PARK USA
A Northwest Pipe Company

STORMWATER ENGINEERING

ENGINEERING CATALOG | STORMWATER EDITION

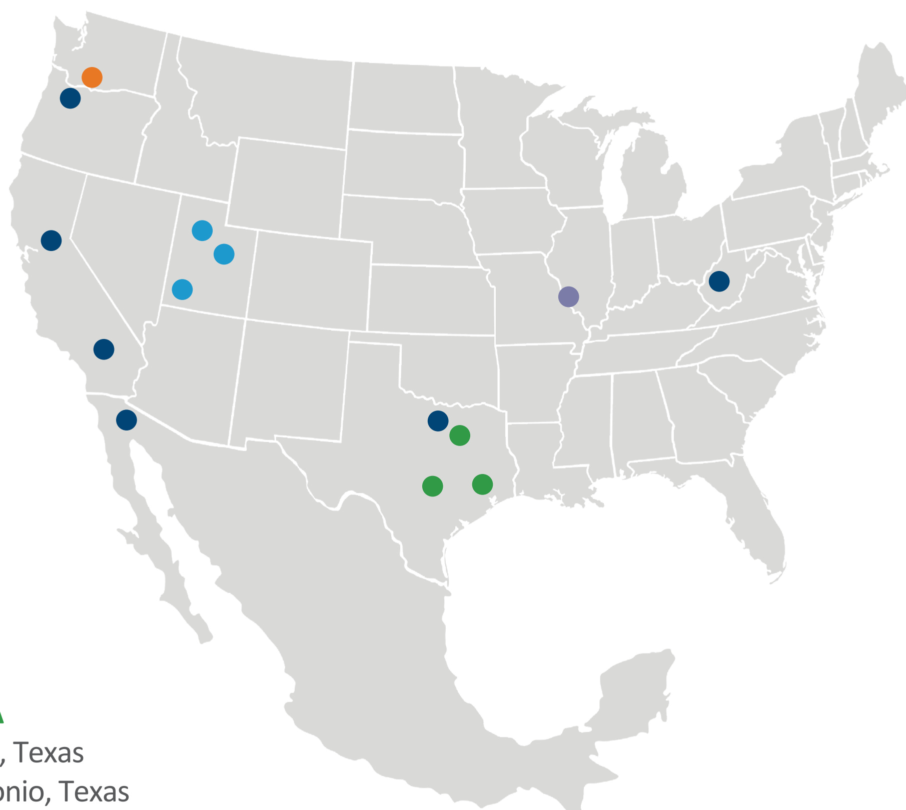
SW Stormwater Version 5.0

888-611-7275 | www.ParkUSA.com

ParkUSA is now part of Northwest Pipe Company!

You can expect the same great line of innovative products, quality manufacturing, and responsive team service. This merger helps us meet the high demand for specialized products that ensure effective and compliant water management and will add more manufacturing plants to provide solutions for crucial water segments including wastewater products, stormwater, and water distribution.

LOCATIONS



CORPORATE HEADQUARTERS

Vancouver, Washington

WATER TRANSMISSION

Portland, Oregon
Tracy, California
Adelanto, California
Saginaw, Texas
Parkersburg, West Virginia
SLRC, Mexico

PERMALOK STEEL CASING PIPE

St. Louis, Missouri

PRECAST & INFRASTRUCTURE

Geneva Pipe & Precast

Salt Lake City, Utah
Orem, Utah
St. George, Utah

ParkUSA

Houston, Texas
San Antonio, Texas
Ferris, Texas

INNOVATIVE WATER TECHNOLOGIES TO BUILD ON

ParkUSA is a technology leader in the water industry, a position we have worked hard to establish and maintain for over 35 years. As demands and regulations on water, stormwater and wastewater infrastructure have evolved, so have we. Our innovative design and manufacturing capabilities enable us to provide sustainable solutions for today's water issues.

Our innovative designing and manufacturing capabilities afford us the ability to custom fabricate precast, metal, plastics and fiberglass, that complements our line of standard products. With over 70 acre of fabrication facilities and many years of experience, ParkUSA is capable of true innovation and commitment to quality.

As markets have evolved, so have we. This requires a team capable of true innovation and commitment to quality. We believe that our employees are the key to our success. Attracting and developing qualified individuals is the best assurance for continuing the success of our business.

We believe that stand-out talent lives by two core values: a commitment to their professional growth and to be the best in everything that they do. ParkUSA employees go the distance for our customers and give back to the communities in which we live and work.

ParkUSA can be your valued partner. Our major focus is on providing engineered solutions to design professionals and contractor. We produce complete systems designed specifically for your project. Our Sales and Engineering departments are ready to assist you with complete project design, estimating, quotations, value engineering and expert submittals. Engineering manuals, software tools and application evaluations are available.

Our team stays well-informed on environmental updates and regulations; offering professional presentations to municipalities, contractors and engineering firms to promote product education and regulatory awareness.

Contact us to discuss your design challenge.

STORMWATER INTRODUCTION

In 1972, the Clean Water Act (CWA) established the NPDES permit program to address water pollution by regulating waste water treatment plants and industries that discharge pollutants to waters of the United States.

By 1987, EPA began to develop a storm water permitting program. This program was implemented in two phases (Phase I: 1990; Phase II: 1999), establishing permit requirements for municipal, industrial, and construction site storm water runoff; designed to prevent stormwater runoff from washing harmful pollutants into local surface waters.

When it rains, some rainwater soaks into the ground, and some flows over the ground and into creeks, streams or rivers. The water that runs off into the river is called runoff, or stormwater runoff. When buildings, parking lots, and other hard surfaces are added to the landscape, the ground cannot absorb the water. Water from rain instead flows over streets, parking lots and roofs and into a water body or storm drain. This is of a concern for two main reasons: increased volume and timing of the runoff; and pollutants like trash, chemicals, oils, and dirt/sediment being carried to our rivers, streams, lakes, and coastal waters.

To address the increase in volume and timing of stormwater runoff, methods to detain and control the runoff are used. These include stormwater detention, rainwater harvesting and drainage systems.

To protect our water resources from pollution, communities, construction companies, industries, and others, use stormwater controls, known as best management practices (BMPs) that filter out pollutants and/or prevent pollution by controlling it at its source. The benefits of effective stormwater runoff management include: protection of wetlands and aquatic ecosystems; improved quality of receiving waterbodies; conservation of water resources, and protection of public health.

ParkUSA has been in the business of manufacturing stormwater infrastructure and water quality devices since the beginning, providing sustainable solutions for today's stormwater issues.

SW Revision v5.0

CONTENTS

STORMWATER DETENTION

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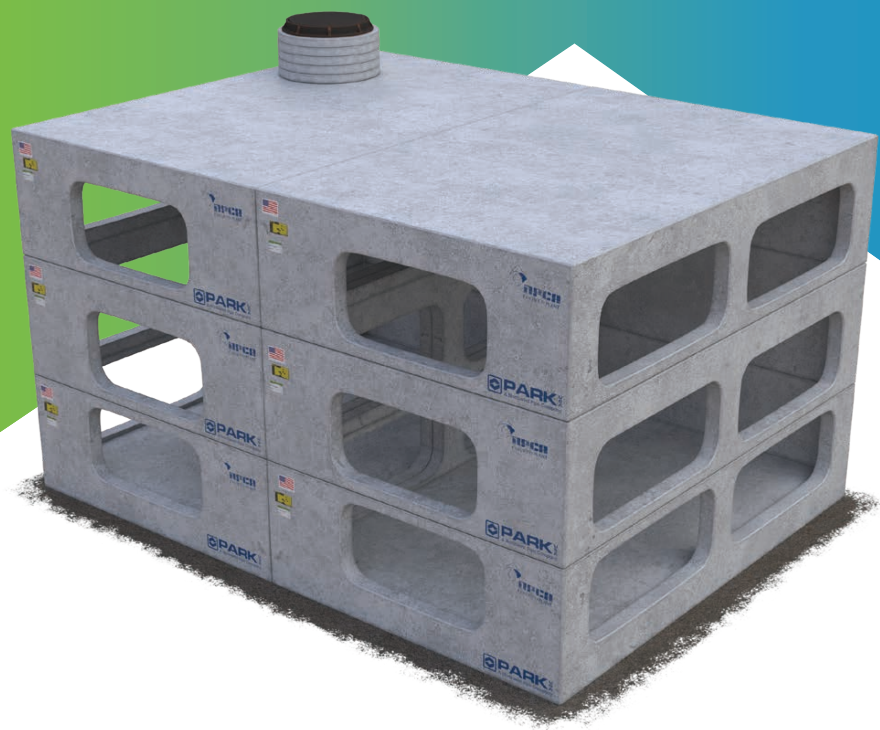
RAINBASIN™
UNDERGROUND DETENTION SYSTEM



Features

- Easy installation
- High capacity level
- Component construction
- Standard and custom sizes available
- LEED compliant
- Long-term sustainability

Underground Detention System

The ParkUSA RainBasin® is a stormwater detention system designed to mitigate the effects of New Development and Redevelopment on an existing drainage system. In addition, the system can be used for the management of storable and reusable stormwater runoff through ground water recharge or rain harvesting.

Stormwater storage presents a valuable resource for sustainability and overall project goals. One of the common issues is the need of site-specific applications where stormwater needs to be detained and allowed to discharge at a slower controlled rate often mimicking pre-development conditions.

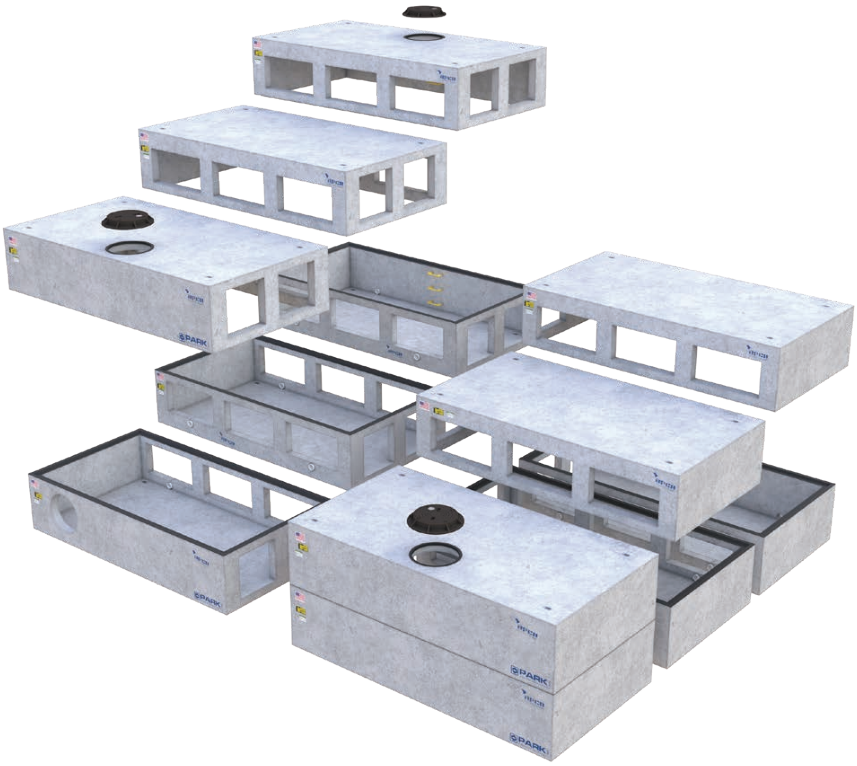
The RainBasin is a system that affords the designer the opportunity to maximize the developed land by placing the detention easily underground such as parking lots and roadways with minimal cover.

#BUILDING AMERICA!

RW | RAINBASIN Standard

LEED® COMPLIANT | NPCA | Steel Tank Institute | ASPE American Society of Plumbing Engineers | ASTM | BMP® BEST MANAGEMENT PRACTICE | IPC® INTERNATIONAL PLUMBING CODE | UPC

INFO@PARKUSA.COM | 888-611-7275 | WWW.PARKUSA.COM



Sizing and Design Considerations

When designing a RainBasin system, the surface area and rainfall intensity is used to calculate the overall volume needed to be stored. The number of modules will depend on the storage volume needed. The individual vaults have standard dimensions and come in varying sizes.

Sizing Calculation

To calculate the total detention volume for an area between one acre and 10 acres of existing impervious cover following the methodology specified in the City of Houston Design Manual, the appropriate equation is:

Vt = [43,560 * (0.50 * Aii)] +(1815 * Aei)

Vt = Total detention volume in Cubic Ft
Aii = Area of Impervious cover (acres)
Aei = Area of existing Impervious cover (acres) for which detention is not currently provided

Visit **rainbasin.parkusa.com** for more information and design assistance.

How it Works

The RainBasin system consists of a series of interconnected vaults. Stormwater runoff can enter the system through multiple options such as inlets, outlet openings, curbs, grates and downspouts. The accumulated stormwater will be stored within the system with a residence time varying with application and volume.

System Benefits

- Onsite stormwater management
- Stormwater runoff emulates natural conditions
- Mitigation of downstream flooding
- Modular structure for design considerations
- Rainwater harvesting option

Maintenance

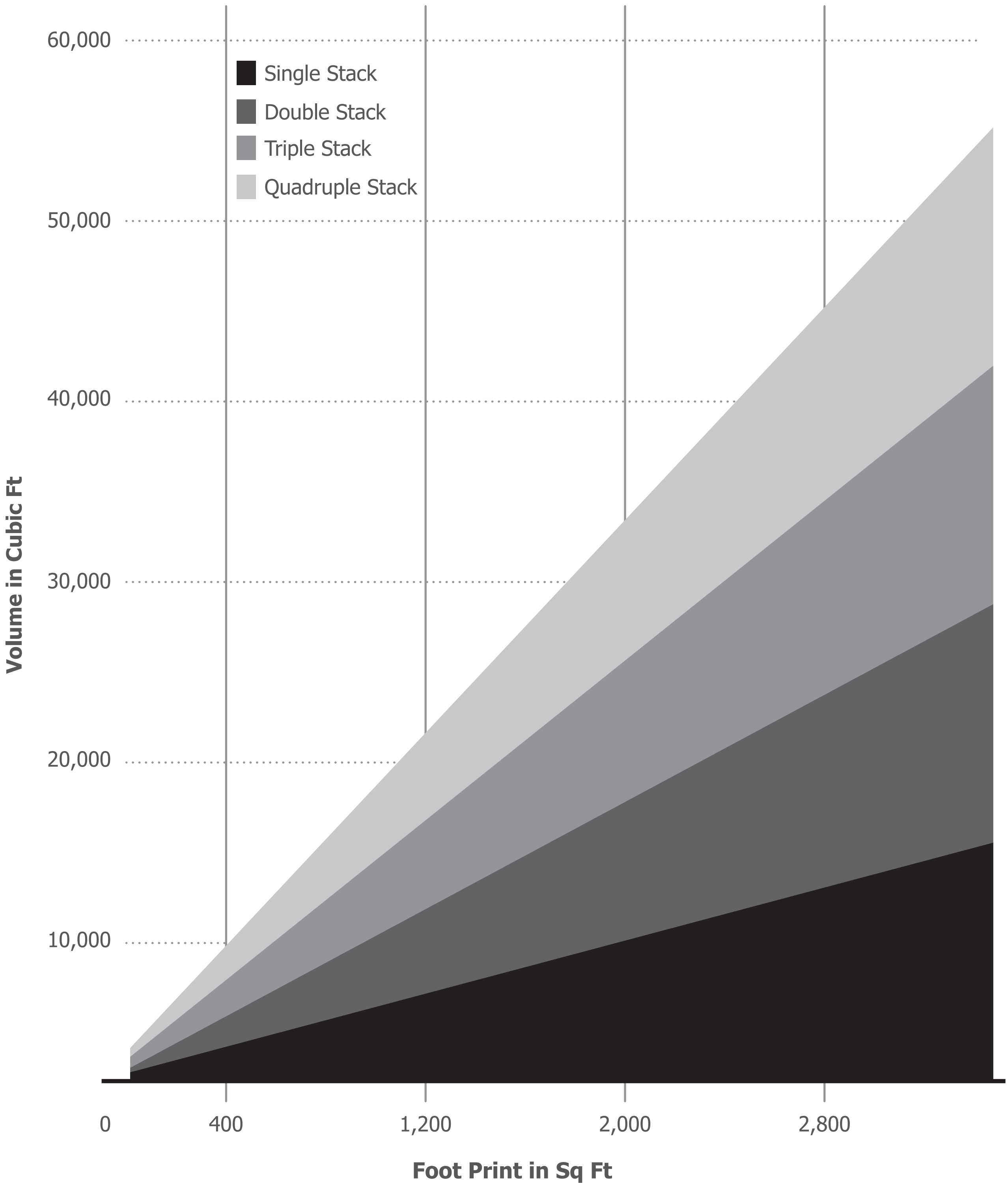
The RainBasin system is designed for easy maintenance and longevity. The access modules can be arraigned for convenience. The interior of the vault is open. Inspection should be performed at least once a year. During which a complete quality control documentation must be prepared. Confined space certification is required for maintenance.

To request a quote or catalog, visit **request.parkusa.com.**

APPLICATIONS

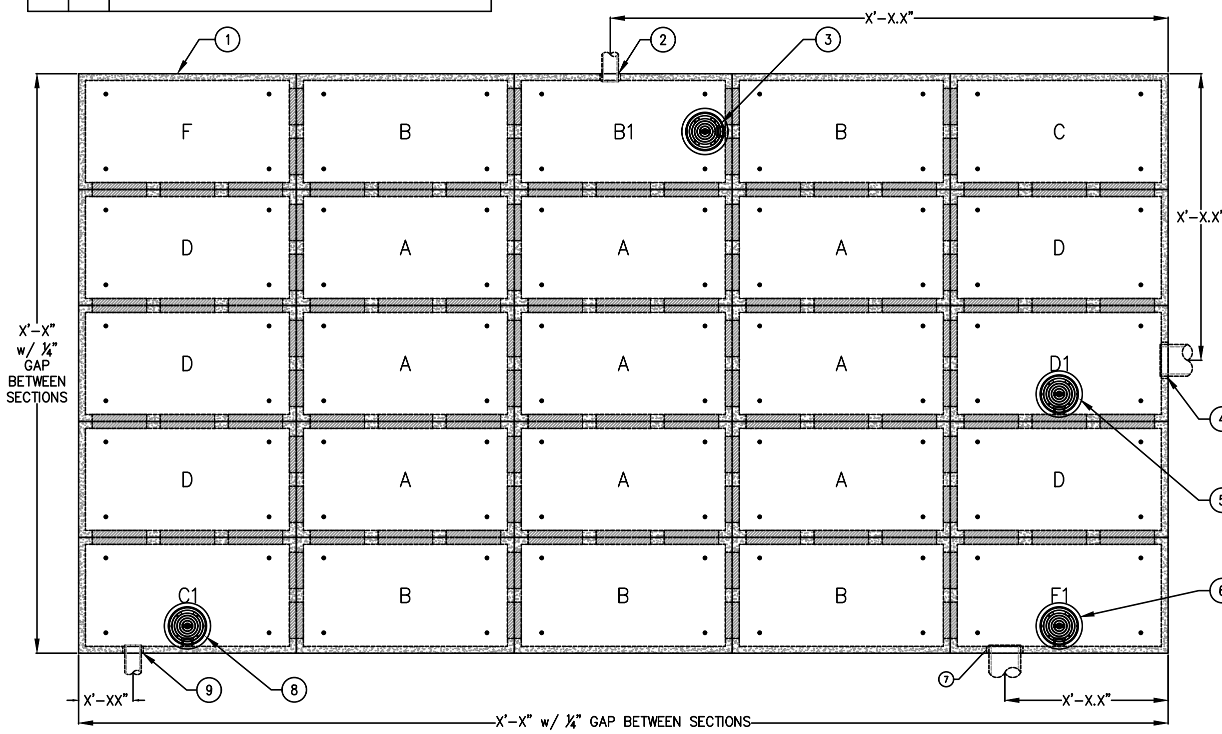
Good to use in BMPs | Commercial | Low Impact Development | Residential | Industrial | Municipal

RAINBASIN VOLUME
COMPARED TO FOOT PRINT



KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	RAINBASIN VAULT BY PARKUSA INSIDE DIMENSIONS: 7'-6" W x 15'-0" L x 4'-0" H
2	1	INLET – 18" DIA HOLE FOR 12" HDPE PIPE 6" BASE ELBOWS
3	1	30" DIA CAST IRON FRAME & COVER w/ STEPS @ 12"
4	1	OUTLET – 32" DIA HOLE FOR 24" HDPE PIPE
5	1	30" DIA CAST IRON FRAME & COVER w/ STEPS @ 12"
6	1	30" DIA CAST IRON FRAME & COVER w/ STEPS @ 12"
7	1	INLET – 32" DIA HOLE FOR 24" HDPE PIPE
8	1	30" DIA CAST IRON FRAME & COVER w/ STEPS @ 12"
9	1	INLET – 18" DIA HOLE FOR 12" HDPE PIPE

VAULT SPECIFICATIONS				
TYPE	VOLUME (ft^3)	QTY	TOTAL VOLUME PER VAULT TYPE (ft^3)	HEIGHT
A	485	9	4,365	4'-0"
B	473	5	2,365	4'-0"
B1	473	1	473	4'-0"
C	467.5	1	467.5	4'-0"
C1	467.5	1	467.5	4'-0"
D	479.5	5	2,397.5	4'-0"
D1	479.5	1	479.5	4'-0"
F	467.5	1	467.5	4'-0"
F1	467.5	1	467.5	4'-0"
TOTAL QTY		25		
TOTAL VOLUME			11,950 ft^3	CUBIC FEET
REQUIRED VOLUME			10,815 ft^3	CUBIC FEET



SAMPLE CONFIGURATION

RB-01

NOTES:

1. DESIGN LOADINGS:
   A. AASHTO HS-20-44 w/ IMPACT.
   B. DEPTH OF COVER= 6" – 5'-0" (120 PCF ASSUMED).
   C. ASSUMED WATER TABLE= BELOW BOTTOM OF PRECAST.
   D. DRY LATERAL EARTH PRESSURE (EFP)= 45 PCF.
   E. LATERAL LIVE LOAD SURCHARGE= 80 PSF (APPLIED TO 8' BELOW GRADE).
   F. NO LATERAL SURCHARGE FROM ADJACENT BUILDINGS, WALL PIERS, OR FOUNDATIONS.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH SHALL BE 6,000 PSI.
3. STEEL REINFORCEMENT: REBAR, ASTM A-615 OR A-706, GRADE 60.
4. MESH REINFORCEMENT: ASATM A-1064, S1.2, GRADE 80.
5. CEMENT: ASTM C-150 SPECIFICATION.
6. REQUIRED BASE LAYER DEPTH= NOT APPLICABLE.
7. REQUIRED NATIVE ALLOWABLE SOIL BEARING PRESSURE= 2,500 PSF
8. REFERENCE STANDARDS:
   A. ASTM C 890
   B. ASTM C 891
   C. ASTM C 913
9. CONSTRUCTION EQUIPMENT EXCEEDING DESIGN LOADING SHALL NOT BE ALLOWED ON STRUCTURE. ANY DESIGN CONSTRAINT DIFFERENT FROM ABOVE REQUIRES CUSTOM STRUCTURAL DESIGN AND MAY REQUIRE THICKER SUBGRADE AND REVISED PRICING.
10. SEE STRUCTURAL CALCULATIONS ATTACHED TO REVIEW LOADINGS.
11. ALL CAST IRON ACCESS COVERS ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30

A	.	.	
REV	DATE		DESCRIPTION

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA®
www.parkusa.com 888-611-PARK

STORMWATER DETENTION
RAINBASIN – SAMPLE CONFIGURATION

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RB-01	A
DATE 05/2019					

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CULTEC STORMWATER CHAMBERS

Features

- Overlapping rib connection
- Unique in-line internal manifold
- High infiltrative capability
- Lightweight
- Variety of sizes
- Chemically resistant

Stormwater Storage

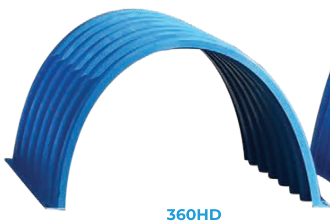
Stormwater storage presents a valuable resource for sustainability and overall project goals. One of the common issues is the need of site-specific applications where stormwater needs to be detained and allowed to discharge at a slower controlled rate, mimicking pre-development conditions.

In built-up areas, buildings and paved surfaces inhibit the natural infiltration of stormwater into the ground. With expanding urbanization, existing infrastructure is unable to accommodate the increased peak flows and runoff volumes which lead to ponding and flooding problems. Conventional stormwater management systems such as ponds, swales, pipe and concrete structures capture water but are labor intensive, expensive to maintain and occupy valuable land. CULTEC Stormwater Chambers provide a cost-effective solution for underground detention and infiltration.

#BUILDING AMERICA!

SW STORMWATER CHAMBERS Standard

LEED® COMPLIANT   NPCA   Steel Tank Institute   ASPE American Society of Plumbing Engineers   ASTM   BMP® BEST MANAGEMENT PRACTICE   IPC® INTERNATIONAL PLUMBING CODE   UPC®



360HD

902HD

280HD

330XLHD

How it Works

ParkUSA® offers CULTEC Contactor® and Recharger® plastic stormwater chambers which are dome shaped, open bottomed corrugated plastic structures. They function like conventional stormwater ponds and work in conjunction with existing storm sewer infrastructure to provide underground retention/ detention and infiltration of rainwater into the ground. With a wide range of sizes and models available, their advanced design and ease of installation makes them an ideal alternative to above-ground ponds, swales, crate or concrete structures or pipe installations. Water enters via a catch basin or other collective device followed by a pretreatment device (such as ParkUSA StormTrooper®) to be treated. Once treated, the water is piped towards the bed of chambers and distributed throughout the chamber network via the internal manifold and surrounding stone embedment. Depending on the system application, the water infiltrates into the ground, or it is detained and released.

To request a quote or catalog, visit **request.parkusa.com.**

Applications

- Retention system
- Store larger volumes in a lower profile than comparably sized pipe
- Ability to recharge water on-site

Models

Contactor® Series
Lower profile chambers sizes range from 8.5 - 12.5 inches (216 – 318 mm) in height. Available models are the Contactor® Field Drain C-4HD and Contactor® 100HD.

Recharger® Series
Higher profile, larger capacity chambers sizes range from 18.5 - 48 inches (470 - 1219 mm) in height. Chamber capacities vary from 2.65 - 17.31 ft3/ft (0.246 - 1.64 m3/m). Available models within this series are the Recharger® 150XLHD, 180HD, 280HD, 330XLHD and 902HD.

Optional Components

- StormTrooper®
- TrashTrooper®

APPLICATIONS

Green Infrastructure | Good to use in BMPs | Commercial | Flood Mitigation | Low Impact Development

NOTES

PUMP LIFT STATIONS

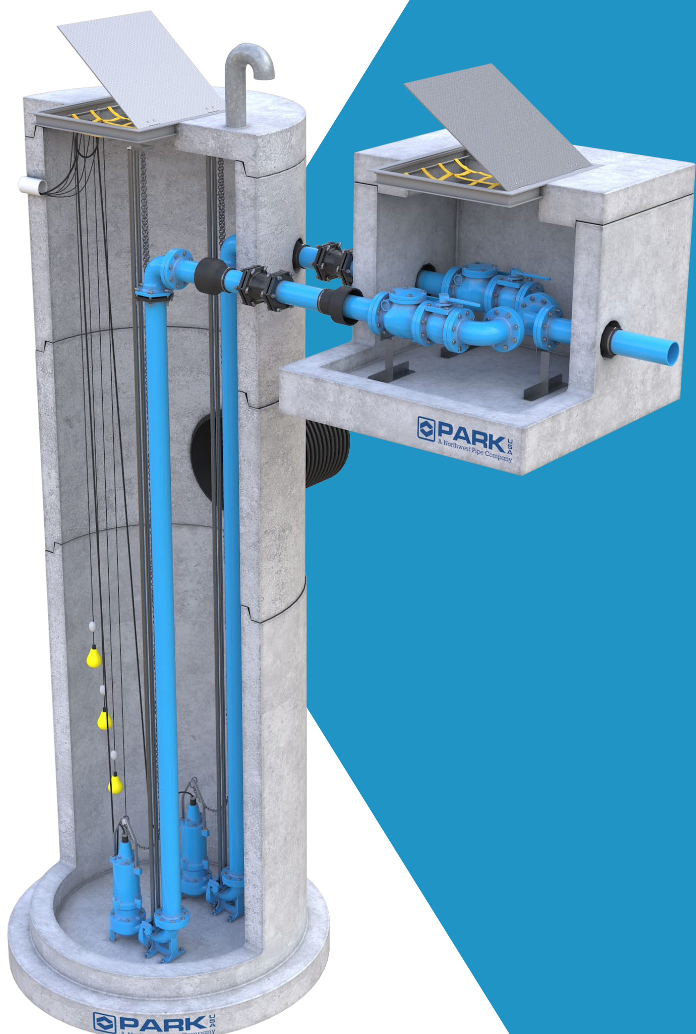
NOTES

Pump Trooper®
Lift Stations

BEST USE FOR:

STORMWATER

WASTEWATER



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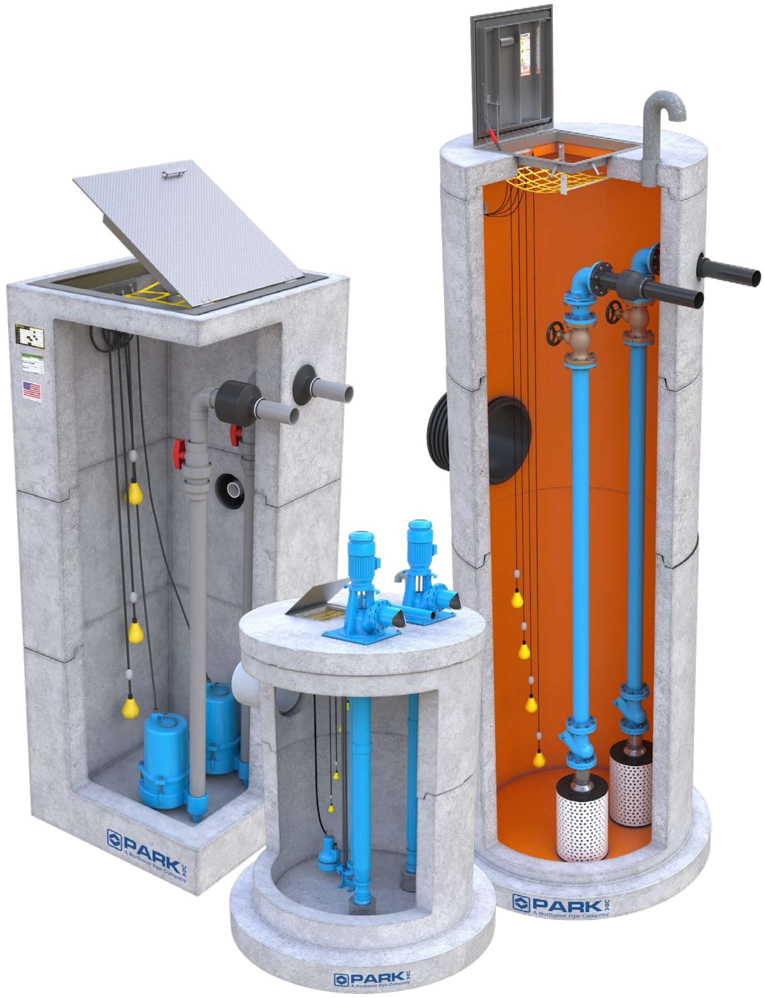
ENGINEERING **FACTS**



FEATURES

- Precast Concrete or Fiberglass Models Available
- Various Pump Types Available
- Pedestrian or Traffic Rated
- Remote Maintenance Alarm Available
- Interior Liners Available
- Meets all Building Codes

MODELS

Most pump stations are designed for duplex, triplex, or quadruplex pump installations. Although PumpTroopers can contain any number of pumps and pump sizes, the most common pump-motor unit is the duplex system. In this system, two pumps alternate in operation to equalize the wear of the pumps and to prevent the buildup of solids in the wet well. ParkUSA's multiple pump system offers continued operation in the case of a pump failure, removal for servicing, and an extended capacity in times of extraordinary loading. The types of submersible pumps available are outlined to the right:

GENERAL INFORMATION

ParkUSA®'s PumpTrooper®, a submersible pump lift station, is a reliable and cost-effective solution to prevent flooding by receiving and moving stormwater and/or sanitary wastewater to designated locations. Generally, a lift station is used to temporally transfer liquid that cannot flow by gravity on its own. This centrifugal pump system is powered by a close-coupled electric motor. The pump operates quietly and is cooled by the moving liquid to maximize its lifespan.

Most pump stations are designed for multiple pump installations. The duplex system is the most common where two pumps alternate in operation to equalize the wear of the pumps and to keep the wet well from solids build-up. The multiple pump system offers continued operation in the case of a pump failure, removal for servicing, and provides extra capacity in times of extraordinary loading.

EFFLUENT PUMPS

Effluent pumps are used to move small quantities of stormwater or subsurface water at low to moderate flow rates. The Park line of Effluent Pump Station is ideal for effluent applications where a gravity flow system is not practical. The effluent pump package is available in a Simplex (single pump) or Duplex (dual pump). The discharge size is typically 1 ¼ inch to two inch with flow rates up to 30 gpm and horsepower ranging from fractional to two HP.

Features:

- ⅓ HP through three HP effluent pumps
- Offered as complete turnkey systems or engineered to project specifications
- Computer system design and selection programs available for design assistance
- Variable Wet Well Sizes
- Grating or Hatchway Access
- Automatic or Manual Operation

GRINDER PUMPS

A grinder pump is a high-powered pump fitted with sharp cutters to shred solids and move them under high pressure usually in a relatively small diameter pipe. Grinder pumps are most commonly used for lower flows and high pressure or higher head applications. A common application where a grinder pump is used is when pumping into a pressure sewer system.

Grinder Pumps are designed to disintegrate or grind the solids in wastewater thus reducing discharge pipe size and creating a pressurized system. Grinder pumps are used on small to medium sized commercial applications. The discharge pipe size is two inch and three inch, with flow rates up to 100 gpm and horsepower ranging from two to 7 ⅕ HP.

The Park line of Grinder Pump Stations is ideal for sewer applications where a gravity flow system is not practical. The grinder pump package is available in a Simplex (single pump) or Duplex (dual pump).

Features:

- A market leader in packaged grinder pump systems
- Two HP through 15 HP grinder pumps with lifts to 260 feet and flows to 190 GPM
- Offered as complete turnkey systems or engineered to project specifications
- Computer system design and selection programs available for design assistance
- Explosion-proof construction available

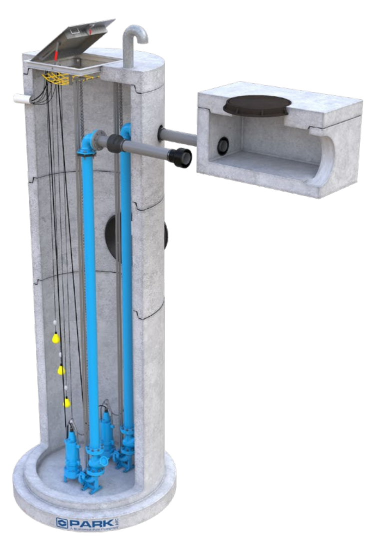
NON-CLOG PUMPS

Submersible Non-Clog pumps are fitted with a specially designed Non-Clog impeller specifically suited for stormwater, raw and treated sewage, industrial wastes, contaminated liquids, storm and mine water, drainage, liquids containing solids in suspension, stringy material, slurries, etc.

The Park Non-Clog Pump Station is an excellent choice for stormwater sewer applications where a gravity flow system is not practical. The non-clog pump package is available in a Simplex (single pump), Duplex (dual pump), Triplex (three pumps), and other multiple configurations.

Features:

- A market leader in packaged non-clog pump systems
- One HP through 100 HP non-clog pumps
- Offered as complete turnkey systems or engineered to project specifications
- Computer system design and selection programs available for design assistance
- Explosion-proof construction available



AXIAL FLOW PUMPS

Submersible Axial flow pump lift stations are ideal for stormwater applications where the pump performance requires high–flow and low-head. This situation occurs many times where a stormwater detention pond is located. The pond depth is to too deep for the gravity flow drainage. The pump station will lift the water to enable gravity-flow drainage.

The Park Axial Flow Pump Station is an excellent choice for stormwater sewer applications where a gravity flow system is not practical. The axial flow pump package is generally installed in a Duplex (dual pump) arrangement, but can be designed for multiple pump configurations.

Features:

- A market leader in packaged non-clog pump systems
- 600 through 5000 GPM flow rates
- Offered as complete turnkey systems or engineered to project specifications
- Computer system design and selection programs available for design assistance
- Explosion-proof construction available

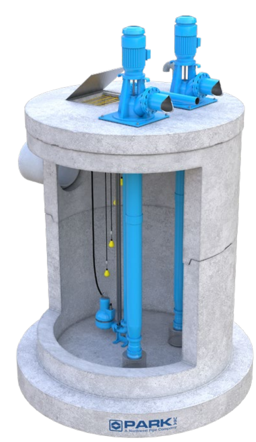
VERTICAL TURBINE FLOW PUMPS

Vertical turbine flow pump lift stations are ideal for stormwater applications where the pump performance requires high–flow as well as moderate to high-head. This situation occurs when stormwater is being sent through a force main a large distance away, or if the stormwater is being used in a pressurized irrigation system.

The Park Vertical Turbine Pump Station is an excellent choice for stormwater sewer applications where a gravity flow system is not practical. The vertical turbine pump consists of a submersible pump and discharge column, and a TEFC dry motor. The pump package is generally installed in a Duplex (dual pump) arrangement, but can be designed for multiple pump configurations.

Features:

- A market leader in packaged vertical pump systems.
- 600 through 5000 GPM flow rates
- Offered as complete turnkey systems or engineered to project specifications.
- Computer system design and selection programs available for design assistance.
- Explosion-proof construction available.
- Variable Frequency Drive (VFD) Control Systems for Constant Pressure/Variable Flow Systems



SYSTEM COMPONENTS

The ParkUSA PumpTrooper includes the following components:

Pump-Motor Unit(s): Described above, under pump models.

Wet Well Basin with Access Cover: The wet well structure for a submersible pump system is generally located below grade. Precast concrete construction is recommended for buried wet wells that require strength and corrosion resistance. Fiberglass wet wells are suggested for above ground applications, basements, or parking garages. Wet wells range from four feet to 12 feet in diameter, with depths up to 30 feet. An access hatchway is located at the top of the wet well to permit visual examination of the wet well interior, and for the removal or installation of the pumps. The hatchway is manufactured from coated steel or aluminum, and a locking arm allows the hatchway to be locked in an open position during service. Materials for the hatchway should be specified as rated for either pedestrian or traffic duty for safety and security purposes.

Pump Removal Apparatus (Guide Rail System): The guide rail system is unique to the submersible pump system. It allows for pump removal, inspection, servicing, and reinsertion of the pump with no need for service personnel to enter the wet well. The rail system consists of stainless steel vertical pipe rails, which extend from the base plate of the wet well to the access cover. During insertion of the pump, the pump is lowered down the rails and fitted to the discharge pipe with a quick-disconnect sealing flange. A chain or cable is attached to each pump and extends up to the access cover. The pumps can be lifted by a portable or permanent hoist for non-confined space removal and replacement.

Control Panels with Level Control Equipment:
The PumpTrooper relies on an electrical control system to monitor the liquid level to operate the pumps. The controls include a control panel mounted above ground plus multiple float switches located in the wet well. The control panel should be weatherproof for outdoor usage. The panel contains pump disconnects, starters with overload protection, hands-off automatic selectors, and alarm systems to indicate high liquid level conditions.

Shut off Valves, Check Valves, and Piping:
The submersible lift station has at least one inlet pipe where wastewater enters the wet well. When the liquid level rises to a predetermined level, the pumps are activated. The liquid passes through the pump impeller and is forced through the discharge pipe and into the sewer. A check valve and a gate valve are implemented on each discharge line to prevent backflow, and to allow isolation of each pump for servicing. These valves are usually located in the wet well where the discharge piping is two inches or less. When the piping is three inches or larger, an external valve pit assembly may be required.

OPERATION

Sanitary wastewater or storm water enters the wet-well basin through the inlet pipe. An electric liquid level control system monitors the water level and engages the pump(s) at pre-determined levels. The pumps then transfer the liquid up and out of the wet-well basin into the sanitary or storm sewer system.

