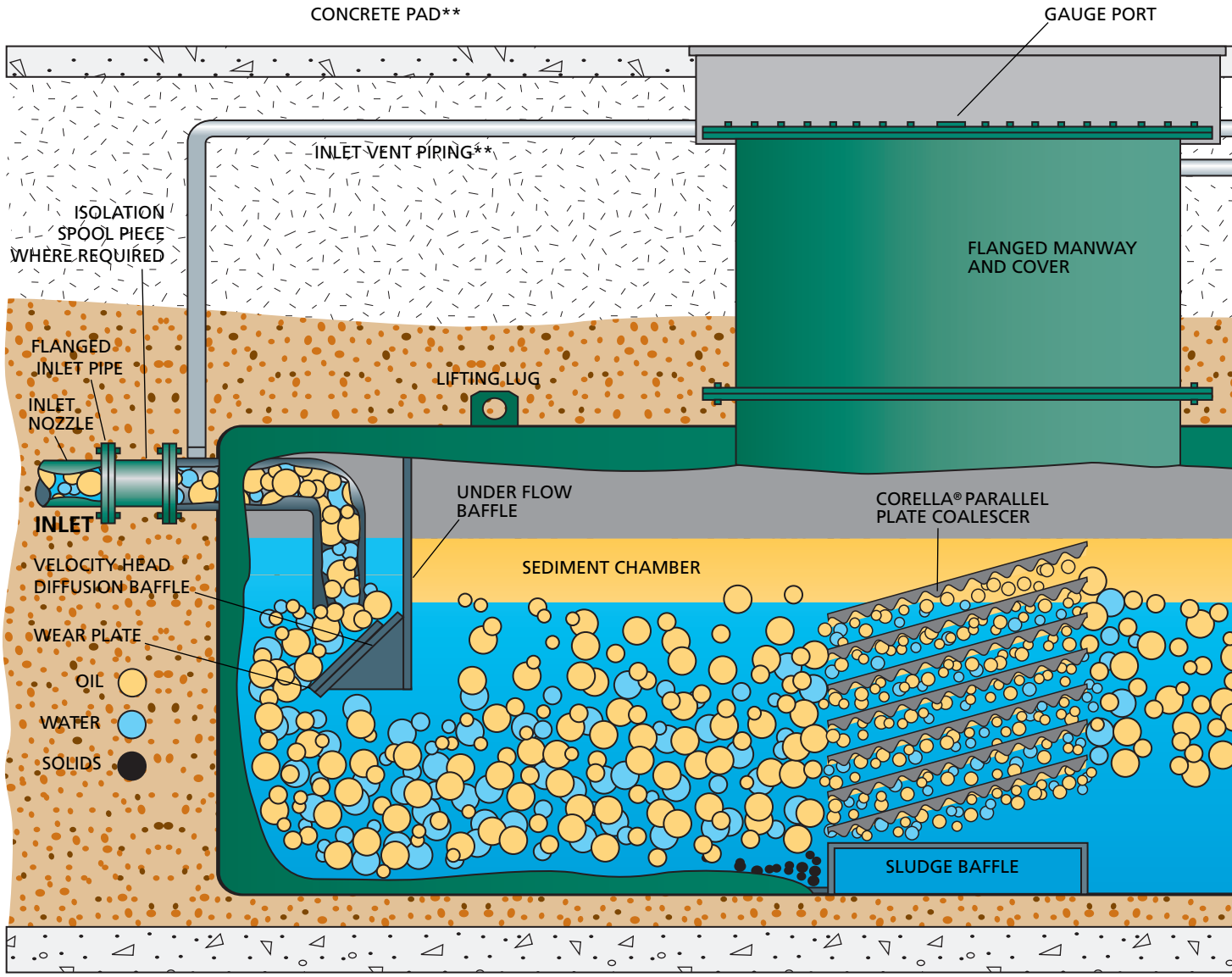
- Fueling Facilities
- Repair and Maintenance Shops
- Wash Areas

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.

Highland separators can be designed to handle high flow rates and remove oils with a specific gravity up to .95. API-421 design criteria can be employed to engineer a separator to the specified wastewater flow rate, temperature, oil globule size, and specific gravity of oil and wastewater. Effluent quality down to 10 ppm has been consistently demonstrated on our high performance Model HTC UL-SU2215 labeled oil/water separators.

Our separators come in a variety of design options and are available in either single-walled or double-walled construction, especially for those states and counties where underground oil/water separators are considered to be "commercial underground storage tanks." We offer an extensive range of standard sizes and capacities with complete accessory packages including leak and level sensors, alarm/control panels, influent, effluent, and oil pump systems. Whether your oil/water separator application is for emergency spill control or high performance wastewater treatment, Highland Tank has the product for you.

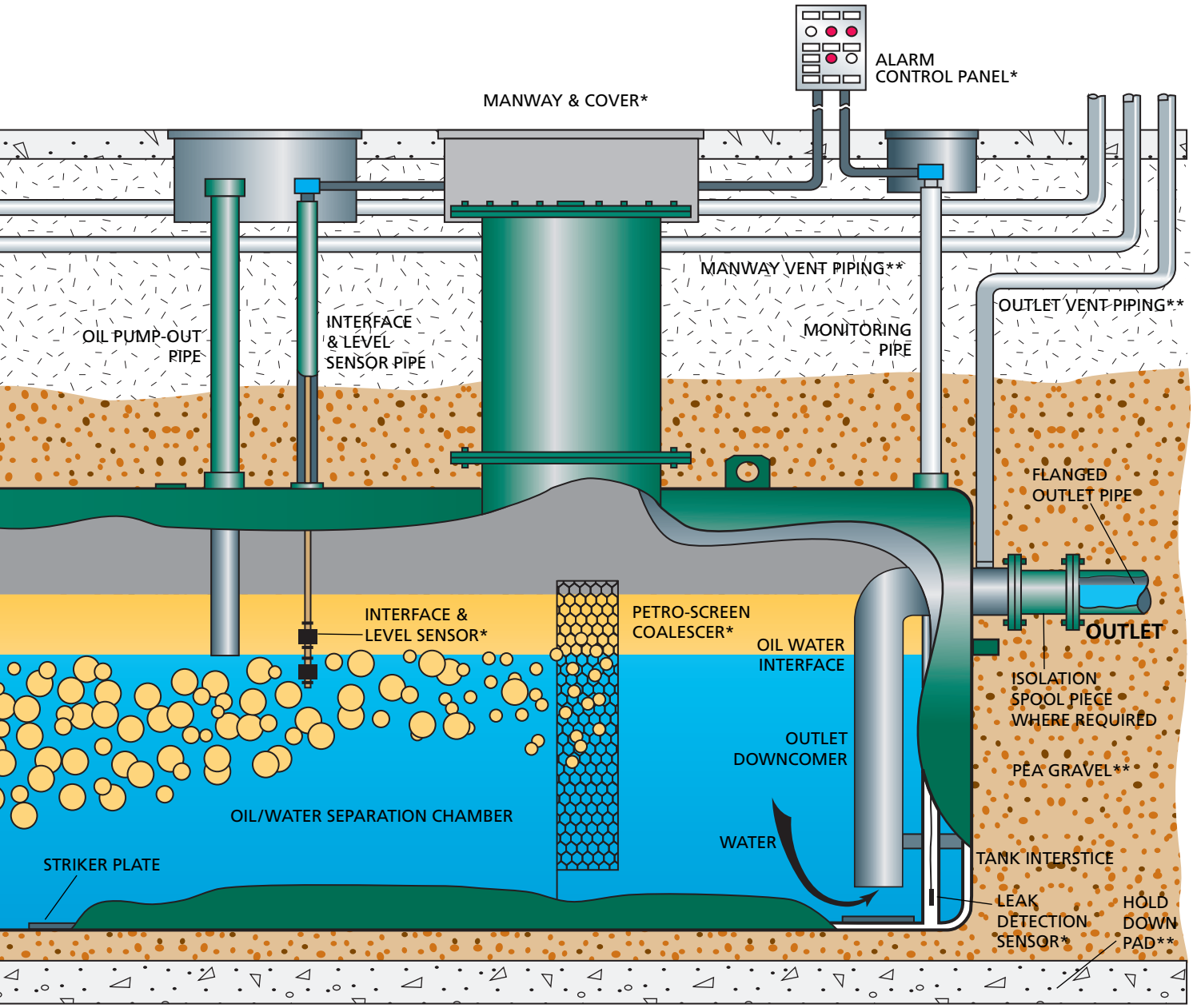
Cleaner, Safer, Smarter...



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

How It Works...

Highland'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 for 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



Model HTC Oil/Water Separator with EZ-Access Option shown

SU2215 Listed

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 downward to the outlet and is discharged by gravity displacement. To intercept droplets of oil too minute to be removed by the parallel flat/corrugated plates, we use a Petro-Screen polypropylene impingement coalescer (an encased bundle of layered oil-attracting fibers). Electronic oil level controls sound an alarm at high oil levels so that waste oil can be removed from the separator. Double-walled separators are monitored with electronic leak detection systems for the interstitial space.

The Corella® Coalescer

The Corella® inclined parallel plate coalescer combines the features of both a flat-plate separator and a corrugated-plate separator into a new, "self-cleaning" design that performs better than traditional plate coalescers.

The primary reason for oil/water separator failure is clogging of the coalescing plates with settleable solids. The Corella® solves the problem of extensive separator shutdown and maintenance by simultaneously separating free oil droplets and settleable or suspended solids from water, without clogging the coalescer.

The difference lies in our precise manufacturing of the coalescer with inclined parallel plates that are flat on the top and corrugated on the bottom. The plates are constructed and arranged to allow settleable solids to accumulate on the flat top of the plates and slide downward, while the oil coalesces into sheets on the corrugated undersides and flows upwards. Unlike other oil/water separators, both oil and solids can be removed without shutting down the separator for periodic cleaning.