DESIGN CONSIDERATIONS

Depending on the project, the number of submersible pumps, as well as the valve system, are subject to change. In smaller stations, there can be one submersible pump and the valve assembly is housed within the wet well to save infrastructure cost. In larger stations, which can house multiple submersible pumps, it is recommended that the valve system be housed in a separate valve vault. This makes it easier to conduct maintenance when necessary.

SIZING

In order to size a Lift Station unit, two main factors must be considered:

Pump Selection: the operation point of the pump must be calculated, this variable is directly related to total dynamic head and volume capacity. There are several charts available to estimate this variable.

Wet Well Sizing: Once the proper pump has been selected, we are able to determine what type and size of wet well is needed. There are two types of wet wells that ParkUSA uses for lift stations, round and rectangular. Round wells have the benefit of reduced material costs as well as strength properties. A wet well for a submersible pump is generally located below grade. Buried wet wells require strength and corrosion resistance making precast concrete the primary choice.

For wet wells above grade, steel and fiberglass are the recommended material. To summarize when determining the size of the wet well, we must find the minimum storage volume. Flow rate and retention time are basic variables to do this calculation.

MAINTENANCE

To ensure the Lift Station operates properly, routine inspections and preventive maintenance should be performed to prevent expensive repair problems, spills, etc. The common routine activities to follow are:

- The unit should be inspected weekly, but based on model and location, inspections may be required more often.
- Records must be maintained for each of the routine inspections. Logs and physical records are useful in the long run.
- Wet well should be pumped out and cleaned at least twice a year.
- Inspections of pumps are required quarterly.
- Inspection of check valves are required twice a year.
- Cleaning of floats are necessary four times a year.
- Inspection of the alarm system is required weekly.
- Amp and vibration readings should be taken at least once a month.
- Annual inspection of the complete control system is required.

STORMWATER

Human life, as with all animal and plant life on the planet, depends upon water; at ParkUSA, we greatly value the importance of protecting this natural resource. To contribute our part in conservation and sustainability, ParkUSA offers a wide range of stormwater management products, which include stormwater quantity and stormwater quality units. We engineer advanced water technologies designed to combat pollution and control the flow of stormwater. These cleaning processes and water drainage methods provide breakthrough safety modifications for significant activities in day-to-day life.
Most importantly, ParkUSA's mission is to offer innovative solutions to important stormwater management needs around the world. ParkUSA has been in the business of manufacturing stormwater infrastructure and water quality devices since the beginning of the Clean Water Act, providing sustainable solutions for today's stormwater issues. As always, we aim to impact people's lives and provide a safe quality of life for generations.

ParkUSA IS ALWAYS READY TO **DESIGN** AND **ENGINEER** PRODUCTS FOR YOUR UPCOMING PROJECTS!

OTHER STORMWATER PRODUCTS

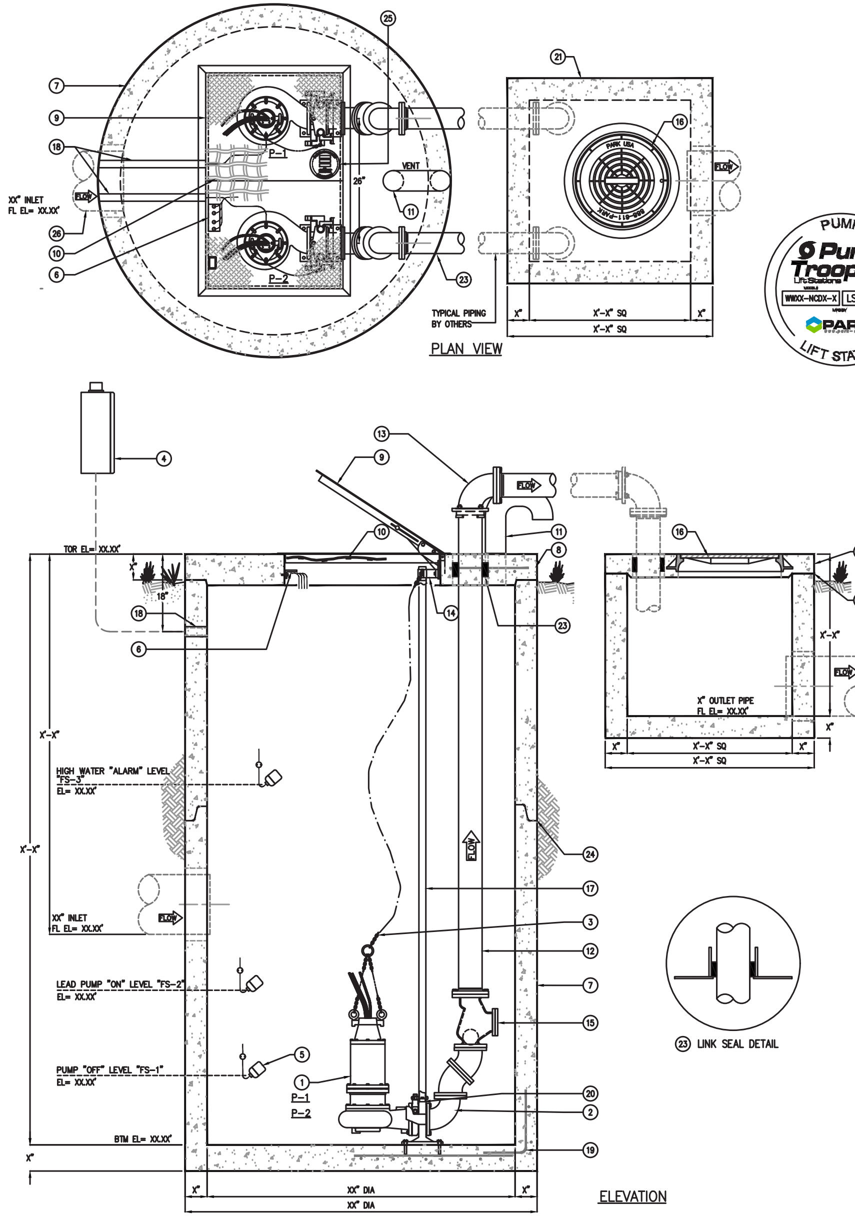
INLETS

DRAINAGE PIPES

CATCH BASINS

SALES@PARKUSA.COM
888-611-PARK

PARK USA
A Northwest Pipe Company



STATION OPERATION LEVELS		
RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	LEAD PUMP TURNS "ON", FS-2	LEAD PUMP "ON"
XX.XX'	HIGH WATER "ALARM" LEVEL, FS-3	HIGH LEVEL ALARM "ON"
FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	HIGH WATER ALARM, FS-3	HIGH LEVEL ALARM "OFF"
XX.XX'	PUMPS "OFF" LEVEL, FS-1	ALL PUMPS "OFF" LAG PUMP SWITCHES TO LEAD PUMP

SYSTEM DESIGNED TO RUN ONE PUMP AT A TIME. ALTERNATING STARTS.

PUMP Trooper Lift Stations WWXX-NCDX-X LS-XXXXXX PARK USA LIFT STATION

MODEL NUMBER:
ParkUSA
888-611-PARK, www-PARKUSA.com
WWXX-NCDX-XXX-XX-XXX-XX

WET WELL SIZE (ID)
72 - 72" DIA
96 - 96" DIA

PUMP CONFIGURATION
S - SIMPLEX
D - DUPLEX

PUMP DISCHARGE SIZE
3 - 3"
4 - 4"
6 - 6"
8 - 8"

FLOW RATE CAPACITY (GPM)
100 - 100 GPM
200 - 200 GPM
ETC...

POWER CHARACTERISTICS
43 - 460V/3PH/60Hz
23 - 230V/3PH/60hz
21 - 230V/1PH/60Hz

PUMP MOTOR SIZE
050 - 5.0 HP
075 - 7.5 HP
100 - 10.0 HP
150 - 15.0 HP
200 - 20.0 HP

PUMP HEAD CAPACITY (TDH)
10 - 10' TOTAL DYNAMIC HEAD
20 - 20' TOTAL DYNAMIC HEAD
ETC...

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	2	X" SUBMERSIBLE PUMP
2	2	X" BASE ELBOWS
3	2	¼" SS STEEL CHAINS
4	1	DUPLEX CONTROL PANEL NEMA 4X
5	4	FLOAT SWITCH
6	1	SS CABLE BRACKET
7	1	XX" DIA x X'-X" DEEP CONCRETE WET WELL
8	1	X" THK FLAT CONCRETE TOP
9	1	XX"xXX" DOUBLE LEAF ALUMINUM HATCHWAY
10	1	SAFETY NET
11	1	4" GALVANIZED VENT
12	2	FL x PE X" DUCTILE IRON PIPE
13	2	X" DI 90° ELBOW FL x MJ w/ STAR GRIPS
14	2	SS UPPER GUIDE BRACKETS
15	2	X" HDL BALL CHECK VALVE
16	2	XX" CAST IRON RING AND COVER
17	4	SS GUIDE RAILS
18	2	3" CONDUIT
19	–	REBAR AS REQ'D
20	2	LIFT-OUT ASSEMBLY
21	1	XX" x XX" x X'-X" DEEP PRECAST CONCRETE DISCHARGE STRUCTURE
22	1	X" THK DISCHARGE STRUCTURE LID
23	–	X" SLEEVE X pcs. LS-XXX LINK SEAL
24	–	ALL JOINTS MADE WATER-TIGHT w/ PLASTIC FLEXIBLE GASKET (RAM-NEK)
25	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WWXX-NCDX-XXX-XX-XXX-XX DATE MANUFACTURED
26	1	STORM INLET PIPING SEAL w/ NON-SHRINK GROUT (BY OTHERS)

NOTE:
ALL DASHED PIPING TO BE FURNISHED BY CONTRACTOR

NOTE:
VERIFY ALL ELEVATIONS PRIOR TO FABRICATION

NOTE:
VERIFY ALL INLET/OUTLET ORIENTATIONS PRIOR TO FABRICATION

SPECIFICATIONS

CONCRETE:
CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT:
GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ALUMINUM HATCH:
300 PSF RATED, 1/4" ALUMINUM SKID-RESISTANT FLOOR PLATE, STAINLESS STEEL TAMPERPROOF BOLTING & HINGES & SLAMLOCK. (H-20 RATING OPTIONAL)

PUMPS:
PUMPS SHALL BE CENTRIFUGAL TYPE WITH INTEGRAL NON-CLOG UNIT AND SUBMERSIBLE TYPE MOTOR. PUMPS SHALL HAVE A CAPACITY AS FOLLOWS:

PUMP No.	TYPE	GPM	TDH	RPM	ELECTRICAL HP	V	PH	Hz
P-1	NON CLOG	XX	XX'	XXXX	X	XXX	X	XX
P-2	NON CLOG	XX	XX'	XXXX	X	XXX	X	XX

CONTROLS:
PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA-4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

ENGINEERING DATA
FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF ASSEMBLY. USE DIMENSIONAL DATA AS SHOWN. ALL PIPE, VALVES AND FITTINGS OF THE ASSEMBLY ARE APPROVED BY ONE OF THE FOLLOWING ASSOCIATIONS:

DRAWING NOT FOR SUBMITTAL. CONTACT PARKUSA FOR LIFT STATION DESIGN ASSISTANCE.

WWXX-NCDXX-1

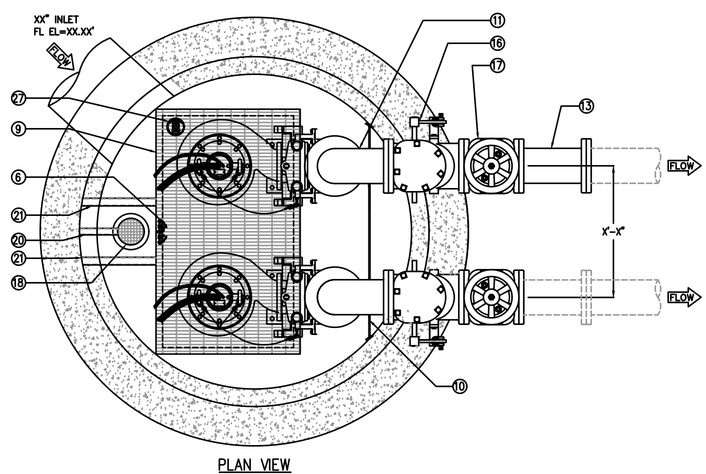
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

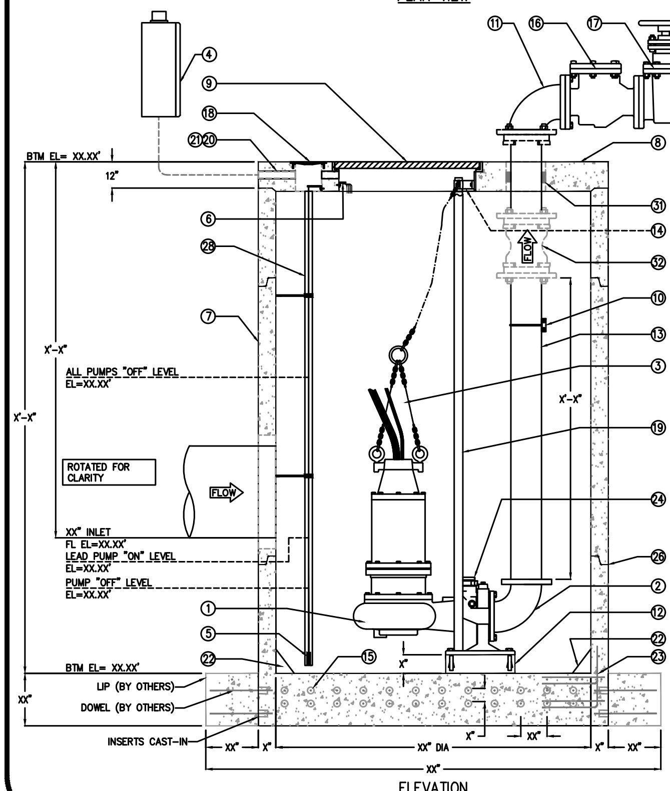
PARK USA
www.parkusa.com 888-611-PARK

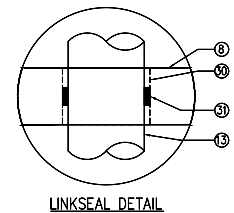
STORM SEWER LIFT STATION
SUBMERSIBLE NON-CLOG PUMP STATION

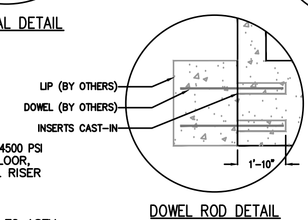
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WWXX-NCDXX-1	.
DATE 05/2019					

PUMP
LIFT STATIONS









STATION OPERATION LEVELS		
RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
144.20'	LEAD PUMP "ON"	LEAD PUMP "ON"
154.50'	ALL PUMPS "OFF" GRATE INLET APPROACHING FULL	ALL PUMPS "OFF"
FALLING LEVEL CYCLE		
154.50'	LEAD PUMP TURNS "ON" GRATE INLET LEVEL RECEDING	HIGH LEVEL ALARM "OFF"
142.20'	PUMPS "OFF" LEVEL	ALL PUMPS "ON"

SYSTEM DESIGNED TO RUN ONE PUMP @ A TIME

888-611-PARK,www-PARKUSA.com
WWXXX-NCDXX-XXX-XX-XXX-XX

WET WELL SIZE (ID)
- 72 – 72" DIA
- 96 – 96" DIA

PUMP CONFIGURATION
- S – SIMPLEX
- D – DUPLEX

PUMP DISCHARGE SIZE
- 3 – 3"
- 4 – 4"
- 6 – 6"
- 8 – 8"

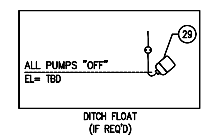
FLOW RATE CAPACITY (GPM)
- 100 – 100 GPM
- 200 – 200 GPM
- ETC...

POWER CHARACTERISTICS
- 43 – 460V/3PH/60Hz
- 23 – 230V/3PH/60hz
- 21 – 230V/1PH/60Hz

PUMP MOTOR SIZE
- 050 – 5.0 HP
- 075 – 7.5 HP
- 100 – 10.0 HP
- 150 – 15.0 HP
- 200 – 20.0 HP

PUMP HEAD CAPACITY (TDH)
- 10 – 10' TOTAL DYNAMIC HEAD
- 20 – 20' TOTAL DYNAMIC HEAD
- ETC...

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	2	X" SUBMERSIBLE PUMP
2	2	X" BASE ELBOW
3	2	SS STEEL CHAINS
4	1	DUPLEX CONTROL PANEL NEMA 4X SS
5	1	LEVEL CONTROL TRANSDUCER
6	1	SS CABLE BRACKET
7	1	XX" DIA x X'-X" DEEP CONCRETE WET WELL
8	1	X" THK FLAT CONCRETE TOP
9	1	X'-X"xX'-X" FRP GRATING AND SUPPORT
10	1	DISCHARGE PIPE SUPPORT
11	2	X" FLxMJ 90° ELBOW
12	2	GALVANIZED STEEL STAND
13	1	X" D.I. PIPE
14	2	SS UPPER GUIDE BRACKETS
15	–	CAST-IN DOWEL ROD INSERTS ON X" O.C.
16	2	X" C.I. CHECK VALVE
17	2	X" C.I. GATE VALVE
18	1	X" TRANSDUCER MANHOLE
19	4	SS GUIDE RAILS
20	1	2" CONDUIT
21	2	3" CONDUIT
22	–	FILLET BY OTHERS
23	–	REBAR AS REQ'D
24	2	LIFT-OUT ASSEMBLY
25	–	NOT USED
26	–	ALL JOINTS MADE WATER-TIGHT w/ PLASTIC FLEXIBLE GASKET (RAM-NEK)
27	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WWXXX-NCDXX-XXX-XX-XXX-XX DATE MANUFACTURED
28	1	X" PVC STILLING WELL FOR TRANSDUCER w/ SS MOUNTING BRACKETS (CENTERED IN MANHOLE)
29	1	HIGH LEVEL SHUT-OFF DITCH FLOAT (IF REQ'D) (INSTALLED & WIRED BY OTHERS)
30	1	X" GALVANIZED SLEEVE
31	1	LINKSEAL LS-XXX x X pcs
32	–	MJ x MJ CONNECTION (BY OTHERS)



SPECIFICATIONS

CONCRETE:
CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT:
GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ALUMINUM HATCH:
300 PSF RATED, 1/4" ALUMINUM SKID-RESISTANT FLOOR PLATE, STAINLESS STEEL TAMPERPROOF BOLTING & HINGES & SLAMLOCK. (H-20 RATING OPTIONAL)

PUMPS:
PUMPS SHALL BE CENTRIFUGAL TYPE WITH INTEGRAL NON-CLOG UNIT AND SUBMERSIBLE TYPE MOTOR. PUMPS SHALL HAVE A CAPACITY AS FOLLOWS:

PUMP No.	TYPE	GPM	TDH	RPM	ELECTRICAL HP	V	PH	Hz
P-1	NON CLOG	XX	XX'	XXXX	X	XXX	X	XX
P-2	NON CLOG	XX	XX'	XXXX	X	XXX	X	XX

CONTROLS:
PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA-4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

ENGINEERING DATA
FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF ASSEMBLY. USE DIMENSIONAL DATA AS SHOWN. ALL PIPE, VALVES AND FITTINGS OF THE ASSEMBLY ARE APPROVED BY ONE OF THE FOLLOWING ASSOCIATIONS:

B64.5

NOTE:
ALL DASHED PIPING TO BE FURNISHED BY CONTRACTOR

NOTE:
VERIFY ALL ELEVATIONS PRIOR TO FABRICATION

NOTE:
VERIFY ALL INLET/OUTLET ORIENTATIONS PRIOR TO FABRICATION

PUMP Pump Trooper Lift Stations WW144-NCD10-43 LS-XXXXXX LIFT STATION

DRAWING NOT FOR SUBMITTAL.
CONTACT PARKUSA FOR LIFT STATION DESIGN ASSISTANCE.

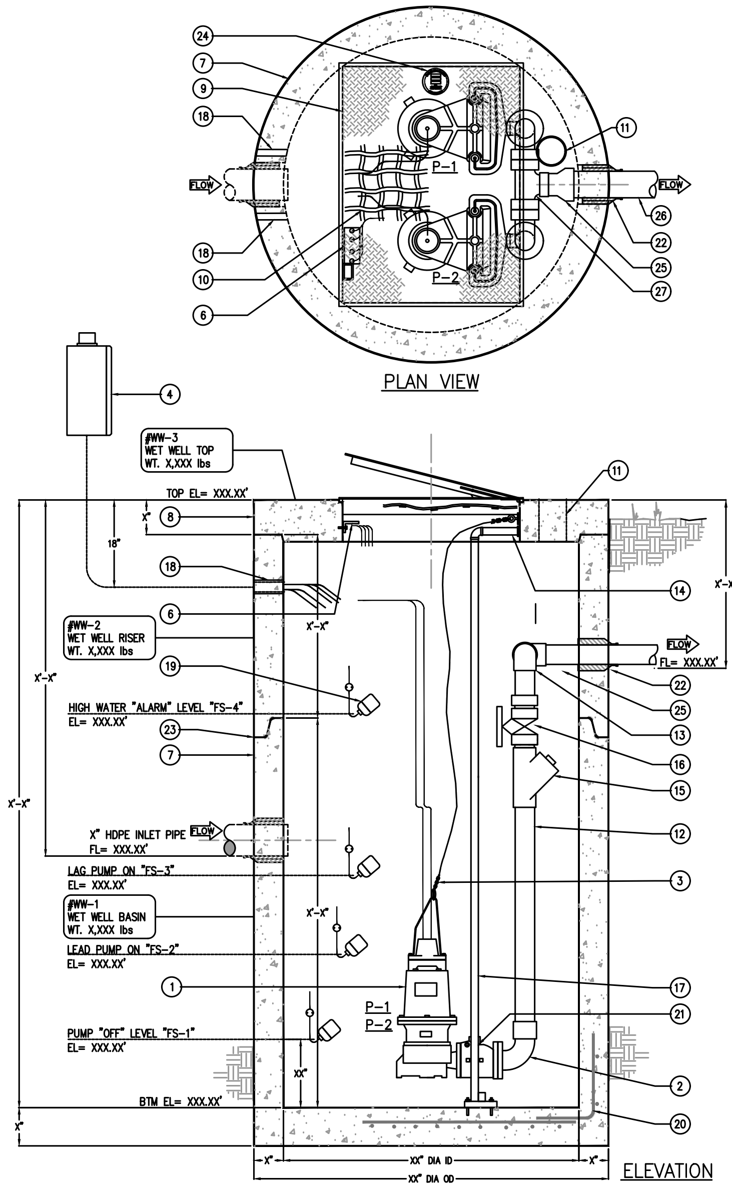
WWXX-NCDXX-2

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

www.parkusa.com 888-611-PARK

STORM SEWER LIFT STATION
SUBMERSIBLE NON-CLOG PUMP STATION

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.		
DATE 05/2019				WWXX-NCDXX-2	.



STATION OPERATION LEVELS		
RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XXX.XX'	LEAD PUMP TURNS "ON", FS-2	LEAD PUMP "ON"
XXX.XX'	LAG PUMP TURNS "ON", FS-3	LEAD & LAG PUMPS "ON"
XXX.XX'	HIGH WATER "ALARM" LEVEL, FS-4	HIGH LEVEL ALARM "ON"
FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XXX.XX'	HIGH WATER ALARM, FS-4	HIGH LEVEL ALARM "OFF"
XXX.XX'	PUMPS "OFF" LEVEL, FS-1	ALL PUMPS "OFF" LAG PUMP SWITCHES TO LEAD PUMP

MODEL NUMBER: ParkUSA
888-611-PARK,www.PARKUSA.com
WWXX-NCDX-XXX-XX-XX-XX

WET WELL SIZE (ID)
48 - 48" DIA
60 - 60" DIA
72 - 72" DIA
96 - 96" DIA

PUMP CONFIGURATION
S - SIMPLEX
D - DUPLEX

PUMP DISCHARGE SIZE
3 - 3"
4 - 4"
6 - 6"

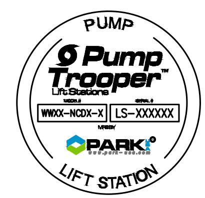
FOW RATE CAPACITY (GPM)
100 - 100GPM
200 200 GPM
ETC...

POWER CHARACTERISTICS
43 - 460V/3PH/60Hz
23 - 230V/3PH/60hz
21 - 230V/1PH/60Hz
03 - 208V/3PH/60Hz
01 - 208V/1PH/60Hz

NON-CLOG PUMP SIZE
01 - 1.0 HP
20 - 2.0 HP
30 - 3.0 HP
50 - 5.0 HP

PUMP HEAD CAPACITY (TDH)
10 - 10' TDH
20 - 20' TDH
ETC...

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	2	X" SUBMERSIBLE PUMP
2	2	X" BASE ELBOW
3	2	STAINLESS STEEL CHAINS
4	1	DUPLEX CONTROL PANEL NEMA 4X FRP (MOUNTED & WIRED BY CONTRACTOR)
5	1	NOT USED
6	1	SS CABLE BRACKET
7	1	XX" DIA x X'-X" DEEP CONCRETE WET WELL
8	1	X" THK FLAT CONCRETE TOP
9	1	XX"xXX" SINGLE LEAF ALUMINUM HATCHWAY
10	1	SAFETY NET
11	1	X" GALVANIZED VENT COUPLING
12	2	X" SCH 80 PVC DISCHARGE PIPE
13	2	X" SCH 80 PVC 90° ELL
14	2	SS UPPER GUIDE BRACKETS
15	2	X" PVC BALL CHECK VALVE
16	2	X" PVC BALL VALVE w/ UNIONS
17	4	SS GUIDE RAILS
18	2	3" ELECTRICAL COUPLING
19	4	FLOAT SWITCH
20	-	REBAR AS REQ'D
21	2	LIFT-OUT ASSEMBLY
22	2	RESILIENT RUBBER BOOT
23	-	ALL JOINTS MADE WATER-TIGHT w/ PLASTIC FLEXIBLE GASKET (RAM-NEK)
24	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WWXX-NCDX-XXX-XX-XX-XX DATE MANUFACTURED
25	1	X"xX" REDUCER
26	-	X" SCH 80 PVC DISCHARGE PIPE
27	1	X" SCH 80 PVC TEE



NAME PLATE

SPECIFICATIONS

CONCRETE:
CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT:
GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ALUMINUM HATCH:
300 PSF RATED, 1/4" ALUMINUM SKID-RESISTANT FLOOR PLATE, STAINLESS STEEL TAMPERPROOF BOLTING & HINGES & SLAMLOCK. (H-20 RATING OPTIONAL)

PUMPS:
PUMPS SHALL BE CENTRIFUGAL TYPE WITH INTEGRAL NON-CLOG UNIT AND SUBMERSIBLE TYPE MOTOR. PUMPS SHALL HAVE A CAPACITY AS FOLLOWS:

PUMP No.	TYPE	GPM	TDH	RPM	ELECTRICAL HP	V	PH	Hz
P-1	NON CLOG	XX	XX'	XXXX	X	XXX	X	XX
P-2	NON CLOG	XX	XX'	XXXX	X	XXX	X	XX

CONTROLS:
PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA-4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

ENGINEERING DATA

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF ASSEMBLY. USE DIMENSIONAL DATA AS SHOWN. ALL PIPE, VALVES AND FITTINGS OF THE ASSEMBLY ARE APPROVED BY ONE OF THE FOLLOWING ASSOCIATIONS:

NPCA CSA B64.5 UL

NOTE:
ALL DASHED PIPING TO BE FURNISHED BY CONTRACTOR

NOTE:
VERIFY ALL ELEVATIONS PRIOR TO FABRICATION

NOTE:
VERIFY ALL INLET/OUTLET ORIENTATIONS PRIOR TO FABRICATION

DRAWING NOT FOR SUBMITTAL. CONTACT PARKUSA FOR LIFT STATION DESIGN ASSISTANCE.

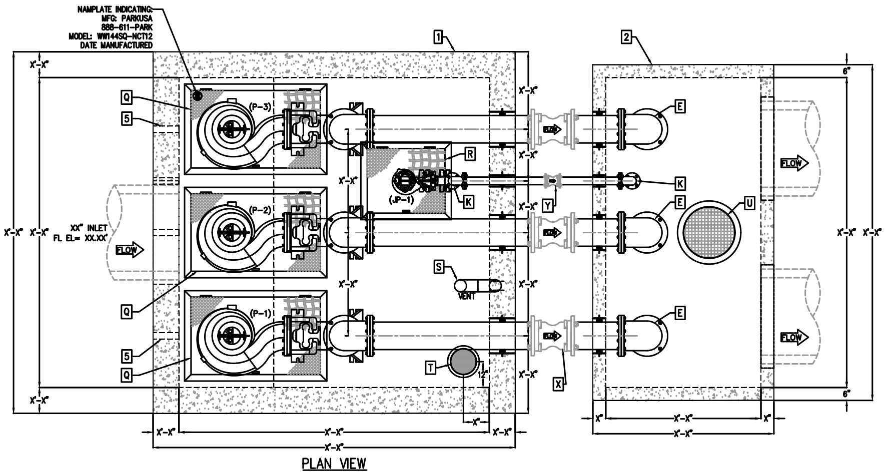
WWXX-NCDXX-3

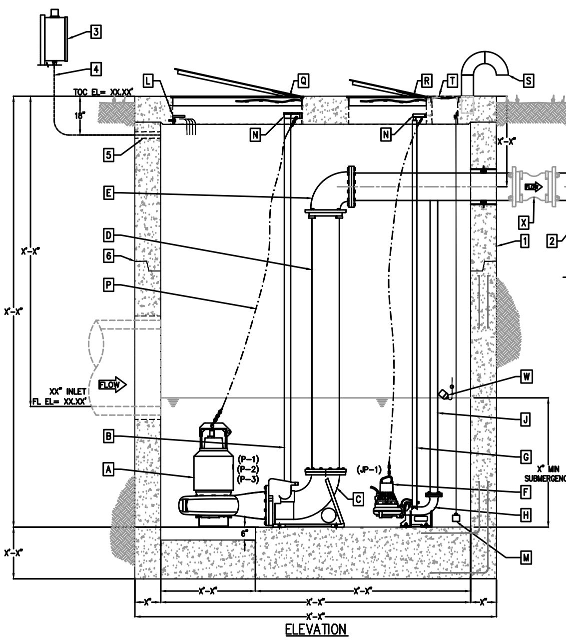
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

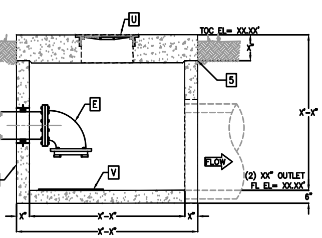
PARK USA
www.parkusa.com 888-611-PARK

STORM SEWER LIFT STATION
SUBMERSIBLE NON-CLOG PUMP STATION

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WWXX-NCDXX-3	.
DATE 05/2019					







STATION OPERATION LEVELS		
RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	LEAD PUMP TURNS "ON"	LEAD PUMP "ON"
XX.XX'	STANDBY PUMP TURNS "ON"	STANDBY PUMP "ON", LEAD PUMP "OFF"
XX.XX'	SWITCH TO GRAVITY OUTFALL	ALL PUMPS "OFF"
XX.XX'	HIGH WATER "ALARM" LEVEL	HIGH LEVEL ALARM "ON", ALL PUMPS "OFF"
FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	HIGH WATER "ALARM" LEVEL	SS GUIDE RAIL SYSTEM
XX.XX'	SWITCH FROM GRAVITY OUTFALL TO PUMP	3" DISCHARGE ELBOW
XX.XX'	STANDBY PUMP TURNS "ON"	3" DI DISCHARGE PIPE
XX.XX'	STANDBY PUMP TURNS "OFF"	3" DI 90° ELL

MATERIAL LIST		
MARK	QTY	DESCRIPTION
A	3	X" SUBMERSIBLE PUMP (P-1, P-2, P-3)
B	3	SS GUIDE RAIL SYSTEM
C	3	X" DISCHARGE ELBOW
D	–	X" DI DISCHARGE PIPE (FLxPE)
E	6	X" DI 90° ELL (FLxMJ)
F	1	X" SUBMERSIBLE PUMP (JOCKEY)
G	1	SS GUIDE RAIL SYSTEM
H	1	X" DISCHARGE ELBOW (FLxMJ)
J	–	X" DI DISCHARGE PIPE (FLxPE)
K	2	X" DI 90° ELL
L	1	SS CONTROL CABLE BRACKET
M	1	PRESSURE TRANSDUCER
N	4	UPPER GUIDE BRACKET
P	4	SS LIFTING CHAIN
Q	3	XX"xXX" ALUMINUM HATCHWAY w/ SLAMLOCK, HINGES, AND SAFETY NET
R	1	XX"xXX" ALUMINUM HATCHWAY w/ SLAMLOCK, HINGES, AND SAFETY NET
S	1	X" GALVANIZED VENT w/ INSECT SCREEN
T	1	XX" ACCESS COVER
U	1	XX" CAST IRON RING & COVER
V	3	XX"xXX"xX" DIFFUSER PLATE SECURED TO BOTTOM w/ (4) ½" SS ANCHOR BOLTS
W	1	AUX LOW LEVEL FLOAT SENSOR
X	3	X" MJ x MJ CONNECTION (BY OTHERS)
Y	1	X" MJ x MJ CONNECTION (BY OTHERS)
Z	1	NAMPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WWXX-NCTXX DATE MANUFACTURED

PUMP Trooper Lift Stations WWXX-NCDX-X LS-XXXXXX PARK USA LIFT STATION

MODEL NUMBER: ParkUSA
888-611-PARK, www.PARKUSA.com
WWXX-NCDX-XXX-XX-XX-XX

WET WELL SIZE (ID)
48 – 48" DIA
60 – 60" DIA
72 – 72" DIA
96 – 96" DIA
PUMP CONFIGURATION
S – SIMPLEX
D – DUPLEX
PUMP DISCHARGE SIZE
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4 – 4"
6 – 6"
FOW RATE CAPACITY (GPM)
100 – 100GPM
200 200 GPM
ETC...

POWER CHARACTERISTICS
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01 – 208V/1PH/60Hz
NON-CLOG PUMP SIZE
01 – 1.0 HP
20 – 2.0 HP
30 – 3.0 HP
50 – 5.0 HP
PUMP HEAD CAPACITY (TDH)
10 – 10' TDH
20 – 20' TDH
ETC...

KEYED NOTES	
MARK	DESCRIPTION
1	PRECAST CONCRETE WET WELL
2	PRECAST CONCRETE DISCHARGE VAULT
3	TRIPLEX CONTROL PANEL
4	ELECTRICAL CABLE & CONDUIT (BY OTHERS)
5	3" ELECTRICAL COUPLING (TYP 4)
6	ALL JOINTS MADE WATER-TIGHT w/ PLASTIC FLEXIBLE GASKET (RAM-NEK)

SPECIFICATIONS

CONCRETE:
CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

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PUMPS:
PUMPS SHALL BE CENTRIFUGAL TYPE WITH INTEGRAL NON-CLOG UNIT AND SUBMERSIBLE TYPE MOTOR. PUMPS SHALL HAVE A CAPACITY AS FOLLOWS:

PUMP No.	TYPE	GPM	TDH	RPM	ELECTRICAL HP	V	PH	Hz
P-1	NON CLOG	XXXX	XX'	XXXX	XX	XXX	X	XX
P-2	NON CLOG	XXXX	XX'	XXXX	XX	XXX	X	XX
P-3	NON CLOG	XXXX	XX'	XXXX	XX	XXX	X	XX
JP-1	NON CLOG	XXXX	XX'	XXXX	XX	XXX	X	XX

CONTROLS:
PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA-4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

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NPCA 8643

DRAWING NOT FOR SUBMITTAL. CONTACT PARKUSA FOR LIFT STATION DESIGN ASSISTANCE.

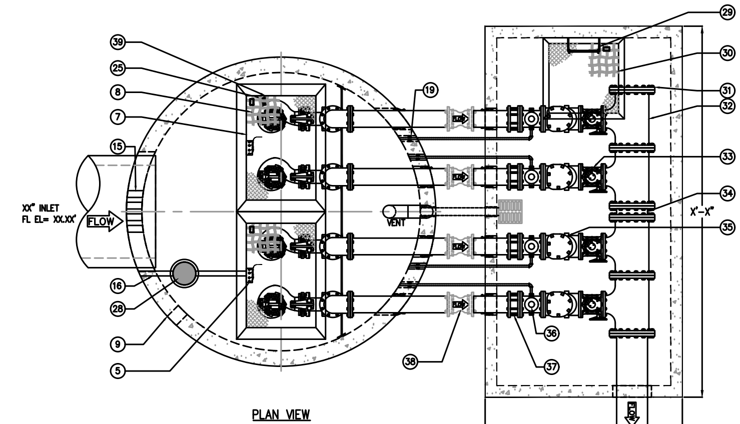
WWXX-NCTXX

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

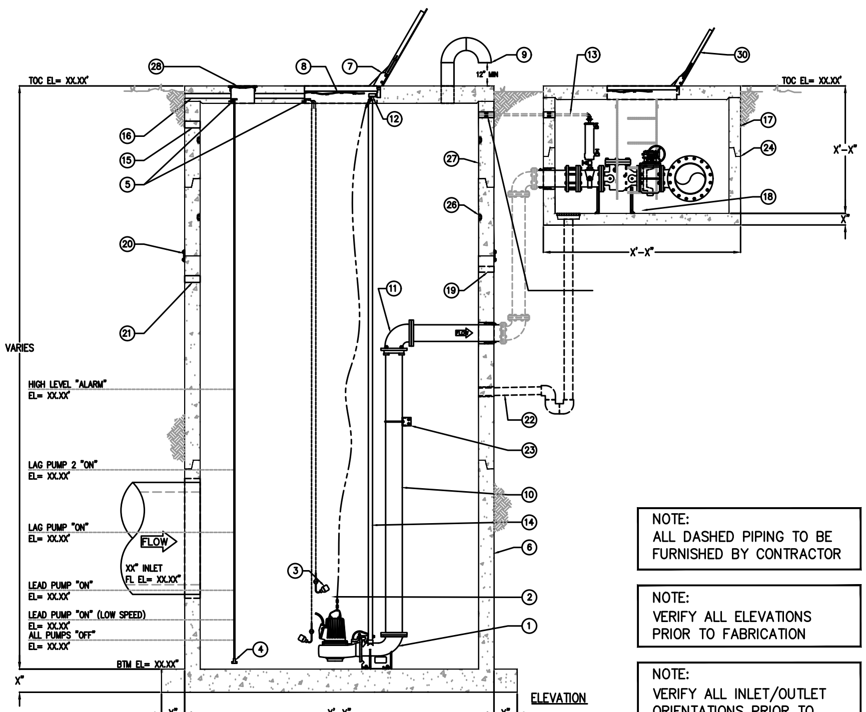
PARK USA
www.parkusa.com 888-611-PARK

STORM SEWER LIFT STATION
SUBMERSIBLE TRIPLEX PUMP STATION

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WWXX-NCTXX	.
DATE	05/2019				



PLAN VIEW



ELEVATION

NAME PLATE

STATION OPERATION LEVELS		
RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	LEAD PUMP TURNS "ON" (LOW)	LEAD PUMP "ON" (LOW SPEED)
XX.XX'	LEAD PUMP TURNS "ON"	LEAD PUMP "ON"
XX.XX'	LAG PUMP 1 TURNS "ON"	LEAD & LAG PUMPS "ON"
XX.XX'	LAG PUMP 2 TURNS "ON"	LEAD & LAG 1-2 PUMPS "ON"
XX.XX'	HIGH WATER "ALARM" LEVEL	LEAD & LAG 1-2 PUMPS "ON" HIGH LEVEL ALARM "ON"
FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	PUMPS "OFF" LEVEL	ALL PUMPS "OFF" LAG PUMP SWITCHES TO LEAD PUMP

MODEL NUMBER: ParkUSA
888-611-PARK,www.PARKUSA.com
WWXXX-NCQX-XXX-XX-XXX-XX

WET WELL SIZE (ID)
48 - 48" DIA
60 - 60" DIA
72 - 72" DIA
96 - 96" DIA
120 - 120" DIA
144 - 144" DIA

PUMP CONFIGURATION
S - SIMPLEX
D - DUPLEX
T - TRIPLEX

PUMP DISCHARGE SIZE
3 - 3"
4 - 4"
6 - 6"
8 - 8"

FLOW RATE CAPACITY (GPM)
100 - 100 GPM
200 - 200 GPM
ETC...

POWER CHARACTERISTICS
43 - 460V/3PH/60Hz
23 - 230V/3PH/60hz
21 - 230V/1PH/60Hz

PUMP MOTOR SIZE
020 - 2.0 HP
030 - 3.0 HP
050 - 5.0 HP
075 - 7.5 HP
100 - 10.0 HP
150 - 15.0 HP
200 - 20.0 HP

PUMP HEAD CAPACITY (TDH)
10 - 10' TOTAL DYNAMIC HEAD
20 - 20' TOTAL DYNAMIC HEAD
ETC...

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	4	X" DISCHARGE ELBOW
2	4	LIFT-OUT CHAIN STAINLESS STEEL
3	2	BACKUP FLOAT SWITCH
4	1	LEVEL CONTROL TRANSDUCER
5	2	SS CABLE BRACKETS
6	1	PRECAST CONCRETE WET WELL BASIN
7	2	XX"xXX" SINGLE LEAF ALUMINUM HATCH w/ SS HINGES & SLAMLOCK
8	2	SAFETY NET
9	1	6" GALV VENT
10	1	X" DISCHARGE PIPE DUCTILE IRON
11	4	X" FLxMJ 90° ELL
12	4	UPPER GUIDE BRACKET
13	1	AIR RELEASE VALVE PIPING (BY OTHERS)
14	8	STAINLESS STEEL GUIDE RAILS
15	3	3" ELECTRICAL CPLG (TYP 3)
16	1	1" ELECTRICAL CONDUIT
17	1	PRECAST CONCRETE VALVE VAULT
18	–	GALVANIZED PIPE SUPPORTS (TYP)
19	1	X" HOLE FOR X" PIPING LSXXX x X PCS LINKSEAL (TYP)
20	4	GALV STEEL PLATES & BOLTS
21	3	3" ELECTRICAL CPLG
22	1	X" PVC DRAIN (BY OTHERS)
23	1	SS PIPE SUPPORTS AS REQ'D
24	–	ALL JOINTS MADE WATER-TIGHT w/ PLASTIC FLEXIBLE GASKET (RAMNEK)
26	1	LIFTING DEVICES (TYP 4 PER RISER)
27	2	PRECAST CONCRETE RISER SECTION
28	1	X" OPW COVER
29	1	LADDER
30	1	XX"xXX" ALUMINUM HATCH w/ SS HINGES & SLAMLOCK AND SAFETY NET
31	1	BLIND FLANGE
32	4	X"xX" REDUCING TEE
33	4	X" PLUG VALVE
34	4	X" SPOOL
35	4	X" SWING CHECK
36	4	X" AIR/VACUUM RELEASE VALVE
37	4	X" JCM CPLG
38	–	MJxMJ CONNECTION (BY OTHERS)
39	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WWXX-NCQXX DATE MANUFACTURED

SPECIFICATIONS

CONCRETE:
CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT:
GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ALUMINUM HATCH:
300 PSF RATED, 1/4" ALUMINUM SKID-RESISTANT FLOOR PLATE, STAINLESS STEEL TAMPERPROOF BOLTING & HINGES & SLAMLOCK. (H-20 RATING OPTIONAL)

PUMPS:
PUMPS SHALL BE CENTRIFUGAL TYPE WITH INTEGRAL NON-CLOG UNIT AND SUBMERSIBLE TYPE MOTOR. PUMPS SHALL HAVE A CAPACITY AS FOLLOWS:

PUMP No.	TYPE	GPM	TDH	RPM	ELECTRICAL HP	V	PH	Hz
1	NON CLOG	XXXX	XX'	XXXX	XX	XXX	X	XX
1	NON CLOG	XXXX	XX'	XXXX	XX	XXX	X	XX
1	NON CLOG	XXXX	XX'	XXXX	XX	XXX	X	XX
1	NON CLOG	XXXX	XX'	XXXX	XX	XXX	X	XX

CONTROLS:
PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA-4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

ENGINEERING DATA

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF ASSEMBLY. USE DIMENSIONAL DATA AS SHOWN. ALL PIPE, VALVES AND FITTINGS OF THE ASSEMBLY ARE APPROVED BY ONE OF THE FOLLOWING ASSOCIATIONS:

NPCA CERTIFIED PLANT B64.5

NOTE:
ALL DASHED PIPING TO BE FURNISHED BY CONTRACTOR

NOTE:
VERIFY ALL ELEVATIONS PRIOR TO FABRICATION

NOTE:
VERIFY ALL INLET/OUTLET ORIENTATIONS PRIOR TO FABRICATION

DRAWING NOT FOR SUBMITTAL. CONTACT PARKUSA FOR LIFT STATION DESIGN ASSISTANCE.

WWXX-NCQXX

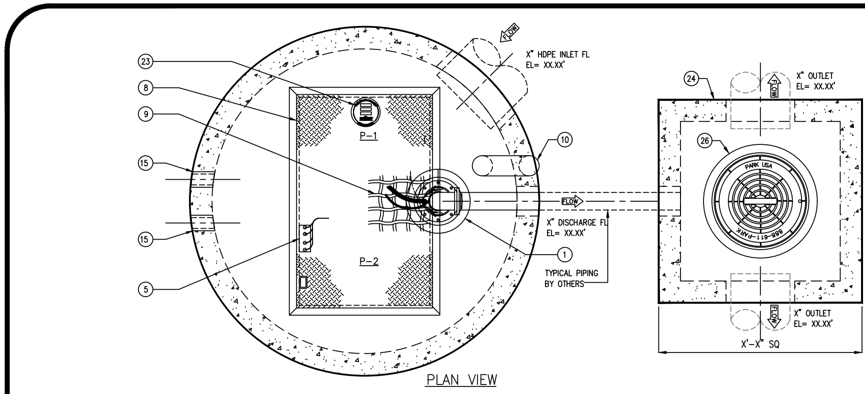
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

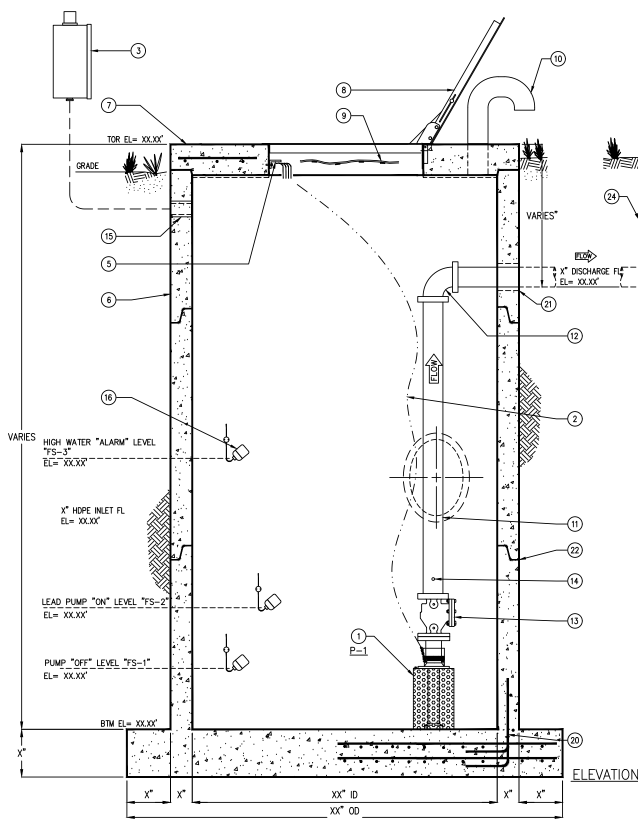
STORM SEWER LIFT STATION
SUBMERSIBLE QUADPLEX PUMP STATION

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WWXX-NCQXX	.
DATE 05/2019					

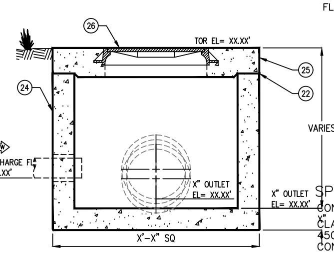
PUMP LIFT STATIONS



PLAN VIEW



ELEVATION



STATION OPERATION LEVELS		
RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	LEAD PUMP TURNS "ON", FS-2	LEAD PUMP "ON"
XX.XX'	HIGH WATER "ALARM" LEVEL, FS-3	HIGH LEVEL ALARM "ON"
FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	HIGH WATER "ALARM", FS-3	HIGH LEVEL ALARM "OFF"
XX.XX'	PUMPS "OFF" LEVEL, FS-1	ALL PUMPS "OFF" LAG PUMP SWITCHES TO LEAD PUMP

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	X" SUBMERSIBLE AXIAL PUMP
2	1	STAINLESS STEEL CHAINS
3	1	SIMPLEX CONTROL PANEL NEMA 4X FRP (MOUNTED & WIRED BY CONTRACTOR)
4	1	NOT USED
5	1	SS CABLE BRACKET
6	1	XX" DIA x X'-X" DEEP CONCRETE WET WELL
7	1	X" THK FLAT CONCRETE TOP
8	1	XX"xXX" DOUBLE LEAF ALUMINUM HATCHWAY
9	1	SAFETY NET
10	1	X" GALVANIZED VENT
11	1	X" SCH 80 PVC DISCHARGE PIPE
12	1	X" PVC 90° ELL SCH80 FLxMJ w/STAR GRIP
13	1	X" SWING CHECK
14	1	WEEP HOLE
15	2	X" ELECTRICAL COUPLING
16	3	FLOAT SWITCH
17	–	NOT USED
18	–	NOT USED
19	–	NOT USED
20	1	REBAR AS REQ'D
21	1	RESILIENT RUBBER BOOT
22	1	ALL JOINTS MADE WATER-TIGHT w/ PLASTIC FLEXIBLE GASKET (RAM-NEK)
23	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WWXX-AXSX-XXX-XX-XXX-XX DATE MANUFACTURED
24	1	XX"XXX"XX'-X" DEEP PRECAST DISCHARGE STRUCTURE
25	1	X" DISCHARGE STRUCTURE LID
26	1	CAST IRON RING & COVER

PUMP Pump Trooper LIFT STATION WWXX-AXS LS-XXXXXX

MODEL NUMBER: WWXX-AXSX-XXX-XX-XXX-XX

WET WELL SIZE (ID)
48 – 48" DIA
60 – 60" DIA
72 – 72" DIA
96 – 96" DIA

PUMP CONFIGURATION
S – SIMPLEX
D – DUPLEX

PUMP DISCHARGE SIZE
3 – 3"
4 – 4"
6 – 6"
8 – 8"

FLOW RATE CAPACITY (GPM)
100 – 100 GPM
200 – 200 GPM
ETC...

POWER CHARACTERISTICS
43 – 460V/3PH/60Hz
23 – 230V/3PH/60hz
21 – 230V/1PH/60Hz

PUMP MOTOR SIZE
020 – 2.0 HP
030 – 3.0 HP
050 – 5.0 HP
075 – 7.5 HP
100 – 10.0 HP
150 – 15.0 HP
200 – 20.0 HP

PUMP HEAD CAPACITY (TDH)
10 – 10' TOTAL DYNAMIC HEAD
20 – 20' TOTAL DYNAMIC HEAD
ETC...

SPECIFICATIONS

CONCRETE:
CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT:
GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ALUMINUM HATCH:
300 PSF RATED, 1/4" ALUMINUM SKID-RESISTANT FLOOR PLATE, STAINLESS STEEL TAMPERPROOF BOLTING & HINGES & SLAMLOCK.

PUMPS:
PUMPS SHALL BE CENTRIFUGAL SOLIDS HANDLING TYPE WITH SUBMERSIBLE TYPE MOTOR. PUMPS SHALL HAVE A CAPACITY AS FOLLOWS:

PUMP No.	TYPE	GPM	TDH	RPM	ELECTRICAL HP	V	PH	Hz
P-1	AXIAL	XX	X'	XX	X	X	X	X

CONTROLS:
PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA-4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BECON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

Engineering Data
FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF ASSEMBLY. USE DIMENSIONAL DATA AS SHOWN. ALL PIPE, VALVES AND FITTINGS OF THE ASSEMBLY ARE APPROVED BY ONE OF THE FOLLOWING ASSOCIATIONS:

NPCA CERTIFIED PLANT B64.5 UL AMERICAN SOCIETY OF SANITARY ENGINEERING

NOTE:
ALL DASHED PIPING TO BE FURNISHED BY CONTRACTOR

NOTE:
VERIFY ALL ELEVATIONS PRIOR TO FABRICATION

NOTE:
VERIFY ALL INLET/OUTLET ORIENTATIONS PRIOR TO FABRICATION

DRAWING NOT FOR SUBMITTAL. CONTACT PARKUSA FOR LIFT STATION DESIGN ASSISTANCE.

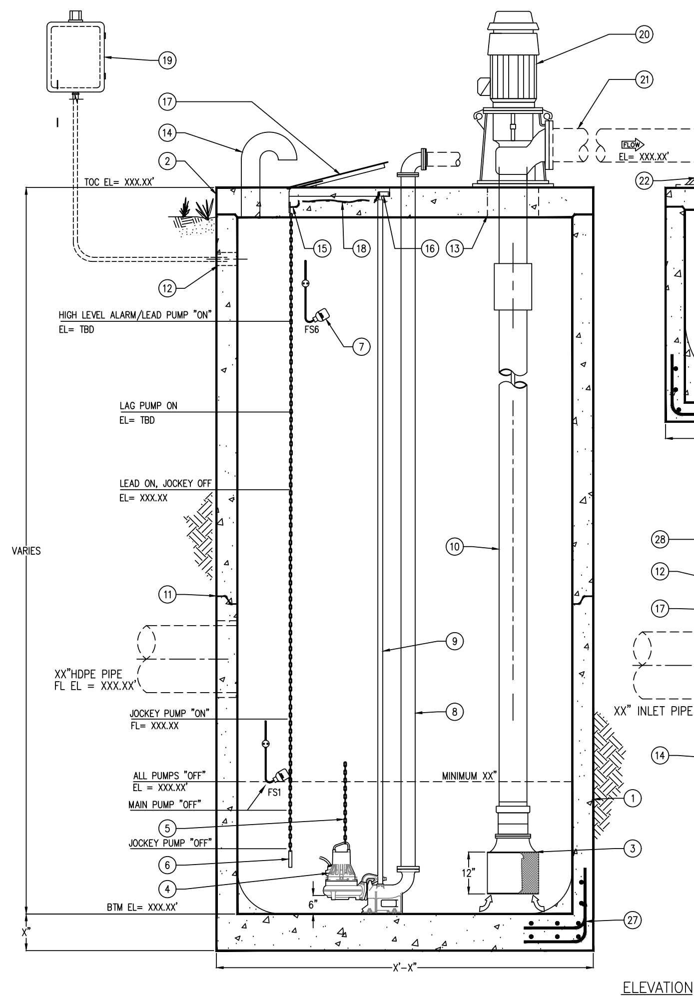
WWXX-AXS

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

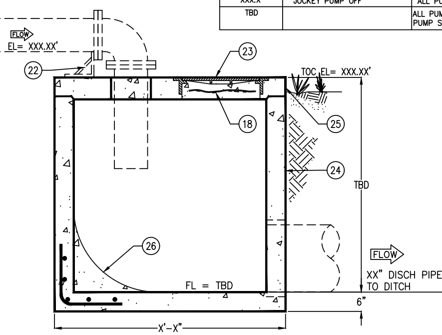
PARK USA®
www.parkusa.com 888–611–PARK

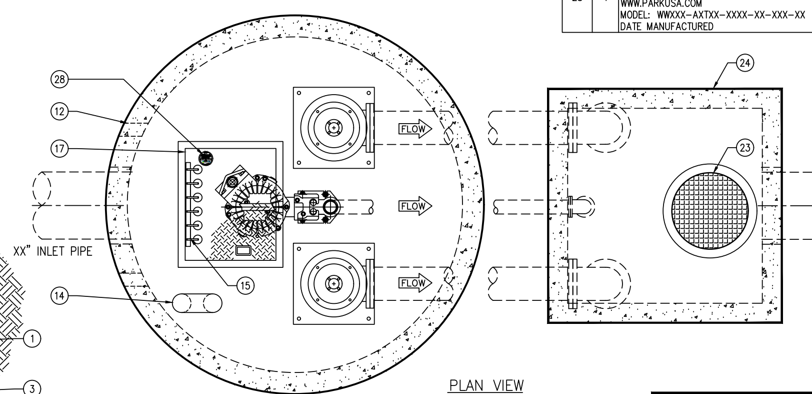
STORM SEWER LIFT STATION
SUBMERSIBLE AXIAL PUMP STATION

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WWXX-AXS	.
DATE 05/2019					



ELEVATION





PLAN VIEW

STATION OPERATION LEVELS		
RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XXX.XX'	JOCKEY PUMP ON	JOCKEY PUMP
XXX.XX'	PUMP ONE TURNS ON	JOCKEY OFF
	PUMP TWO	ONE AND TWO ALTERNATE
XXX.XX'	HIGH LEVEL ALARM ON	PUMP 1 RUNNING
FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XXX.XX'	PUMP 1 OFF	JOCKEY PUMP ON
XXX.X'	JOCKEY PUMP OFF	ALL PUMPS OFF
TBD		ALL PUMPS STOPPED - STANDBY PUMP SWITCHES TO LEAD PUMP

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	XX" DIA x X'-X" DEEP PRECAST CONCRETE WET WELL
2	1	X" THK FLAT CONCRETE TOP
3	1	BELL SUCTION w/ CLIP-ON SCREEN
4	1	X" SUBMERSIBLE JOCKEY PUMP
5	1	STAINLESS STEEL LIFTING CHAIN
6	1	LEVEL CONTROL TRANSDUCER
7	2	FLOAT SWITCH
8	1	X" SCH 80 PVC DISCHARGE PIPE
9	2	STAINLESS STEEL GUIDE RAILS
10	2	XX" DIA PIPE COLUMN
11	–	ALL JOINTS MADE WATER-TIGHT w/ PLASTIC FLEXIBLE GASKET (RAM-NEK)
12	2	X" ELECTRICAL COUPLING
13	2	XX" BLOCKOUTS FOR PUMPS
14	1	X" GALV STEEL VENT
15	1	SS CABLE BRACKET
16	1	UPPER GUIDE BRACKETS
17	1	XX"xXX" SINGLE LEAF ALUMINUM HATCHWAY
18	2	SAFETY NET
19	1	TRIPLEX CONTROL PANEL (MOUNTED & WIRED BY CONTRACTOR)
20	2	XXHP AXIAL FLOW PUMPS
21	–	XX" DISCHARGE PIPING (BY OTHERS)
22	2	GALV STEEL PIPE SUPPORTS
23	1	XX" DIA CAST IRON RING & COVER
24	1	XX" x XX" x X'-X" DEEP DISCHARGE VAULT
25	1	X" THK FLAT CONCRETE TOP
26	1	CONCRETE INVERT
27	–	REBAR AS REQ'D
28	1	NAMEPLATE INDICATING: MFG: ParkUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WWXXX-AXTXX-XXXX-XX-XXX-XX DATE MANUFACTURED

Specifications

CONCRETE :
Class I/II concrete with design strength of 4500 PSI at 28 days. Unit is of monolithic construction at floor, first stage of wall and baffle with sectional riser to required depth.

REINFORCEMENT:
Grade 60 reinforced with steel rebar conforming to ASTM A615 on required centers or equal.

ALUMINUM HATCH:
300 PSF rated, 1/4" aluminum skid-resistant floor plate, stainless steel tamperproof bolting & hinges & slamlock.

C.I. CASTINGS:
Manhole rings & covers are manufactured of grey cast iron conforming to ASTM A48-76 Class 30. Manhole shall have 24 inch inside diameter and be traffic duty.

PUMPS:
Pumps shall be vertical turbine type with top mount motor. Pumps shall have a capacity as follows:

PUMP No.	TYPE	GPM	TDH	RPM	HP	ELECTRICAL V	PH	Hz
1	AXIAL	XX	X	XX	X	XX	X	X
2	AXIAL	XX	X	XX	X	XX	X	X
3	NON-CLOG	XX	X	XX	X	XX	X	X

CONTROLS:
Pump controls shall be mounted inside a UL Listed NEMA-4X enclosure and include circuit breakers, alarm circuit fuse, IEC rated motor starter, pump HOA, and alternator relay. Panel shall have a visual alarm becon. Panel is designed for remote mounting.

Engineering Data

Field excavation and preparation shall be completed prior to delivery of assembly. Use dimensional data as shown. All pipe, valves and fittings of the assembly are approved by one of the following associations:

B64.5

NOTE:
ALL DASHED PIPING TO BE FURNISHED BY CONTRACTOR

NOTE:
VERIFY ALL ELEVATIONS PRIOR TO FABRICATION

WWXX-AXT-1

MODEL NUMBER: WWXXX-X-XX-XXX-XX-XXX-XX
- WET WELL SIZE (ID)
  - 48 – 48" DIA
  - 60 – 60" DIA
  - 72 – 72" DIA
  - 84 – 84" DIA
- PUMP CONFIGURATION
  - S – SIMPLEX
  - D – DUPLEX
- DISCHARGE SIZE
  - 8 – 8"
  - 12 – 12"
  - 24 – 24"
  - 30 – 30"
- FLOW RATE CAPACITY (GPM)
  - 765 – 765 GPM
  - 2000 – 2000 GPM
  - ETC...
- POWER CHARACTERISTICS
  - 43 – 460V/3PH/60Hz
  - 23 – 230V/3PH/60Hz
  - 21 – 230V/1PH/60Hz
- PUMP MOTOR SIZE
  - 020 – 2.0 HP
  - 030 – 3.0 HP
  - 050 – 5.0 HP
  - 075 – 7.5 HP
  - 100 – 10.0 HP
  - 400 – 40.0 HP
  - ETC...
- PUMP HEAD CAPACITY (TDH)
  - 8 – 8' TOTAL DYNAMIC HEAD
  - 20 – 20' TOTAL DYNAMIC HEAD
  - ETC...

DRAWING NOT FOR SUBMITTAL.
CONTACT PARKUSA FOR LIFT
STATION DESIGN ASSISTANCE.

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA®
www.parkusa.com 888-611-PARK

STORM SEWER LIFT STATION
SUBMERSIBLE AXIAL PUMP STATION

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WWXX-AXT-1	.
DATE 05/2019					

PUMP
LIFT STATIONS

MODEL NUMBER: ParkUSA
888–611–PARK,www.PARKUSA.com
WWXXX–NCQX–XXX–XX–XXX–XX

WET WELL SIZE (ID)
48 – 48" DIA
60 – 60" DIA
72 – 72" DIA
96 – 96" DIA
120 – 120" DIA
144 – 144" DIA

PUMP CONFIGURATION
S – SIMPLEX
D – DUPLEX
T – TRIPLEX

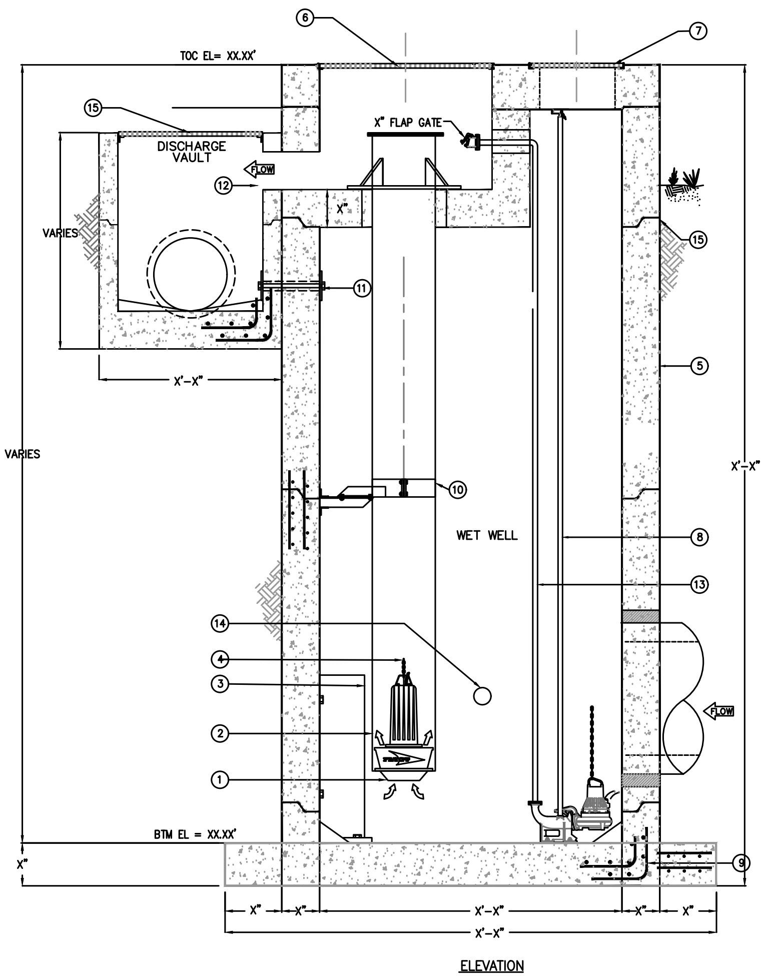
PUMP DISCHARGE SIZE
3 – 3"
4 – 4"
6 – 6"
8 – 8"

FLOW RATE CAPACITY (GPM)
100 – 100 GPM
200 – 200 GPM
ETC...

POWER CHARACTERISTICS
43 – 460V/3PH/60Hz
23 – 230V/3PH/60hz
21 – 230V/1PH/60Hz

PUMP MOTOR SIZE
020 – 2.0 HP
030 – 3.0 HP
050 – 5.0 HP
075 – 7.5 HP
100 – 10.0 HP
150 – 15.0 HP
200 – 20.0 HP

PUMP HEAD CAPACITY (TDH)
10 – 10' TOTAL DYNAMIC HEAD
20 – 20' TOTAL DYNAMIC HEAD
ETC...



ELEVATION

SPECIFICATIONS

CONCRETE:
CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT:
GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ALUMINUM HATCH:
300 PSF RATED, 1/4" ALUMINUM SKID–RESISTANT FLOOR PLATE, STAINLESS STEEL TAMPERPROOF BOLTING & HINGES & SLAMLOCK. (H–20 RATING OPTIONAL)

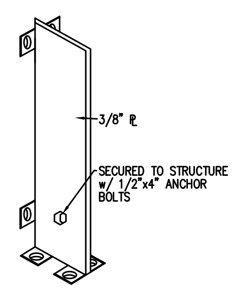
PUMP No.	TYPE	GPM	TDH	RPM	ELECTRICAL HP	V	PH	Hz
1	AXIAL	XXXX	XX'	XXXX	XX	XXX	X	XX
1	AXIAL	XXXX	XX'	XXXX	XX	XXX	X	XX
1	NON–CLOG	XXXX	XX'	XXXX	XX	XXX	X	XX

CONTROLS:
PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA–4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

INSTALLATION INFORMATION
BACKFILL ALL EXCAVATED AREAS WITH CEMENT STABILIZED SAND AND COMPACT TO 95% STANDARD PROCTOR DENSITY. THE CEMENT STABILIZED SAND SHALL EXTEND ATLEAST 2' BEYOND THE WALLS.

ENGINEERING DATA
FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF ASSEMBLY. USE DIMENSIONAL DATA AS SHOWN. ALL PIPE, VALVES AND FITTINGS OF THE ASSEMBLY ARE APPROVED BY ONE OF THE FOLLOWING ASSOCIATIONS:

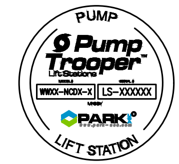
NPCA B64.5



ANTI–VORTEX PLATE

NOTE:
ALL DASHED PIPING TO BE FURNISHED BY CONTRACTOR

NOTE:
VERIFY ALL ELEVATIONS PRIOR TO FABRICATION



NAME PLATE

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	2	SUBMERSIBLE PUMP FLYGT #NC3127 (TYP–2)
2	1	A36 STEEL PUMP TUBE ASSEMBLY
3	1	ANTI–VORTEX PLATE
4	2	STAINLESS STEEL LIFT CHAIN
5	1	PRECAST CONCRETE LIFT STATION, PARK MODEL WW10SQ
6	1	WET WELL GALV FRAME & GRATE
7	1	PUMP GALV FRAME & GRATE
8	4	SS GUIDE RAILS
9	–	STEEL REINFORCEMENT AS REQ'D
10	1	WALL SUPPORT
11	1	GALV. BOLTS & PLATES
12	1	SLOTTED OPENING
13	1	DISCHARGE PIPE
14	1	PRESSURE RELIEF VALVE
15	1	DISCHARGE VAULT GALV FRAME & GRATE
16	–	ALL JOINTS MADE WATER–TIGHT W/ PLASTIC FLEXIBLE GASKET (RAMNEK)
17	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM PARKUSA MODEL: WWXX–AXT–2 DATE MANUFACTURED

DRAWING NOT FOR SUBMITTAL.
CONTACT PARKUSA FOR LIFT STATION DESIGN ASSISTANCE.

WWXX–AXT–2

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

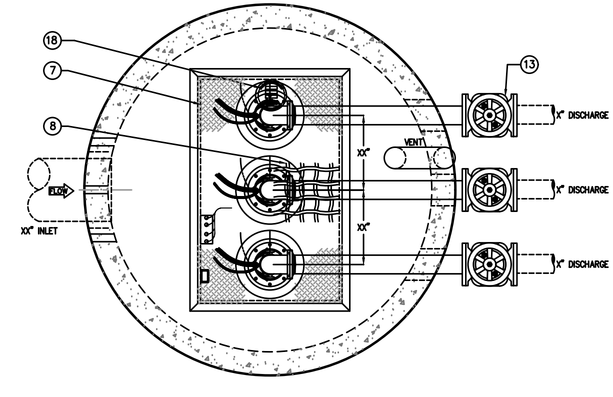
PARK USA
www.parkusa.com 888–611–PARK

STORM WATER LIFT STATION
DUPLEX PUMP SYSTEM

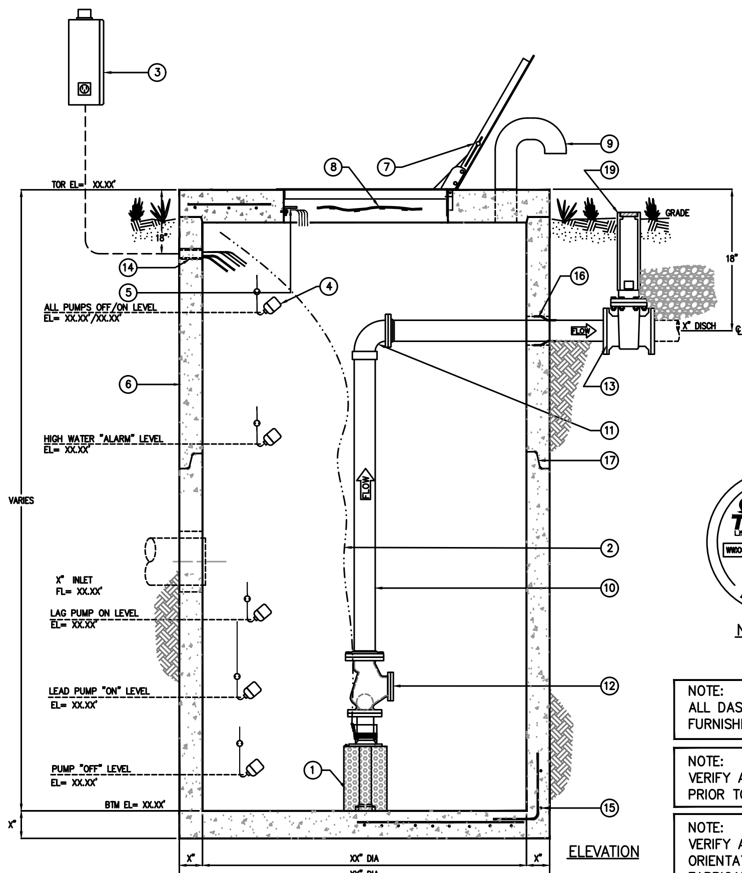
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WWXX–AXT–2	.
DATE 05/2019					

STATION OPERATION LEVELS		
RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	LEAD PUMP TURNS "ON"	LEAD PUMP "ON"
XX.XX'	LAG PUMP TURNS "ON"	LEAD & LAG PUMPS "ON"
XX.XX'	HIGH WATER "ALARM" LEVEL	LEAD & LAG PUMPS "ON" HIGH LEVEL ALARM "ON"
XX.XX'	ALL PUMPS OFF/ON	LEAD & LAG PUMPS "OFF"
FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	PUMPS "OFF" LEVEL	ALL PUMPS "OFF" LAG PUMP SWITCHES TO LEAD PUMP
XX.XX'	ALL PUMPS OFF/ON	LEAD & LAG PUMPS "ON"

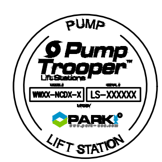
PUMPS TO ALTERNATE THRU ALL PUMPS ONLY 2 PUMPS RUN AT A TIME



PLAN VIEW



ELEVATION



NAME PLATE

NOTE:
ALL DASHED PIPING TO BE FURNISHED BY CONTRACTOR

NOTE:
VERIFY ALL ELEVATIONS PRIOR TO FABRICATION

NOTE:
VERIFY ALL INLET/OUTLET ORIENTATIONS PRIOR TO FABRICATION

SPECIFICATIONS

CONCRETE:
CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT:
GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ALUMINUM HATCH:
300 PSF RATED, 1/4" ALUMINUM SKID-RESISTANT FLOOR PLATE, STAINLESS STEEL TAMPERPROOF BOLTING & HINGES & SLAMLOCK. (H-20 RATING OPTIONAL)

PUMP No.	TYPE	GPM	TDH	RPM	ELECTRICAL HP	V	PH	Hz
1	AXIAL	XXXX	XX'	XXXX	XX	XXX	X	XX
1	AXIAL	XXXX	XX'	XXXX	XX	XXX	X	XX
1	AXIAL	XXXX	XX'	XXXX	XX	XXX	X	XX

CONTROLS:
PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA-4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

ENGINEERING DATA
FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF ASSEMBLY. USE DIMENSIONAL DATA AS SHOWN. ALL PIPE, VALVES AND FITTINGS OF THE ASSEMBLY ARE APPROVED BY ONE OF THE FOLLOWING ASSOCIATIONS:

NPCA B64.5

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	3	SUBMERSIBLE AXIAL PUMP
2	3	LIFT-OUT CHAIN STAINLESS STEEL
3	1	NEMA 4X CONTROL PANEL W/ GENERATOR RECPTACLE (MOUNTED BY CONTRACTOR)
4	5	FLOAT SWITCH
5	1	CONTROL CABLE BRACKET
6	1	PRECAST CONCRETE WET WELL BASIN
7	1	XX"xXX" DOUBLE LEAF ALUMINUM HATCH w/ SS HINGES & SLAMLOCK (300 PSF)
8	1	SAFETY NET
9	1	X" VENT W/ INSECT SCREEN GALV STEEL CONSTRUCTION
10	1	X" DISCHARGE PIPE
11	2	X" ELBOW
12	1	X" BALL CHECK VALVE
13	2	X" DIRECT DURY GATE VALVE
14	3	3" ELEC CPLG
15	–	REBAR AS REQ'D
16	1	RESILENT BOOT FOR X" PIPE
17	1	ALL JOINTS MADE WATER-TIGHT W/ PLASTIC FLEXIBLE GASKET (RAM-NEK)
18	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM PARKUSA MODEL: WWXX-AXT-3 DATE MANUFACTURED
19	2	CAST IRON VALVE BOX

MODEL NUMBER: WWXX-AXTX-XXX-XX-XXX-XX

WET WELL SIZE (ID)
48 – 48" DIA
60 – 60" DIA
72 – 72" DIA
96 – 96" DIA

PUMP CONFIGURATION
S – SIMPLEX
D – DUPLEX

PUMP DISCHARGE SIZE
3 – 3"
4 – 4"
6 – 6"
8 – 8"

FLOW RATE CAPACITY (GPM)
100 – 100 GPM
200 – 200 GPM
ETC...

POWER CHARACTERISTICS
43 – 460V/3PH/60Hz
23 – 230V/3PH/60hz
21 – 230V/1PH/60Hz

PUMP MOTOR SIZE
020 – 2.0 HP
030 – 3.0 HP
050 – 5.0 HP
075 – 7.5 HP
100 – 10.0 HP
150 – 15.0 HP
200 – 20.0 HP

PUMP HEAD CAPACITY (TDH)
10 – 10' TOTAL DYNAMIC HEAD
20 – 20' TOTAL DYNAMIC HEAD
ETC...

DRAWING NOT FOR SUBMITTAL. CONTACT PARKUSA FOR LIFT STATION DESIGN ASSISTANCE.