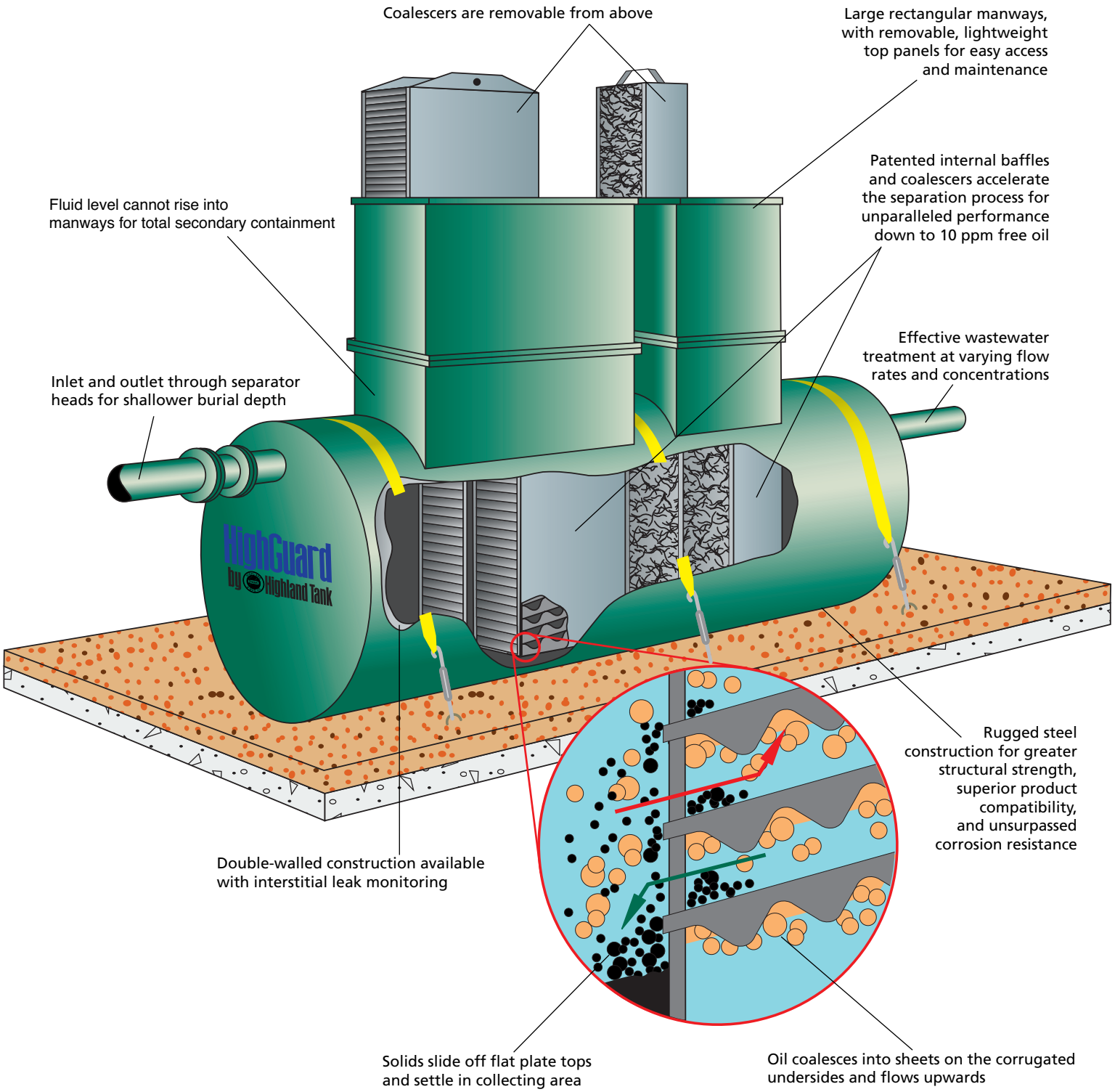
Utilizing Highland's EZ Access manways, inspection of the Corella® is easy, without a dangerous confined space entry. Both oil and solids can be removed without shutting down the separator. The access from above permits separator pumpout and cleaning, using a high-pressure washer with the coalescer in place, so that hazardous materials are not discharged at grade during the cleaning process.

This new "self-cleaning" design performs better than traditional plate coalescers. Corella® plate packs are available with a variety of pack lengths and angles and are tailored to the specified separator duty. They can be configured to meet a wide variety of capacities and conditions and can be integrated with many other unit operations to provide a total solution to a wastewater treatment problem.

Features, Advantages, and Benefits

- Permits separation of mixtures containing both oil and settleable solids without the settleable solids clogging the coalescer.
- Process flows from 5 to 6,000 gal/min.
- Separation of oil droplets of 60 micron or larger size.
- Provides improved oil separating efficiency.
- Operates on water temperatures from 40° to 120° F.
- Handles wide range and specific gravities of oil and suspended particle concentrations.
- Manufactured of oleophilic (oil-attracting) materials or stainless steel.
- Constructed using multiple cartridges to allow for easy removal.
- Custom packs are available for higher flow rates, temperatures or solids loading.

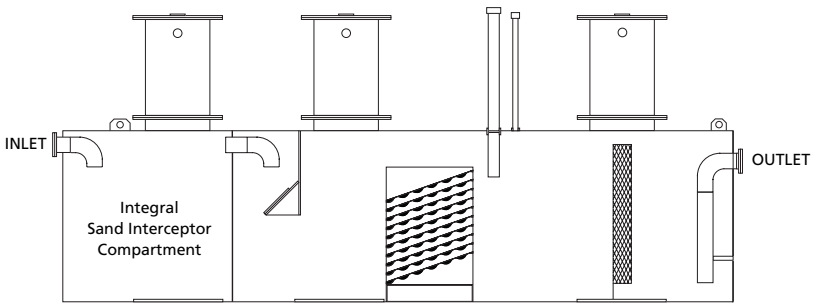
The Corella® Coalescer is a removable, inclined parallel, flat/corrugated plate coalescer that enhances separation of both oil and solids from all strata of the wastewater stream. It is individually engineered to specific application and job-site requirements to maximize utility.



Pre-Engineered Design Options

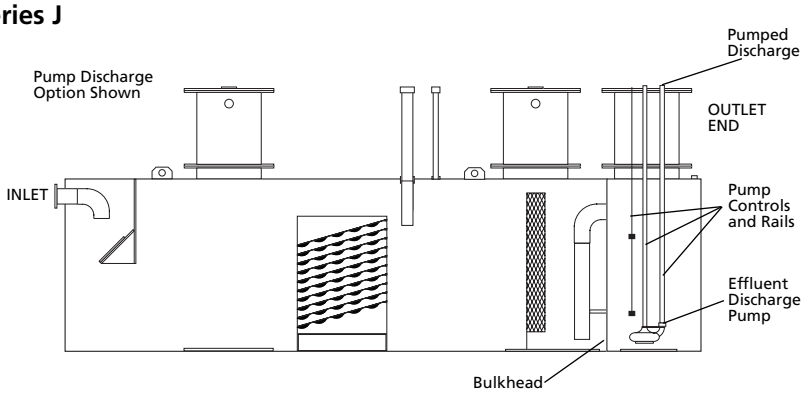
Series G oil/water separators feature an integral sand interceptor compartment to permit sand and gravel to settle out before the wastewater enters the oil/water separator.

Series G



Series J oil/water separators have an integral effluent pump-out compartment with level controls. The pumped effluent can be routed through Highland's Advanced Filtration System to further reduce the oil content.

Series J



Highland 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

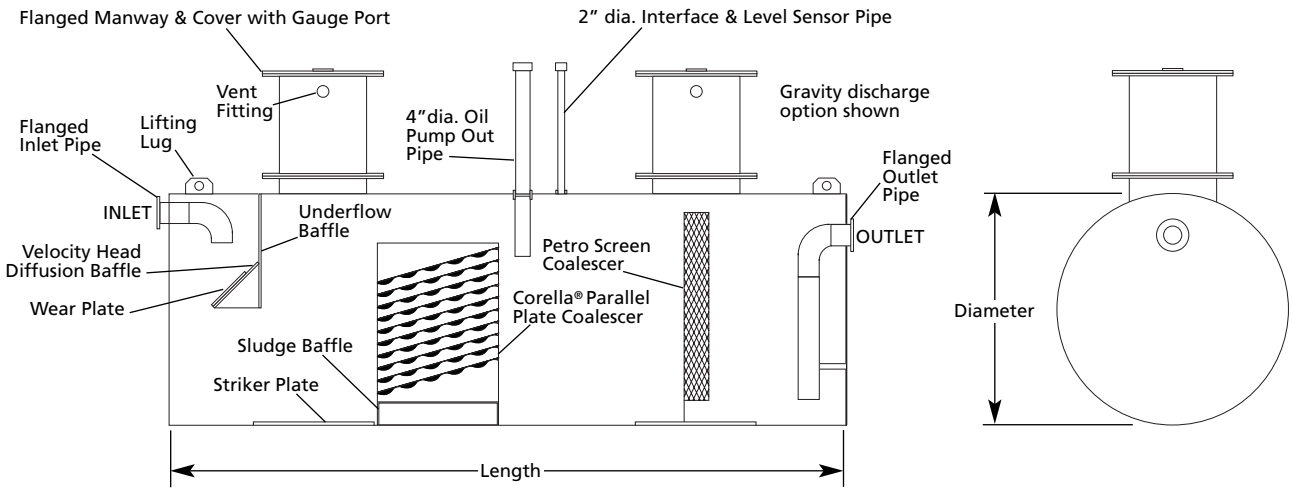
Canadian Patents - 1,325,179, 1,296,263 & 2,389,065

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

Cylindrical Separator Sizing Guide



Model HTC or HT	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	2,400	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'-6"	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. Custom sizing is available.
Consult Highland Tank for Series G, J oil/water separator sizing guides.