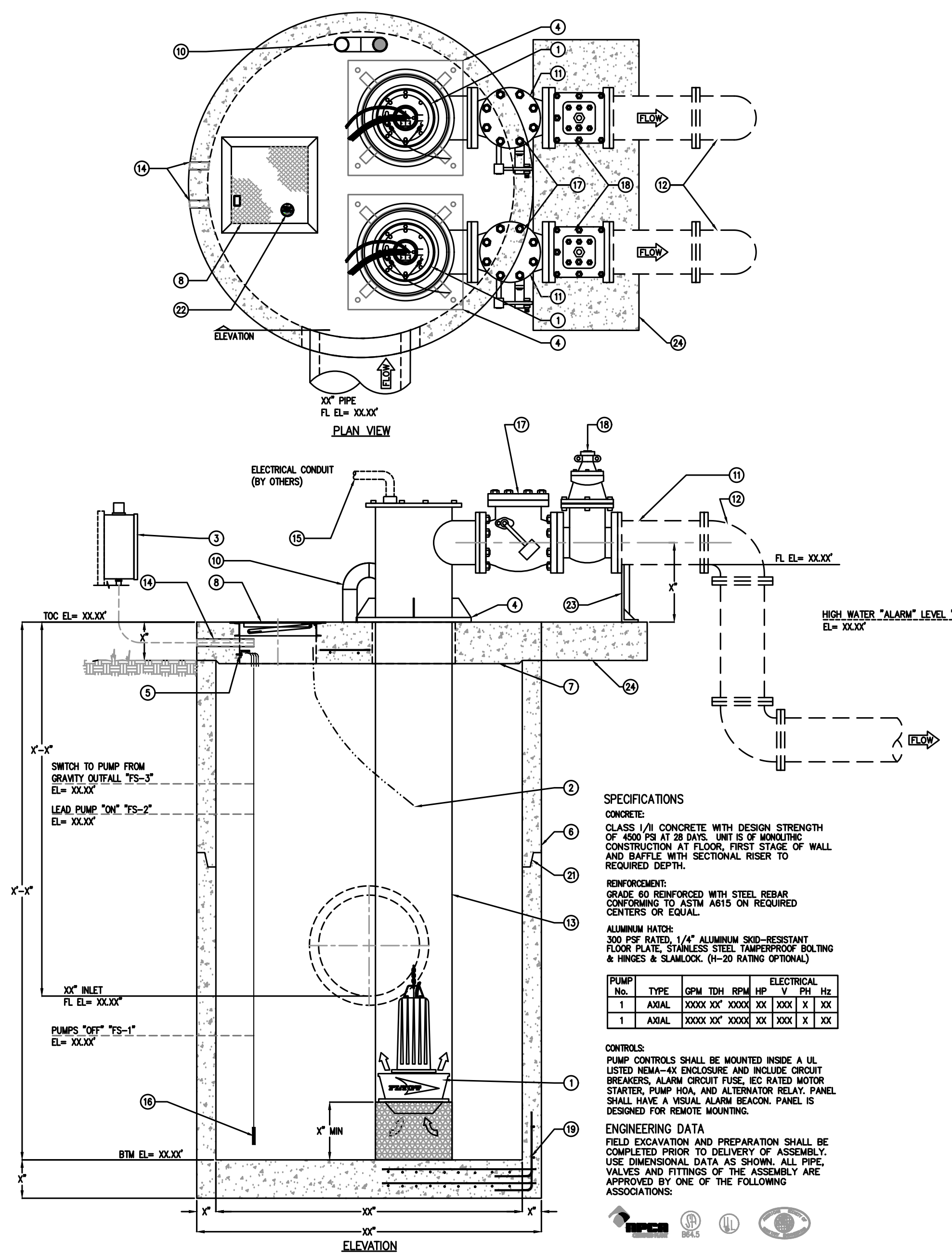
WWXX-AXT-3

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

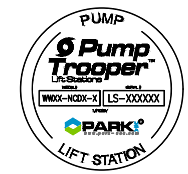
STORM SEWER LIFT STATION
SUBMERSIBLE AXIAL PUMP STATION

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WWXX-AXT-3	.
DATE 05/2019					



STATION OPERATION LEVELS		
RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
XX.XX'	PUMPS OFF LEVEL – NO ACTION	ALL PUMPS ARE OFF
FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
XX.XX'	LEAD PUMP TURNS ON	LEAD PUMP "ON"
XX.XX'	LEAD PUMP TURNS OFF	ALL PUMPS STOPPED – STANDBY PUMP SWITCHES TO LEAD PUMP
SPECIAL OPERATION		
WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
XX.XX'	ALL PUMPS TURN OFF	ALL PUMPS STOPPED DITCH HALF FULL

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	2	FLYGT AXIAL PUMP
2	2	STAINLESS STEEL CHAINS
3	1	DUPLEX CONTROL PANEL NEMA 4X FRP (MOUNTED & WIRED BY CONTRACTOR)
4	2	XX"xXX"xX" SUPPORT PLATE
5	1	SS CABLE BRACKET
6	1	XX" DIA x X'–X" DEEP CONCRETE WET WELL
7	1	XX" FLAT CONCRETE TOP
8	1	XX"xXX" ALUMINUM HATCH W/ SAFETY NET
9	–	NOT USED
10	1	X" GALVANIZED STEEL VENT
11	2	X" DISCHARGE PIPE (BY OTHERS)
12	2	X" 90° ELL (BY OTHERS)
13	2	XX"xX'–X" GALV SCH 80 A36 STEEL PUMP TUBE ASSEMBLY W/ X" DISCHARGE
14	2	2" ELECTRICAL COUPLING
15	2	ELECTRICAL CONDUIT (BY OTHERS)
16	2	MULTITRODE LEVEL CONTROL
17	2	X" LEVER AND WEIGHT CHECK VALVE
18	2	X" PLUG VALVE w/ 2" NUT OPERATOR
19	–	REBAR AS REQ'D
20	–	NOT USED
21	–	ALL JOINTS MADE WATER-TIGHT w/ PLASTIC FLEXIBLE GASKET (RAM-NEK)
22	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WW96-AXDX-XXX-XXX-XXX-XX DATE MANUFACTURED
23	1	GALVANIZED PIPE SUPPORT (BY OTHERS)
24	1	CONCRETE PAD (BY OTHERS)



NAME PLATE

MODEL NUMBER:
WW96–AXDX–XXX–XXX–XXX–XX

WET WELL SIZE (ID)
84 – 84" DIA
96 – 96" DIA
PUMP CONFIGURATION
S – SIMPLEX
D – DUPLEX
PUMP DISCHARGE SIZE
6 – 6"
8 – 8"
FLOW RATE CAPACITY (GPM)
100 – 100 GPM
200 – 200 GPM

POWER CHARACTERISTICS
43 – 460V/3PH/60Hz
23 – 230V/3PH/60Hz
21 – 230V/1PH/60Hz
PUMP MOTOR SIZE
100 – 10.0 HP
150 – 15.0 HP
200 – 20.0 HP
PUMP HEAD CAPACITY (TDH)
10 – 10' TOTAL DYNAMIC HEAD
20 – 20' TOTAL DYNAMIC HEAD

SPECIFICATIONS

CONCRETE:
CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT:
GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ALUMINUM HATCH:
300 PSF RATED, 1/4" ALUMINUM SKID-RESISTANT FLOOR PLATE, STAINLESS STEEL TAMPERPROOF BOLTING & HINGES & SLAMLOCK. (H-20 RATING OPTIONAL)

PUMP No.	TYPE	GPM	TDH	RPM	ELECTRICAL HP	V	PH	Hz
1	AXIAL	XXXX	XX'	XXXX	XX	XXX	X	XX
1	AXIAL	XXXX	XX'	XXXX	XX	XXX	X	XX

CONTROLS:
PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA-4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

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NPCA B64.5

DRAWING NOT FOR SUBMITTAL. CONTACT PARKUSA FOR LIFT STATION DESIGN ASSISTANCE.

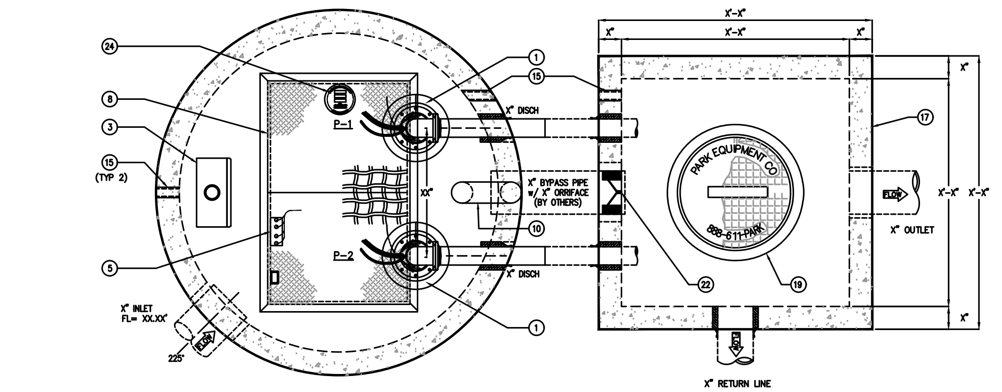
WWXX–AXD–2

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

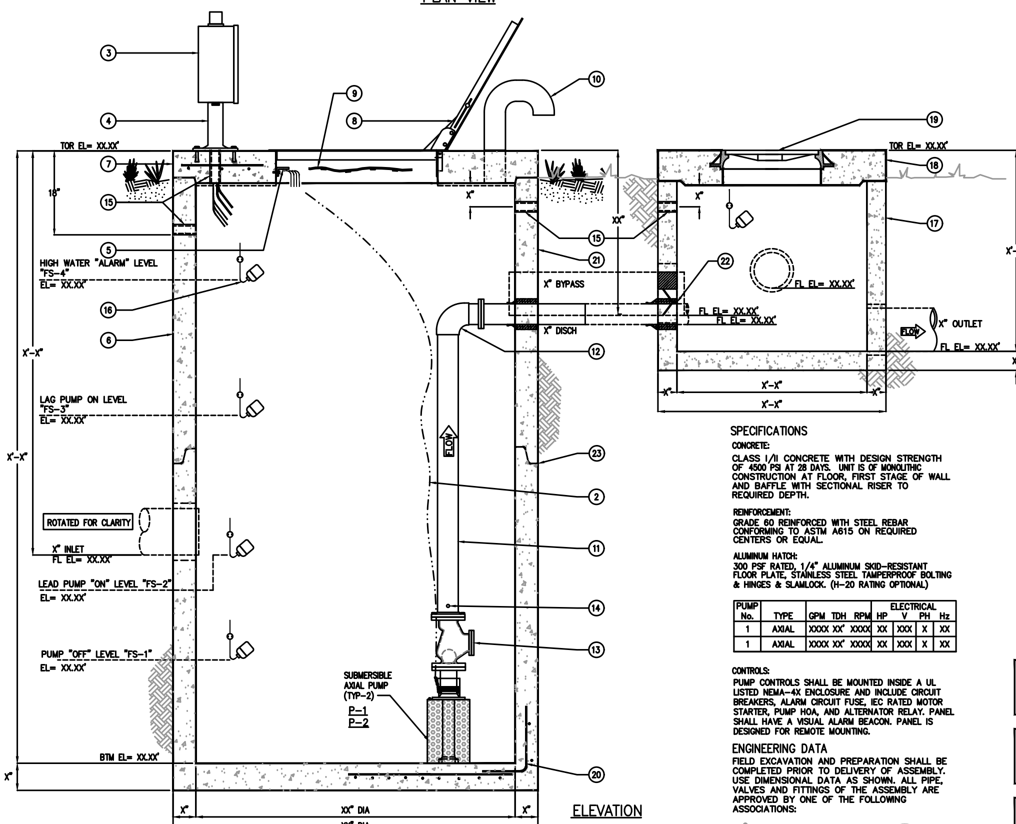
PARK USA
www.parkusa.com 888–611–PARK

STORM WATER LIFT STATION
DUPLEX PUMP SYSTEM

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WWXX–AXD–2	.
DATE	05/2019				

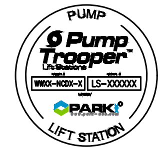


PLAN VIEW



ELEVATION

STATION OPERATION LEVELS		
RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	LEAD PUMP TURNS "ON", FS-2	LEAD PUMP "ON"
XX.XX'	LAG PUMP TURNS "ON", FS-3	LEAD & LAG PUMPS "ON"
XX.XX'	HIGH WATER "ALARM" LEVEL, FS-4	HIGH LEVEL ALARM "ON"
XX.XX'	CUT-OFF LEVEL, FS-5	ALL PUMPS "OFF"
FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION
XX.XX'	CUT-OFF LEVEL, FS-5	ALL PUMPS "ON"
XX.XX'	HIGH WATER ALARM, FS-4	HIGH LEVEL ALARM "OFF"
XX.XX'	PUMPS "OFF" LEVEL, FS-1	ALL PUMPS "OFF" LAG PUMP SWITCHES TO LEAD PUMP



NAME PLATE

REMOTE MOUNT DITCH FLOAT, "FS-5"
CUT-OFF EL=XX.XX'

INSTALLED AND WIRED (BY OTHERS)

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	2	X" SUBMERSIBLE AXIAL PUMP
2	2	STAINLESS STEEL CHAINS
3	1	DUPLEX CONTROL PANEL NEMA 4X FRP (MOUNTED & WIRED BY CONTRACTOR)
4	1	ALUMINUM PEDESTAL
5	1	SS CABLE BRACKET
6	1	XX" DIA x X'-X" DEEP CONCRETE WET WELL
7	1	X" FLAT CONCRETE TOP
8	1	XX"xXX" DOUBLE LEAF ALUMINUM HATCHWAY
9	1	SAFETY NET
10	1	X" GALVANIZED VENT
11	2	X" DISCHARGE PIPE
12	2	X" ELL
13	2	X" CAST IRON BALL CHECK VALVE
14	2	⅛" WEEP HOLE
15	2	3" ELECTRICAL COUPLING
16	5	FLOAT SWITCH
17	1	XX" x XX" x X'-X" DEEP DISCHARGE STRUCTURE
18	1	X" FLAT CONCRETE TOP
19	1	XX" CAST IRON RING & COVER
20	-	REBAR AS REQ'D
21	2	RESILIENT RUBBER BOOT
22	1	X" DUCKBILL VALVE (INSTALLED BY CONTRACTOR)
23	-	ALL JOINTS MADE WATER-TIGHT w/ PLASTIC FLEXIBLE GASKET (RAM-NEK)
24	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WWXX-AXDX-XXX-XX-XXX-XX DATE MANUFACTURED

MODEL NUMBER: WWXX-AXDX-XXX-XX-XXX-XX

WET WELL SIZE (ID)
48 – 48" DIA
60 – 60" DIA
72 – 72" DIA
96 – 96" DIA

PUMP CONFIGURATION
S – SIMPLEX
D – DUPLEX

PUMP DISCHARGE SIZE
3 – 3"
4 – 4"
6 – 6"
8 – 8"

FLOW RATE CAPACITY (GPM)
100 – 100 GPM
200 – 200 GPM
ETC...

POWER CHARACTERISTICS
43 – 460V/3PH/60Hz
23 – 230V/3PH/60hz
21 – 230V/1PH/60Hz

PUMP MOTOR SIZE
020 – 2.0 HP
030 – 3.0 HP
050 – 5.0 HP
075 – 7.5 HP
100 – 10.0 HP
150 – 15.0 HP
200 – 20.0 HP

PUMP HEAD CAPACITY (TDH)
10 – 10' TOTAL DYNAMIC HEAD
20 – 20' TOTAL DYNAMIC HEAD
ETC...

DRAWING NOT FOR SUBMITTAL. CONTACT PARKUSA FOR LIFT STATION DESIGN ASSISTANCE.

WWXX-AXD-3

SPECIFICATIONS

CONCRETE:
CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

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PUMP No.	TYPE	GPM	TDH	RPM	ELECTRICAL HP	V	PH	Hz
1	AXIAL	XXXX	XX'	XXXX	XX	XXX	X	XX
1	AXIAL	XXXX	XX'	XXXX	XX	XXX	X	XX

CONTROLS:
PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA-4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

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NOTE: ALL DASHED PIPING TO BE FURNISHED BY CONTRACTOR

NOTE: VERIFY ALL ELEVATIONS PRIOR TO FABRICATION

NOTE: VERIFY ALL INLET/OUTLET ORIENTATIONS PRIOR TO FABRICATION

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: .   PROJ #: .
DATE: .   LOCATION: .

www.parkusa.com   888-611-PARK

STORM SEWER LIFT STATION
SUBMERSIBLE AXIAL PUMP STATION

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WWXX-AXD-3	.
DATE 05/2019					

PUMP
LIFT STATIONS

NOTES

STORMWATER INTERCEPTORS

NOTES

Storm Trooper®
Stormwater Treatment System
Patent No: 7,470,361

BEST USE FOR:

STORMWATER

PARK USA
A Northwest Pipe Company

ENGINEERING **FACTS**

PARK USA
A Northwest Pipe Company

GENERAL INFORMATION

The ParkUSA® StormTrooper® model SWST is a product designed to remove sediments and oil from stormwater runoff. The unit consists of a control manhole connected to a separator unit (Model SWST, which can have either a circular or rectangular separator box) or just a separator unit with a flow control system inside of it (SWAQ). Both models are patented and comply with many regulations and performance tests.

Stormwater runoff from urban areas carries pollutants and trash into the storm drainage system. Unlike sanitary sewer systems, stormwater typically receives no treatment. Polluted stormwater eventually drains into public waterways, rivers, aquifers, lakes, and oceans. The pollution can contain significant amounts of oils and sediment from impervious areas, which could be harmful to the environment, both biologically and aesthetically.

Although dramatic improvements have been made to the nation's waters, degraded bodies of water still exist. Approximately 40 percent of surveyed U.S. bodies of water are impaired by pollution and do not meet current water quality standards. A leading source of this impairment is polluted runoff.

Most stormwater discharges are considered nonpoint sources and require coverage by an EPA NPDES permit. The primary method to control stormwater discharge is through the use of Best Management Practices (BMP).

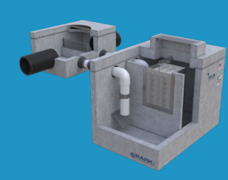
FEATURES

- Wide range of models and capacities available
- Customizable design to adapt to jobsite configuration
- Prepacked system for easy installation
- Oil removal through an engineered coalescing media
- Simple maintenance
- Coating options available for different environmental conditions
- Low and high flow capabilities

MODELS

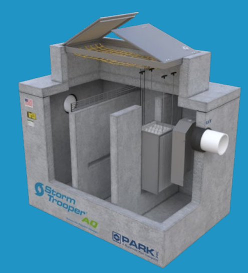
There are various models available for the ParkUSA StormTrooper, depending on location and project needs:

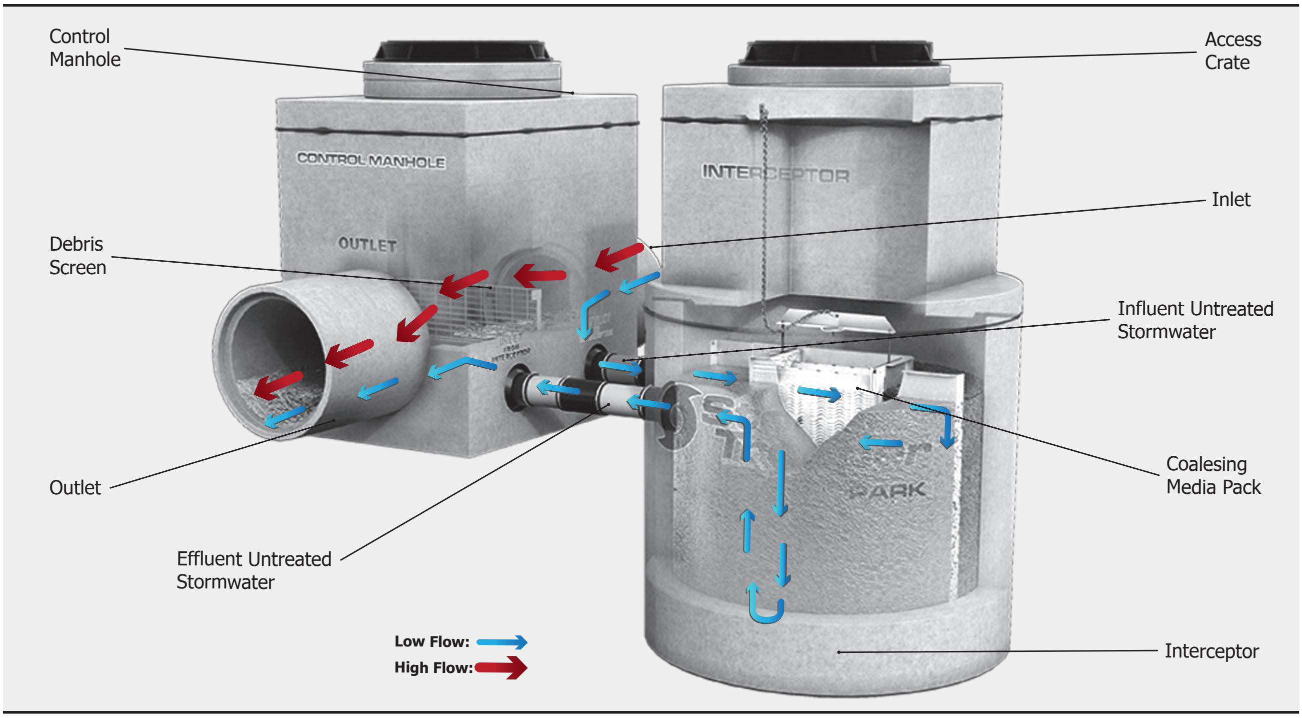
- **Model SWST:** square separator, up to 15000 gallons capacity.



- **Model SWST-C:** cylindrical separator, up to 6000 gallons capacity.

- **Model SWAQ:** unit with control manholes absent--the flow control system is inside the unit. This model is designed for use in the Edwards Aquifer, meeting all regulations and requirements.





OPERATION

The function of the StormTrooper stormwater interceptor model SWST is to intercept free oils/solids and retain them for periodic removal. The StormTrooper interceptor is designed to treat a finite amount of stormwater, typically sized for the initial flow rate of a storm event. Most studies have shown that the pollutants are found in this "first-flush" stormwater discharge.

Stormwater runoff can range from low to very high flow rates. A high flow rate can be detrimental to a stormwater interceptor in that excessive flows tend to scour (stir up) the retained pollutants from the previous storm event. The StormTrooper controls high flow rates by utilizing a control manhole, which is engineered to divert the designed flow rate of stormwater through the interceptor while bypassing high flows to the storm sewer.

Low Flow: Stormwater runoff flows into the inlet of the control manhole. Stormwater is then diverted from the bypass weir to the interceptor. The stormwater debris, oils, and sediments are filtered and separated. The flow is discharged via the outlet of the control manhole to the Municipal Separate Storm Sewer System (MS4).

High Flow: Stormwater runoff flows into the inlet of the control manhole. During high flow conditions, stormwater rises over the bypass weir and is discharged via the outlet of the control manhole to the MS4. Trash is collected in the control manhole debris screen.

Treated Stormwater: As water enters the treatment chamber of the interceptor, trash and light debris are filtered through a screen; heavy oils immediately rise to the surface, while total suspended solids (TSS) sink to the bottom. The remaining oily water mixture flows through the second chamber. Both the smaller oil droplets and the finer TSS are progressively separated. Coalescing media is used to separate significant concentrations of hydrocarbons. In the final stage, effluent is discharged at the bottom of the interceptor, preventing collected pollutants from entering the outlet piping. Collected oils and solids remain in the interceptor until removal.

SYSTEM COMPONENTS

The StormTrooper consists of a control manhole connected to a separator unit to remove debris (TSS) and hydrocarbons from stormwater.

- The control manhole shall tie directly into the storm sewer line by means of a connection as specified in section ASTM C923. The control manhole shall contain a cast weir wall to divert flow through the separator unit for treatment of the first flush. The weir wall shall have a trash screen attached to retain large debris when the unit is under standard flow conditions.
- The separator unit shall be connected to the control manhole by means of a flexible resilient rubber boot. The unit shall maintain a minimum separation of 36 inches between the control manhole and the separator unit.

The separator unit shall contain a prefabricated corrugated plate for intermittent and variable flows of water, oil, or any combination of non-emulsified oil-water mixtures ranging from zero-flow up to one hundred percent of the maximum hydraulic capacity. This will allow the separator unit to maintain an acceptable water effluent.

DESIGN CONSIDERATIONS

The separator tank is designed to conform to ASTM C913 "Standard Specification for Precast Concrete Water and Wastewater Structures." The weight of the soil above shall be capable of withstanding a live load equal to an AASHTO HS20 or HL93 highway loading, using full impact load, or 300 psf applied to the top slab.

All exterior walls of the tank shall be designed for an equivalent fluid pressure of 85 lbs/ft2. Structure shall be designed to resist buoyant uplift forces with a factor of safety not less than 1.10. The top of the pressure diagram shall be assumed to originate at finished ground level. Additional lateral pressure from approaching truck wheels and/or 300 psf surcharge shall be considered in accordance with AASHTO "Standard Specification for Highway Bridges".

SIZING

Under the Storm Water Phase II Final Rule, urbanized areas where construction disturbs one acre or more of land must develop water quality controls. Forty states have developed numeric performance and/or design standards to control post construction stormwater discharges. Some require water quality system design that will reduce TSS loadings by an average of 80% annually. A professional engineer must develop a best management practice (BMP) plan to obtain a National Pollutant Discharge Elimination System (NPDES) number from permitting authorities. Typically, a designer utilizes site specific runoff coefficients and rainfall intensity rates to develop the hydrology calculations and structural control systems that become a Storm Water Quality Management Plan (SWQMP) or BMP.

Using the "First Flush Principle" has become the acceptable means of determining treated stormwater flow rates. The initial runoff flow is recognized to be more polluted than the stormwater that runs off later, after the rainfall has "cleansed" the catchment area. The stormwater containing this high initial pollutant load will be treated with the StormTrooper® stormwater interceptor. Most studies have found that significant concentration pollutant loads are retained when at least 90% of the storm events are treated.

To determine the treated flow rate required of the stormwater interceptor, estimate the flow rate of the first flush. An accepted practice is to calculate the drainage using the rational method, employed to estimate design peak discharge from a small watershed or the total acreage of a development.

The StormTrooper system should be located downstream of stormwater runoff for maximum performance – typically the final conveyance before stormwater exits the property. The stormwater interceptor is buried, allowing for gravity flow of the runoff. The interceptor should be installed and located so that it will be easily accessible for inspection, cleaning, and removal of separated pollutants. There should be an adequate number of interceptor access openings to permit cleaning of all compartments. All access manholes should extend to grade.

The StormTrooper interceptor is designed for stormwater runoff from typical commercial applications where light amounts of oil & contaminants are found (e.g., parking lots). For industrial applications where excessive pollutants are present, the StormTrooper EX Extra-Duty (over 1000 ppm) is recommended.

CYLINDRICAL DESIGNS

MODEL NO	GALLONS	GPM	CFS
SWST-05C	500	300	0.67
SWST-06C	600	400	0.89
SWST-08C	800	500	1.11
SWST-10C	1,000	650	1.45
SWST-15C	1,500	875	1.95
SWST-20C	2,000	1,125	2.51
SWST-25C	2,500	1,375	3.06
SWST-30C	3,000	1,600	3.56
SWST-35C	3,500	1,775	3.95
SWST-40C	4,000	1,950	4.34
SWST-45C	4,500	2,150	4.79
SWST-50C	5,000	2,350	5.23
SWST-60C	6,000	2,675	5.96

RECTANGULAR DESIGNS

MODEL NO	GALLONS	GPM	CFS
SWST-10	1,000	650	1.45
SWST-15	1,500	875	1.95
SWST-20	2,000	1,125	2.51
SWST-25	2,500	1,375	3.06
SWST-30	3,000	1,600	3.56
SWST-35	3,500	1,775	3.95
SWST-40	4,000	1,950	4.34
SWST-45	4,500	2,150	4.79
SWST-50	5,000	2,350	5.23
SWST-60	6,000	2,675	5.96
SWST-70	7,000	3,000	6.68
SWST-80	8,000	3,325	7.41
SWST-90	9,000	3,625	8.07
SWST-100	10,000	3,900	8.69
SWST-110	11,000	4,175	9.30
SWST-120	12,000	4,425	9.86
SWST-130	13,000	4,725	10.52
SWST-140	14,000	4,950	11.02
SWST-150	15,000	5,200	11.58

EXAMPLE

A common application is stormwater run-off from a 12 acre commercial building site. The stormwater run-off consists of trace amounts of oil, litter, and road grime. Using the Rational Method, and an average Runoff Coefficient of C=.80, the treated flow rate is calculated:

Formula: Multiply the number of Acres in the following equation to obtain the treated flow rate:

$$Q_{GPM} = A \times C \times I \times 449$$

:WHERE

Q	=	Treated Flow Rate (gpm)
A	=	Drainage Area (acres)
C	=	Runoff Coefficient
I	=	Design Rainfall Intensity
449	=	conversion from cfs to gpm

Solution: A city requires Stormwater treatment of at least 80% of annual stormwater events; with Design Rainfall Intensity of I=.27

$$Q_{GPM} = A \times C \times I \times 449$$

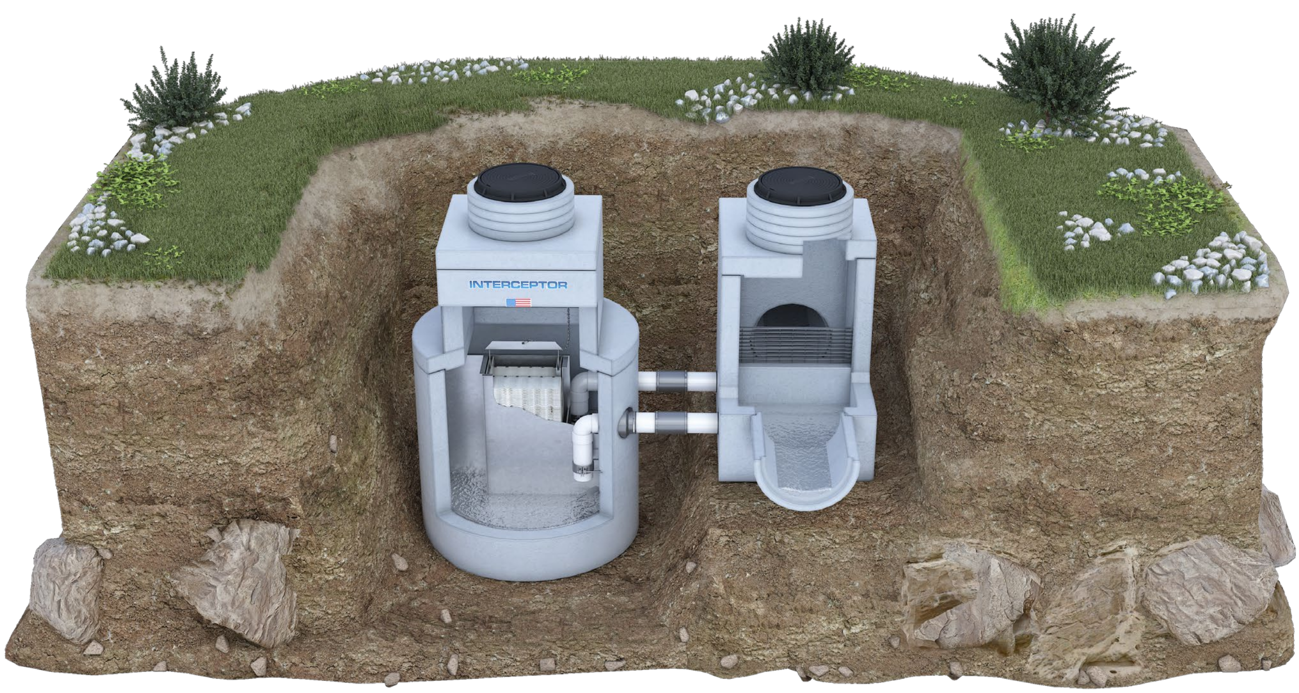
$$Q_{GPM} = 12 \times .80 \times .27 \times 449$$

$$Q_{GPM} = 1162.9_{GPM} \text{ OR } 2.59_{CFS}$$

This example recommends the
StormTrooper® Model SWST-25C
Rated for 1,375 gpm (or 3.08 cfs).

MAINTENANCE

The frequency of cleaning at any given installation will vary depending on use. The StormTrooper stormwater interceptor should be cleaned (or pumped out) routinely to prevent the escape of appreciable quantities of detained pollutants. Sediment should be removed before accumulations effectively reduce storage capacity and detention time of the interceptor. Hydrocarbon-absorbing pillows, when used, should be properly disposed of and replaced when full.
A professional pumping company familiar with regulations regarding proper disposal should pump out the interceptor.



STORMWATER

Human life, as with all animal and plant life on the planet, depends upon water; at ParkUSA, we greatly value the importance of protecting this natural resource. To contribute our part in conservation and sustainability, ParkUSA offers a wide range of stormwater management products, which include stormwater quantity and stormwater quality units. We engineer advanced water technologies designed to combat pollution and control the flow of stormwater. These cleaning processes and water drainage methods provide breakthrough safety modifications for significant activities in day-to-day life. Most importantly, ParkUSA's mission is to offer innovative solutions to important stormwater management needs around the world. ParkUSA has been in the business of manufacturing stormwater infrastructure and water quality devices since the beginning of the Clean Water Act, providing sustainable solutions for today's stormwater issues. As always, we aim to impact people's lives and provide a safe quality of life for generations.

ParkUSA IS ALWAYS READY TO **DESIGN** AND **ENGINEER** PRODUCTS FOR YOUR UPCOMING PROJECTS!

OTHER STORMWATER PRODUCTS

CATCH BASINS

MANHOLES

POND INLET FILTER

SALES@PARKUSA.COM
888-611-PARK

PARK USA
A Northwest Pipe Company

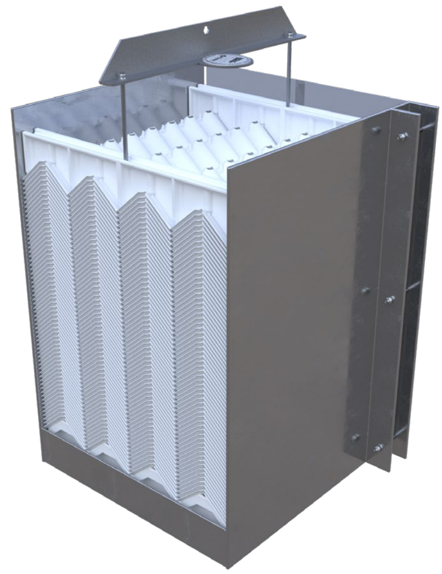
COALESCING MEDIA PACK INFORMATION

As the oil/water/solids mixture travels through the plates, oil rises to the top and solids drop to the bottom through dedicated surfaces and weep holes. Plate supports at the bottom allow for easy removal of the solids that collect beneath the plates. And because of the steep angles and short travel distances, oils and solids are quickly released, making the media virtually self-cleaning.

Whether you're dealing with rainwater run-off, groundwater remediation, coolant tramp oil removal, or oil and grease removal from wash down and maintenance areas, StormTrooper Stormwater Interceptors and Park Oil/ Water Separators can meet your needs ranging in size from 1 gpm to as large as 20,000 gpm – or larger as required.

ParkUSA application engineers are available to help you design stormwater and oil/water separator systems that not only meet regulatory requirements, but are cost-effective as well. And, through the Facet proprietary computer simulation process.

The "Mpak® Quality Prediction Program", we quickly and accurately predict your effluent quality based on your influent conditions – **guaranteed!**



STOKE'S LAW

V_R@ 68°F = $9/18\mu\ (\int w - \int o)\ D^2$ where:

V_R = rising velocity of the oil droplet in cm/sec.
g = gravity constant (980 cm/sec^2)
μ = viscosity of water in poises (about 0.01)
$\int w$ = densities (gm/cm3) or specific gravities of
$\int^d_o$ water and oil
D = diameter of the oil droplet in cm

Like all gravity separators, Park's performance prediction is based on Stoke's Law. The formula on the left represents the physical law governing the rise rate of an oil droplet in a fluid stream.

Capture Efficiency: Oil droplet capture is maximized by the closely spaced (1/4") Mpak® polypropylene plates. For perspective, a 20-micron oil droplet takes 38 minutes to rise 3" or 9.5 minutes. By rising only 1/4" before being captured on the oleophilic (oil attractive) undersurface plate, separation is very efficient in the coalescing media pack compartment (CMP).

Calculated Performance: Park uses a Mpak® propietary computer-modeling program, which utilizes Stoke's Law, droplet size distribution, particle rise (TSS), and other relevant input to make accurate performance predictions.

RECTANGULAR STORMTROOPER PERFORMANCE DATA

STORMTROOPER® SYSTEM SIZING RECTANGULAR STYLE

STORM TROOPER MODEL	VOLUME (GAL)	MINIMUM TREATMENT CAPACITY (>80% TSS RE- (MOVAL		EXTRA TREATMENT CA- PACITY (TSS REMOVAL 85%<)		MAXIMUM TREATMENT CAPACITY (>90% TSS RE- (MOVAL	
SWST-10	1,000	650	1.45	335	0.75	300	0.67
SWST-15	1,500	875	1.95	450	1.00	350	0.78
SWST-20	2,000	1,125	2.51	575	1.28	400	0.89
SWST-25	2,500	1,375	3.06	700	1.56	475	1.06
SWST-30	3,000	1,600	3.56	800	1.78	550	1.22
SWST-35	3,500	1,775	3.95	900	2.00	625	1.39
SWST-40	4,000	1,950	4.34	1,000	2.23	700	1.56
SWST-45	4,500	2,150	4.79	1,500	3.34	775	1.73
SWST-50	5,000	2,350	5.23	1,225	2.73	850	1.89
SWST-60	6,000	2,675	5.96	1,400	3.12	1,000	2.23
SWST-70	7,000	3,000	6.68	1,600	3.56	1,150	2.56
SWST-80	8,000	3,325	7.41	1,775	3.95	1,300	2.90
SWST-90	9,000	3,625	8.07	1,950	4.34	1,450	3.23
SWST-100	10,000	3,900	8.69	2,125	4.73	1,600	3.56
SWST-110	11,000	4,175	9.30	2,300	5.12	1,750	3.90
SWST-120	12,000	4,425	9.86	2,450	5.46	1,900	4.23
SWST-130	13,000	4,725	10.52	2,650	5.90	2,050	4.57
SWST-140	14,000	4,950	11.02	2,800	6.24	2,200	4.90
SWST-150	15,000	5,200	11.58	2,975	6.63	2,350	5.23

Note: Minimum TSS Treatment Capacity is used on all StormTrooper® Drawings

Storm Trooper® Stormwater Treatment System Patent No. 7,470,361

STORMWATER INTERCEPTOR
TYPICAL APPLICATIONS

PARK USA®
www.parkusa.com 888–611–PARK

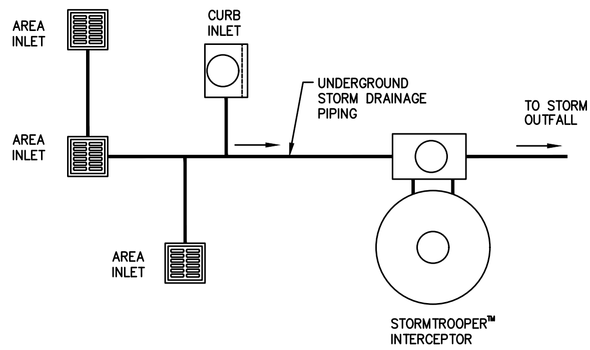


FIGURE 1 — GRAVITY FLOW

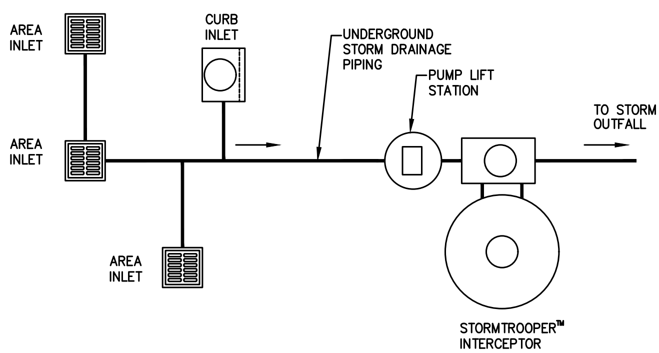
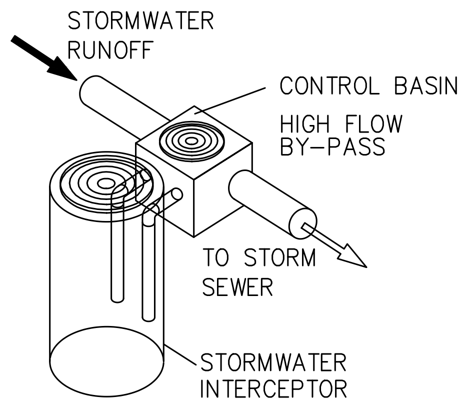


FIGURE 2 — PUMPED FLOW



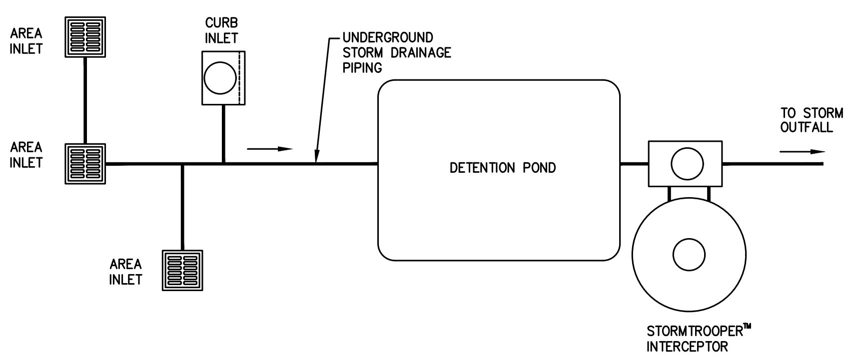


FIGURE 3 — GRAVITY FLOW w/ DETENTION POND

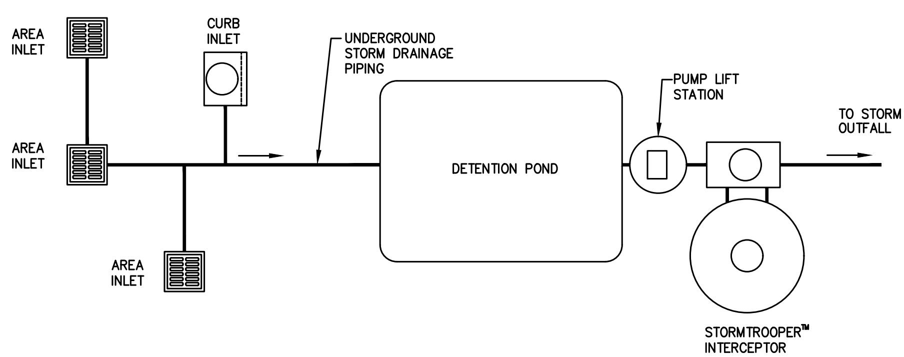


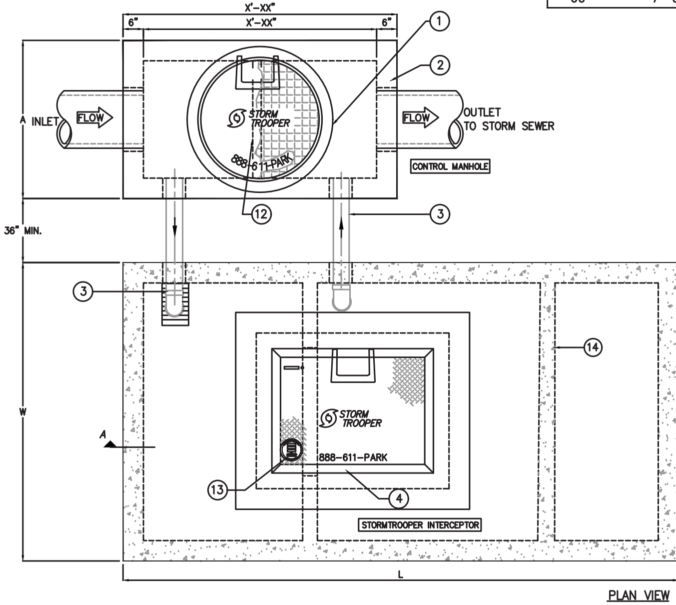
FIGURE 4 — PUMPED FLOW w/ DETENTION POND

SWST INSTALL APPS

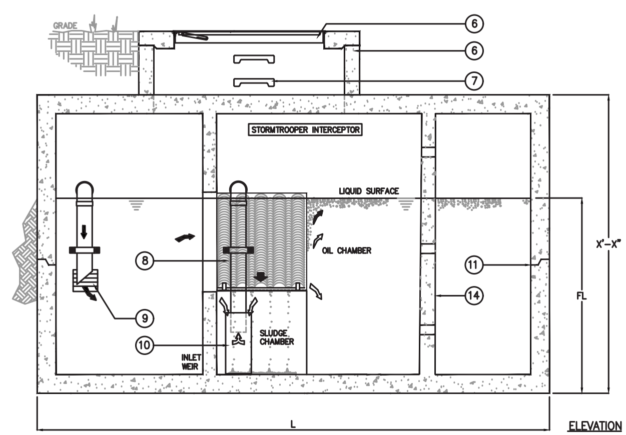
STORMWATER INTERCEPTORS

Storm Trooper®
Stormwater Treatment System Patent No: 7,470,361

MAX PIPE SIZE (IN)	CONTROL BASIN WIDTH A
30"	4'–0"
36"	5'–0"
48"	6'–0"
60"	7'–0"



PLAN VIEW



ELEVATION

GENERAL INFORMATION
PARK STORMTROOPER® INTERCEPTOR
THE STORMTROOPER STORMWATER INTERCEPTOR IS DESIGNED TO RECEIVE & TREAT STORMWATER RUNOFF ON A GRAVITY–FLOW AND ONCE–THROUGH BASIS.

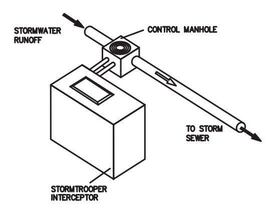
GUARANTEED PERFORMANCE
PRE–ENGINEERED COALESCING MEDIA PACKS ARE UTILIZED FOR ENHANCED SEPARATION WHICH PROVIDE SUPERIOR PERFORMANCE COMPARED TO OTHER SEPARATORS WHICH UTILIZE BAFFLES OR DIVERTERS.

APPLICATIONS
THE PARKUSA STORMTROOPER® INTERCEPTOR IS DESIGNED FOR STORMWATER RUNOFF FROM COMMERCIAL & INDUSTRIAL APPLICATIONS WHERE EXCESSIVE POLLUTANTS MAY HARM THE ENVIRONMENT OR DAMAGE SEWER SYSTEMS.

BY–PASS DESIGN
THE UNIQUE DESIGN OF THE CONTROL BASIN ALLOWS FOR RESULTS AN OWNER CAN CLEARLY SEE. DURING A STORM EVENT, UNTREATED STORMWATER ENTERS THE INLET COMPARTMENT AND IS DIVERTED TO THE INTERCEPTOR FOR TREATMENT. CLEAN STORMWATER CAN BE WITNESSED IN THE EFFLUENT COMPARTMENT AFTER TREATMENT.

MAINTENANCE
STORMTROOPER HAS BECOME KNOWN IN THE INDUSTRY AS THE "EASIEST TO MAINTAIN." HATCHWAY DESIGN MAKES INSPECTION AND VAULT ENTRY ACCESSIBLE FOR MAINTENANCE. ALL COMPARTMENTS ALLOW FOR THE LARGER HOSE ASSOCIATED WITH VACTOR TRUCK PUMP OUT. MAINTENANCE INSTRUCTIONS AND LOGS ARE AVAILABLE FROM PARK ENGINEERING.

CALL US
CONTACT PARK ENGINEERING FOR HELP SIZING, SWQMPS AND PERFORMANCE INFORMATION.



SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

D.I. CASTINGS: MANHOLE FRAMES, COVERS OR GRATES ARE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536, AASHTO M306, & AASHTO M105 STANDARDS. MANHOLE SHALL BE NOMINAL 24" DIAMETER AND BE TRAFFIC DUTY.

STEEL COVER: GALVANIZED STEEL SKID–RESISTANT SINGLE LEAF H–20 LOADED.

ENGINEERING DATA

INTERCEPTOR IS STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO REGULATORY STANDARDS. NOMINAL TOTAL LIQUID CAPACITY AND OIL HOLDING CAPACITY AS INDICATED.

STORMWATER INTERCEPTORS ARE UTILIZED TO REDUCE NON–POINT SOURCE POLLUTION ASSOCIATED WITH OIL AND SEDIMENT. THE INTERCEPTOR IS DESIGNED TO ALLOW FOR THE DETAINMENT OF SETTLABLE & FLOATABLE SOLIDS & LIQUIDS. THE INTERCEPTOR SHOULD BE INSPECTED ON A REGULAR BASIS TO DETERMINE PROPER OPERATION AND CLEANING.

NAMEPLATE

APPLICATIONS
- INDUSTRIAL
- COMMERCIAL
- RESIDENTIAL
- INSTITUTIONAL
- REDEVELOPMENT
- NPDES – MUNICIPAL/INDUSTRIAL
- BMP STRUCTURAL SOLUTION

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	30" DIA DUCTILE IRON RING W/ COVER, H20 TRAFFIC DUTY
2	1	CONTROL MANHOLE FOR BY–PASS DIVERSION DURING HIGH FLOW
3	1	MANIFOLD PIPING
4	1	STEEL ACCESS HATCHWAY
5	1	INTERCEPTOR OPENING AND HATCHWAY
6	1	CONCRETE EXTENSION RINGS AS REQ'D
7	1	OSHA MANHOLE STEPS AS REQ'D
8	1	COALESCING MEDIA PACK
9	1	DIFFUSION BAFFLE
10	1	SLUDGE BAFFLE
11	—	ALL JOINTS TO BE SEALED W/ PLASTIC FLEXIBLE GASKET
12	1	CONTROL MANHOLE DEBRIS SCREEN
13	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL: STORMTROOPER SWST–XX DATE MANUFACTURED SERIAL # XXXXXX
14	1	STRUCTURAL SUPPORT WALL FOR SIZES GREATER THAN SWST–60

STORMTROOPER, U.S. PATENT 7,470,361
STORMWATER INTERCEPTOR SCHEDULE

MODEL NO.	TOTAL CAPACITY	TREATMENT PERFORMANCE				DIMENSIONS			
		FLOWRATE		SOLIDS	OIL	LENGTH	WIDTH	FLOWLINE	HEIGHT
STD DUTY	USGal	GPM	CFS	FT^3	USGal	L	W	FL	H
SWST–05	500	300	0.67	25	165	7'–10"	4'–4"	3'–3"	5'–3"
SWST–06	600	400	0.89	36	198	7'–10"	4'–4"	3'–10"	5'–10"
SWST–08	800	500	1.11	50	264	7'–10"	4'–4"	4'–0"	6'–0"
SWST–10	1,000	650	1.45	60	460	9'–0"	6'–0"	4'–6"	6'–0"
SWST–15	1,500	875	1.95	115	570	9'–0"	6'–0"	5'–6"	7'–0"
SWST–20	2,000	1,125	2.51	130	1,080	9'–0"	6'–0"	6'–6"	8'–0"
SWST–25	2,500	1,375	3.06	145	1,080	13'–0"	7'–0"	5'–6"	7'–0"
SWST–30	3,000	1,600	3.56	215	1,080	13'–0"	7'–0"	6'–6"	8'–0"
SWST–35	3,500	1,775	3.95	290	1,080	13'–0"	7'–0"	6'–10"	8'–4"
SWST–40	4,000	1,950	4.34	225	1,680	16'–0"	8'–6"	5'–6"	7'–10"
SWST–45	4,500	2,150	4.79	330	1,680	16'–0"	8'–6"	6'–0"	8'–0"
SWST–50	5,000	2,350	5.23	340	1,680	16'–0"	8'–6"	6'–6"	8'–0"
SWST–60	6,000	2,675	5.96	450	1,680	16'–0"	8'–6"	7'–6"	9'–0"
*SWST–70	7,000	3,000	6.68	500	2,375	18'–0"	9'–0"	7'–8"	9'–2"
*SWST–80	8,000	3,325	7.41	635	2,375	18'–0"	9'–0"	8'–6"	10'–0"
*SWST–90	9,000	3,625	8.07	770	2,375	18'–0"	9'–0"	9'–4"	10'–10"
*SWST–100	10,000	3,900	8.69	830	2,375	24'–2"	11'–2"	7'–2"	9'–6"
*SWST–110	11,000	4,175	9.30	910	3,490	21'–2"	11'–2"	8'–0"	9'–6"
*SWST–120	12,000	4,425	9.86	970	3,490	21'–2"	11'–2"	8'–6"	10'–0"
*SWST–130	13,000	4,725	10.52	1,070	3,740	21'–2"	11'–2"	9'–0"	10'–6"
*SWST–140	14,000	4,950	11.02	1,200	3,740	21'–2"	11'–2"	9'–8"	11'–2"
*SWST–150	15,000	5,200	11.58	1,335	3,740	21'–2"	11'–2"	10'–8"	12'–2"

OTHER SIZES ARE AVAILABLE. CONTACT US FOR MORE INFORMATION
*INCLUDES ADDITIONAL STRUCTURAL SUPPORT WALL

ASCE NPCA CERTIFIED PLANT ASPE ASTM C-913

SWST-1

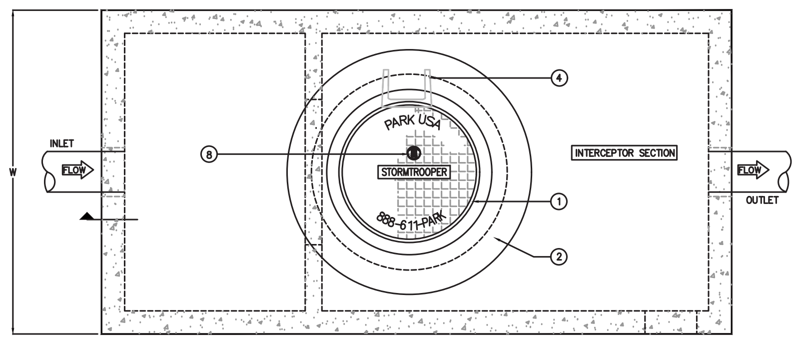
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

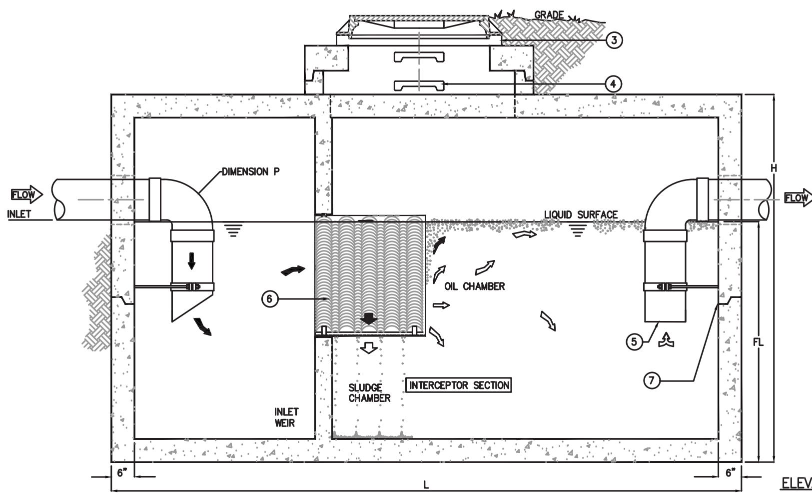
STORMWATER INTERCEPTOR
STORMTROOPER MODEL SWST 05 THRU 150

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SWST–1	.
DATE 05/2019					

Storm Trooper®
Stormwater Treatment System
Patent No: 7,470,361



PLAN VIEW



ELEVATION

PARK STORM-TROOPER INTERCEPTOR
THE STORM-TROOPER STORMWATER INTERCEPTOR IS DESIGNED TO RECEIVE & TREAT STORMWATER RUNOFF ON A GRAVITY-FLOW AND ONCE-THROUGH BASIS.

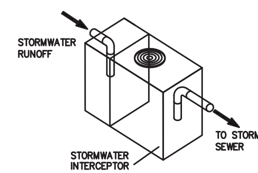
GUARANTEED PERFORMANCE
PRE-ENGINEERED COALESCING MEDIA PACKS ARE UTILIZED FOR ENHANCED SEPARATION WHICH PROVIDE SUPERIOR PERFORMANCE COMPARED TO OTHER SEPARATORS WHICH UTILIZE BAFFLES OR DIVERTORS.

MAINTENANCE
THE PARK STORM-TROOPER INTERCEPTOR REQUIRES MINIMAL MAINTENANCE. HYDROCARBONS AND SOLIDS ARE REMOVED FROM THE STORMWATER VIA BAFFLES AND COMPARTMENTS. FOR EXTRA-DUTY APPLICATIONS, THE COALESCING MEDIA PACK IS RECOMMENDED.

THESE POLLUTANTS ARE REMOVED FROM THE SEPARATOR WHEN SERVICED BY A LICENSED VACUUM TRUCK OPERATOR.

APPLICATIONS
THE PARK STORM-TROOPER INTERCEPTOR IS DESIGNED FOR STORMWATER RUNOFF FROM COMMERCIAL & INDUSTRIAL APPLICATIONS WHERE EXCESSIVE POLLUTANTS MAY HARM THE ENVIRONMENT OR DAMAGE SEWER SYSTEMS.

CALL US
CONTACT OUR ENGINEERING DEPT. FOR SPECIFIC PERFORMANCE INFORMATION.



NAMEPLATE

APPLICATIONS
- *COMMERCIAL*
- *INDUSTRIAL*
- *RESIDENTIAL*
- *INSTITUTIONAL*
- *REDEVELOPMENT*
- *NPDES – MUNICIPAL/INDUSTRIAL*
- *BMP STRUCTURAL SOLUTION*

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	30" DIA DUCTILE IRON RING W/ COVER, H20 TRAFFIC DUTY
2	1	48" DIA RISER
3	1	CONCRETE EXTENSION RINGS TO GRADE
4	1	OSHA MANHOLE STEPS
5	1	OIL DAM PIPING
6	1	COALESCING MEDIA PACK
7	1	ALL JOINTS TO BE SEALED W/ PLASTIC FLEXIBLE GASKET
8	1	NAMPLATE INDICATING: MFG: PARKUSA WWW.PARKUSA.COM 888-611-PARK MODEL: SWST-1 DATE MANUFACTURED SERIAL #XXXXXX

STORMTROOPER, U.S. PATENT 7,470,361
STORMWATER INTERCEPTOR SCHEDULE

MODEL NO.	TOTAL CAPACITY	TREATMENT PERFORMANCE				DIMENSIONS				
		FLOWRATE		SOLIDS	OIL	LENGTH	WIDTH	FLOWLINE	HEIGHT	PIPE SIZE
STD DUTY	USGal	GPM	CFS	FT^3	USGal	L	W	FL	H	P
SWST-05	500	300	0.67	25	165	7'-10"	4'-4"	3'-3"	5'-3"	4"
SWST-06	600	400	0.89	36	198	7'-10"	4'-4"	3'-10"	5'-10"	4"
SWST-08	800	500	1.11	50	264	7'-10"	4'-4"	4'-0"	6'-0"	4"
SWST-10	1,000	650	1.45	60	460	9'-0"	6'-0"	4'-6"	6'-0"	4"
SWST-15	1,500	875	1.95	115	570	9'-0"	6'-0"	5'-6"	7'-0"	4"
SWST-20	2,000	1,125	2.51	130	1,080	9'-0"	6'-0"	6'-6"	8'-0"	6"
SWST-25	2,500	1,375	3.06	145	1,080	13'-0"	7'-0"	5'-6"	7'-0"	6"
SWST-30	3,000	1,600	3.56	215	1,080	13'-0"	7'-0"	6'-6"	8'-0"	6"
SWST-35	3,500	1,775	3.95	290	1,080	13'-0"	7'-0"	6'-10"	8'-4"	8"
SWST-40	4,000	1,950	4.34	225	1,680	16'-0"	8'-6"	5'-6"	7'-10"	8"
SWST-45	4,500	2,150	4.79	330	1,680	16'-0"	8'-6"	6'-0"	8'-0"	8"
SWST-50	5,000	2,350	5.23	340	1,680	16'-0"	8'-6"	6'-6"	8'-0"	8"
SWST-60	6,000	2,675	5.96	450	1,680	16'-0"	8'-6"	7'-6"	9'-0"	8"
SWST-70	7,000	3,000	6.68	500	2,375	18'-0"	9'-0"	7'-8"	9'-2"	10"
SWST-80	8,000	3,325	7.41	635	2,375	18'-0"	9'-0"	8'-6"	10'-0"	10"
SWST-90	9,000	3,625	8.07	770	2,375	18'-0"	9'-0"	9'-4"	10'-10"	10"
SWST-100	10,000	3,900	8.69	830	2,375	24'-2"	11'-2"	7'-2"	9'-6"	12"
SWST-110	11,000	4,175	9.30	910	3,490	21'-2"	11'-2"	8'-0"	9'-6"	12"
SWST-120	12,000	4,425	9.86	970	3,490	21'-2"	11'-2"	8'-6"	10'-0"	12"
SWST-130	13,000	4,725	10.52	1,070	3,740	21'-2"	11'-2"	9'-0"	10'-6"	14"
SWST-140	14,000	4,950	11.02	1,200	3,740	21'-2"	11'-2"	9'-8"	11'-2"	14"
SWST-150	15,000	5,200	11.58	1,335	3,740	21'-2"	11'-2"	10'-8"	12'-2"	14"

OTHER SIZES ARE AVAILABLE. CONTACT US FOR MORE INFORMATION

SWST-APP-INL

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

ENGINEERING DATA
INTERCEPTOR IS STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO REGULATORY STANDARDS. NOMINAL TOTAL LIQUID CAPACITY AND OIL HOLDING CAPACITY AS INDICATED.

STORMWATER INTERCEPTOR ARE UTILIZED TO REDUCE NON-POINT SOURCE POLLUTION ASSOCIATED WITH OIL AND SEDIMENT. THE INTERCEPTOR IS DESIGNED TO ALLOW FOR THE DETAINMENT OF SETTLABLE & FLOATABLE SOLIDS & LIQUIDS. THE INTERCEPTOR SHOULD BE INSPECTED ON A REGULAR BASIS TO DETERMINE PROPER OPERATION AND CLEANING.

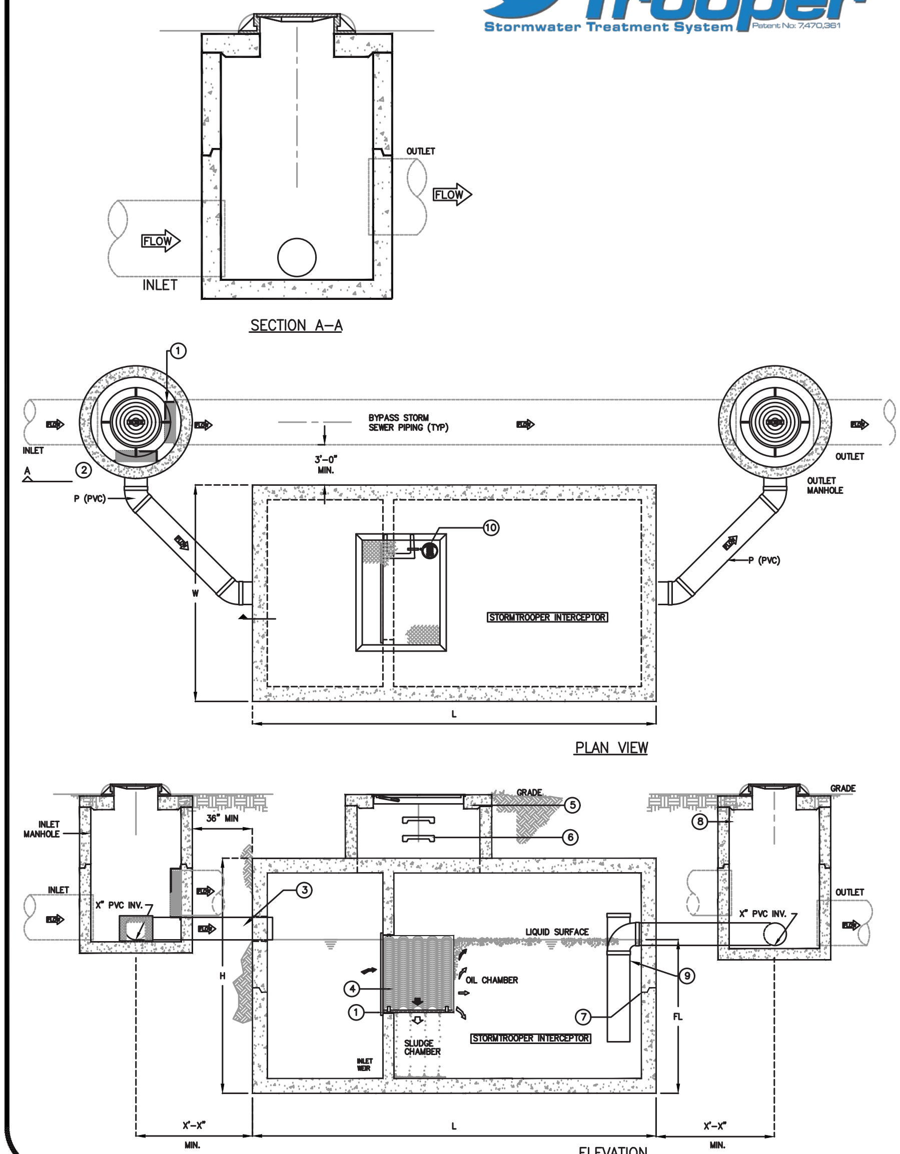
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

STORMWATER INTERCEPTOR
INLINE ARRANGEMENT

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SWST-APP-INL	.
DATE 05/2019					

STORMWATER INTERCEPTORS



Storm Trooper® Stormwater Treatment System Patent No: 7,470,361

THE STORMTROOPER® STORMWATER INTERCEPTOR IS DESIGNED TO RECEIVE & TREAT STORMWATER RUNOFF ON A GRAVITY-FLOW AND ONCE-THROUGH BASIS.

GUARANTEED PERFORMANCE
PRE-ENGINEERED COALESCING MEDIA PACKS ARE UTILIZED FOR ENHANCED SEPARATION WHICH PROVIDE SUPERIOR PERFORMANCE COMPARED TO OTHER SEPARATORS WHICH UTILIZE BAFFLES OR DIVERTORS.

APPLICATIONS
THE PARK STORM-TROOPER INTERCEPTOR IS DESIGNED FOR STORMWATER RUNOFF FROM COMMERCIAL & INDUSTRIAL APPLICATIONS WHERE EXCESSIVE POLLUTANTS MAY HARM THE ENVIRONMENT OR DAMAGE SEWER SYSTEMS.

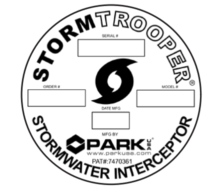
CONTROL MANHOLE
A FULL SIZE BY-PASS DIVERTS STORMWATER DURING HEAVY PEAK STORM PERIODS. THIS ALLOWS FOR OPTIMAL INTERCEPTOR SIZING.

MAINTENANCE
THE PARK STORM-TROOPER INTERCEPTOR REQUIRES MINIMAL MAINTENANCE. HYDROCARBONS AND SOLIDS ARE REMOVED FROM THE STORMWATER VIA BAFFLES AND COMPARTMENTS. FOR EXTRA-DUTY APPLICATIONS, THE COALESCING MEDIA PACK IS RECOMMENDED.

THESE POLLUTANTS ARE REMOVED FROM THE SEPARATOR WHEN SERVICED BY A LICENSED VACUUM TRUCK OPERATOR.

CALL US
CONTACT OUR ENGINEERING DEPARTMENT FOR SPECIFIC PERFORMANCE INFORMATION.

APPLICATIONS
- *COMMERCIAL*
- *INDUSTRIAL*
- *RESIDENTIAL*
- *INSTITUTIONAL*
- *REDEVELOPMENT*
- *NPDES – MUNICIPAL/INDUSTRIAL*
- *BMP STRUCTURAL SOLUTION*



NAMEPLATE

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	DEBRIS SCREEN, SS
2	1	INLET MANHOLE
3	1	X" INTERCEPTOR INLET PIPING
4	1	COALESCING MEDIA PACK
5	1	CONCRETE EXTENSION RINGS TO GRADE
6	1	OSHA MANHOLE STEPS
7	1	ALL JOINTS TO BE SEALED W/ PLASTIC FLEXIBLE GASKET
8	1	OUTLET MANHOLE
9	1	SLEEVES FOR STORM WATER PIPING (TYP). ALL PIPES PROVIDED BY OTHERS
10	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: STORMTROOPER STDM DATE MANUFACTURED SERIAL #XXXXXX

STORMTROOPER, U.S. PATENT 7,470,361

STORMWATER INTERCEPTOR SCHEDULE											
MODEL NO.	TOTAL CAPACITY USGal	TREATMENT PERFORMANCE				DIMENSIONS					
STD DUTY		FLOWRATE GPM	CFS	SOLIDS FT^3	OIL USGal	LENGTH L	WIDTH W	FLOWLINE FL	HEIGHT H	PIPE SIZE P
STDM-10	1,000	650	1.45	60	460	8'-8"	5'-0"	4'-6"	6'-0"	4"
STDM-15	1,500	875	1.95	115	570	9'-2"	5'-8"	5'-6"	7'-0"	4"
STDM-20	2,000	1,125	2.51	130	1,080	13'-0"	7'-0"	4'-6"	5'-10"	6"
STDM-25	2,500	1,375	3.06	145	1,080	13'-0"	7'-0"	5'-6"	7'-0"	6"
STDM-30	3,000	1,600	3.56	215	1,080	13'-0"	7'-0"	6'-6"	8'-0"	6"
STDM-35	3,500	1,775	3.95	290	1,080	13'-0"	7'-0"	6'-10"	8'-4"	8"
STDM-40	4,000	1,950	4.34	225	1,680	16'-0"	8'-6"	5'-6"	7'-0"	8"
STDM-50	5,000	2,350	5.23	340	1,680	16'-0"	8'-6"	6'-6"	8'-0"	8"
STDM-60	6,000	2,675	5.96	450	1,680	16'-0"	8'-6"	7'-6"	9'-0"	8"
STDM-70	7,000	3,000	6.68	500	2,375	18'-0"	9'-0"	7'-8"	9'-2"	10"
STDM-80	8,000	3,325	7.41	635	2,375	18'-0"	9'-0"	8'-6"	10'-0"	10"
STDM-90	9,000	3,625	8.07	770	2,375	18'-0"	9'-0"	9'-4"	10'-10"	10"
STDM-100	10,000	3,900	8.69	910	2,375	18'-0"	9'-0"	10'-6"	12'-0"	12"
STDM-110	11,000	4,175	9.30	830	3,490	21'-2"	11'-2"	8'-0"	9'-6"	12"
STDM-120	12,000	4,425	9.86	970	3,490	21'-2"	11'-2"	8'-6"	10'-0"	12"
STDM-130	13,000	4,725	10.52	1,070	3,740	21'-2"	11'-2"	9'-0"	10'-6"	14"
STDM-140	14,000	4,950	11.02	1,200	3,740	21'-2"	11'-2"	9'-8"	11'-2"	14"
STDM-150	15,000	5,200	11.58	1,335	3,740	21'-2"	11'-2"	10'-0"	12'-2"	14"

OTHER SIZES ARE AVAILABLE. CONTACT US FOR MORE INFORMATION

STDM-1

SPECIFICATIONS

CONCRETE :	CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.
REINFORCEMENT:	GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.
MATERIALS:	ACCESS FRAME & COVER SHALL BE FABRICATED WITH MIN. 1/4" THICK NONSKID FLOOR PLATE, BOLTDOWN, GASKETED, & LIFTING HANDLES. ALL MATERIALS TO BE CORROSION RESISTANT.

ENGINEERING DATA
INTERCEPTOR IS STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO REGULATORY STANDARDS. NOMINAL TOTAL LIQUID CAPACITY AND OIL HOLDING CAPACITY AS INDICATED.

STORMWATER INTERCEPTOR ARE UTILIZED TO REDUCE NON-POINT SOURCE POLLUTION ASSOCIATED WITH OIL AND SEDIMENT. THE INTERCEPTOR IS DESIGNED TO ALLOW FOR THE DETAINMENT OF SETTLABLE & FLOATABLE SOLIDS & LIQUIDS. THE INTERCEPTOR SHOULD BE INSPECTED ON A REGULAR BASIS TO DETERMINE PROPER OPERATION AND CLEANING.

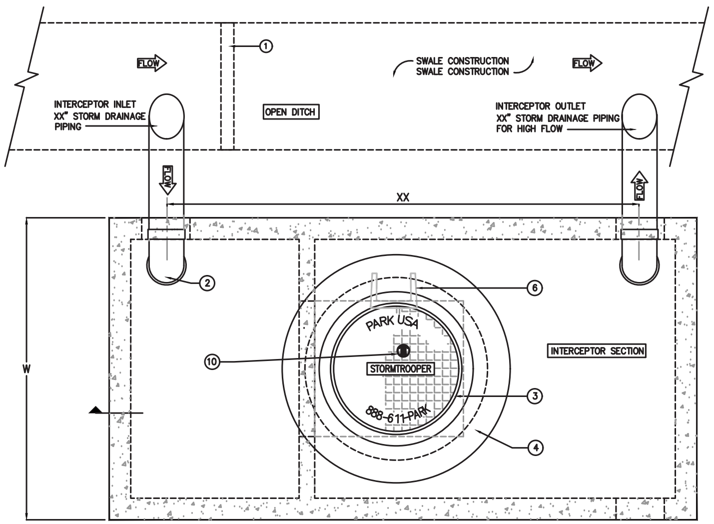
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA®
www.parkusa.com 888-611-PARK

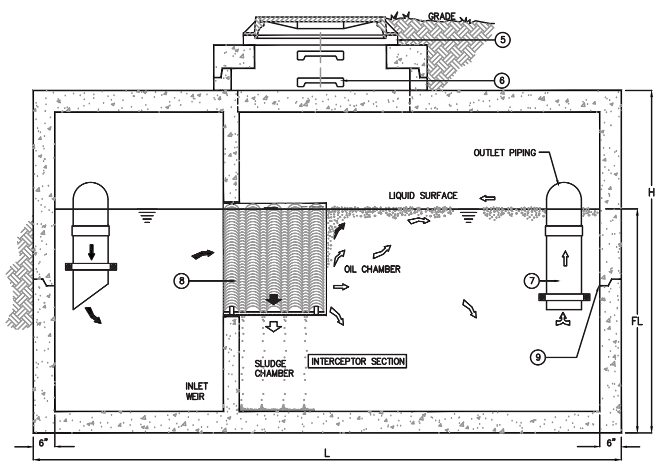
STORMWATER INTERCEPTOR
STORMTROOPER MODEL STDM

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	STDM-1	.
DATE 05/2019					

Storm Trooper®
Stormwater Treatment System
Patent No: 7,470,361



PLAN VIEW



STORMTROOPER, U.S. PATENT 7,470,361

ELEVATION

PARK STORM-TROOPER INTERCEPTOR
THE STORM-TROOPER STORMWATER INTERCEPTOR IS DESIGNED TO RECEIVE & TREAT STORMWATER RUNOFF ON A GRAVITY-FLOW AND ONCE-THROUGH BASIS.

GUARANTEED PERFORMANCE
PRE-ENGINEERED COALESCING MEDIA PACKS ARE UTILIZED FOR ENHANCED SEPARATION WHICH PROVIDE SUPERIOR PERFORMANCE COMPARED TO OTHER SEPARATORS WHICH UTILIZE BAFFLES OR DIVERTORS.

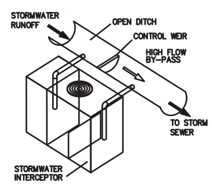
APPLICATIONS
THE PARK STORM-TROOPER INTERCEPTOR IS DESIGNED FOR STORMWATER RUNOFF FROM COMMERCIAL & INDUSTRIAL APPLICATIONS WHERE EXCESSIVE POLLUTANTS MAY HARM THE ENVIRONMENT OR DAMAGE SEWER SYSTEMS.

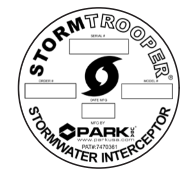
BY-PASS DESIGN
AN FULL SIZE BY-PASS DIVERTS STORMWATER DURING HEAVY PEAK STORM PERIODS. THIS ALLOWS FOR OPTIMAL INTERCEPTOR SIZING.

MAINTENANCE
THE PARK STORM-TROOPER INTERCEPTOR REQUIRES MINIMAL MAINTENANCE. HYDROCARBONS AND SOLIDS ARE REMOVED FROM THE STORMWATER VIA BAFFLES AND COMPARTMENTS. FOR EXTRA-DUTY APPLICATIONS, THE COALESCING MEDIA PACK IS RECOMMENDED.

THESE POLLUTANTS ARE REMOVED FROM THE SEPARATOR WHEN SERVICED BY A LICENSED VACUUM TRUCK OPERATOR.

CALL US
CONTACT OUR ENGINEERING DEPT. @ FOR SPECIFIC PERFORMANCE INFORMATION.





NAMEPLATE

APPLICATIONS
- COMMERCIAL
- INDUSTRIAL
- RESIDENTIAL
- INSTITUTIONAL
- REDEVELOPMENT
- NPDES – MUNICIPAL/INDUSTRIAL
- BMP STRUCTURAL SOLUTION

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	CONTROL WEIR FOR BY-PASS DIVERSION DURING HIGH FLOW
2	1	MANIFOLD PIPING
3	1	30" DIA DUCTILE IRON RING W/ COVER, H20 TRAFFIC DUTY
4	1	48" DIA RISER
5	1	CONCRETE EXTENSION RINGS TO GRADE
6	1	OSHA MANHOLE STEPS
7	1	OIL DAM PIPING
8	1	COALESCING MEDIA PACK
9	1	ALL JOINTS TO BE SEALED W/ PLASTIC FLEXIBLE GASKET
10	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: STORMTROOPER SWST DATE MANUFACTURED SERIAL #XXXXXX

STORMTROOPER, U.S. PATENT 7,470,361
STORMWATER INTERCEPTOR SCHEDULE

MODEL NO.	TOTAL CAPACITY	TREATMENT PERFORMANCE				DIMENSIONS				
		FLOWRATE		SOLIDS	OIL	LENGTH	WIDTH	FLOWLINE	HEIGHT	PIPE SIZE
STD DUTY	USGal	GPM	CFS	FT^3	USGal	L	W	FL	H	P
SWST-05	500	300	0.67	25	165	7'-10"	4'-4"	3'-3"	5'-3"	4"
SWST-06	600	400	0.89	36	198	7'-10"	4'-4"	3'-10"	5'-10"	4"
SWST-08	800	500	1.11	50	264	7'-10"	4'-4"	4'-0"	6'-0"	4"
SWST-10	1,000	650	1.45	60	460	9'-0"	6'-0"	4'-6"	6'-0"	4"
SWST-15	1,500	875	1.95	115	570	9'-0"	6'-0"	5'-6"	7'-0"	4"
SWST-20	2,000	1,125	2.51	130	1,080	9'-0"	6'-0"	6'-6"	8'-0"	6"
SWST-25	2,500	1,375	3.06	145	1,080	13'-0"	7'-0"	5'-6"	7'-0"	6"
SWST-30	3,000	1,600	3.56	215	1,080	13'-0"	7'-0"	6'-6"	8'-0"	6"
SWST-35	3,500	1,775	3.95	290	1,080	13'-0"	7'-0"	6'-10"	8'-4"	8"
SWST-40	4,000	1,950	4.34	225	1,680	16'-0"	8'-6"	5'-6"	7'-10"	8"
SWST-45	4,500	2,150	4.79	330	1,680	16'-0"	8'-6"	6'-0"	8'-0"	8"
SWST-50	5,000	2,350	5.23	340	1,680	16'-0"	8'-6"	6'-6"	8'-0"	8"
SWST-60	6,000	2,675	5.96	450	1,680	16'-0"	8'-6"	7'-6"	9'-0"	8"
*SWST-70	7,000	3,000	6.68	500	2,375	18'-0"	9'-0"	7'-8"	9'-2"	10"
*SWST-80	8,000	3,325	7.41	635	2,375	18'-0"	9'-0"	8'-6"	10'-0"	10"
*SWST-90	9,000	3,625	8.07	770	2,375	18'-0"	9'-0"	9'-4"	10'-10"	10"
*SWST-100	10,000	3,900	8.69	830	2,375	24'-2"	11'-2"	7'-2"	9'-6"	12"
*SWST-110	11,000	4,175	9.30	910	3,490	21'-2"	11'-2"	8'-0"	9'-6"	12"
*SWST-120	12,000	4,425	9.86	970	3,490	21'-2"	11'-2"	8'-6"	10'-0"	12"
*SWST-130	13,000	4,725	10.52	1,070	3,740	21'-2"	11'-2"	9'-0"	10'-6"	14"
*SWST-140	14,000	4,950	11.02	1,200	3,740	21'-2"	11'-2"	9'-8"	11'-2"	14"
*SWST-150	15,000	5,200	11.58	1,335	3,740	21'-2"	11'-2"	10'-8"	12'-2"	14"

OTHER SIZES ARE AVAILABLE. CONTACT US FOR MORE INFORMATION
*INCLUDES ADDITIONAL STRUCTURAL SUPPORT WALL

SWST-APP-SBP

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL #4 REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

D.I. CASTINGS: MANHOLE FRAMES, COVERS OR GRATES ARE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536, AASHTO M306, & AASHTO M105 STANDARDS. MANHOLE SHALL BE NOMINAL 24" DIAMETER AND BE TRAFFIC DUTY.

ENGINEERING DATA

INTERCEPTOR IS STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO REGULATORY STANDARDS. NOMINAL TOTAL LIQUID CAPACITY AND OIL HOLDING CAPACITY AS INDICATED.