Innovation, Quality, Economy

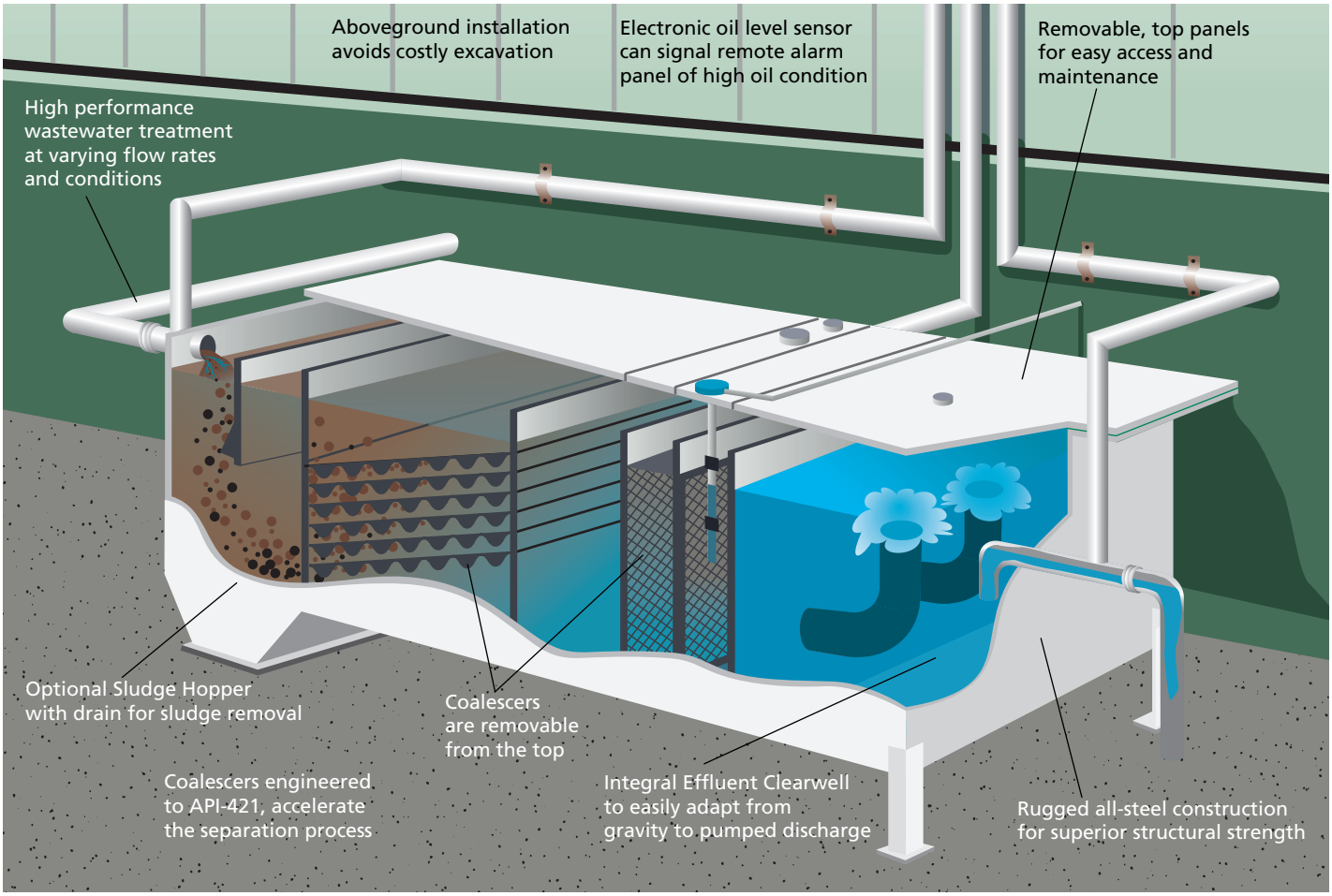
Rectangular separator design permits total, unconfined, unrestricted OSHA compliant top access for safe visual inspection, cleaning, and maintenance.

Rectangular Oil/Water Separators

Rectangular oil/water separators can be installed aboveground to help industrial facilities comply with the EPA's spill and discharge regulations. Like our cylindrical, belowground units, these separators are equipped with our non-clogging Corella® coalescers that accelerate the separation process and greatly reduce the level of oil and oily coated solids discharged into municipal storm or sanitary sewer systems.

Our rectangular separators can serve as a stand-alone oil/water separator or can be readily adapted for use in conjunction with our polishing systems, like our Trickle Filters or Advanced Filtration Systems.

Easy to Install, Operate, and Maintain

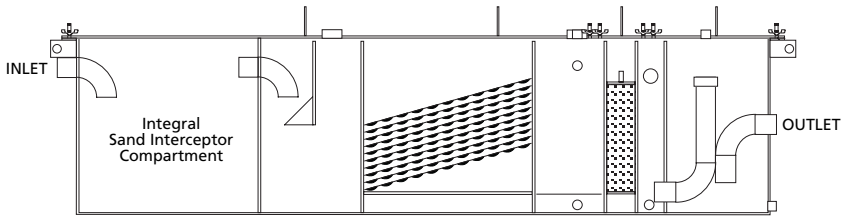


Also available with a UL-SU2215 Label

Pre-Engineered Design Options

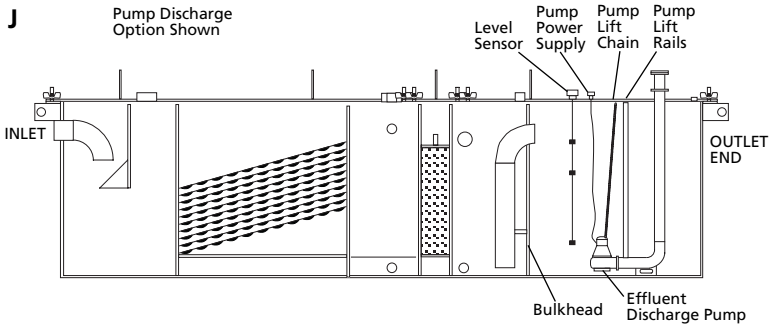
Series G oil/water separators feature an integral sand interceptor compartment to permit sand and gravel to settle out before the wastewater enters the separation chamber.

Series G



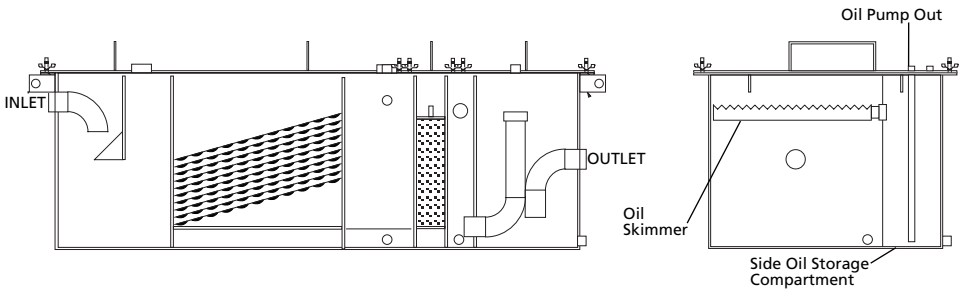
Series J oil/water separators feature an integral effluent pump-out compartment with level controls to operate a pump at prescribed levels. The pumped effluent can then be routed through Highland's Advanced Filtration System to further improve performance.

Series J



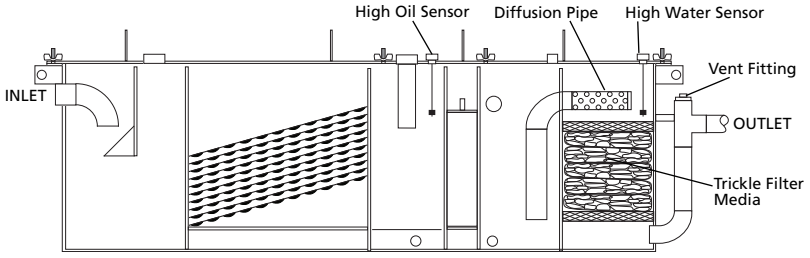
Series S oil/water separators feature an integral side product compartment for storing separated oil. The special side product compartment permits the removal of only the skimmed oil by pump-out. The effluent is discharged either by pump or gravity flow.

Series S

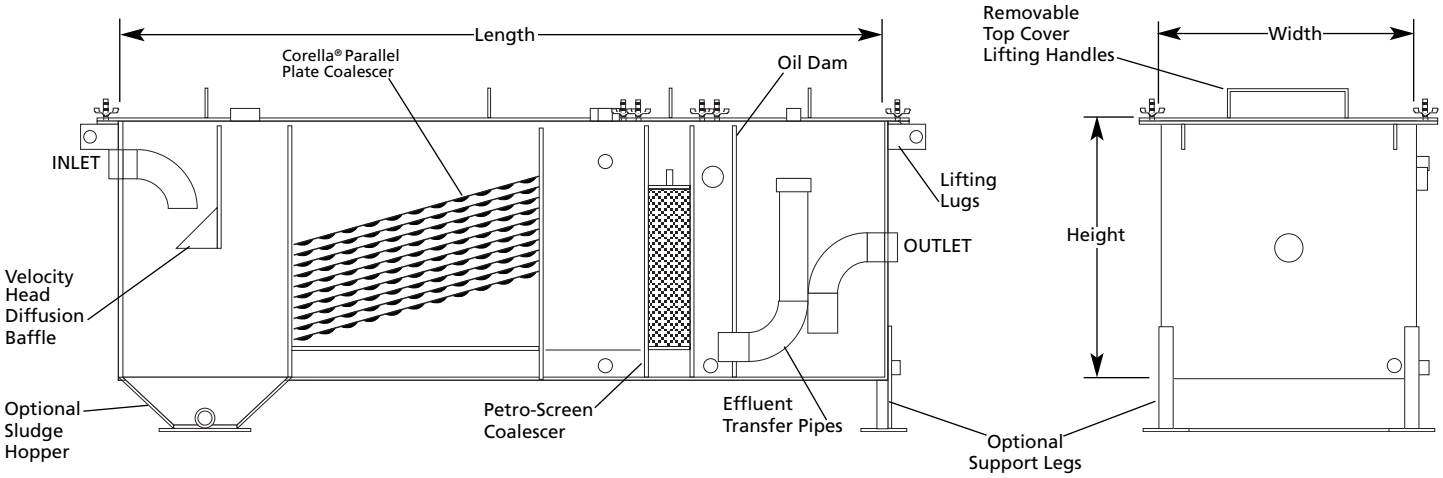


Series TF oil/water separators feature an integral "trickle filter" to remove dispersed and mechanically emulsified oils that may pass through the separator untreated. Water flows freely out of the separator to the diffusion pipe and passes through the oleophilc trickle filter media bags to remove any troublesome discharges. The media bags can be easily removed and replaced when necessary.