STORMWATER INTERCEPTOR ARE UTILIZED TO REDUCE NON-POINT SOURCE POLLUTION ASSOCIATED WITH OIL AND SEDIMENT. THE INTERCEPTOR IS DESIGNED TO ALLOW FOR THE DETAINMENT OF SETTLABLE & FLOATABLE SOLIDS & LIQUIDS. THE INTERCEPTOR SHOULD BE INSPECTED ON A REGULAR BASIS TO DETERMINE PROPER OPERATION AND CLEANING.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

www.parkusa.com 888–611–PARK

STORMWATER INTERCEPTOR
SWALE BY-PASS ARRANGEMENT

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SWST-APP-SBP	.
DATE 05/2019					

STORMWATER INTERCEPTORS

Storm Trooper®
Stormwater Treatment System
Patent No: 7,470,361

CYLINDRICAL STORMTROOPER PERFORMANCE DATA

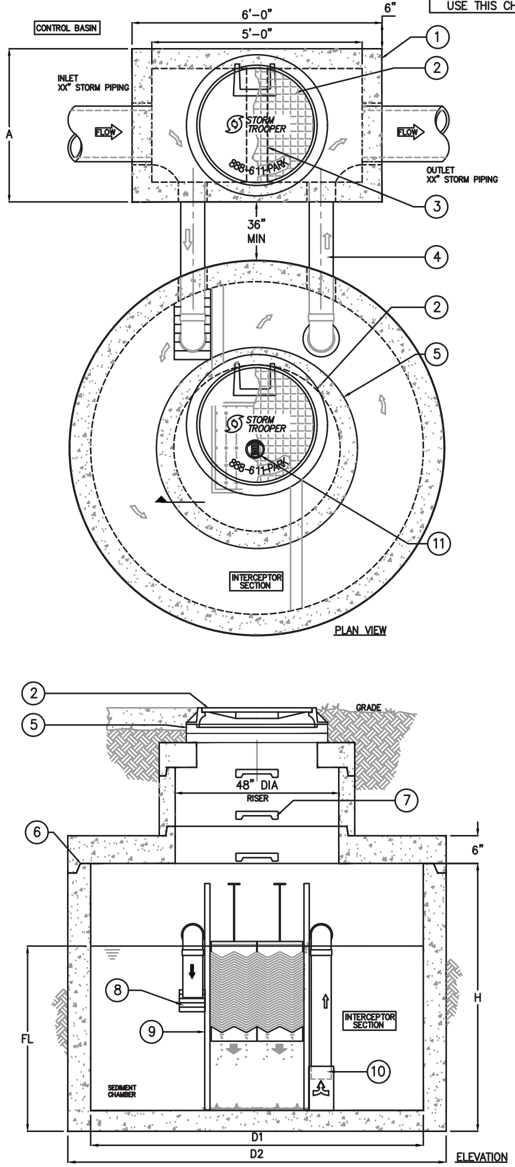
STORMTROOPER® SYSTEM SIZING CYLINDRICAL STYLE							
STORM TROOPER MODEL	VOLUME (GAL)	MINIMUM TREATMENT CAPACITY (TSS REMOVAL 80%<)		EXTRA TREATMENT CAPACITY (TSS REMOVAL 85%<)		MAXIMUM TREATMENT CAPACITY (TSS REMOVAL 90%<)	
SWST-05C	500	300	0.67	150	0.33	125	0.28
SWST-06C	600	400	0.89	200	0.45	175	0.39
SWST-08C	800	500	1.11	250	0.56	225	0.50
SWST-10C	1,000	650	1.45	335	0.75	300	0.67
SWST-15C	1,500	875	1.96	450	1.00	350	0.78
SWST-20C	2,000	1,125	2.51	575	1.28	400	0.89
SWST-25C	2,500	1,375	3.06	700	1.56	475	1.06
SWST-30C	3,000	1,600	3.56	800	1.78	550	1.22
SWST-35C	3,500	1,775	3.95	900	2.00	625	1.39
SWST-40C	4,000	1,950	4.34	1,000	2.23	700	1.56
SWST-45C	4,500	2,150	4.79	1,100	2.45	775	1.73
SWST-50C	5,000	2,350	5.23	1,225	2.73	850	1.89
SWST-60C	6,000	2,675	5.96	1,400	3.12	1,000	2.23

Note: 80% TSS Treatment Capacity is used on all StormTrooper® Drawings

Storm Trooper®
Stormwater Treatment System Patent No: 7,470,361

MAX PIPE SIZE (IN)	CONTROL BASIN WIDTH A
30"	4'-0"
36"	5'-0"
48"	6'-0"
60"	7'-0"

* FOR PIPE SIZES OVER 24" USE THIS CHART



GENERAL INFORMATION
PARK STORMTROOPER INTERCEPTOR
THE STORMTROOPER STORMWATER INTERCEPTOR IS DESIGNED TO RECEIVE & TREAT STORMWATER RUNOFF ON A GRAVITY-FLOW AND ONCE-THROUGH BASIS.

GUARANTEED PERFORMANCE
PRE-ENGINEERED COALESCING MEDIA PACKS ARE UTILIZED FOR ENHANCED SEPARATION WHICH PROVIDE SUPERIOR PERFORMANCE COMPARED TO OTHER SEPARATORS WHICH UTILIZE BAFFLES OR DIVERTERS.

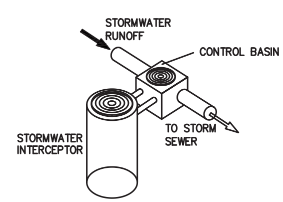
APPLICATIONS
THE PARK STORMTROOPER INTERCEPTOR IS DESIGNED FOR STORMWATER RUNOFF FROM COMMERCIAL & INDUSTRIAL APPLICATIONS WHERE EXCESSIVE POLLUTANTS MAY HARM THE ENVIRONMENT OR DAMAGE SEWER SYSTEMS.

BY-PASS DESIGN
THE CONTROL BASIN DIVERTS STORMWATER DURING PEAK STORM PERIODS. THE BASIN IS NOT FORMED AS PART OF THE INTERCEPTOR AND IS SPECIFIED TO BE SEPARATED BY AT LEAST 36". THIS ALLOWS FOR OPTIMAL INTERCEPTOR SIZING.

MAINTENANCE
THE PARK STORMTROOPER INTERCEPTOR ONLY REQUIRES MINIMAL MAINTENANCE. HYDROCARBONS AND SOLIDS ARE REMOVED FROM THE STORMWATER VIA BAFFLES AND COMPARTMENTS. FOR EXTRA-DUTY APPLICATIONS, THE COALESCING MEDIA PACK IS RECOMMENDED.

THESE POLLUTANTS ARE REMOVED FROM THE SEPARATOR WHEN SERVICED BY A LICENSED VACUUM TRUCK OPERATOR.

CALL US
CONTACT OUR ENGINEERING DEPT. FOR SPECIFIC PERFORMANCE INFORMATION.



NAMEPLATE

APPLICATIONS
- INDUSTRIAL
- COMMERCIAL
- RESIDENTIAL
- INSTITUTIONAL
- REDEVELOPMENT
- NPDES – MUNICIPAL/INDUSTRIAL
- BMP STRUCTURAL SOLUTION

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	CONTROL BASIN FOR BY-PASS DIVERSION DURING HIGH FLOW
2	1	30" DIA DUCTILE IRON RING W/ COVER, H20 TRAFFIC DUTY
3	1	BY-PASS WEIR W/ GALV. DEBRIS SCREEN
4	1	MANIFOLD PIPING
5	1	CONCRETE EXTENSION RINGS AS REQ'D
6	—	ALL JOINTS TO BE SEALED W/ PLASTIC FLEXIBLE GASKET
7	1	OSHA MANHOLE STEPS (AS REQ'D)
8	1	DIFFUSION BAFFLE
9	1	COALESCING MEDIA PACK
10	1	SLUDGE BAFFLE
11	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: STORMTROOPER SWST-C DATE MANUFACTURED SERIAL # XXXXXX

STORMTROOPER, U.S. PATENT 7,470,361

STORMWATER INTERCEPTOR SCHEDULE

MODEL NO.	TOTAL CAPACITY USGal	TREATMENT PERFORMANCE				DIMENSIONS			
		FLOWRATE		SOLIDS	OIL	DIAMETER		FLOWLINE	HEIGHT
		GPM	CFS	FT^3	USGal	D1	D2	FL	H
SWST-05C	500	300	0.67	40	290	5'-0"	6'-0"	48"	58"
SWST-06C	600	400	0.89	60	290	5'-0"	6'-0"	60"	70"
SWST-08C	800	500	1.11	80	290	5'-0"	6'-0"	72"	82"
SWST-10C	1,000	650	1.45	100	290	5'-0"	6'-0"	88"	94"
SWST-15C	1,500	875	1.95	150	425	6'-0"	7'-0"	88"	98"
SWST-20C	2,000	1,125	2.51	200	750	8'-0"	9'-0"	72"	82"
SWST-25C	2,500	1,375	3.06	250	750	8'-0"	9'-0"	84"	94"
SWST-30C	3,000	1,600	3.56	275	1,175	10'-0"	11'-4"	66"	76"
SWST-35C	3,500	1,775	3.95	350	1,175	10'-0"	11'-4"	76"	86"
SWST-40C	4,000	1,950	4.34	400	1,175	10'-0"	11'-4"	86"	98"
SWST-45C	4,500	2,150	4.79	475	1,175	10'-0"	11'-4"	96"	108"
SWST-50C	5,000	2,350	5.23	550	1,175	10'-0"	11'-4"	108"	120"
SWST-60C	6,000	2,675	5.96	675	1,175	10'-0"	11'-4"	128"	140"

OTHER SIZES & CONFIGURATIONS ARE AVAILABLE. CONTACT 800-256-8041 FOR MORE INFORMATION

ASCE | AMERICAN SOCIETY OF SANITARY ENGINEERING | ASPE MEMBER | ASTM C-913 | NPCA CERTIFIED PLANT

SWST-C-01

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

D.I. CASTINGS: MANHOLE FRAMES, COVERS OR GRATES ARE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536, AASHTO M306, & AASHTO M105 STANDARDS. MANHOLE SHALL BE NOMINAL 24" DIAMETER AND BE TRAFFIC DUTY.

ENGINEERING DATA

INTERCEPTOR IS STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO REGULATORY STANDARDS. NOMINAL TOTAL LIQUID CAPACITY AND OIL HOLDING CAPACITY AS INDICATED.

STORMWATER INTERCEPTORS ARE UTILIZED TO REDUCE NON-POINT SOURCE POLLUTION ASSOCIATED WITH OIL AND SEDIMENT. THE INTERCEPTOR IS DESIGNED TO ALLOW FOR THE DETAINMENT OF SETTLABLE & FLOATABLE SOLIDS & LIQUIDS. THE INTERCEPTOR SHOULD BE INSPECTED ON A REGULAR BASIS TO DETERMINE PROPER OPERATION AND CLEANING.

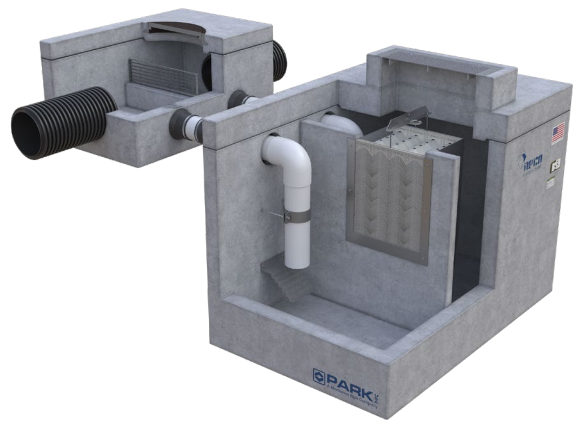
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA®
www.parkusa.com 888-611-PARK

STORMWATER INTERCEPTOR
STORMTROOPER MODEL SWST-05C THRU 60C

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SWST-C-01	.
DATE 05/2019					

STORMWATER INTERCEPTORS

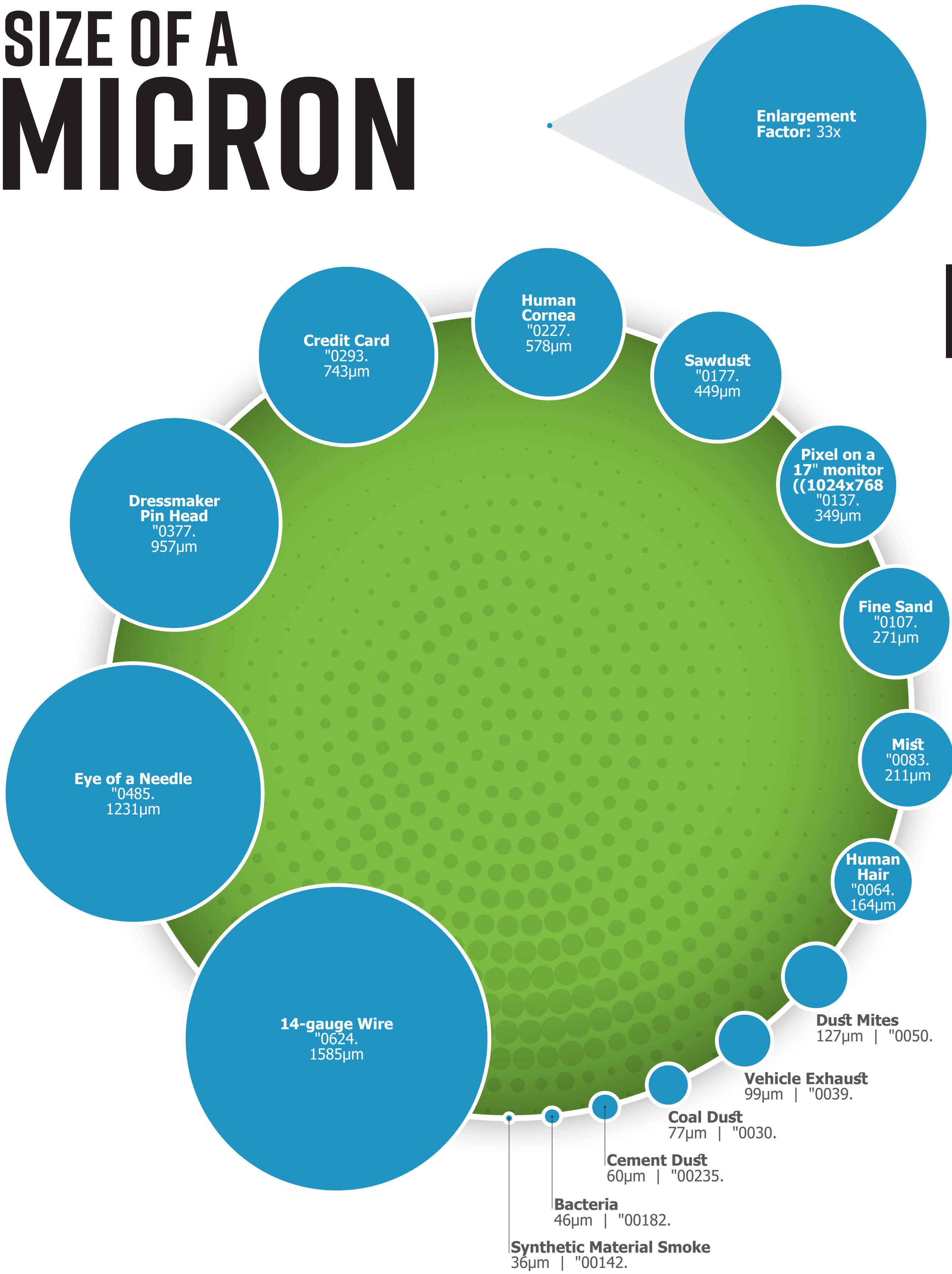


STORMTROOPER CERTIFICATIONS SUMMARY

The StormTrooper® has undergone extensive testing and is patented. Appendix B includes copies of the corresponding patents. Appendix C includes the third-party testing results for particle removal efficiencies that was completed by Southwest Research Institute (SwRI) in San Antonio.

Title 30 Texas Administrative Code Chapter 213 (RG-348), known as Edwards Aquifer rules, address activities that could pose a threat to water quality in the Edwards Aquifer, including wells and springs fed by the aquifer and water sources to the aquifer, including uplands areas draining directly to it and surface streams. Included in the document "Complying with the Edwards Aquifer Rules Technical Guidance on Best Management Practices" (Revised July 2005) is a list of TCEQ Edwards Aquifer Protection Program approved Best Management Practices allowed over the Edwards Aquifer. The StormTrooper AQ has received TCEQ Approval of Innovative Technology. See Appendix D for the language from the Addendum Sheet verifying the StormTrooper inclusion.

SIZE OF A MICRON



STORMWATER INTERCEPTOR SPECIFICATIONS

A. General:

1. A Stormwater Interceptor shall be provided and installed as indicated on plans. System shall be ParkUSA StormTrooper Model SwST-xxx.
2. Manufacturer shall provide proof of third party testing by an independent applied engineering and physical sciences testing organization.
3. The Stormwater Interceptor shall be provided with installation, operation & maintenance manuals.
4. Contractor shall submit ( ) copies of manufacturer's equipment specification for engineer's review. Shop drawings shall include the following:
   a. Detailed manufacturer's data including installation plan/elevation drawings, rebar layout drawings, buoyancy calculations, and site specific coalescing plate performance analysis for TSS & TPH, all certified by a registered professional engineer.
   b. Manhole frame/cover specifications.
   c. Joint Sealant specifications.
   d. Coatings and/or concrete additives specifications.
5. Stormwater Interceptor design shall conform to criteria set forth by the International Association of Plumbing and Mechanical Officials (IAPMO), the American Petroleum Institute, and all other governing state and local code requirements.

B. Materials:

1. Concrete: tank shall be constructed of precast concrete having a 28 day minimum compressive strength of 4500 PSI using a Type I Portland Cement.
2. Steel Reinforcement: Interceptor shall be designed for H-20-44 traffic loading as defined by AASHTO LRFD Eighth Edition 2017 using a 30 percent impact factor. Structural reinforcement placement shall be in accordance to ACI. All reinforcement steel shall comply with ASTM A615 grade 60 or ASTM A706 Grade 60. Bar bending shall comply with latest ACI standards. Lifting inserts to be installed for handling and be installed per manufacturer's requirements.
3. Manhole Access: Interceptor shall have adequate manhole access covers and frames to permit access for cleaning all areas of the interceptor. Each manhole access shall be minimum 24 inch diameter clear opening. Cast iron frame and covers shall conform to ASTM A48-83 Class 30.
4. Fabricated steel access covers shall be ASTM A36 steel construction and hot-dipped galvanized after fabrication and rated traffic duty. Access covers shall be placed at grade elevation by using concrete extensions.
5. Pipe Material: All pipe and fittings shall be of materials approved by engineer.
6. Coalescing Media: The oil coalescing media pak shall be fabricated of an oleophillic polypropylene plastic material and assembled into modules with 304 stainless steel materials. Media assembly shall be self-cleaning and removable.
7. The Stormwater Interceptor shall be equipped with a control manhole by-pass system to control unusually high rainfall. The control system shall prevent resuspension and scouring of the storm water interceptor and shall be equipped with an adjustable weir and stainless- steel debris screen.

C. Installation:

1. The Interceptor shall be installed in strict accordance with the manufacturer's recommendations and according to plans and specifications. The manufacturer shall have representation during the setting procedure to insure proper installation.
2. The Stormwater Interceptor shall be installed on level, undisturbed soil or an approved compact fill with a load bearing capacity of minimum 2000 PSF.
3. The interceptor shall be backfilled after placement with an approved backfill material. Backfill of all sides of structure shall be performed simultaneously to prevent unbalanced lateral pressures during construction.
4. All joints shall be made watertight. Manufacturer shall seal joints with a plastic flexible gasket conforming to AASHTO M-198-75 for bitumen gasket.
5. All interceptor inlet/outlet/vent piping shall be installed in accordance to manufacturer's recommendations and project specifications.
6. Interceptor shall be filled with clean water prior to start-up of system. Follow manufacturer's recommendations for testing and start-up.

STORMTROOPER INSTALLATION AND RECEIVING INSTRUCTIONS

Overview
ParkUSA is a leader in pre-engineered environmental products. Products are catalogued with standard features as shown on specification material. However, these products are often furnished to meet specific engineering requirements and have special features and arrangements. In such cases, handling and installation procedures may vary slightly depending upon the actual type of construction. It is recommended that a company representative be consulted in each unique situation.

Codes and Installation
Local codes and regulations should supersede all recommendations made by ParkUSA and its representatives, and the appropriate authorities should be consulted before installation is made. Where an apparent conflict of code requirements and manufacturer recommendations or standard design exists, the assistance of a company representative should be requested. In almost every instance, ParkUSA will be able to make modifications necessary to comply with local codes, jurisdictions and interpretations, if notified prior to actual fabrication or upon order placement.

Field Preparation
The customer or his contractor shall prepare the excavation to the proper depth using dimensional data and weights from approved submitted drawings.

Call 888-611-PARK to confirm excavation dimensions and crane requirements.

All excavations should be shored or stepped back in accordance to OSHA recommendations.

A level base within the excavation and a minimum of twelve (12) inches of clearance on all sides of the unit is required. The depth of the base and the material shall meet the specifications and requirements for the type of soil at the setting location (consult with design engineer for base specifications).

All field excavation and preparation is the sole responsibility of the customer/contractor.

Scheduling
The delivery of the unit should be scheduled at least 48 hours in advance, weather permitting. To reschedule a delivery, a 24-hour notice is required.

Delivery and Placement
Unit will be delivered and placed in the excavation by ParkUSA or its representatives, when accessible for crane truck. The crane operator will perform rigging and setting unit. It will be necessary for the customer/contractor to furnish the required labor to install the joint sealant and assist our crane operator with the installation. Backfill is the sole responsibility of the owner/contractor.

Backfill
After unit is set, the excavation should be completely backfilled immediately and prior to filling with water. The backfill material shall meet the specifications and requirements for setting location (consult with design engineer for backfill specifications). It is recommended that backfill material be on site at the time of delivery. Two methods of backfill are:

a. With material excavated placed in (1) one foot lifts and compacted and tamped to original density or per owner/engineer's requirements.
b. Bank sand in (2) two foot lifts and compacted or water-jetted per owner/engineer's requirements.

Testing (for tanks)
If project specifications require testing of tanks, follow the following testing procedure. All testing is performed by others.

Water Test
After completing the piping, the unit shall be properly backfilled. Fill the tank with water to the normal operating level. Record this level and let stand for 24 hours. Recheck the water level. A five percent or less variance is generally acceptable. Note that precast concrete tanks are designed for below grade installation with an earthen backfill. DO NOT fill tanks with water until the tanks are properly backfilled. Filling tanks prior to backfilling may cause abnormal stresses and may void the manufacturer's warranty.

Vacuum Testing
Some jurisdictions require testing of the tank prior to backfill. In this case, it is necessary that the tank be tested using the vacuum in lieu of the water test. After completing the piping, all joints should be sealed with the mastic compound. All the piping must be sealed air-tight. Place the vacuum test covers over the access holes. Follow manufacturer's test equipment instructions for pulling vacuum.

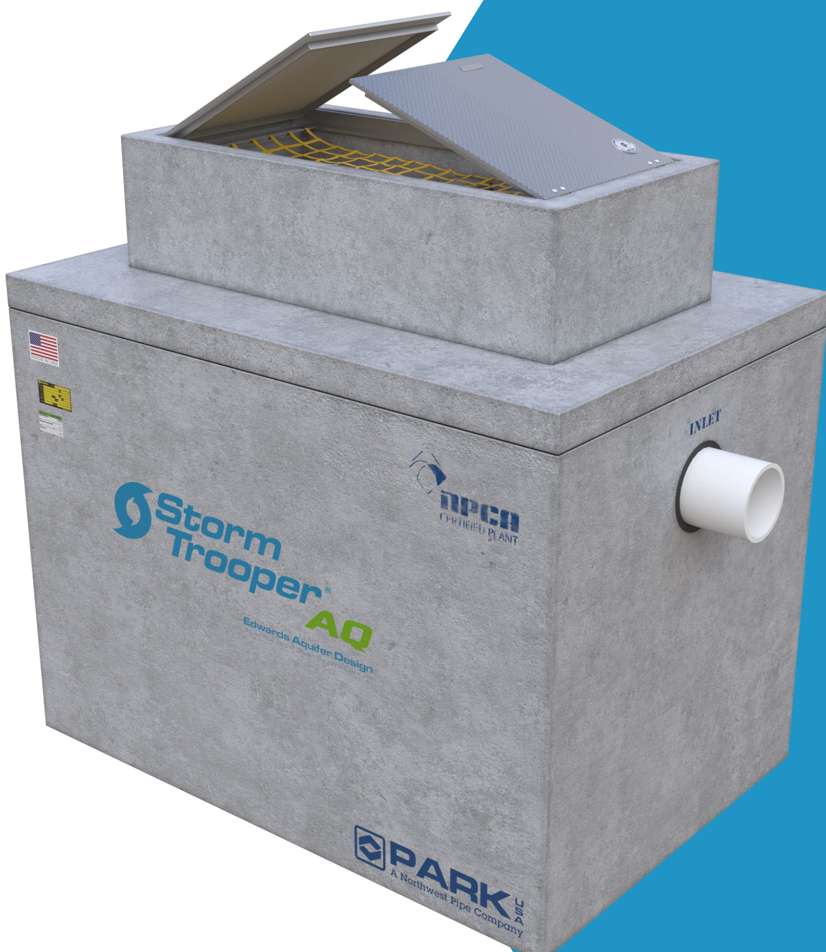
NOTES

Storm Trooper® AQ

Patent No: 7,470,361

BEST USE FOR:

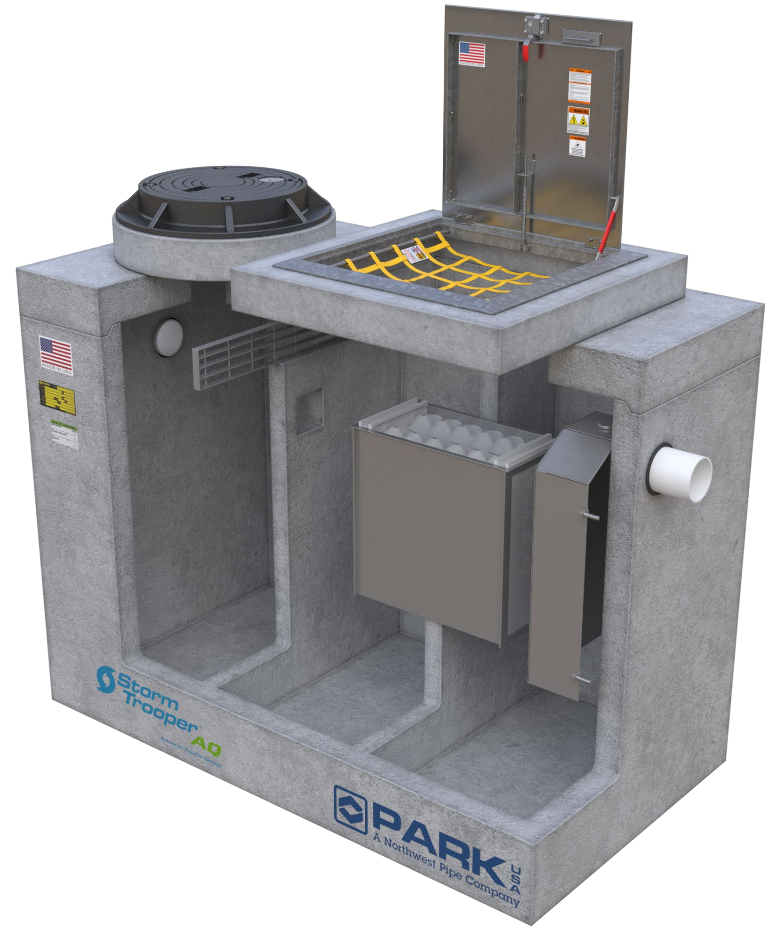
STORMWATER



PARK USA
A Northwest Pipe Company

ENGINEERING FACTS

PARK USA
A Northwest Pipe Company



GENERAL INFORMATION

The ParkUSA® StormTrooper® Model SWAQ is a patented stormwater quality system specifically designed for sensitive environments. It removes sediments and oil from stormwater runoff. The SWAQ was originally designed for the Edwards Aquifer, meeting all requirements for this sensitive aquifer's recharge zones. The unit consists of a separator with internal flow control.

The Edwards Aquifer, located in south central Texas, is one of the greatest artesian aquifers in the world—a precious natural resource. It serves as the primary source of water for over two million people. Because the aquifer is highly permeable and has rapid recharge and discharge times, the aquifer handles large quantities of water. However, this phenomenon makes the aquifer highly vulnerable to contamination in the recharge zone where it is exposed to surface water.

Sustainable management of water quality is imperative if future generations hope to enjoy this natural resource. Stormwater runoff collects pollutants like trash, debris, and oil, dumping them directly into the stormwater drainage system. Until recently, stormwater runoff was left untreated with no protection from pollutants entering the aquifer, public waterways, streams, rivers and lakes.

The StormTrooper AQ is a patented stormwater wet vault specifically designed to intercept free oils, grease, total suspended solids (TSS), debris and other pollutants found in stormwater runoff. The StormTrooper AQ features enhanced gravity separation technology, which utilizes coalescing media plates engineered to a performance prediction based on Stokes's Law. This cutting-edge technology is now available for use to protect the Edwards Aquifer for future generations.

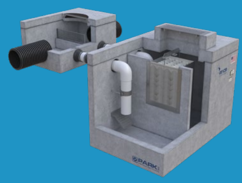
FEATURES

- Valuable best management practice (BMP)
- Larger effective area (EA) treatment
- Low profile design
- LEED compliant
- Enhanced gravity separation, utilizing coalescing media plate (CMP) technology
- Manufactured in Texas
- Third-party tested by Southwest Research Institute (SwRI)

MODELS

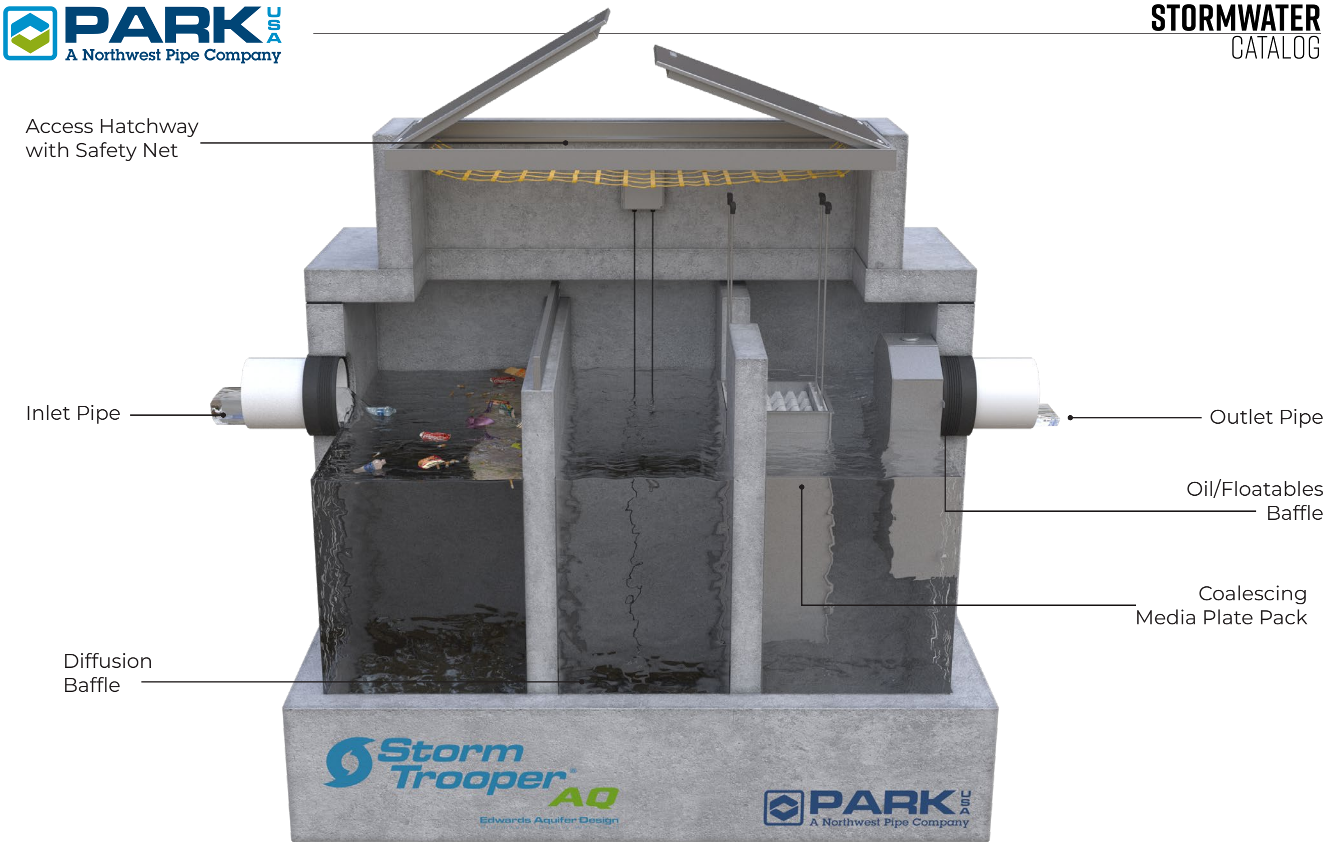
There are various models available for the ParkUSA StormTrooper, depending on location and project needs:

- **Model SWST:** square separator, up to 15000 gallons capacity.



- **Model SWST-C:** cylindrical separator, up to 6000 gallons capacity.

- **Model SWAQ:** unit with control manholes absent--the flow control system is inside the unit. This model is designed for use in the Edwards Aquifer, meeting all regulations and requirements.



OPERATION

Untreated storm water enters the “grit chamber” on the inlet side of the StormTrooper AQ. Larger particles, as well as semi-buoyant material, are captured in this chamber to prevent excessive clogging and obstruction of the frontal area of the coalescing media plates. This process also reduces the potential for short circuiting and higher velocities through the plates. The “diffusion baffle,” which separates the two chambers, works to perform two vital functions. First, it distributes flow evenly through the entire cross-section of the unit allowing for a more uniform delivery of pollutants through the plate. Next, a water quality orifice regulates flow through the plates and lower section of unit to prevent re-suspension of pollutants. Each StormTrooper has a specific maximum flow rate that has been pre-calibrated. Higher flow rates by-pass the system once the pre-calibrated flow rates are exceeded.

Coalescing media plates: A submerged oil/floatable baffle is located around the effluent pipe to allow for the capture and containment of these pollutants. Collected pollutants will remain in the interceptor until removal. Because no filter cartridges are required, operating costs are minimal. Furthermore, the StormTrooper AQ System has no moving parts, substantially reducing maintenance costs. As stormwater pollutants travel through the CMP pack, oil rises to the top and solids drop to the bottom through dedicated surfaces and weep holes. Plate supports at the bottom allow for easy removal of the solids that collect beneath the plates. Because of the steep angles and short travel distances, oils and solids are quickly released from the plates, eventually floating to the surface of the StormTrooper® unit or settling to the bottom.

SYSTEM COMPONENTS

The StormTrooper AQ shall consist of a control manhole connected to a separator unit to remove debris (TSS) and hydrocarbons from stormwater. The separator unit shall be connected to the control manhole by means of a flexible resilient rubber boot [mortar joint]. The unit shall maintain a minimum separation of 36 inches between the control manhole and the separator unit.

The separator unit shall contain a prefabricated corrugated plate for intermittent and variable flows of water, oil, or any combination of non-emulsified oil-water mixtures ranging from zero-flow up to one hundred percent of the maximum hydraulic capacity. This will allow the separator unit to maintain an acceptable water effluent.

DESIGN CONSIDERATIONS

As a flow-based BMP, the StormTrooper is designed using the treatment flow rate for the site, using the Rational Method. The runoff rate from the tributary area is calculated using:

Q = CIA

Where:
Q = flow rate (ft3/s)
C = runoff coefficient for the tributary area
I = design rainfall intensity (1.1 in/hr)
A = drainage area (ac)

The runoff coefficient is calculated as the weighted average of the impervious and pervious areas. Runoff coefficient for impervious areas is assumed to be 0.90 and the runoff coefficient for pervious areas is assumed to be 0.03. The overflow rate (hydraulic loading rate) is calculated using:

VOR = Q/A

Where:
VOR = overflow rate (ft/s)
Q = runoff rate calculated with using first equation (ft3/s)
A = surface area of unit (ft2)

The overflow rate can then be used with Table to determine the StormTrooper unit that provides the desired TSS removal. The StormTrooper system is available in several models.

The characteristics of the catchment area are defined as effective area. The effective area is the number of acres draining to a single treatment unit and is calculated using the following equation:

EA = (Ai * 0.9) + (Ap * 0.03)

Where:
EA = Effective area (acres)
Ai = Impervious area (acres)
Ap = Pervious area (acres)

StormTrooper models can be selected from Table below that will achieve an 80 percent TSS reduction at the corresponding effective areas shown. The StormTrooper Model SWAQ system for the Edwards Aquifer is designed using the overflow rates. These were calculated based on the surface area of the vault alone and a rainfall intensity of 1.1 in/hr.

SIZING

In the below table, the current model and sizes for the StormTrooper AQ are shown.

STORMTROOPER AQ SIZES

MODEL	OVER FLOW RATE GPM	TOTAL SURFACE AREA (FT2)	DIMENSIONS (OUTSIDE DIMENSIONS)			MAX EFFECTIVE AREA (ACRES)
			LENGTH	WIDTH	HEIGHT	
SWAQ-05	420	100	7'-10"	4'-4"	7'-0"	0.13
SWAQ-10	600	149	8'-8"	5'-0"	7'-0"	0.20
SWAQ-20	1,000	248	11'-0"	6'-0"	7'-6"	0.33
SWAQ-25	1,440	369	13'-0"	7'-0"	8'-0"	0.50
SWAQ-40	2,250	588	16'-0"	8'-6"	8'-0"	0.79
SWAQ-70	2,270	730	18'-0"	9'-0"	6'-10"	0.98
SWAQ-110	4,000	913	21'-2"	11'-2"	6'-10"	1.23

MAINTENANCE

A preventative maintenance cleanout schedule is the most valuable tool for maintaining the proper operation of StormTrooper. Separator maintenance costs are greatly reduced if a good housekeeping plan for the property is developed, and implemented i.e., trash pickup, lawn maintenance, dumpster control, etc.

StormTrooper separators have no moving parts and no filter cartridges. The manufacturer recommends quarterly ongoing inspections for accumulated pollutants. Pollutant deposition may vary from year to year. Quarterly inspections ensure that the system is serviced at the appropriate times. Professional vacuum services should be considered when capacities exceed these recommended levels. It is very useful to keep a record of each inspection.

Inspection Procedures

1. Observation and maintenance are most easily accomplished during non-flow (dry weather) conditions three to four days after the most recent rain.
2. Remove interceptor covers or open hatchway to observe conditions. Remove hatchway safety net ("EnterNet"). Look for trash and debris, and remove if necessary. This is the most important maintenance requirement. If absorbent pillows are utilized, note their condition. Uniform browning or gray color of the pillow means they should be replaced. Inspect baffle debris screen and clean if necessary.
3. Coalescing plates are self-cleaning and seldom require maintenance unless damaged. Do not walk on or stand on plate packs.
4. Check the depth (level) of oil and sediment with a tank sampler device designed for this purpose.

STORMWATER

Human life, as with all animal and plant life on the planet, depends upon water; at ParkUSA, we greatly value the importance of protecting this natural resource. To contribute our part in conservation and sustainability, ParkUSA offers a wide range of stormwater management products, which include stormwater quantity and stormwater quality units. We engineer advanced water technologies designed to combat pollution and control the flow of stormwater. These cleaning processes and water drainage methods provide breakthrough safety modifications for significant activities in day-to-day life. Most importantly, ParkUSA's mission is to offer innovative solutions to important stormwater management needs around the world. ParkUSA has been in the business of manufacturing stormwater infrastructure and water quality devices since the beginning of the Clean Water Act, providing sustainable solutions for today's stormwater issues.
As always, we aim to impact people's lives and provide a safe quality of life for generations.

ParkUSA
IS ALWAYS READY TO
DESIGN AND
ENGINEER
PRODUCTS FOR YOUR
UPCOMING PROJECTS!

OTHER STORMWATER PRODUCTS

RAINTROOPER

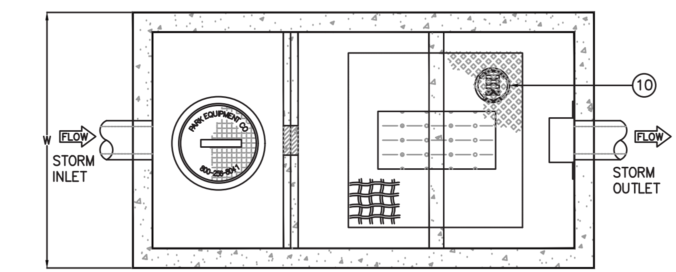
STORMTROOPER

POND INLET FILTER

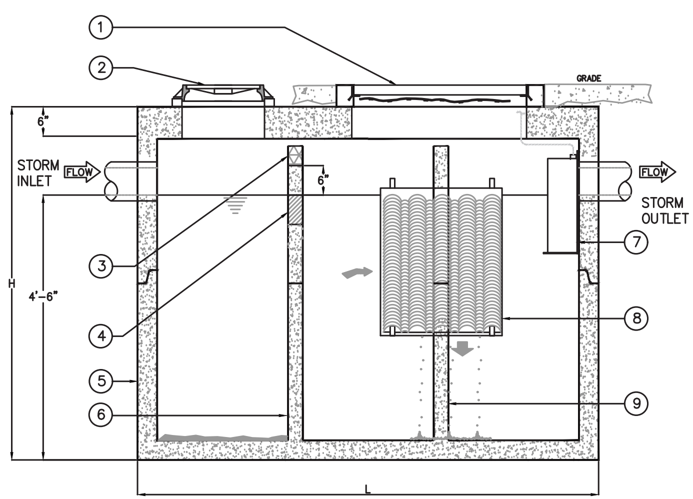
SALES@PARKUSA.COM
888-611-PARK

Storm Trooper® AQ
Edwards Aquifer Design
Stormwater Quality Wet Vault
Patent No: 7,470,361

STORMTROOPER, U.S. PATENT 7,470,361



PLAN VIEW



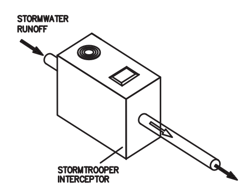
ELEVATION

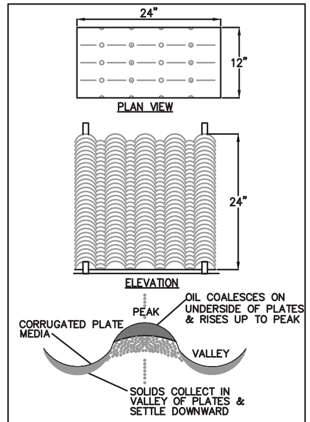
GENERAL INFORMATION
STORMWATER INTERCEPTORS ARE UTILIZED TO REDUCE NON-POINT SOURCE POLLUTION ASSOCIATED WITH OIL AND SEDIMENT. THE INTERCEPTOR IS DESIGNED TO ALLOW FOR THE DETAINMENT OF SETTLABLE & FLOATABLE SOLIDS & LIQUIDS.