Series TF



Rectangular Separator Sizing Guide



Model **R-HTC or R-HT**	Flow Rate **Gal/Min**	Total Volume **Gallons**	Recommended Oil Pump-out **Gallons**	Dimensions **L x W x H**	Inlet & Outlet **Diameter**
100	5	100	20	5′-0″ x 1′-6″ x 3′-0″	1″
200	10	200	40	5-′0″ x 2′-0″ x 3′-0″	2″
300	25	300	60	7′-0″ x 2′-0″ x 3′-0″	3″
600	50	600	120	9′-0″ x 3′-0″ x 3′-0″	4″
900	75	900	180	10′-0″ x 3′-0″ x 4′-0″	6″
1,000	100	1,000	200	11′-0″ x 4′-0″ x 4′-0″	6″
2,000	200	2,000	400	12′-0″ x 5′-0″ x 5′-0″	8″
3,000	300	3,000	600	18′-0″ x 5′-0″ x 5′-0″	10″
4,000	400	4,000	800	18′-0″ x 6′-0″ x 5′-0″	10″
5,000	500	5,000	1,000	20′-0″ x 6′-0″ x 6′-0″	10″
6,000	600	6,000	1,200	19′-2″ x 7′-0″ x 6′-0″	10″
7,000	700	7,000	1,400	19′-2″ x 7′-0″ x 7′-0″	10″
8,000	800	8,000	1,600	19′-2″ x 8′-0″ x 7′-0″	10″
9,000	900	9,000	1,800	18′-10″ x 8′-0″ x 8′-0″	12″
10,000	1,000	10,000	2,000	20′-11″ x 8′-0″ x 8′-0″	12″
12,000	1,200	12,000	2,400	19′-10″ x 9′-0″ x 9′-0″	12″
15,000	1,500	15,000	3,000	24′-9″ x 9′-0″ x 9′-0″	14″
20,000	2,000	20,000	4,000	29′-9″ x 10′-0″ x 9′-0″	16″
25,000	2,500	25,000	5,000	33′-6″ x 10′-0″ x 10′-0″	18″
30,000	3,000	30,000	6,000	40′-0″ x 10′-0″ x 10′-0″	20″

Plate spacing and orientation may vary depending on site conditions.
Consult Highland Tank for series G, J, S, and TF oil/water separator sizing guides.

DSB Separator System

DSBs are installed in vehicle repair and service facilities, car and truck dealerships, and fast lube shops to help prevent discharges of harmful pollutants into the storm or sanitary sewer system.

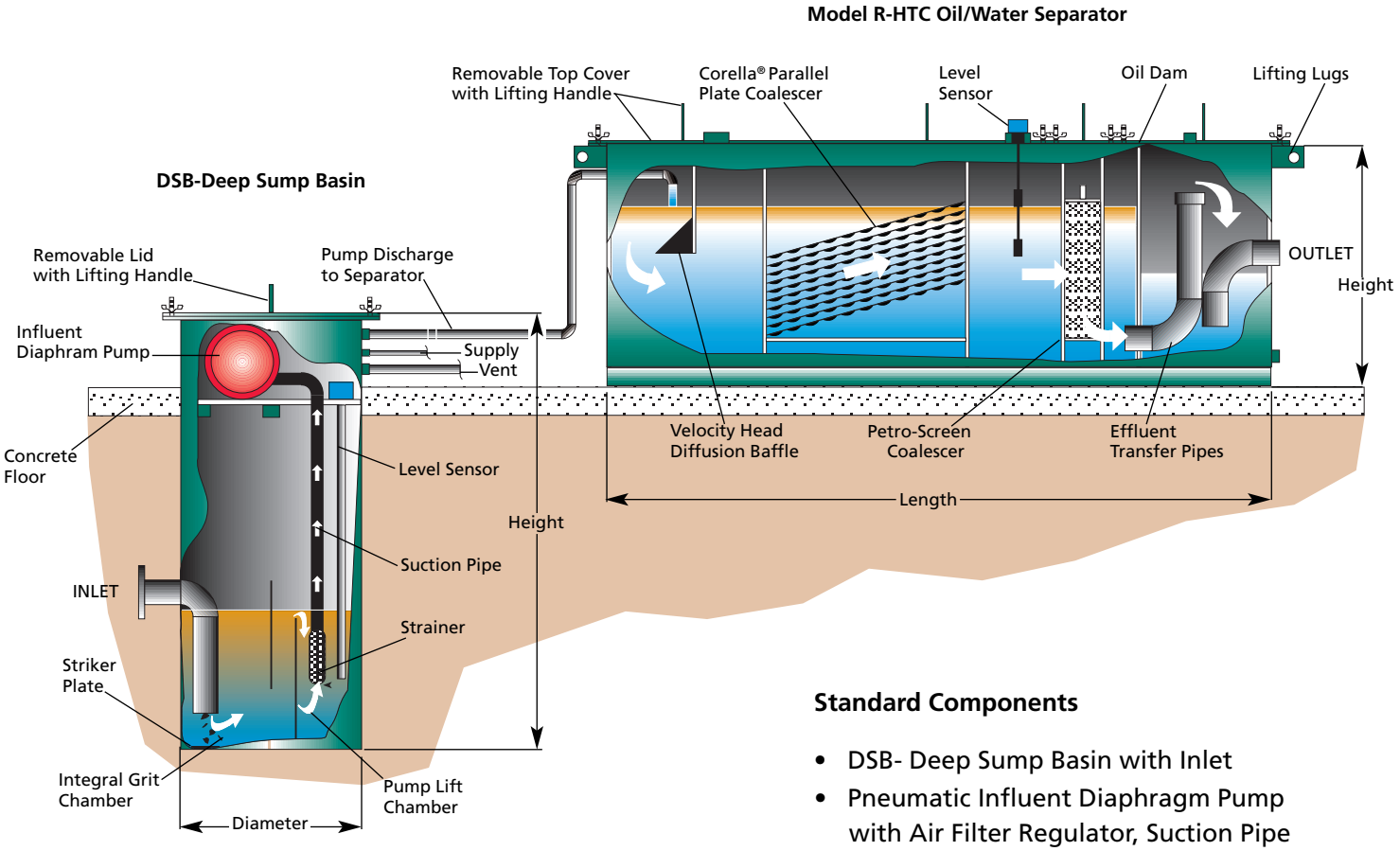
The DSB is a complete packaged system consisting of the Deep Sump Basin with Integral Grit and Pump Lift Chambers, Influent Pump Package, and Model HTC Rectangular Aboveground Oil/Water Separator. The system is designed to remove free-floating oil, grease, and settleable, oily-coated solids from a vehicle maintenance facility's fuel area, wash area, and service bay drains.

DSB Systems are available in standard flow rates from 25 to 200 gal/min. Higher flow rate systems are also available. Pneumatic sensor and influent pump systems are standard, with electronic systems available.

Features

- Automatic for ease of operation.
- Utilizes patented Corella® coalescer technology.
- Rugged all-steel design & construction.
- Easy installation with limited excavation.
- Removable vapor-tight top covers for service and maintenance.

High Performance Separators
with Influent Pump Packages



Standard Components

- DSB- Deep Sump Basin with Inlet
- Pneumatic Influent Diaphragm Pump with Air Filter Regulator, Suction Pipe and Strainer
- Model R-HTC Oil/Water Separator with Level Sensor and Controls

DSB Sizing Guide

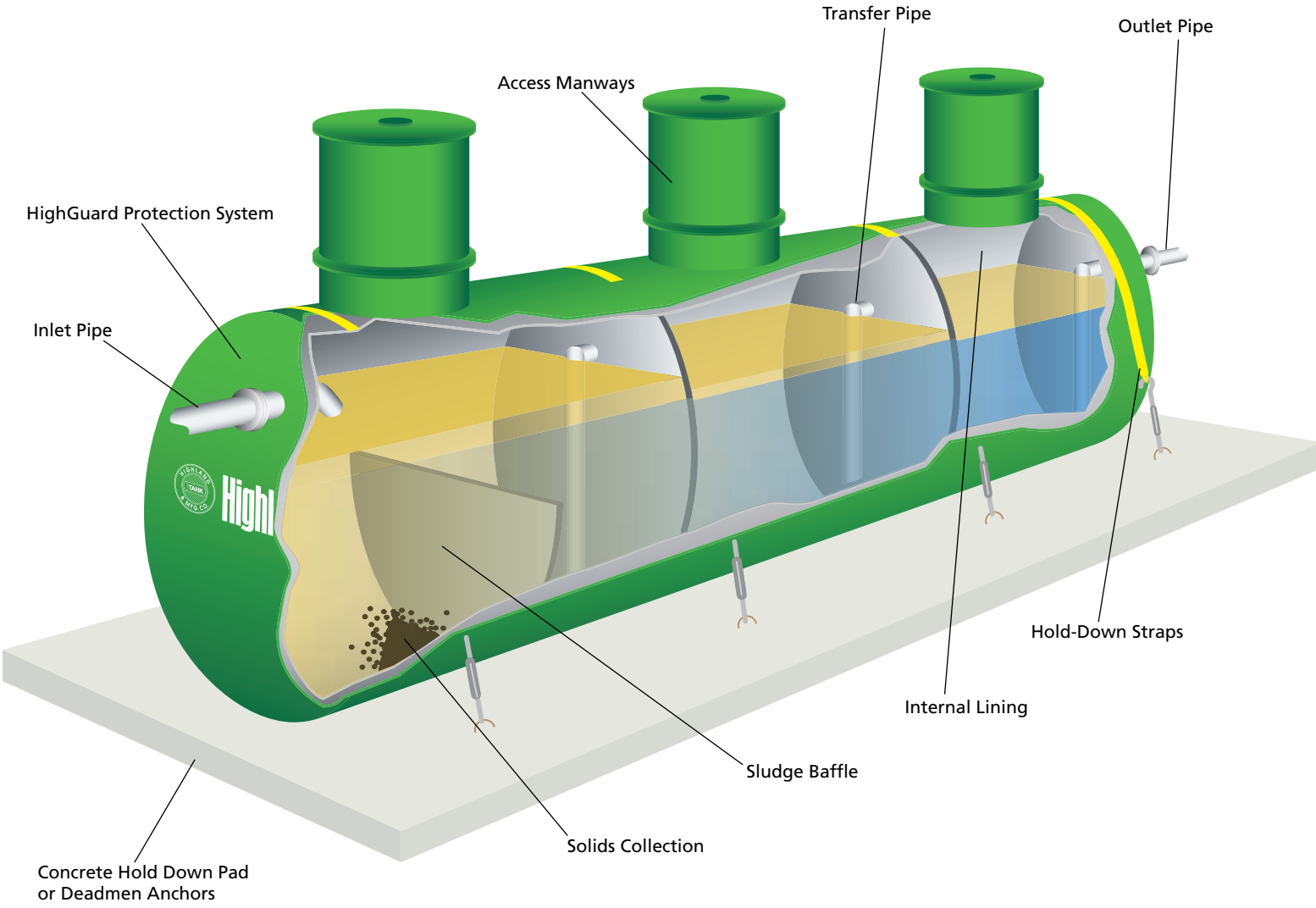
Model **DSB**	Flow Rate **Gal/Min**	Recommended Oil Pump-out **Gallons**	Separator Dimensions **Length Width Height**	Inlet & Outlet **Diameter**	Sump Dimensions* **Diameter x Height**
300	25	60	7′-4″ x 2′-0″ x 3′-0″	1" / 3″	2′-6″ x 6′-0″
600	50	120	9′-0″ x 3′-0″ x 3′-0″	1-1/4" / 4″	2′-6″ x 6′-0″
900	75	180	10′-0″ x 3′-0″ x 4′-0″	2" / 6″	4′-0″ x 8′-0″
1,000	100	200	11′-0″ x 4′-0″ x 4′-0″	2" / 6″	4′-0″ x 8′-0″
2,000	200	400	12′-0″ x 5′-0″ x 5′-0″	4" / 8″	5′-4″ x 9′-0″

*Custom sizing available

Design, Dependability, Durability

Oil/Sand Interceptors are required in all establishments…including car washes, commercial vehicle garages, repair facilities, service stations, and similar facilities that conduct washing, servicing, repairing, maintenance or storage of motor vehicles…where oil and/or flammable liquid may be introduced into the sewer system.