GUARANTEED PERFORMANCE
PRE-ENGINEERED COALESCING MEDIA PACKS ARE UTILIZED FOR ENHANCED ARE UTILIZED FOR ENHANCED SEPARATION WHICH PROVIDE SUPERIOR PERFORMANCE COMPARED TO OTHER SEPARATORS WHICH UTILIZE BAFFLES OR DIVERTERS.

MAINTENANCE
THE INTERCEPTOR SHOULD BE INSPECTED ON A REGULAR BASIS TO DETERMINE PROPER OPERATION AND CLEANING. THE STORMTROOPER HAS BECOME KNOWN IN THE INDUSTRY AS THE "EASIEST TO MAINTAIN." HATCHWAY DESIGN MAKES INSPECTION AND VAULT ENTRY ACCESSIBLE FOR MAINTENANCE.

ALL COMPARTMENTS ALLOW FOR THE LARGER HOSE ASSOCIATED WITH VACTOR TRUCK PUMP OUT. MAINTENANCE INSTRUCTIONS AND LOGS ARE AVAILABLE FROM PARK ENGINEERING.





COALESCING MEDIA PLATE DETAIL

COALESCING PLATE OPERATION

THE COALESCING MEDIA PACKTM CONSISTS OF CLOSELY SPACED CORRUGATED PLATES MANUFACTURED WITH AN OLEOPHILIC (OIL ATTRACTING) MATERIAL. THE PATENTED PLATES ARE AN ENHANCED VERSION OF THE PLATES UTILIZING THE ROYAL DUTCH SHELL PRINCIPLE. THE CORRUGATED PATTERN INDUCES A SINUSOIDAL LAMINAR FLOW OF THE OILY WATER MIXTURE. UNDER LAMINAR FLOW CONDITIONS, BUOYANCY FORCES CAUSE OIL DROPLETS TO RISE UNTIL THEY ADHERE THEMSELVES TO THE OLEOPHILIC PLATES. SMALL OIL DROPLETS TEND TO COALESCE INTO SHEETS OF OIL ON THE UNDERSIDE SURFACES OF THE CORRUGATED PLATES. THE SINUSOIDAL FLOW PATH ALSO PROMOTES A HIGH INCIDENCE OF DROPLET COLLISION AS THE FLUID FLOW CONSTANTLY CHANGES DIRECTION FROM A DOWNWARD PATH TO A VERTICAL PATH. THE COALESCING OIL RISES TO THE SURFACE IN LARGE GLOBULES THROUGH WEEP HOLES OR GUTTERS IN THE COALESCING PLATE PACK.

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	36" X 36" GALV. STEEL FRAME & COVER, RATED FOR H20 TRAFFIC LOADING W/ SAFETY NET (CAST IN OR LOOSE)
2	1	DUCTILE IRON RING/ COVER
3	1	GALV. STEEL TRASH SCREEN
4	1	WATER QUALITY ORIFICE
5	–	BITUMASTIC EXTERIOR COATING
6	1	CONTROL BAFFLE
7	1	EFFLUENT BAFFLE W/ ANTI-SIPHON
8	1	COALESCING MEDIA PACK (SEE DETAIL)
9	1	MONOLITHIC BAFFLE
10	–	NAMEPLATE: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: SWAQ-XX DATE MANUFACTURED

NAMEPLATE

MODEL NO.	FLOW RATE (gpm)	TOTAL SURFACE AREA (SQ FT)	MAX EFFECTIVE DRAINAGE (ACRES)	DIMENSIONS LENGTH L	WIDTH W	HEIGHT H	MINIMUM SETTLING DEPTH
SWAQ-05	420	100	0.13	7'-10"	4'-4"	7'-0"	4'-0"
SWAQ-10	600	149	0.20	8'-8"	5'-0"	7'-0"	4'-0"
SWAQ-20	1000	248	0.33	11'-0"	6'-0"	7'-6"	4'-0"
SWAQ-25	1440	369	0.50	13'-0"	7'-0"	8'-0"	4'-0"
SWAQ-40	2250	588	0.79	16'-0"	8'-6"	8'-0"	4'-0"
SWAQ-70	2720	730	0.98	18'-0"	9'-0"	6'-10"	4'-0"
SWAQ-110	4000	913	1.23	21'-2"	11'-2"	6'-10"	4'-0"

SWAQ-1

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL #4 REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

D.I. CASTINGS: MANHOLE FRAMES, COVERS OR GRATES ARE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536, AASHTO M306, & AASHTO M105 STANDARDS. MANHOLE SHALL BE NOMINAL 24" DIAMETER AND BE TRAFFIC DUTY.

HATCHWAYS: GALVANIZED STEEL SKID-RESISTANT DOUBLE LEAF H-20 RATED.

ENGINEERING DATA

INTERCEPTOR IS STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO UNIFORM PLUMBING CODE. NOMINAL CAPACITY AS INDICATED.

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF INTERCEPTOR. USE DIMENSIONAL DATA AS SHOWN.

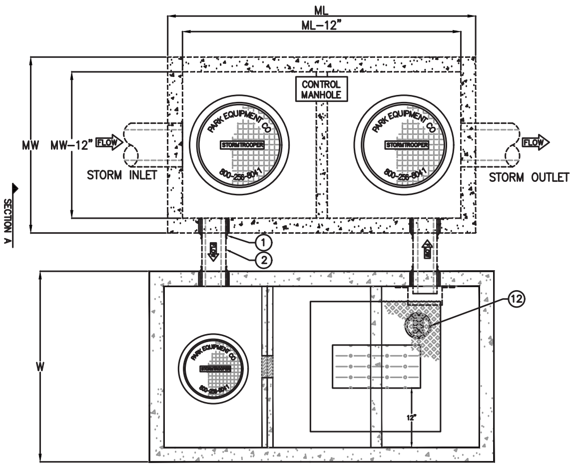
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA®
www.parkusa.com 888-611-PARK

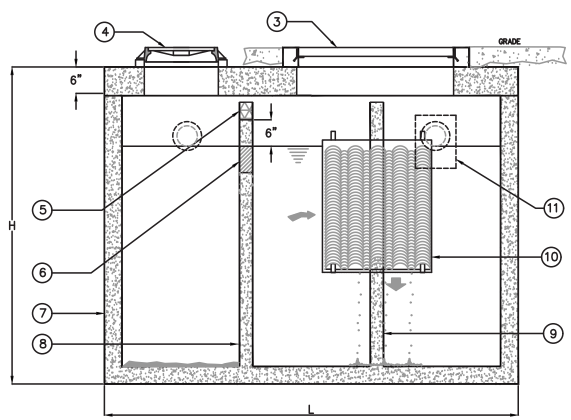
STORMWATER INTERCEPTOR
MODEL SWAQ 05 THRU 110

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SWAQ-1	.
DATE 05/2019					

Storm Trooper AQ
Edwards Aquifer Design



PLAN VIEW



ELEVATION

GENERAL INFORMATION

THE STORMTROOPER® AQ STORMWATER INTERCEPTOR IS DESIGNED TO RECEIVE & TREAT STORMWATER RUNOFF ON A GRAVITY-FLOW AND ONCE-THROUGH

GUARANTEED PERFORMANCE
PRE-ENGINEERED COALESCING MEDIA PACKS ARE UTILIZED FOR ENHANCED SEPARATION WHICH PROVIDE SUPERIOR PERFORMANCE COMPARED TO OTHER SEPARATORS WHICH UTILIZE BAFFLES OR DIVERTERS.

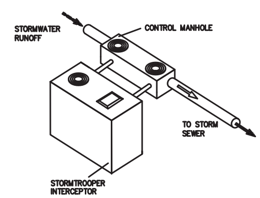
APPLICATIONS
THE PARKUSA STORMTROOPER INTERCEPTOR IS DESIGNED FOR STORMWATER RUNOFF FROM COMMERCIAL & INDUSTRIAL APPLICATIONS WHERE EXCESSIVE POLLUTANTS MAY HARM THE ENVIRONMENT OR DAMAGE SEWER SYSTEMS.

BY-PASS DESIGN
A BY-PASS MANHOLE DIVERTS STORMWATER DURING HEAVY PEAK STORM PERIODS. THIS ALLOWS FOR OPTIMAL INTERCEPTOR SIZING.

MAINTENANCE
THE PARK STORMTROOPER INTERCEPTOR REQUIRES MINIMAL MAINTENANCE. HYDROCARBONS AND SOLIDS ARE REMOVED FROM THE STORMWATER VIA BAFFLES AND COALESCING MEDIA.

THESE POLLUTANTS ARE REMOVED FROM THE SEPARATOR WHEN SERVICED BY A LICENSED VACUUM TRUCK OPERATOR.

USE SWAQ-BYPASS IF DESIGN FLOW EXCEEDS FLOW RATE SHOWN IN SCHEDULE



APPLICATION

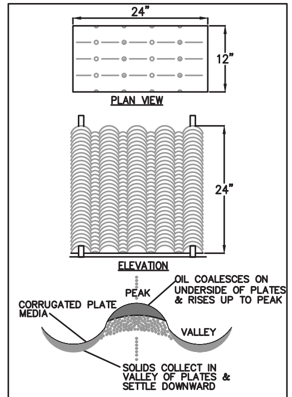
SPECIFICATIONS

CONCRETE :	CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.
REINFORCEMENT:	GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.
ACCESS:	MANHOLE FRAMES, COVERS OR GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30. MANHOLE SHALL HAVE 30 INCH INSIDE DIAMETER AND BE TRAFFIC DUTY.
HATCHWAYS:	GALVANIZED STEEL SKID-RESISTANT DOUBLE LEAF H-20 RATED.

ENGINEERING DATA

INTERCEPTOR IS STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO REGULATORY STANDARDS. NOMINAL CAPACITY AS INDICATED.

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF INTERCEPTOR. USE DIMENSIONAL DATA AS SHOWN.



COALESCING MEDIA PLATE DETAIL

COALESCING PLATE OPERATION

THE COALESCING MEDIA PACKTM CONSISTS OF CLOSELY SPACED CORRUGATED PLATES MANUFACTURED WITH AN OLEOPHILIC (OIL ATTRACTING) MATERIAL. THE PATENTED PLATES ARE AN ENHANCED VERSION OF THE PLATES UTILIZING THE ROYAL DUTCH SHELL PRINCIPLE. THE CORRUGATED PATTERN INDUCES A SINUSOIDAL LAMINAR FLOW OF THE OILY WATER MIXTURE. UNDER LAMINAR FLOW CONDITIONS, BUOYANCY FORCES CAUSE OIL DROPLETS TO RISE UNTIL THEY ADHERE THEMSELVES TO THE OLEOPHILIC PLATES. SMALL OIL DROPLETS TEND TO COALESCE INTO SHEETS OF OIL ON THE UNDERSIDE SURFACES OF THE CORRUGATED PLATES. THE SINUSOIDAL FLOW PATH ALSO PROMOTES A HIGH INCIDENCE OF DROPLET COLLISION AS THE FLUID FLOW CONSTANTLY CHANGES DIRECTION FROM A DOWNWARD PATH TO A VERTICAL PATH. THE COALESCING OIL RISES TO THE SURFACE IN LARGE GLOBULES THROUGH WEEP HOLES OR GUTTERS IN THE COALESCING PLATE PACK.

KEYED NOTES

MARK	QTY	DESCRIPTION
1	4	BOOTS
2	2	PVC
3	1	GALV. STEEL FRAME & COVER, RATED FOR TRAFFIC LOADING (CAST IN OR LOOSE) W/ SAFETY NET
4	1	20" CAST IRON RING AND COVER
5	1	GALV. STEEL TRASH SCREEN
6	1	WATER QUALITY ORIFICE
7	1	BITUMASTIC EXTERIOR COATING
8	1	CONTROL BAFFLE
9	1	MONOLITHIC BAFFLE
10	1	COALESCING MEDIA PACK
11	1	EFFLUENT BAFFLE W/ ANTI-SIPHON
12	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: SWAQ-BP-XX DATE MANUFACTURED

NAMEPLATE

MODEL NO.	FLOW RATE (gpm)	TOTAL SURFACE AREA (SQ FT)	MAX EFFECTIVE DRAINAGE (ACRES)	DIMENSIONS: LENGTH L	WIDTH W	HEIGHT H	MINIMUM SETTLING DEPTH	CONTROL MANHOLE LENGTH (ML)	CONTROL MANHOLE WIDTH (MW)
SWAQ-BP-05	420	100	0.13	7'-10"	4'-4"	7'-0"	4'-0"	7'-0"	4'-0"
SWAQ-BP-10	600	149	0.20	8'-8"	5'-0"	7'-0"	4'-0"	7'-0"	4'-0"
SWAQ-BP-20	1000	248	0.33	11'-0"	6'-0"	7'-6"	4'-0"	11'-0"	4'-0"
SWAQ-BP-25	1440	369	0.50	13'-0"	7'-0"	8'-0"	4'-0"	11'-0"	4'-0"
SWAQ-BP-40	2250	588	0.79	16'-0"	8'-6"	8'-0"	4'-0"	16'-0"	4'-0"
SWAQ-BP-70	2720	730	0.98	18'-0"	9'-0"	6'-10"	4'-0"	16'-0"	4'-0"
SWAQ-BP-110	4000	913	1.23	21'-2"	11'-2"	6'-10"	4'-0"	16'-0"	4'-0"

STORMTROOPER, U.S. PATENT 7,470,361 MEMBER:

SWAQ-BP-01

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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STORMWATER INTERCEPTOR
SWAQ WITH BYPASS

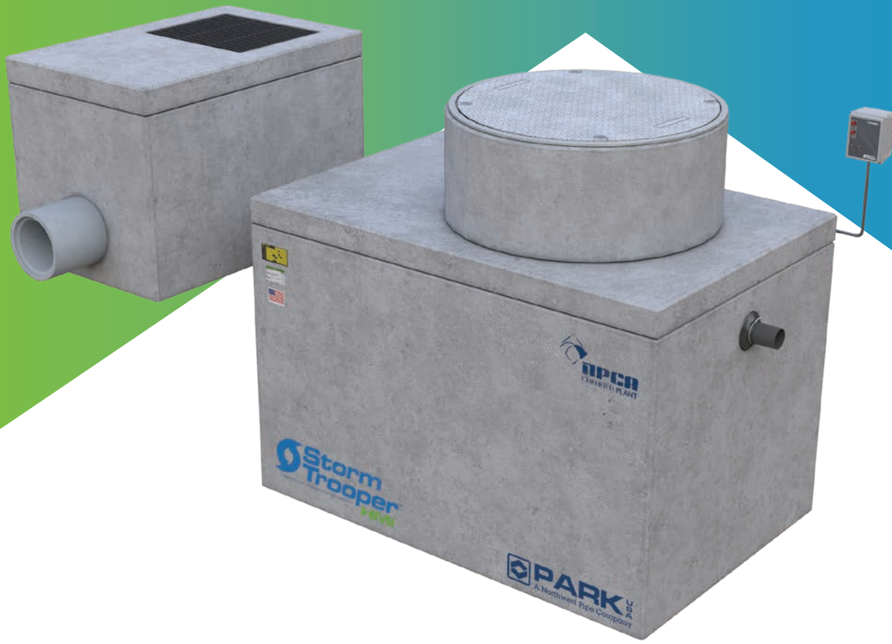
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SWAQ-BP-01	.
DATE 05/2019					

STORMTROOPER AQ CERTIFICATIONS SUMMARY

All Best Management Practices (BMPs) including StormTrooper AQ, require special approval by the Texas Commission on Environmental Quality (TCEQ) Edwards Aquifer Protection Program before they may be submitted for use on a project within the Edward's Aquifer area. The Edwards Aquifer Rules (30 TAC Chapter 213) regulate activities having the potential for polluting the Edwards Aquifer and associated surface waters. The goals of the rules are the protection of existing and potential uses of groundwater and the maintenance of Texas Surface Water Quality Standards. The activities addressed are those that pose a threat to water quality. The rules apply in the Edwards Aquifer recharge, transition, and contributing zones, which include portions of Medina, Bexar, Comal, Kinney, Uvalde, Hays, Travis and Williamson Counties.

The patented StormTrooper AQ (US 7,470,361 B2) has been tested in accordance with the Edward's Aquifer Innovative Technology and New Jersey Department of Environmental Protection testing protocol for Storm Water Treatment Devices. TCEQ approval of StormTrooper AQ is found in the Addendum sheet, RG-348, "Complying with the Edwards Aquifer Rules Technical Guidance on Best Management Practice." For further information concerning our patent, a copy of the patent US 7,470,361 B2 is included in Appendix B. The testing summary written by the Southwest Research Institute is included in Appendix C.

PARK USA
A Northwest Pipe Company



StormTrooper® HMI
Hazardous Material Interceptor

Features

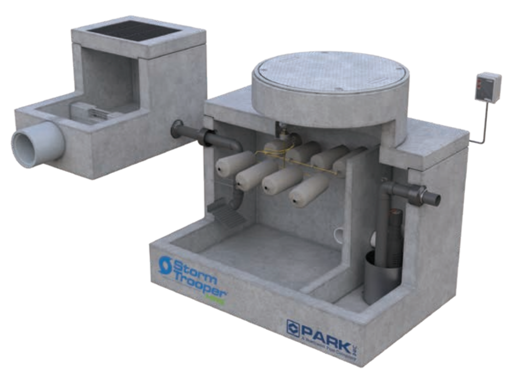
- Best Value BMP
- Larger Effective Area (EA) Treatment
- Accommodates spills up to 3,800 gallons
- Includes diversion structure to bypass flows exceeding the design Water Quality Volume (WQv)
- Enhanced Gravity Separation utilizing CMP Technology
- Texas Manufactured
- Third Party Tested by SwRI

Stormwater Treatment

Sustainable management of water quality is imperative if future generations have access to clean water. Stormwater runoff collects pollutants like trash, debris, oil and gasoline and washes it directly into the stormwater drainage system.

At gasoline stations there is a great risk of pollutants being washed into the stormwater. A spill of only one gallon of gasoline can contaminate 750,000 gallons of water. Many municipalities require spill containment measures around gasoline fueling stations to address this. The City of Austin, Texas specifically requires that a business with a gasoline fueling station have a hazardous material interceptor with the ability to accommodate spills up to 750 gallons in addition to the ability to treat stormwater runoff.

The StormTrooper® HMI is part of the StormTrooper® product family of patented technology that is designed to intercept free oil, grease, TSS, debris and other pollutants found in stormwater. In addition, the HMI system can accommodate fuel spills up to 3,800 gallons.



#BUILDING AMERICA!

SW | STORMTROOPER HMI Standard

LEED® COMPLIANT | NPCA | Steel Tank Institute | ASPE American Society of Plumbing Engineers | ASTM | BMP® BEST MANAGEMENT PRACTICE | IPC INTERNATIONAL PLUMBING CODE | UPC

How it works

The function of the StormTrooper® system is to intercept free oils and sediments from stormwater runoff and retain them for periodic removal. Each system is designed for a rated flow rate capacity of stormwater, known as the initial "first-flush" flow of a storm event. This first-flush will contain the majority of the pollutants washed from the catchment areas. Runoff can range from low to very high flow rates. High flows can be detrimental to stormwater treatment devices in that excessive flows tend to scour and resuspend the existing retained pollutants left from the previous storm event. The StormTrooper® utilizes engineered bypass features to handle excessive flows, permitting only the design flow through the interceptor while bypassing high flows to the storm sewer.

Normal Runoff Flow

Stormwater enters the StormTrooper® through the control manhole with one or multiple inlets and/or a grate inlet. The inlet invert guides the treatment flow into the interceptor's first chamber where the water velocity is significantly reduced, creating non-turbulent conditions. Here, buoyant materials rise to the surface and heavy solids start to settle. As the water flows to the second compartment, it must travel through coalescent media where hydrodynamic coalescence occurs. During this laminar flow period, hydrocarbons separate and rise to the upper region of the interceptor. Sediment particles do the opposite, as they are separated and sink to the interceptor bottom region. All pollutants remain in these lower and upper regions, where they are securely detained until they are removed during maintenance. The water exits the interceptor to the control manhole's outlet compartment and then continues to the storm sewer.

High Runoff Flow

The StormTrooper has a flow limiter which ensures that the rated flow capacity is not exceeded through the interceptor. During high flow, runoff enters the control manhole where water builds and rises in the control manhole's inlet compartment. The excess runoff that does not flow into the interceptor will flow through a trash screen and over the bypass weir. In the control manhole's second compartment, the bypassed flow and the treated flow from the interceptor merges and then exits to the storm sewer.

Visit **hmi.parkusa.com** for more information and design assistance.

StormTrooper® is protected by US Patents #7,470,361, 7,780,855 & Trademark Reg #2628121.

Model OSV

OilStop Valve is protected by US Patent #9,963,358

Peak WQq (cfs)	Spill Capacity (gal)	Total Volume (gal)	StormTrooper Model
0.282	750	1,500	HMI-100
0.352	1,600	3,200	HMI-125
0.422	2,000	4,000	HMI-150
0.493	3,000	5,900	HMI-175
0.563	3,200	6,400	HMI-200
0.634	3,800	7,600	HMI-225

Water Quality Flow is:

WQq = (qu) (A) (WQv)

WQv = Rv * i (inches)

A = area (impervious area in sq miles)

qu = unit peak discharge for NRCS Type III storm distribution

Rv = volumetric runoff coefficient =(0.05 + (0.009 (% impervious))

i = rainfall intensity

Example: A 2.75 acre gas station, in Austin TX, with 0.75 acres drainage basin of 100 percent impervious cover needs a treatment device that will hold a minimum of 750 gallon fuel spill during dry conditions and the ability to treat the Water Quality Volume (WQv) for the drainage basin. The StormTrooper is sized using a flow rate. Using the above methodology converts the required Water Quality Volume to a discharge rate for sizing purposes. The calculated WQq of 0.33 cfs is the controlling factor for sizing the unit. The StormTrooper model HMI-125 is recommended.

Where:

i = (0.5 + ((A impervious / A total) - 0.2)) = 0.57 inches*

Rv = 0.05 + (0.009 * 80) = 0.77

WQv = 0.77 * 0.57 = 0.439 watershed inches

qu = 677 cfs/mi^2/watershed inches

WQq = (qu) (A) (WQv)

WQq = (677) (0.001172) (0.439) = 0.33 cfs

*25-8-213 (B) Water Quality Control Standard, City of Austin

APPLICATIONS

Good to use in BMPs | Fueling Depots | Industrial | Parking Lots Streets & Highways | Low Impact Development | Green Infrastructure

HAZARDOUS MATERIALS INTERCEPTOR SPECIFICATIONS

A. General:

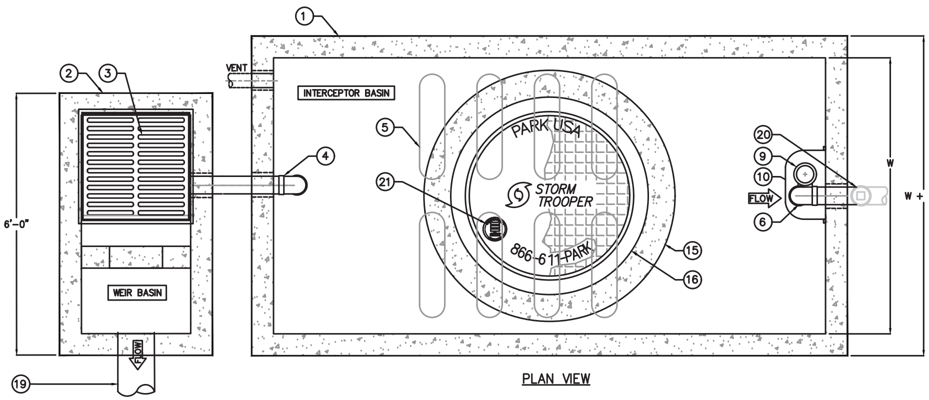
1. A Hazardous Material Interceptor shall be provided and installed as indicated on plans. System shall be ParkUSA StormTrooper Model HMI-xxx.
2. The Hazardous Material Interceptor shall be rectangular, atmospheric-type, precast concrete vessel intended to accommodate fuel spills and treat stormwater. The interceptor shall consist of overflow weir, chamber with vent, hydrophobic media pillows, high oil float sensor, sludge baffle, automatic oil stop valve, and high oil alarm panel. The Hazardous Material Interceptor tank and access port manhole covers shall be capable of withstanding HS-20 traffic loading.
3. The interceptor shall be provided with installation, operation & maintenance manuals.
4. Contractor shall submit ( ) copies of manufacturer's equipment specification for engineer's review. Shop drawings shall include the following:
    a. Detailed manufacturer's data including installation plan/elevation drawings, rebar layout drawings, and buoyancy calculations, all certified by a registered professional engineer.
    b. Manhole frame/cover specifications.
    c. Joint Sealant specifications.
    d. Coatings and/or concrete additives specifications.
5. The interceptor will accommodate fuel spills and intercept free oil, grease, TSS, debris and other pollutants found in stormwater.
6. The interceptor shall conform to criteria set forth by the International Association of Plumbing and Mechanical Officials (IAPMO), the American Petroleum Institute (API), and all other governing state and local code requirements. Interceptor shall be pre-approved by the authority having jurisdiction (AHJ).

B. Materials:

1. Concrete: shall be constructed of precast concrete having a 28 day minimum compressive strength of 4500 PSI using a Type I Portland Cement.
2. Steel Reinforcement: Shall be designed for H-20-44 traffic loading as defined by AASHTO Eighth Edition 2017 using a 30 percent impact factor. Structural reinforcement placement shall be in accordance to ACI. All reinforcement steel shall comply with ASTM A615 grade 60 or ASTM A706 Grade 60.
3. Cover: One (1) 48 inch diameter ring and cover and/or (1) 30"x60" Galvanized Steel Hatchway capable of withstanding HS-20 loading, UL approved, complete with extension (length to be verified in the field by the contractor), cover, gasket, and bolts. General contractor to add extensions as necessary to bring access ports to grade.
4. The oil-stop control valve shall contain a single moving part and be provided to prevent hydrocarbons from discharging form the separator and shall consist of a base, guides, inlet housing, and buoy and outlet connection. Valve shall be designed to operate on a specific gravity differential principle. The valve shall have a resilient ring gasket for positive shutoff and a manual reset device.
5. The high-oil level monitoring system shall consist of a panel and oil sensor. The panel shall be designed to function with the interceptor and be factory wired and tested. Enclosure shall be Nema 4X Intrinsic Safe construction. The monitor panel shall feature a red high-high-level alarm light, amber high-level alarm light, and audible alarm, test switch, and silence switch.
6. The Interceptor shall be equipped with a control manhole by-pass system to control unusually high rainfall. The control system shall prevent resuspension and scouring of the storm water interceptor and shall be equipped with a stainless- steel debris screen.

C. Installation:

1. The Interceptor shall be installed in strict accordance with the manufacturer's recommendations and according to plans and specifications. The manufacturer shall have representation during the setting procedure to insure proper installation.
2. The Hazardous Material Interceptor shall be installed on level, undisturbed soil or an approved compact fill with a load bearing capacity of minimum 2000 PSF and be backfilled after placement with an approved backfill material. Backfill of all sides of structure shall be performed simultaneously to prevent unbalanced lateral pressures during construction.
3. All joints shall be made watertight and seal joints with a plastic flexible gasket conforming to AASHTO M-198-75 for fuel resistant bitumen gasket.
4. Interceptor shall be filled with clean water prior to start-up of system. Follow manufacturer's recommendations for testing and start-up.



PLAN VIEW

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	INTERCEPTOR BASIN
2	1	WEIR BASIN
3	1	INLET CAST IRON FRAME & GRATE, H-20 RATED
4	1	INLET PIPING
5	8	HYDROPHOBIC MEDIA
6	1	6 MONTH STORM OUTLET PIPE
7	1	REMOVABLE DEBRIS BASKET STAINLESS STEEL
8	1	HIGH OIL FLOAT SWITCH
9	1	AUTOMATIC OIL STOP VALVE
10	1	SLUDGE BAFFLE
11	–	BITUMASTIC INTERIOR LINER
12	1	DIFFUSION BAFFLE
13	1	25YR STORM OVERFLOW WEIR
14	1	STORM EVENT OVERFLOW WEIR
15	–	MANWAY EXTENSIONS AS REQ'D
16	1	GALVANIZED BOLT DOWN RING & COVER, H-20 RATED
17	–	ALL JOINTS TO BE SEALED W/ PLASTIC FLEXIBLE GASKET
18	1	HIGH OIL ALARM PANEL MOUNTED AT REMOTE LOCATION
19	1	OVERFLOW PIPING
20	1	OUTLET PIPE CLEAN-OUT (BY OTHERS)
21	1	NAMEPLATE INDICATING: MFG: PARKUSA.COM TEL 888-611-PARK MODEL: HMI-1 DATE MANUFACTURED

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: MANHOLE FRAMES, COVERS OR GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30. MANHOLE SHALL BE TRAFFIC DUTY.

ENGINEERING DATA

INTERCEPTOR IS STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO REGULATORY STANDARDS. NOMINAL TOTAL LIQUID CAPACITY AND OIL HOLDING CAPACITY AS INDICATED. FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF INTERCEPTOR. USE DIMENSIONAL DATA AS SHOWN.

STORMWATER INTERCEPTOR ARE UTILIZED TO REDUCE NON-POINT SOURCE POLLUTION ASSOCIATED WITH OIL AND SEDIMENT. THE INTERCEPTOR IS DESIGNED TO ALLOW FOR THE DETAINMENT OF SETTLABLE & FLOATABLE SOLIDS & LIQUIDS. THE INTERCEPTOR SHOULD BE INSPECTED ON A REGULAR BASIS TO DETERMINE PROPER OPERATION AND CLEANING.

Influent oily water contains oil droplets of many different sizes. These droplets rise at different rates. Park utilizes a statistical program that divides the droplets into ranges of sizes and calculates the rise rates of each range. This calculation determines which droplets the separator can capture.

Contact our Engineering Dept. @ 866-611-PARK for a free performance evaluation.

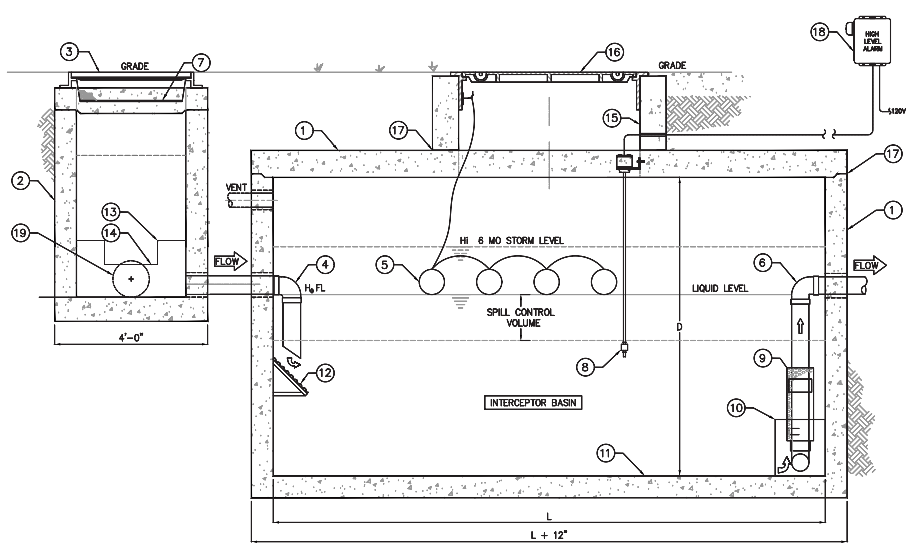
APPLICATIONS

- *MAINTENANCE WASHDOWN & GARAGES*
- *GOLF COURSES*
- *EQUIPMENT & TRANSPORTATION WASHDOWN FACILITIES*
- *CARWASHES*
- *STORMWATER RUNOFF*
- *SERVICE STATION FUEL DEPOTS*
- *MANUFACTURING FACILITY EFFLUENT WATER*
- *REMEDIATION WATER CLEANUP*
- *GENERAL INDUSTRY*

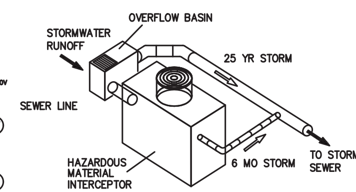
Storm Trooper Stormwater Treatment System Patent No: 7,470,361

STORMTROOPER HMI					
MODEL NO.	W, WIDTH (FT)	L, LENGTH (FT)	D, DEPTH (FT)	VOLUME (GAL)	Q (GPM)
HMI-100	5.0	8.0	5.0	1,496	126
HMI-125	6.0	12.0	6.0	3,231	158
HMI-150	6.0	12.0	7.5	4,039	190
HMI-165	6.0	15.0	6.0	4,039	221
HMI-175	7.5	15.0	7.0	5,891	253
HMI-200	7.6	15.0	7.6	6,481	284
HMI-225	7.5	15.0	9.0	7,574	316
HMI-250	8.0	17.0	9.5	9,664	348
HMI-275	8.0	17.0	10.5	10,681	379
HMI-300	10.0	20.0	9.0	13,464	411
HMI-325	10.0	20.0	9.8	14,586	442
HMI-350	10.0	20.0	10.5	15,708	474
HMI-375	10.0	20.0	11.3	16,830	506
HMI-400	10.0	20.0	12.5	18,700	537

HMI-1



ELEVATION



Design Tip:
The ParkUSA StormTrooper HMI is a patented stormwater wet vault specifically designed to accommodate fuel spills up to 750 gallons and intercept free oil, grease, TSS, debris and other pollutants found in stormwater. The system qualifies as a permanent best management practice (BMP) for EPA Stormwater Quality and SPCC management programs.

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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HAZARDOUS MATERIAL INTERCEPTOR
STORMTROOPER MODELS HMI-100 THRU 400

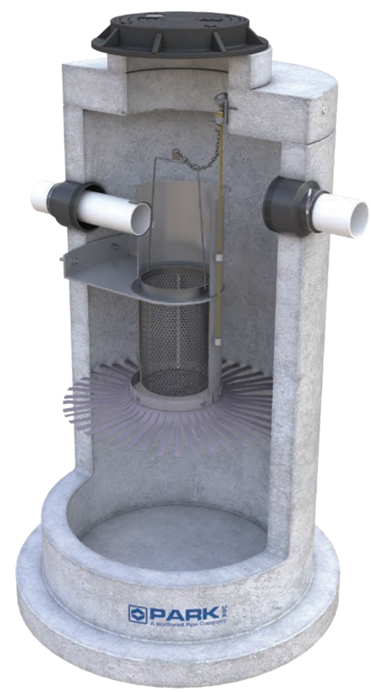
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	HMI-1	.
DATE 05/2019					

PARK USA
A Northwest Pipe Company

BIOBASIN™

Features

- Hydrocarbon capture
- Stormwater BMP
- Manufactured in Texas
- Made in the USA - Biobasins are made in America and meet the requirements of the Buy America Act



Biofiltration

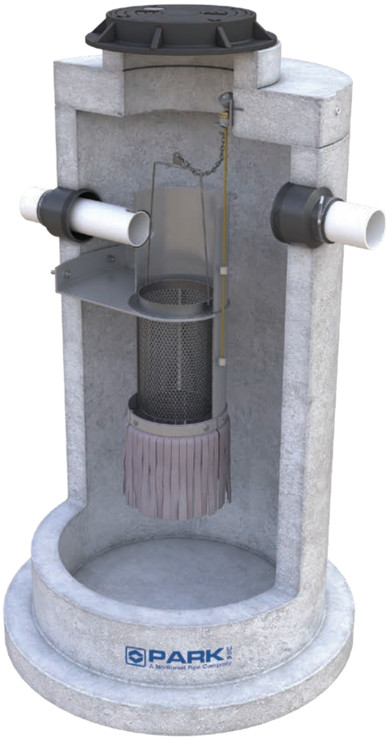
Floatable trash, sediment, and hydrocarbons are common pollutants that wash into storm sewer systems and are regulated by the Clean Water Act. The US Environmental Protection Agency (EPA) has established total maximum daily loads (TMDL) for pollutants throughout the country.

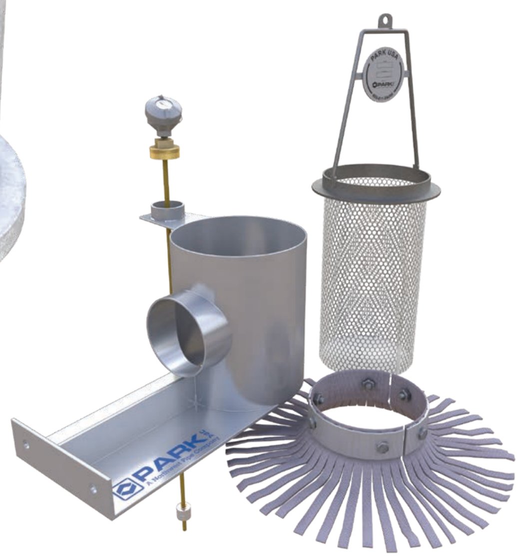
To address pollutants once they enter their storm sewer systems municipalities, land owners and developers are being required to install best management practices (BMP). The BioBasin® is a water quality and treatment device or BMP that is designed to specifically remove floatable trash, hydrocarbons and sediment from stormwater.

#BUILDING AMERICA!

SW | BIOBASIN Standard

LEED® COMPLIANT | NPCA | Steel Tank Institute | ASPE American Society of Plumbing Engineers | ASTM | BMP® BEST MANAGEMENT PRACTICE | IPC® INTERNATIONAL PLUMBING CODE | UPC®





How it Works

The BioBasin™ basin is outfitted with a textile boom. Floating pollutants are detained by an absorbent floating boom with an integral lower skirt portion comprised of fabric tendrils hanging beneath the boom. Water enters the structure from an inlet device, such as a grate or curb inlet, and is temporarily detained in the structure. Fluid is required to pass through the treatment fabric, which is submerged below the water level.

Floatable trash, sediment, and hydrocarbons are retained in the unit. The BioBasin™ includes a high oil sensing unit and a filter service alert. The service alert panel notifies of a clogged filter by means of an audible and visual alarm.

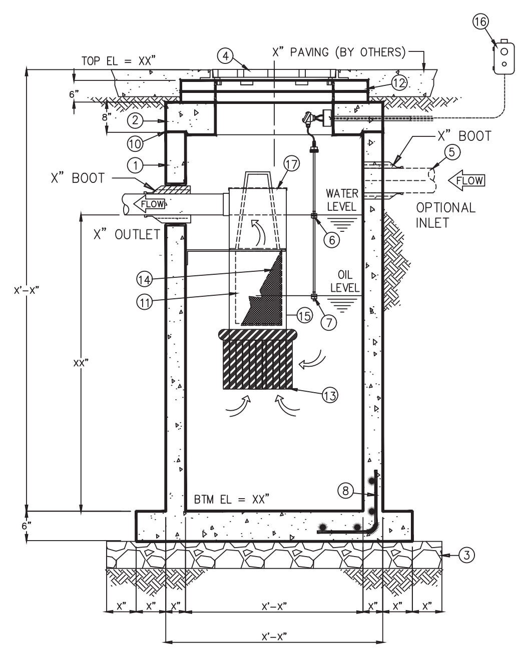
Visit **biobasin.parkusa.com** for more information and design assistance.