Oil/Sand Interceptors



Oil/Sand Interceptors (OSI) are wastewater treatment tanks designed to intercept and collect sand, grit, free oil, and grease (hydrocarbons and other petroleum products), and prevent their entry into the sanitary sewer system.

Designed to accept gravity flow, the Interceptor's large volume allows for a lengthy retention time for these materials to separate from the water due to their differences in specific gravity. The Interceptor contains one to four compartments (basins) where oil separates and floats to the surface,while sand and grit settles to the bottom sludge baffle. The clearer water beneath flows downward to the outlet downcomer where it is discharged from the quiescent section of the interceptor.

Interceptor sizing and construction conforms to many recognized plumbing codes and municipal sewer pretreatment regulations. They are available in double-walled construction for those states and local jurisdictions where underground interceptors are considered to be "commercial underground storage tanks."

They're lighter than concrete interceptors and can be sized for greater volumes and retention times. Unlike many competitive concrete units, they are water-tight and pressure or vacuum testable in both the factory and the field.

We offer an extensive range of standard sizes and capacities with complete accessory packages, including leak and level sensors, alarm/control panels, and influent, effluent, and oil pump systems. Variations in capacity, arrangement, dimensions, and pipe penetration locations can be made to fit your specific requirements.

Pre-Engineered Design Options

Single-basin interceptors have a single collection chamber and sludge baffle to remove sand, grit, grease, and free oil. It's our own simple oil and sand "knock-out" design.

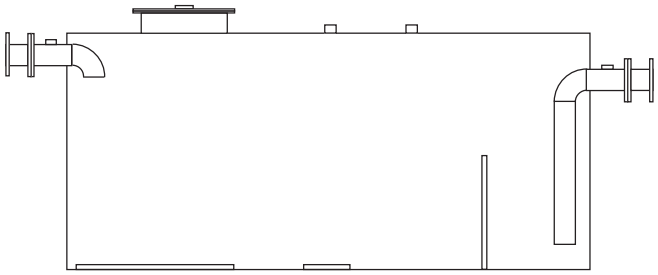
Double-basin interceptors have two collection chambers and a sludge baffle. Commonly used in car wash and commercial or municipal vehicle washing applications for oil and sand removal prior to discharging to a recycle wash system. An optional overflow bypass directs excess flow to an auxiliary retention area.

Triple-basin* interceptors have three collection chambers and a sludge baffle. Our most popular and versatile design has a variety of applications, such as car washes and commercial garages. Floatables, oil, sand, and other sediments are trapped in the first chamber, and any remaining oil is trapped in the second chamber. The third chamber can be equipped with an effluent pump system when used in conjunction with Highland's HighCycle Wash Water Recycle System.

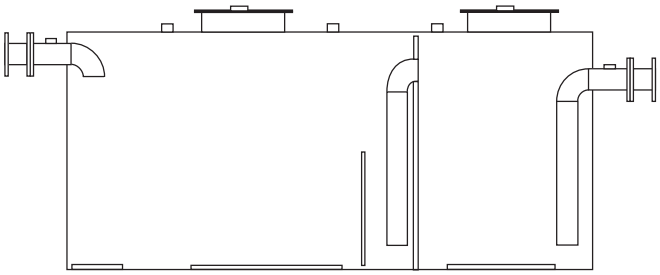
Quad-basin interceptors have four collection chambers and a sludge baffle. In addition to their use at large, commercial vehicle washes, they are commonly used at construction sites for oil, dirt, and debris removal during site dewatering operations, to comply with strict stormwater regulations.

• Conforms to IAPMO - PS - 80 - 2006.

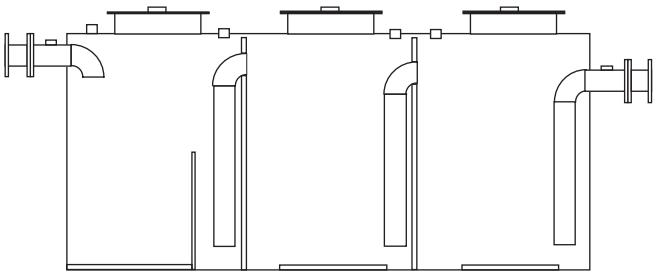
Single Basin



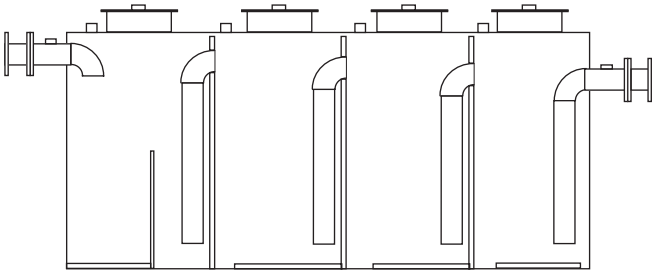
Double Basin



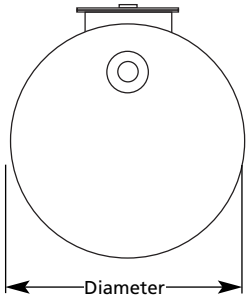
Triple Basin

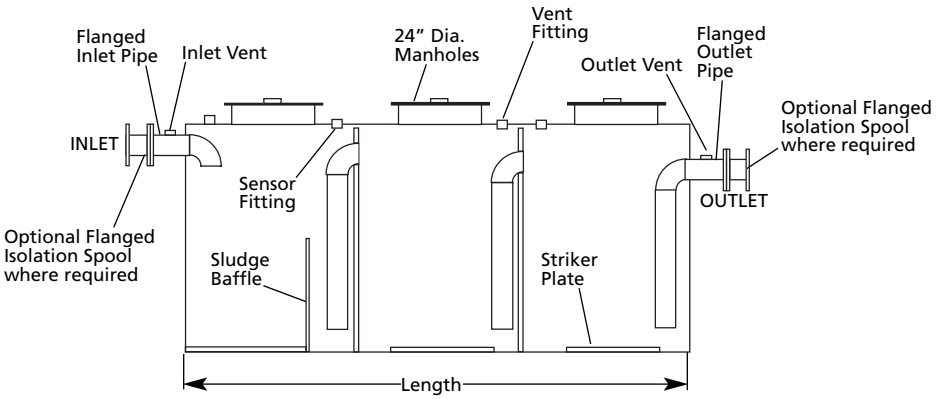


Quad Basin



Oil/Sand Interceptor Sizing Guide





Model **OSI**	Flow Rate **Gal/Min**	Total Volume **Gallons**	Recommended Oil Pump-out **Gallons**	Dimensions **Diameter**	**Length**	Inlet & Outlet **Diameter**
*350	35	350	88	3'-6"	4'-3"	4"
550	55	550	138	3'-6"	7'-9"	4"
750	75	750	188	4'-0"	8'-0"	6"
1,000	100	1,000	250	4'-0"	10'-9"	6"
1,500	150	1,500	375	5'-4"	9'-0"	6"
2,000	200	2,000	500	5'-4"	12'-0"	6"
3,000	300	3,000	750	5'-4"	18'-0"	8"
4,000	400	4,000	1,000	5'-4"	24'-0"	8"
5,000	500	5,000	1,250	6'-0"	23'-10"	8"
6,000	600	6,000	1,500	6'-0"	28'-8"	10"
7,000	700	7,000	1,750	7'-0"	24'-4"	10"
8,000	800	8,000	2,000	7'-0"	28'-0"	10"
9,000	900	9,000	2,250	8'-0"	24'-0"	12"
10,000	1,000	10,000	2,500	8'-0"	26'-8"	12"
12,000	1,200	12,000	3,000	8'-0"	32'-0"	12"
15,000	1,500	15,000	3,750	10'-0"	25'-6"	14"
20,000	2,000	20,000	5,000	10'-6"	31'-0"	16"
25,000	2,500	25,000	6,250	10'-6"	38'-9"	18"
30,000	3,000	30,000	7,500	10'-6"	46'-6"	20"
40,000	4,000	40,000	10,000	12'-0"	47'-3"	24"
50,000	5,000	50,000	12,500	12'-0"	59'-0"	24"
60,000	6,000	60,000	15,000	13'-0"	60'-6"	24"

NPT available for 4 - 6" Inlet and Outlet; 8" and larger will be Flanged Connections

Optional sampling/monitoring ports available. * One Manway, Single and Double Basin ONLY.

Solids Stormwater Interceptor

SSI perform a key role in removing floating debris and settleable solids from a stormwater stream prior to its entry into a detention basin, constructed wetland, or collection system.

The Solids Stormwater Interceptor (SSI) is a simple, inexpensive hydrodynamic separation device designed to remove debris and settleable and suspended solids from stormwater runoff through gravitational settling and trapping of pollutants.

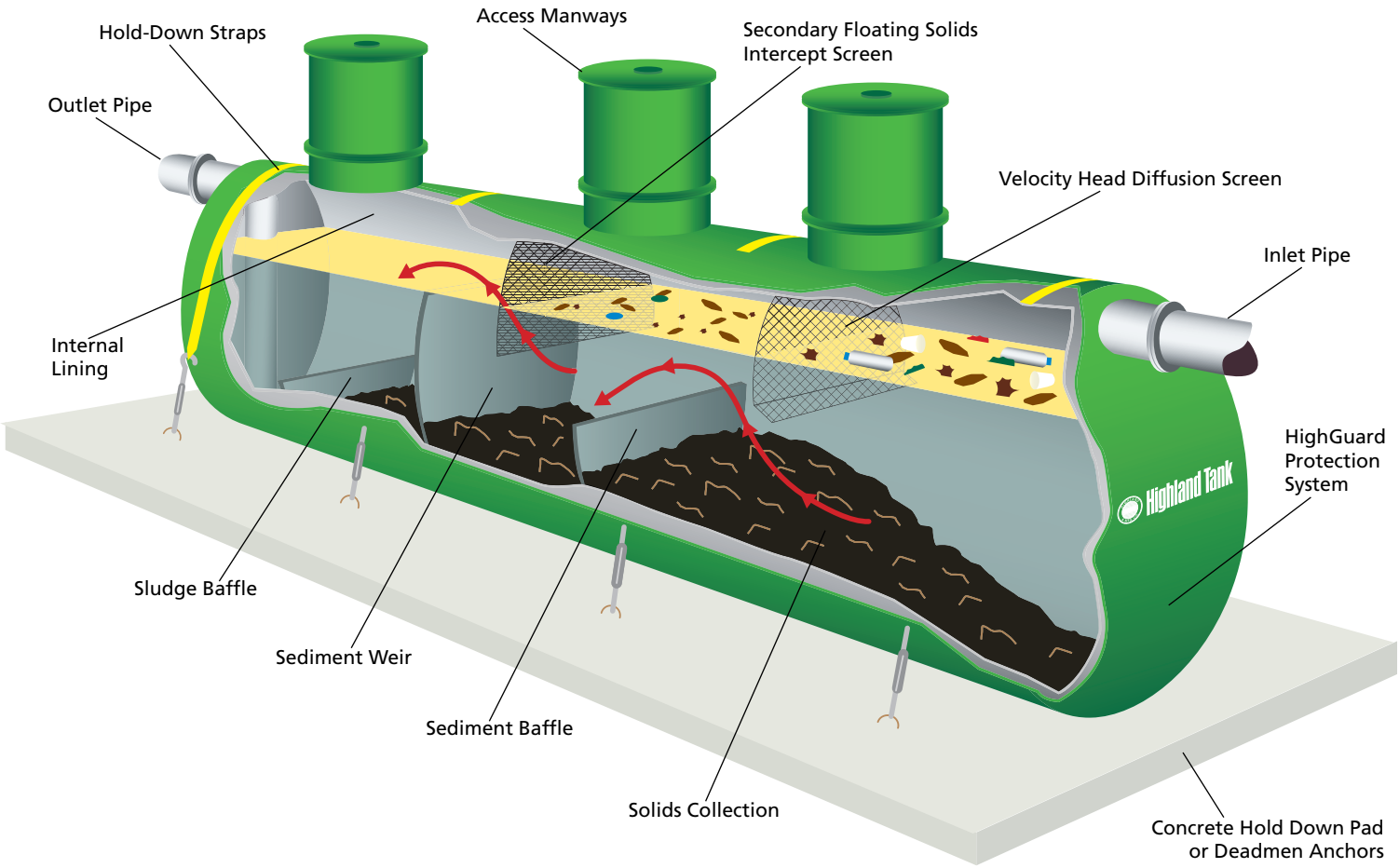
The SSI is designed to slow the flow velocity though the interceptor, thereby allowing solids and associated pollutants to settle and accumulate on the bottom.
The SSI contains a series of settling chambers separated by baffles to capture sand, sediment, and grit and specially designed trash-screens to capture larger materials, trash and floatables.

In operation, stormwater enters the interceptor by gravity flow and encounters the velocity head diffusion screen. Floating solids are trapped and the flow velocity decreases allowing particles to settle. The baffles impede particle movement – as suspended solids strike the baffles they begin to settle. Large particles settle out first and accumulate in the first chamber while smaller particles usually settle out in subsequent chambers. Large access manways allow maintenance personnel to inspect and remove the accumulated waste from grade level.

The SSI system is typically designed to bypass runoff flows in excess of the design flow rate. A diversion structure installed ahead of the SSI as well as an outfall adapter can be provided to allow flows in excess of the "first flush" to bypass the SSI preventing wash out.

SSI's are constructed from protected steel, meeting ASTM specifications. Industry and factory specifications are followed to assure complete internal and external corrosion protection.
We offer complete interior/ exterior blast and finish coatings, including Highland's HighGuard protective coating. An additional internal polyurethane lining assures years of continuous service. Stainless steel and/or double-wall construction are available.

How it Works!



Solids Interceptors Sizing Guide

Model **SSI**	Drainage Area **Acres**	Req'd. WQTV* **Gallons**	Flow Rate **Gal/Min-Ft³/s**	Total Volume **Gallons**	Sediment Volume **Cubic Feet**	Dimensions **Dia/Length**	Inlet & Outlet **Diameter**
2,000	1/8	1,700	300-0.668	2,000	186.2	5'-4" X12'-0"	6"
4,000	1/4	3,400	500-1.114	4,000	361.7	5'-4" X 24'-0"	8"
8,000	1/2	6,800	1,000-2.228	8,000	746.2	8'-0" X 21'-4"	10"
12,000	3/4	10,200	1,500-3.342	12,000	1,128.5	10'-0"X 20'-6"	12"
15,000	1	13,600	1,700-3.787	15,000	1,382.1	10'-0" X 25'-6"	14"
20,000	1 1/4	17,000	2,500-5.570	20,000	1.836.8	10'-6" X 31'-0"	16"
25,000	1 1/2	20,400	3.000-6.684	25,000	2,312.3	10'-6" X 38'-9"	18"
30,000	2	27,200	3,500-7.798	30,000	2,710.2	10'-6" X 46'-6"	18"
40,000	2 1/2	34,000	4.500-10.026	40,000	3,551.0	12'-0" X 47'-9"	24"
50,000	3	40,800	5,200-11.585	50,000	4,425.1	12'-0" X 59'-6"	24"
60,000	4	54,400	6,100-13.591	60,000	5,361.5	13'-0" X 60'-6"	24"

Notes:

1. Standard SSI will provide efficient removal of pollutant particles (1/2 inch solids/sieve size 200 sediment) for the majority of site conditions.
2. WQTV* is the Water Quality Treatment Volume ("First Flush") or the first 1/2 inch of rainwater runoff from the drainage area.
3. 24" dia. Manways are standard; 30", 36", and large rectangular "EZ-Access" Manways are available.

Manual Oil Interceptors

City of New York Material and Equipment Acceptance MEA NO. 8-07-E

MEMBER

MEMBER

Manual Oil Interceptors (MOI) are designed to trap sediment and retain free-floating oil and grease (petroleum hydrocarbons and other volatile liquids) from wastewater discharged from floor drains, such as those found in aircraft and vehicle maintenance, storage, and washing facilities. MOIs prevent the discharge of sediment, oil, grease, and other substances harmful to the building drainage system, the public sewer, or sewage treatment plant or processes.

They are constructed of mild carbon steel and coated with heavy duty polyurethane for superior corrosion resistance. Stainless steel construction is also available. MOIs are suitable for installation above or below grade, and are available in configurations to fit almost any requirement. Top Deck Plate Covers allow for flush-with-floor installation for easy access for maintenance and cleaning. Vapor-tight, quick opening covers or hinged, hatch doors are available as an option. Highland Tank offers an extensive range of standard sizes and capacities. Custom manufacturing and many options and accessories are available.

Operation

Manual Oil Interceptors are installed between the floor drain(s) and the sanitary sewer. The operation of the MOI is simple: MOIs retain wastewater long enough to allow those contaminants with specific gravities different than water, to separate out by gravity. Since oil is lighter than water, the oil floats and can be manually skimmed from the surface of the interceptor. Conversely, solids settle to the bottom and accumulate at the sludge baffle. The accumulating waste oil and solids are periodically removed and properly disposed.

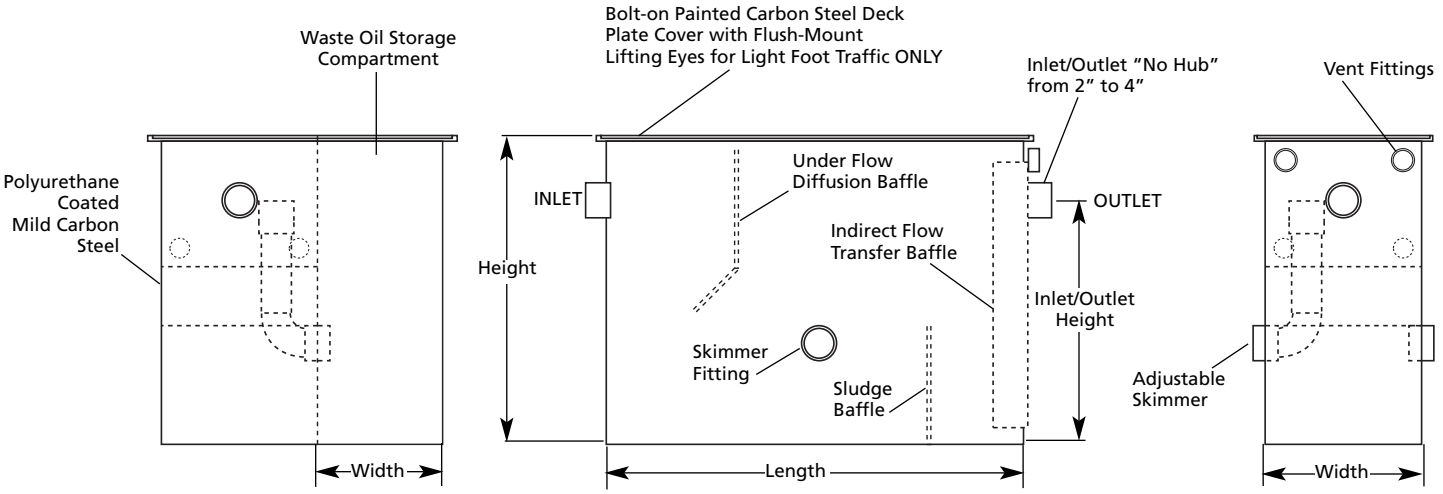
All-NEW Product!

Manual Oil Interceptors are now available with an integral waste oil storage compartment. This simplifies the installation and maintenance of the interceptor system by fabricating the oil separation chamber and storage tank in one unit, thus eliminating the need to install a separate waste oil storage tank and connecting piping.

Operation of the MOI-SO is simple: as the separated oil floats to the surface of the separation compartment, it is removed by the adjustable oil skimmer into the adjacent oil compartment by gravity. The collected oil can then be regularly removed by a certified waste hauler. Access hatches are supplied for each compartment of the interceptor for ease of inspection and maintenance.

Manual Oil Interceptors Sizing Guide

MOI-SO



MOI

Model	*Flow Rate	Total Volume		Dimensions (Inches)			†Inlet/ Outlet	CL Inlet/ Outlet	Waste Oil Storage Compartment	
	Gal/Min	**Gallons**	**Ft.³**	**Length**	**Width**	**Height**	**NPT**	**Height**	**Width**	**Volume**
MOI - 25	25	55.2	7.4	26	20	32	3	26	17-1/4"	50
MOI - 35	35	74.7	10	32	22	32	3	26	14"	50
MOI - 50	50	80.8	10.8	32	22	34	3	28	25-3/4"	100
MOI - 75	75	168.9	22.6	46	32	36	3	28	18"	100
MOI - 100	100	187.5	25.1	49	34	36	4	28	33"	200
MOI - 125	125	195.2	26.1	51	34	37	4	28	33"	200
MOI - 150	150	214.3	28.6	56	34	38	4	28	29-1/2"	200
MOI - 200	200	291.4	39	66	34	42	4	32	33"	300
MOI - 250	250	426.4	57	72	38	50	4	38	22-3/4"	300
MOI - 300	300	511.3	68.3	76	42	52	4	40	25-1/2"	300
MOI - 350	350	549.7	73.5	78	44	52	4	40	37"	500
MOI - 400	400	621.3	83.1	80	46	54	4	42	34-3/8"	500
MOI - 450	450	664.5	88.8	82	48	54	4	42	33-1/2"	500
MOI - 500	500	781.8	104.5	84	50	58	4	46	30"	500

* Intermittent flow.
† NPT. 6" and larger – companion flanged connection. Also available with 8" or 10" inlet or outlet. "No-Hub" connections can be supplied for floor mounting or partially recessed installations.
Note: Vent Connections are 2" or 3" NPT, on outlet end of MOI. Check and advise for local code requirements.

Collection Catch Basins

Collection Catch Basins (CB) are designed to capture sand, grit, debris, and associated pollutants discharged from vehicle maintenance and fueling facilities and to prevent their entry into the drainage system. When installed in conjunction with an oil/water separator, the catch basin acts as a simple pretreatment device, to collect this trash and help prevent it from clogging the drain lines. The result is also less waste material entering into the separator!

Catch basins are easy to install, operate, and maintain. The catch basin's removable drop-in wastebasket collects trash, which may be deposited at the service bay drains or fuel islands. A second screen welded inside the catch basin, adds further protection against waste entering the separator.

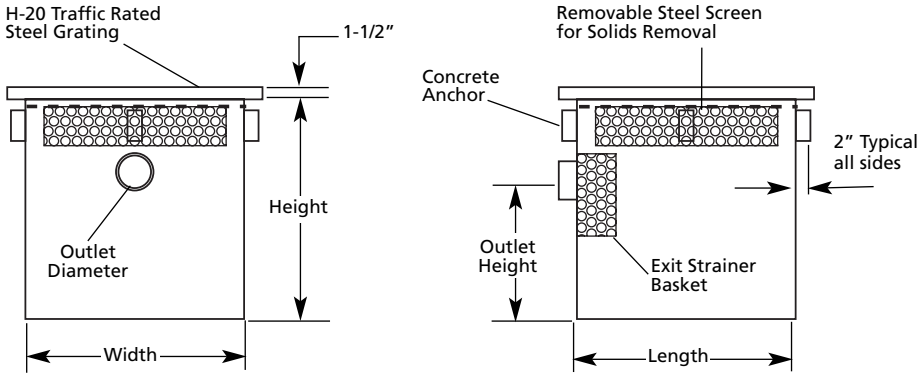
Unlike older style concrete units, our catch basins are constructed of heavy duty steel that won't crack or leak.

They're also available in double-walled construction to meet strict environmental regulations

Features:

- Coated mild carbon or stainless steel construction
- Pre-formed attached grating frame with heavy duty grate
- Easy access removable basket for trash collection and removal
- Screened discharge pipe
- Large sediment retention

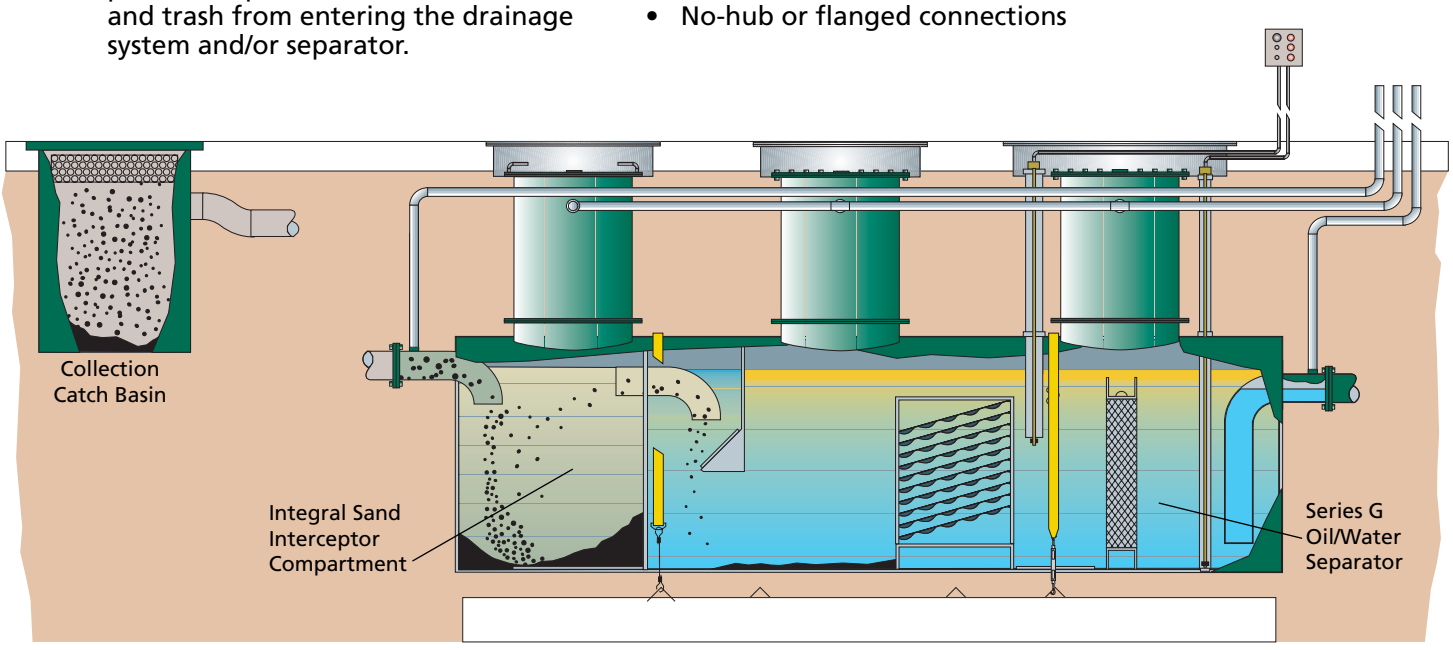
Collection Catch Basins Sizing Guide



Model	Length	Width	Height	Outlet Diameter	Outlet Height
CB-30	18"	18"	36"	4"	24"
CB-55	24"	24"	36"	4"	24"
CB-125	36"	30"	42"	6"	30"
CB-150	36"	36"	42"	6"	30"

Options:

- Side inlet connections
- Hooded outlet or down-turned 90^0 down comer pipe helps prevent petroleum products, floatable solids, and trash from entering the drainage system and/or separator.
- Custom sizing
- Pedestrian grating
- Bottom outlet connections
- No-hub or flanged connections



Advanced Filtration System

Advanced Filtration Systems (AFS) are used in applications where hydrocarbon removal beyond the capability of a standard oil/water separator is necessary. These robust, field-proven filtration systems provide efficient and cost-effective removal of a variety of hydrocarbons, ranging from BTEX to crude oil, from water. They also help safeguard the environment and personnel from harmful, persistent chemicals and pollutants.

AFS contain oleophobic filters that utilize a patented hydrocarbon removal technology that instantly bonds hydrocarbons to the filter media-making them hydrophobic and viscoelastic - removing them completely from the water.

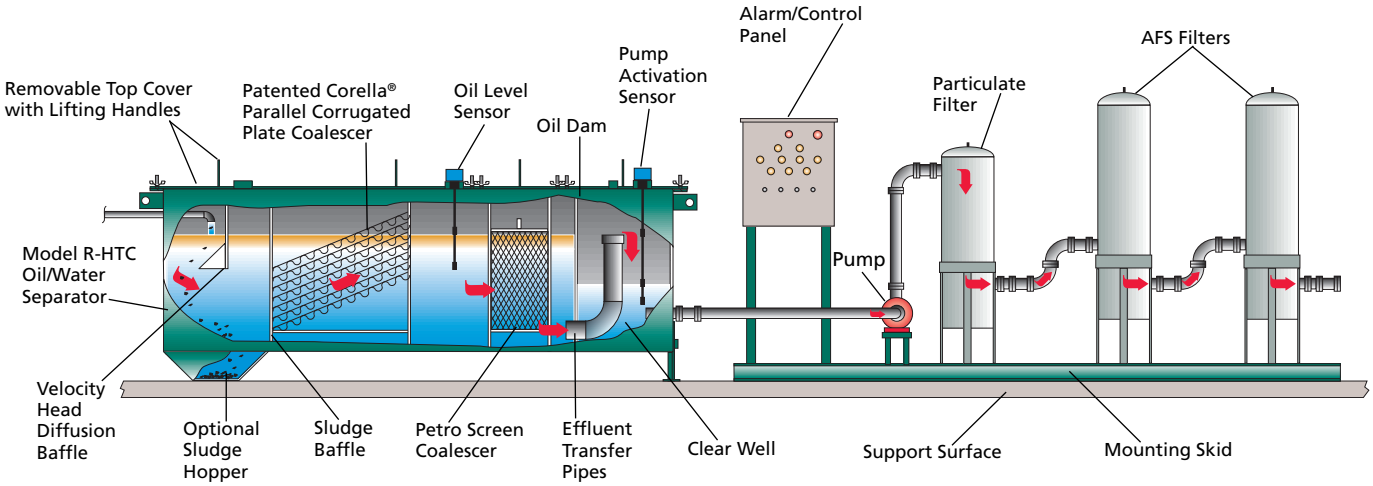
The single-pass efficiency through the filter cartridges is often as high as 99.9%, with very little pressure drop created by oil saturation.

Features and Benefits:

- Ideal for use by a diverse range of industries
- Consistently high hydrocarbon removal efficiency
- Ensures compliance with environmental regulations
- Durable construction and simple servicing
- Compact design - small footprint
- Easy operation & maintenance
- Minimized waste disposal

Our custom built AFS are skid-mounted with filters, pumps, motors, controls, valves, piping, and wiring. By designing our AFS from the ground up, Highland's skilled engineers can assemble all the components necessary to meet your specific applications.

For Superior Hydrocarbon Removal



How It Works...

The Advanced Filtration System is designed to enhance the performance of any oil/water separator system.

The wastewater passes through the high performance R-HTC Oil/Water Separator with Corella® and Petro-Screen Coalescers designed for gravity separation of free oils, along with settleable solids from water.

These wastes accumulate in the separator while the wastewater passes through the effluent transfer pipes to the effluent clearwell. The effluent pump's automatic level controls start and stop the pump at predetermined levels.

The effluent is then pumped through the AFS consisting of particulate and oleophilic filters. Oil and grease, total petroleum hydrocarbons, dissolved hydrocarbons, solvents, volatile organic compounds (VOC), and organically bound metals are removed here, prior to final discharge. In many applications, especially MTBE remediation, Granular Activated Carbon (GAC) can be added to the treatment system. GAC offers an excellent final polishing step to meet strict discharge levels.

Modular Cartridge AFS Sizing Guide

HT-M **Model**	Number of **Cartridges**	Housing Diameter **Approx.**	Flow Rate **Gal/Min**	Oil Capacity Approx. **Kg.**	**Lb.**	Treatment Capacity @10mg/L removal rate **Approx. Gallons**
HT-M4-40	4	7.5"	80	3.5	7.7	93,000
HT-M12-40	12	11.0"	240	10.5	23.1	279,000
HT-M21-40	21	14.5"	420	18.5	40.7	488,000
HT-M33-40	33	17.5"	660	29.0	63.8	767,000
HT-M50-40	50	24.0"	1,000	44.0	96.8	1,162,000

HighCycle Wash Water Recycle Systems

The HighCycle Wash Water Recycle System (HCS) is designed to process wastewater discharged from vehicle cleaning operations at military, commercial, and municipal maintenance facilities. The HighCycle helps eliminate contaminants and provide an unlimited supply of water for vehicle and equipment washing. This modular system is capable of effectively removing sand, grit, settleable oily-coated solids, free-floating hydrocarbons, and mechanically emulsified or semi-miscible oils. Wastewater can be either recycled or discharged according to the facility's proper discharge procedure.

Advantages

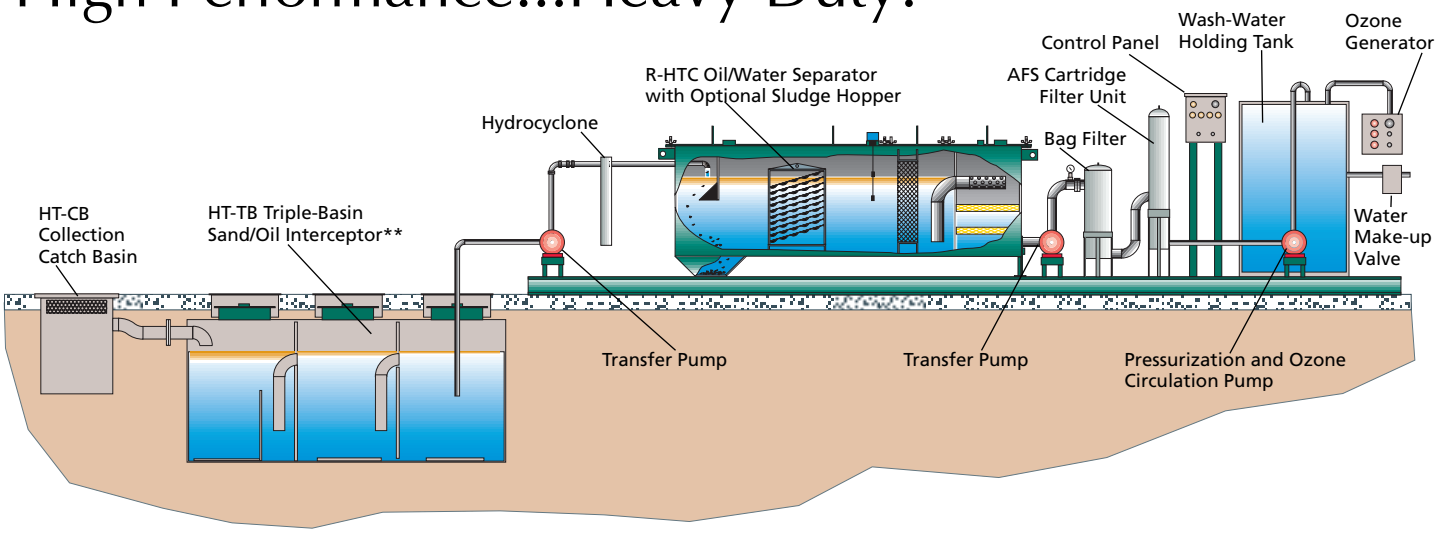
- Rugged compact design.
- Proven performance of Highland Tank Oil/Water Separators & Interceptors.
- Modular design allows for closed-loop recycle system, partial sewer discharge, or total discharge configurations.
- Eliminates the need for dangerous treatment chemicals.
- Designed for minimal service and low operating cost.
- Saves thousands on water and sewer fees.

Applications

- Construction Equipment
- Landfills
- Municipal Garages
- Mines and Quarries
- Military Facilities
- Public Transit Authorities
- Schools
- Truck Fleets
- Waste Haulers

Highland Tank offers a wide variety of standard systems for most vehicle washing applications. In addition, custom-built systems can be designed and manufactured for specific applications.

High Performance...Heavy Duty!



How It Works...

The HighCycle is easy to install, operate, and maintain. Vehicle wash water is collected in the Collection Catch Basin (HT-CB) where trash, sand, and grit are removed. Wash water flows by a gravity drain to the Triple Basin Interceptor (HT-TB) for additional solids and oil removal. Water is drawn from the HT-TB's effluent compartment using a sensor-controlled, self-priming pump and forced through the hydrocyclone, where additional solid particles are removed and transferred back to the interceptor.

The workhorse of the system is the high performance Oil/Water Separator (R-HTC) with Corella® and Petro-Screen Coalescers which effectively removes free oils down to 20 microns. An oil level sensor in the R-HTC will indicate the need for accumulated oil removal.

At this stage, a second sensor controlled, self-priming pump draws water from the R-HTC clearwell and forces it through the bag-filter for final solids removal. Pressure gauges on either side of the bag filter permit visual monitoring of solids collection.

The Advanced Filtration System (AFS), with its specially treated oleophilic cartridge filters, finally removes any remaining mechanically emulsified and semi-miscible oils. The cartridges can be visually inspected for oil and easily replaced when saturated, in a matter of minutes, without any special tools or equipment. No messy backwashing is required!

A clean water storage tank is provided for the final ozonation process. Ozone, which helps purify the wastewater, is produced on site in the Ozone Generator, using premium components to insure the most trouble-free operation possible. Ozone is added to oxidize any remaining contaminants and keep the water free from bacteria and odor. The final pump recirculates the water in the tank and completes the cycle by providing a clean, pressurized water source for the facility's vehicle wash system.

HighCycle Sizing Guide

Model	System Rate **Gal/Min**	Catch Basin **Model**	Oil/Sand Interceptor **Model**	R-HTC Oil/Water Separator **Model**	Filter Skid Footprint **Approx.**
HCS - 10	10	CB - 55	550	300	8'-0" x 6'-0" x 2'-0"
HCS - 25	25	CB - 125	550	600	8'-0" x 6'-0" x 2'-0"
HCS - 50	50	CB - 150	1,000	900	9'-0" x 6'-0" x 3'-0"

*Filtration component skid dimensions subject to change as required by site and application requirements.
** Interceptor size may vary based on sludge and oil storage requirements and individual site conditions.

Accessories

From level sensors and control panels to anchoring systems and grade level manways, Highland Tank is equipped to take your next project from concept to reality.

Customized To Meet Your Specific Needs

Highland Tank's accessory line is designed to augment our wide selection of Wastewater Treatment Systems, making it easy to quickly and efficiently turn any of our separators or interceptors into a complete operating system. Take the guesswork out of your installation with the use of one of our comprehensive master installation kits.

Some of our quality accessories:

1. **Concrete Deadmen Anchors**
   Work with our standard underground oil/water separators and interceptors from 500 to 50,000 gallons.
2. **Polyester Hold-Down Straps**
   Designed to secure separators and interceptors in areas where high water levels may result in floatation.
3. **Leak and Level Sensors**
   A wide variety of sensors used to detect leaks or liquid levels, or interfaces between liquids.
4. **Complete Pump Package System**
   Complete influent, effluent, and oil pump systems - platform or tank mounted.
5. **Alarm and Control Panels**
   A comprehensive panel selection for leak and level alarm, valve actuation, heating, or pump control.
6. **Grade Level Manways**
   Designed to AASHTO H-20 requirements and are constructed using A36 steel plates from 10 gauge to 3/8" thick.

Highland Service

COMMITTED TO YOU...

Highland Tank is committed to providing you, our customer, with the best professional service possible. By utilizing our knowledge, capabilities, and experience to meet your needs, Highland Tank remains dedicated to providing you with dependable, quality products and services at competitive prices.

Our competent support personnel are eager to help you with solutions to your wastewater treatment system's needs. We are the only manufacturer whose skilled maintenance experts will visit your site to troubleshoot any problems that may arise before, during, or after installation. We are also there when you need us for any unexpected problems that might occur after installation. Our fully equipped field service technicians are capable of performing:

- System Troubleshooting
- System Inspection, Repairs, or Modifications (including confined space entry and on-site welding)
- Painting and Coating Repair

The combination of Highland's professional know-how and dedication makes us the best choice for your next wastewater treatment project.

www.separatorsonline.com

Highland Tank's websites are an excellent place to find more information on all of our quality products.

- View online or quickly download specific product literature and spec sheets, as well as PDF files of all standard products.
- View and download size specific product drawings in PDF or AutoCAD .DXF Format.
- View and download editable product specifications in MS Word format.
- Calculate sizing requirements for grease interceptors and oil/water separators.
- View and download our User's Manuals with complete installation, start-up, operation, maintenance, and trouble-shooting instructions.
- Visit our online Replacement Parts Center where you can easily locate and request replacement parts for oil/water separators and interceptors, storage tanks, and grease interceptors.
- Access links to all 50 state environmental agencies and storage tank regulatory groups.
- Generate a gauge chart for any size horizontal, vertical, or rectangular tank.
- Get updated company information, press and new product releases, and technical papers.
- Download and view short digital video tours of Highland's six plants.

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