To request a quote or catalog, visit **request.parkusa.com.**

System Components

The BioBasin™ is designed with the following components:

- High oil sensor
- Filter maintenance sensor
- Removable filter screen
- "Service alert panel" notifies of clogged filter with audible and visual alarm
- Basket lid for grate inlet option



SECTION A–A

APPLICATIONS

Green Infrastructure

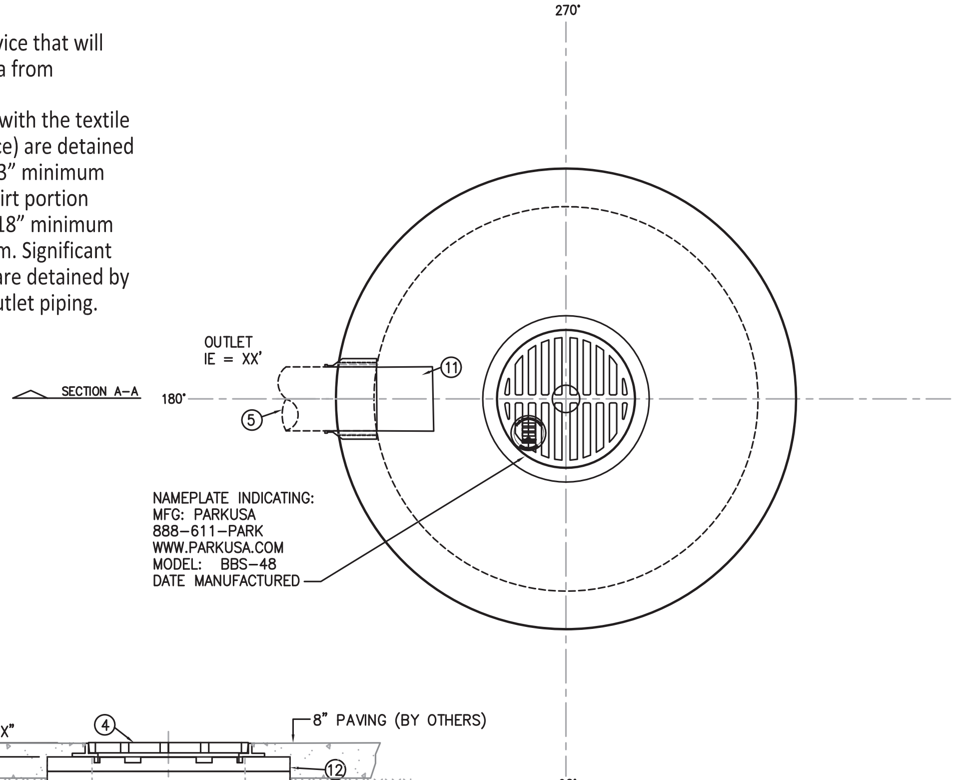
Parking Lots Streets & Highways

Low Impact Development

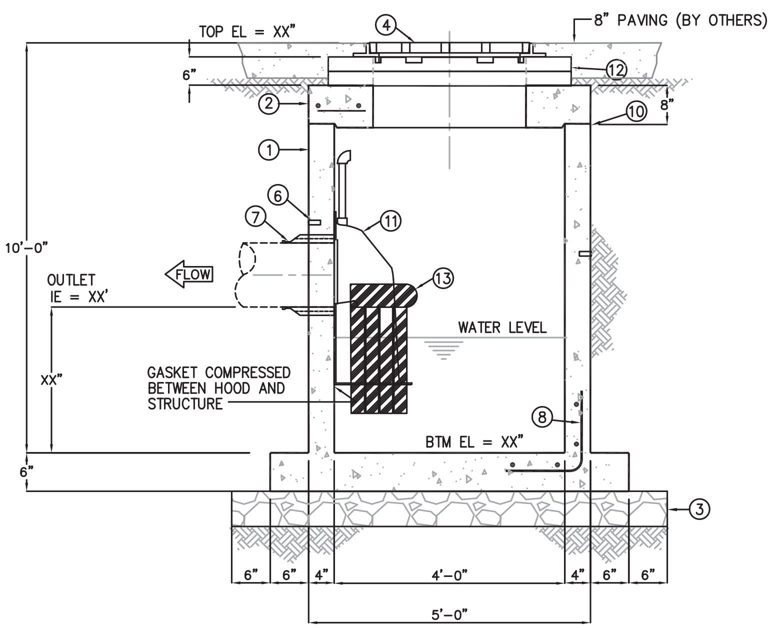
Commercial

How it Works:

The BioBasin is a water quality device that will remove hydrocarbons and Bacteria from stormwater.
The stormwater basin is outfitted with the textile boom. Floating hydrocarbons (trace) are detained by an adsorbent floating boom of 3" minimum diameter with an integral lower skirt portion comprised of fabric tendrils of an 18" minimum length that hang beneath the boom. Significant quantities of hydrocarbons (spill) are detained by a structural hood in front of the outlet piping.



PLAN VIEW



SECTION A–A

1. BASIN BOTTOM SECTION
2. BASIN TOP SECTION
3. 6" THK GRANULAR COMPACTED FILL BEDDING MATERIAL (BY OTHERS)
4. 24" HEAVY DUTY FRAME & GRATE, NEENAH MODEL R–2588A
5. ALL PIPING BY OTHERS (TYP)
6. TYPICAL LIFTING INSERT (TYP)
7. PRESS SEAL PIPE CONNECTIONS (TYP)
8. STEEL REINFORCEMENT (TYP)
9. ANCHOR BOLT FIELD INSTALLED
10. JOINT SEALANT, RAM–NEK
11. HYDRAULIC HOOD SEAL
12. ADJUSTMENT RINGS AS REQ'D
13. FILTRATION MEDIA

PROJECT :	
CUSTOMER :	
ENGINEER :	
ARCHITECT :	
QUOTE :	..
ORDER # :	..

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PARK USA
DESIGN FOR WATER

STORMWATER BIOFILTRATION SYSTEM
BIOBASIN™

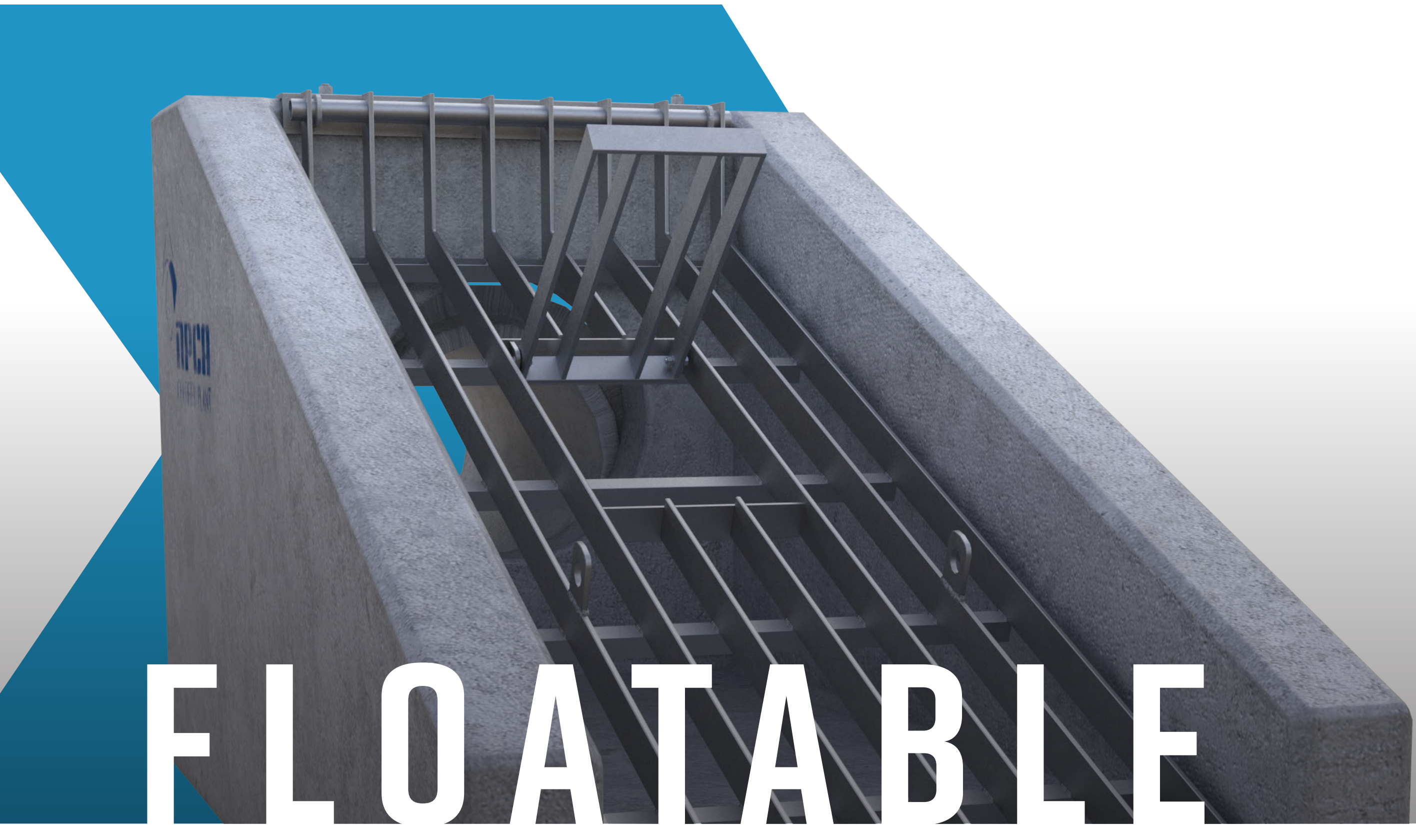
PM	DRN	ENG	DWG. NO.	REV.
JH	JE	AR	BBR48–1	A
DATE	01/18			

Specifications

CONCRETE : Class 1 concrete with of design strength of 4500 PSI at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth. Rated for H–20 Loading.

REINFORCEMENT: Grade 60 reinforced. No. 4 steel rebar to conform to ASTM A615 on required centers or equal. Bar bending and placement shall conform the latest ACI standards. Manhole shall conform to ASTM C478 – "Precast Reinforced Concrete Manholes".

NPCA CERTIFIED PLANT
ASTM C–478



FLOATABLE COLLECTION

NOTES

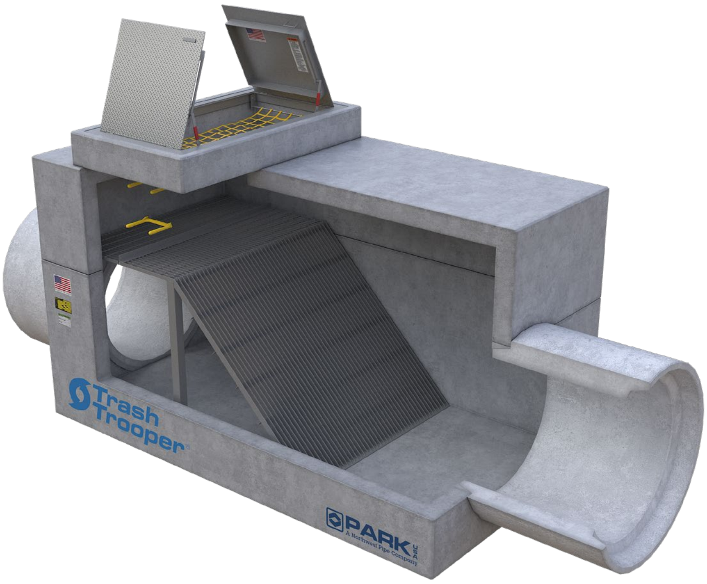
Trash Trooper®

BEST USE FOR:

STORMWATER

PARK USA
A Northwest Pipe Company

ENGINEERING
FACTS



GENERAL INFORMATION

Stormwater runoff is generated from rain and snowmelt events that flow over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground. The runoff picks up pollutants like trash, floatable material, chemicals, oils, and dirt/sediment that can harm our rivers, streams, lakes, and coastal waters. Unlike sanitary sewer systems, stormwater typically receives no treatment.

Trash, often referred to as floatables, is a pollutant. Trash in waters can prevent beneficial uses, degrade habitats and harm wildlife, and may endanger people's health. The Clean Water Act Section 303 (d) requires all states to evaluate and identify water bodies where current pollution controls are insufficient to attain water quality standards. Over 200 individual water body reaches in various states have been listed impaired for trash, debris or floatables since 1996.

To protect these resources, communities, construction companies, industries, and others, use stormwater controls, known as best management practices (BMPs). These BMPs filter out pollutants and/or prevent pollution by controlling it at its source. The benefits of effective stormwater runoff management include:

- protection of wetlands and aquatic ecosystems,
- improved quality of receiving waterbodies,
- conservation of water resources,
- protection of public health, and
- flood control.

Complying with the CWA, states, agencies and municipalities require new and/or redeveloped sites of one or more acre, to control the transport of pollutants into public waterways through municipal separate storm sewer systems (MS4) and other drainage systems. An example of an agency addressing the transport of floatable is the requirement established by Harris County TX. The Harris County and Harris County Flood Control District require all projects that constitute new development or significant redevelopment install a post-construction BMP to address floatable pollutants being discharged during and following rain events. Additional information may be found in Harris County Flood Control "Policy, Criteria, and Procedure Manual for Approval, and Acceptance of Infrastructure". Floatable collection devices include TrashTrooper, floatable collection screens, bar screen devices, inlet debris screens and pond outlet devices.

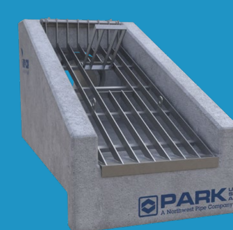
FEATURES

- Various bar screen designs
- Low-profile design
- LEED compliant
- Manufactured in Texas
- Easy installation and maintenance

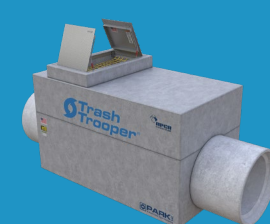
MODELS

There are various configurations and sizes available for the ParkUSA® TrashTrooper® to fit any application.

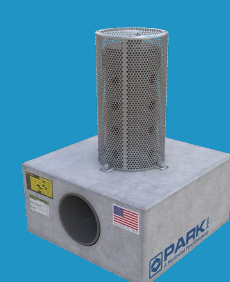
- **Model FCS**



- **Model TT-01**



- **Model SWPI**



OPERATION

ParkUSA's TrashTrooper captures unwanted floatable pollutants from stormwater systems. Inside the interceptor, the influent will encounter a floatable collection bar screen that traps floating debris as small as 1½" in size, preventing them from invading municipal separate storm sewer systems (MS4s), rivers, drainage swales, lakes, bayous, estuaries, and coastal waters. The separated effluent will exit the TrashTrooper and continue through the stormwater sewer system, leaving behind the debris in the product.

SYSTEM COMPONENTS

The TrashTrooper is designed with the following components:

- Bar screens
- Heavy-duty galvanized steel collection screens
- Inlet debris screens and pollution inserts
- Concrete vault piping when needed
- Access hatchways
- Ladder

DESIGN CONSIDERATIONS

Proper design starts with consulting city, county, state, or national EPA stormwater quality and flood control regulations for floatable collection systems' minimum structural BMP requirements.

The local jurisdiction storm water quality guidance manual may require all new development and significant redevelopment projects to install a post-construction best management practice (BMP). Post-construction BMPs take different forms, both structural and nonstructural. Examples of nonstructural controls include public service announcements, controlling sources of water pollution, and low-impact development. Structural controls are stormwater quality basins, detention ponds, vegetative practices, and floatable collection products.

Items to consider when designing a floatable collection device include:

- Accessibility by maintenance personnel
- Screen designed for hand raking of debris to top pf structure for dewatering and removal
- Net opening of the screen to allow a flow rate of 1.0 cfs
- Overall screen area designed for a 100-year/24-hr intensity rate
- Accessibility to clean between the screen and outlet

Regardless of size or design, an interceptor is only as good as its maintenance program. For this reason, most plumbing codes require the interceptors to be installed and located in areas easily accessible for inspection, cleaning, and removal of collected debris. The TrashTrooper is equipped with an access hatchway and an integrated ladder to permit access for cleaning all areas of the system. The product is to be installed below grade, and is typically located upstream of a primary treatment unit for further separation and treatment of smaller pollutants.

SIZING

The following sizing charts for the TrashTrooper interceptor are based on the method of equivalent open areas, where the cross-sectional area of the pipe is less than or equal to the open area of the grate with the maximum anticipated blinding. These charts should serve as a reference guide and are subject to change based on recommendation by the engineer of record.

A TrashTrooper should be sized based on the anticipated amount of debris, but also on the surrounding vegetation. Blinding of the screen can occur with the accumulation of captured pollutant; however, leaves, branches, and vegetation of the surrounding natural ecosystem can also contribute to blinding. ParkUSA has provided two sizing methods to take standard blinding and heavy blinding conditions into consideration. Standard blinding would take place on a site with minimal trees and other vegetation. Sites that are densely covered by trees and other vegetation are considered heavy blinding areas.

The following charts are based on sizing of the Trash Trooper interceptor using a methodology of equivalent areas; the cross-sectional area of the pipe ≤ the open area of the grate w/the maximum anticipated blinding. This chart is to be used as a reference only and is subject to change based on recommendation by the Engineer of Record.

Anticipated amount of debris is based on the amount of surrounding vigitation in addition to the trash. ParkUSA has provided two options as a guideline. Standard blinding would apply for a site with minimal trees and other vegetation. SItes with dense tree cover and vegetation would fall under the heavy blinding category.

The open area of the sloped grate in the treated flow area is assumed to be 92 percent of the total area of the grate. The bypass grate for the TTB-60, the sizes over 60" ⌀ will utilize the 2" x ¼" x 3" O.C. grate.

See table on following page.

MAINTENANCE

A preventative maintenance cleanout schedule is the most valuable tool for maintaining the proper operation of ParkUSA Floatable Collection Screen. Maintenance costs are greatly reduced if a good housekeeping plan for the property is implemented i.e., trash pickup, lawn maintenance, dumpster control, etc.

ParkUSA Floatable Collection Screen has no moving parts. ParkUSA recommends inspection after any major storm event and monthly inspections. Complete a Floatable Collection Screen Maintenance Report after each inspection and maintain for inspections and water quality permit renewals. Record and retain manifests of any vacuum truck pump cleanings.

Typical maintenance procedures include:

1. Monthly maintenance is advisable in heavy weather months and after any major storm event, using one inch in 24 hours as a minimum guideline depending on non-structural controls of the site.
2. Observation and maintenance is best accomplished during non-flow (dry weather) conditions 2-3 days after the most recent rain.
3. Observe for trash and debris and remove. It is particularly important to remove large solids like wood or trash bags as well as maintain cleared grating. Failure to remove trash and debris could be problematic to entire stormwater system.
4. ParkUSA Floatable Collection Screen units are designed based on the inlet/outlet pipe type and size. ParkUSA recommends removal and cleaning of unit when measurable pollutants reach 25 percent of pipe diameter. For example: If 48 inch HDPE pipe is utilized on the inlet of the Floatable Collection Screen cleaning should occur when measurable solids reach 12 feet.
5. Shut access grate and secure.

Vacuum trucks are the most effective and safe method of cleaning sediment from the Floatable Collection Screen.

HEAVY BLINDING LOADING
(CONSIDERABLE TRASH, LEAVES, PINE NEEDLES, ETC.)

TRASH TROOPER MODEL	TTB-24-66	TTB-30-66	TTB-36-66	TTB-42-66	TTB-48-66	TTB-54-66	TTB-60-66	TTB-72-66
MAX PIPE SIZE in (Ø IN INCHES)	24	30	36	42	48	54	60	72
AREA OF THE PIPE (FT2)	3.1	4.9	7.1	9.6	12.6	15.9	19.6	28.3
NOMINAL FLOWRATE (CFS USING V=4FPS)	12.4	19.6	28.4	38.4	50.4	63.6	78.4	113.2
HEIGHT OF PLATFORM ABOVE BASE (FT)	2	2.5	3	3.5	4	5	6	7.5
ANGLE OF THE GRATE (DEGREES)	45	45	45	45	45	45	45	45
LENGTH OF GRATE (FT)	2.8	3.5	4.2	4.9	5.6	8.7	9.6	12.7
INTERIOR WIDTH (FT)	6	6	6	7	7	7	7	7.5
AREA OF GRATE (FT2)	16.8	21	25.2	34.3	39.2	60.9	67.2	95.3
OPEN AREA OF GRATE (FT2)	15.5	19.3	23.2	31.6	36.1	56	61.8	87.6
OPEN AREA W/33% BLINDING (FT2)	5.1	6.4	7.7	10.4	11.9	18.5	20.4	28.4
BYPASS AREA (FT2)	17.3	17.3	17.3	20.2	20.2	20.2	20.2	27.6
SIZING OF OUTSIDE OF VAULT (WXLXH)	6'x11'x7'	6'x11'x9'	6'x11'x9'	7'x13'x9'	7'x13'x9'-7"	7'x13'x9'-2"	7'x13'x9'	8'-6"x16'x9'

STANDARD BLINDING LOADING
(NORMAL TRASH, LEAVES, PINE NEEDLES, ETC.)

TRASH TROOPER MODEL	TTB-24-33	TTB-30-33	TTB-36-33	TTB-42-33	TTB-48-33	TTB-54-33	TTB-60-33	TTB-72-33	TTB-84-33	TTB-96-33
MAX PIPE SIZE IN (Ø IN INCHES)	24	30	36	42	48	54	60	72	84	96
AREA OF THE PIPE (FT2)	3.1	4.9	7.1	9.6	12.6	15.9	19.6	28.3	38.5	50.3
NOMINAL FLOWRATE (CFS USING V=4FPS)	12.4	19.6	28.4	38.4	50.4	63.6	78.4	113.2	154	201.2
HEIGHT OF PLATFORM ABOVE BASE (FT)	2	2.5	3	3.5	4	5	6	7.5	7.5	7.5
ANGLE OF THE GRATE (DEGREES)	45	45	45	45	45	45	45	45	45	30
LENGTH OF GRATE (FT)	2.8	3.5	4.2	4.9	5.6	7	8.4	10.6	10.6	15.1
INTERIOR WIDTH (FT)	6	6	6	7	7	7	7	7.5	8	10
AREA OF GRATE (FT2)	16.8	21	25.2	34.3	39.2	49	58.8	79.5	84.8	151
OPEN AREA OF GRATE (FT2)	15.5	19.3	23.2	31.6	36.1	45.1	54.1	73.1	78	138.9
OPEN AREA W/33% BLINDING (FT2)	10.2	12.7	15.3	20.9	23.8	29.8	35.7	48.2	51.5	91.7
BYPASS AREA (FT2)	17.3	17.3	17.3	20.2	20.2	20.2	20.2	27.6	29.4	55.2
SIZING OF OUTSIDE OF VAULT (WXLXH)	6'x11'x7'	6'x11'x9'	6'x11'x9'	7'x13'x9'	7'x13'x9'-7"	7'x13'x9'-2"	7'x13'x9'	8'-6"x16'x9'	9'x18'x9'-6	11'x21'-2"x11'-2"

STORMWATER

Human life, as with all animal and plant life on the planet, depends upon water; at ParkUSA, we greatly value the importance of protecting this natural resource. To contribute our part in conservation and sustainability, ParkUSA offers a wide range of stormwater management products, which include stormwater quantity and stormwater quality units. We engineer advanced water technologies designed to combat pollution and control the flow of stormwater. These cleaning processes and water drainage methods provide breakthrough safety modifications for significant activities in day-to-day life. Most importantly, ParkUSA's mission is to offer innovative solutions to important stormwater management needs around the world. ParkUSA has been in the business of manufacturing stormwater infrastructure and water quality devices since the beginning of the Clean Water Act, providing sustainable solutions for today's stormwater issues. As always, we aim to impact people's lives and provide a safe quality of life for generations.

ParkUSA
IS ALWAYS READY TO
DESIGN AND
ENGINEER
PRODUCTS FOR YOUR
UPCOMING PROJECTS!

OTHER STORMWATER PRODUCTS


RAINTROOPER


STORMTROOPER


STORMTROOPER AQ

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PARK USA
A Northwest Pipe Company

TRASHTROOPER INTERCEPTOR SPECIFICATIONS

A. General:

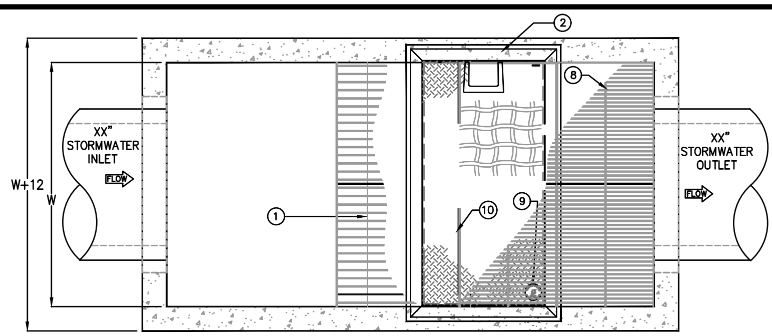
1. A Trash Interceptor shall be provided and installed as indicated on plans. System shall be ParkUSA StormTrooper Model SwST-xxx.
2. Manufacturer shall provide proof of third party testing by an independent applied engineering and physical sciences testing organization.
3. The Stormwater Interceptor shall be provided with installation, operation & maintenance manuals.
4. Contractor shall submit ( ) copies of manufacturer's equipment specification for engineer's review. Shop drawings shall include the following:
   a. Detailed manufacturer's data including installation plan/elevation drawings, rebar layout drawings, buoyancy calculations, and site specific coalescing plate performance analysis for TSS & TPH, all certified by a registered professional engineer.
   b. Manhole frame/cover specifications.
   c. Joint Sealant specifications.
   d. Coatings and/or concrete additives specifications.
5. Stormwater Interceptor design shall conform to criteria set forth by the International Association of Plumbing and Mechanical Officials (IAPMO), the American Petroleum Institute, and all other governing state and local code requirements.

B. Materials:

1. Concrete: tank shall be constructed of precast concrete having a 28 day minimum compressive strength of 4500 PSI using a Type I Portland Cement.
2. Steel Reinforcement: Interceptor shall be designed for H-20-44 traffic loading as defined by AASHTO Eighth Edition 2017 using a 30 percent impact factor. Structural reinforcement placement shall be in accordance to ACI. All reinforcement steel shall comply with ASTM A615 grade 60 or ASTM A706 Grade 60. Bar bending shall comply with latest ACI standards. Lifting inserts to be installed for handling and be installed per manufacturer's requirements.
3. Manhole Access: Interceptor shall have adequate manhole access covers and frames to permit access for cleaning all areas of the interceptor. Each manhole access shall be minimum 24 inch diameter clear opening. Cast iron frame and covers shall conform to ASTM A48-83 Class 30.
4. Fabricated steel access covers shall be ASTM A36 steel construction and hot-dipped galvanized after fabrication and rated traffic duty. Access covers shall be placed at grade elevation by using concrete extensions.
5. Pipe Material: All pipe and fittings shall be of materials approved by engineer.
6. Coalescing Media: The oil coalescing media pak shall be fabricated of an oleophillic polypropylene plastic material and assembled into modules with 304 stainless steel materials. Media assembly shall be self-cleaning and removable.
7. The Stormwater Interceptor shall be equipped with a control manhole by-pass system to control unusually high rainfall. The control system shall prevent resuspension and scouring of the storm water interceptor and shall be equipped with an adjustable weir and stainless-steel debris screen.

C. Installation:

1. The Interceptor shall be installed in strict accordance with the manufacturer's recommendations and according to plans and specifications. The manufacturer shall have representation during the setting procedure to insure proper installation.
2. The Stormwater Interceptor shall be installed on level, undisturbed soil or an approved compact fill with a load bearing capacity of minimum 2000 PSF.
3. The interceptor shall be backfilled after placement with an approved backfill material. Backfill of all sides of structure shall be performed simultaneously to prevent unbalanced lateral pressures during construction.
4. All joints shall be made watertight. Manufacturer shall seal joints with a plastic flexible gasket conforming to AASHTO M-198-75 for bitumen gasket.
5. All interceptor inlet/outlet/vent piping shall be installed in accordance to manufacturer's recommendations and project specifications.
6. Interceptor shall be filled with clean water prior to start-up of system. Follow manufacturer's recommendations for testing and start-up.



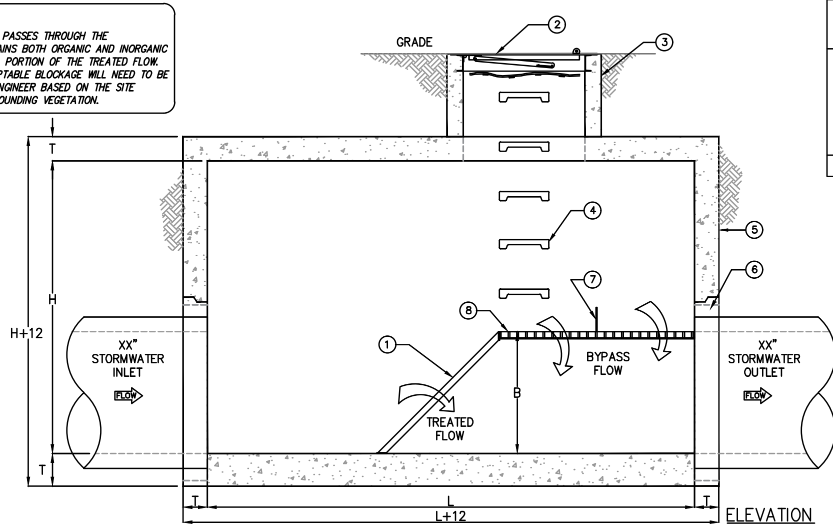
PLAN VIEW

NAMEPLATE

TTB-STD									
MODEL NO.	MAX PIPE SIZE	LENGTH (L) I.D.	WIDTH (W) I.D.	HEIGHT (H) I.D.	WALL THICKNES S (T)	GRATE (B)	AREA OF PIPE (ft^2)	OPEN AREA OF GRATE (ft^2)	AREA OF BYPASS (ft^2)
TTB–24–33	24"	10'–0"	5'–0"	8'–0"	0'–6"	24"	3.1	10.2	17.3
TTB–24–66	24"	10'–0"	5'–0"	8'–0"	0'–6"	24"	3.1	5.1	17.3
TTB–30–33	30"	10'–0"	5'–0"	8'–2"	0'–6"	30"	4.9	12.7	17.3
TTB–30–66	30"	10'–0"	5'–0"	8'–2"	0'–6"	30"	4.9	6.4	17.3
TTB–36–33	36"	10'–0"	5'–0"	8'–2"	0'–6"	36"	7.1	15.3	17.3
TTB–36–66	36"	10'–0"	5'–0"	8'–2"	0'–6"	36"	7.1	7.7	17.3
TTB–42–33	42"	12'–0"	6'–0"	8'–0"	0'–6"	42"	9.6	17.80	17.3
TTB–42–66	42"	12'–0"	6'–0"	8'–0"	0'–6"	42"	9.6	8.90	17.3
TTB–48–33	48"	12'–0"	6'–0"	8'–7"	0'–6"	48"	12.6	20.4	17.3
TTB–48–66	48"	12'–0"	6'–0"	8'–7"	0'–6"	48"	12.6	10.20	17.3
TTB–54–33	54"	13'–0"	7'–0"	9'–2"	0'–6"	54"	15.9	45.1	20.2
TTB–60–33	60"	13'–0"	7'–0"	9'–0"	0'–6"	60"	19.6	54.1	20.2
TTB–72–33	72"	15'–0"	7'–6"	8'–9"	0'–6"	72"	28.3	48.2	27.6

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	GALV. STEL BAR GRATE 2" x 1/4" @ 3" O.C.
2	1	XX"xXX" GALVANIZED STEEL HATCHWAY W/ LOCK HASP (OFFSET) w/SAFETY NET
3	1	CONCRETE EXTENSION AS REQUIRED
4	1	OSHA APPROVED STEPS @ 12" O.C.
5	1	PRECAST CONCRETE TRASH SEPARATOR
6	1	XX"ø HOLE FOR PIPE
7	1	KICKPLATE
8	1	REMOVABLE GALV. 1–1/4"x3/16" SERRATED GRATE
9	1	NAMEPLATE MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL: TTB–XX DATE MANUFACTURED S/N: XXXXXX
10	1	SAFETY NET

Design Tip:
AS THE STORM WATER PASSES THROUGH THE TRASHTROOPER IT RETAINS BOTH ORGANIC AND INORGANIC DEBRIS AND BLOCKS A PORTION OF THE TREATED FLOW. THE AMOUNT OF ACCEPTABLE BLOCKAGE WILL NEED TO BE DETERMINED BY THE ENGINEER BASED ON THE SITE CONDITIONS AND SURROUNDING VEGETATION.



ELEVATION

TTB-1

A	.	.	.
REV	DATE	BY	DESCRIPTION

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA®
www.parkusa.com 888–611–PARK

TRASHTROOPER
SOLIDS INTERCEPTOR MODEL TTB–24 THRU 72

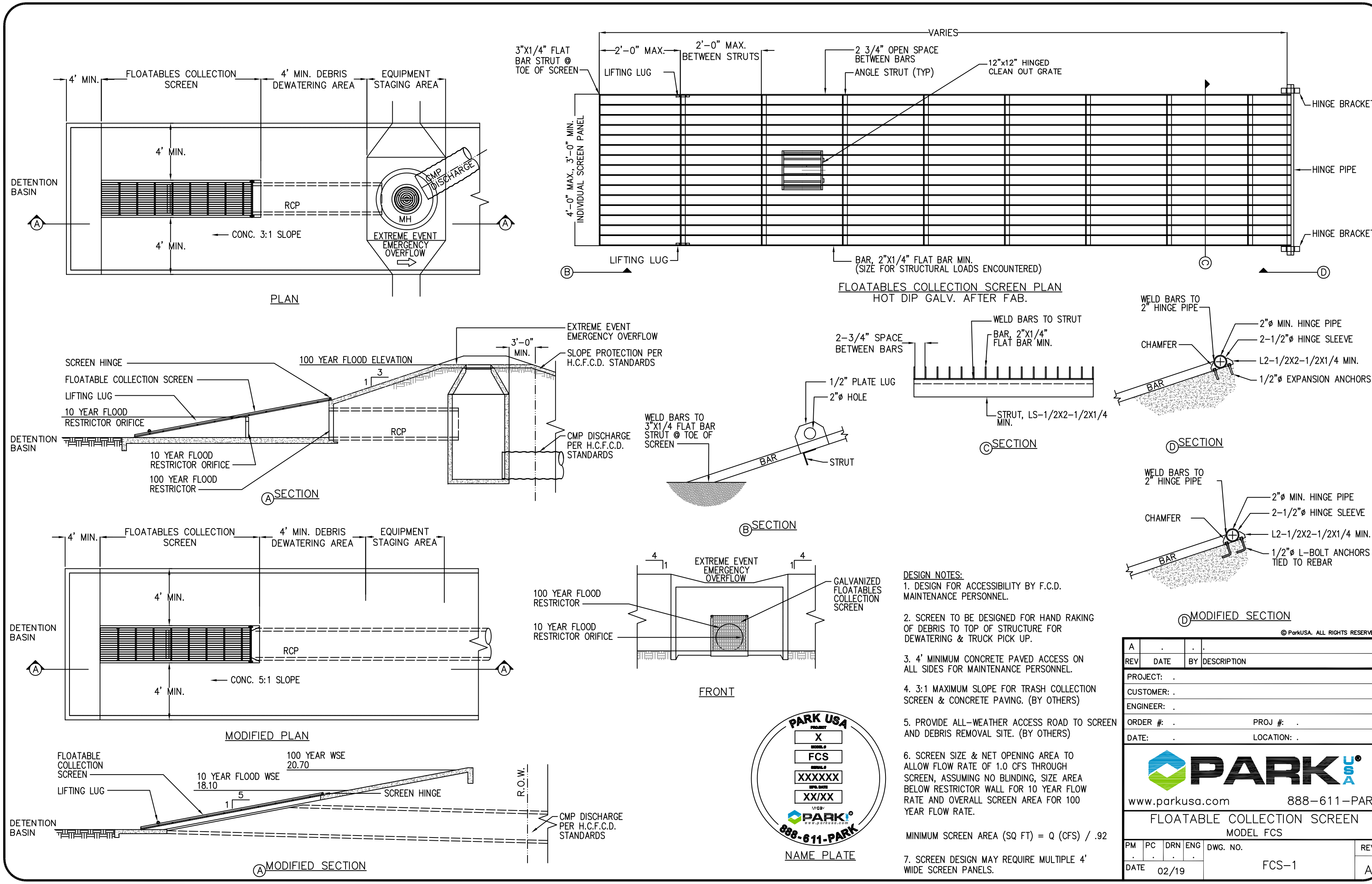
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	TTB–1	.
DATE .					

SPECIFICATIONS

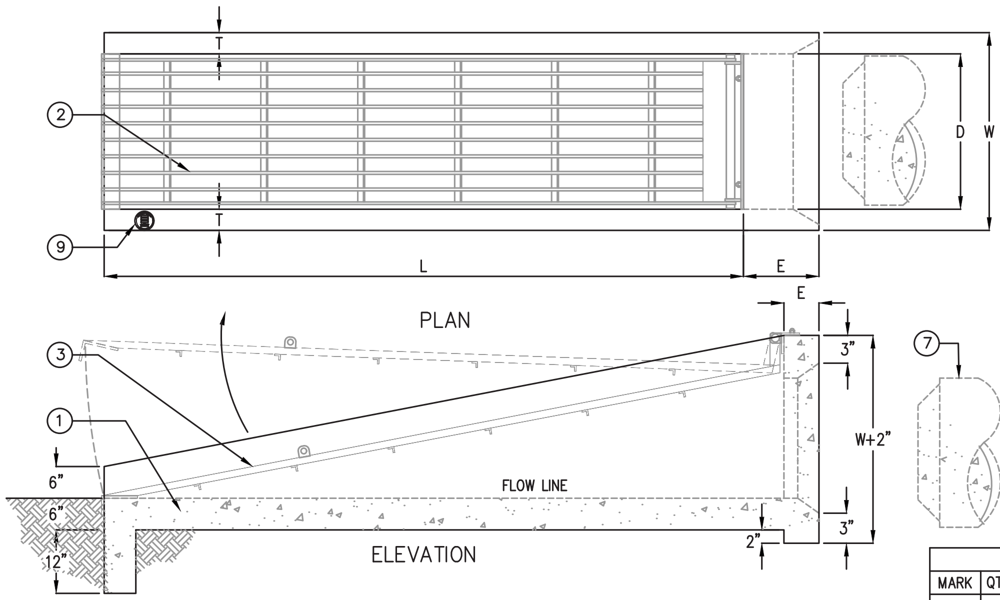
CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. COMBINED ASSEMBLY WEIGHT OF APPROXIMATELY 36,100 LBS.

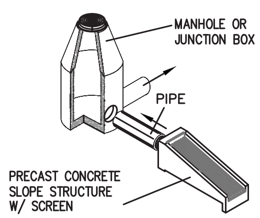
REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING & PLACEMENT SHALL COMPLY WITH THE LATEST ACI STANDARDS FOR PRECAST CONCRETE. LIFTING INSERTS SHALL BE INSTALLED PER MFG'S REQUIREMENTS.

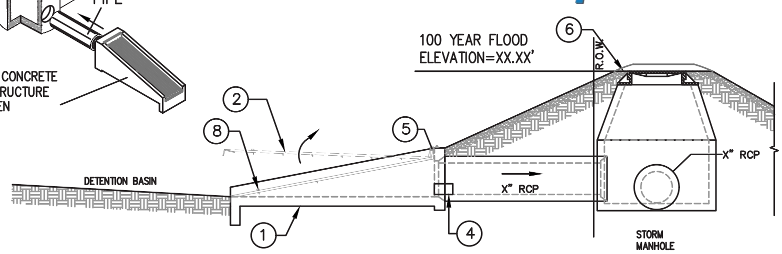
STEEL: ALL STEEL SHALL BE A36 STEEL WELDED IN ACCORDANCE TO AWS D1.1. ALL STEEL SHALL BE HOT–DIPPED GALVANIZED AFTER FABRICATION.



FLOATABLE COLLECTION







APPLICATION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	PRECAST CONCRETE SLOPE STRUCTURE
2	1	FLOATABLES COLLECTION SCREEN, GALVANIZED STEEL, 2"x¼" BARS @ 3" O.C., 2¾" CLEAR OPENING
3	1	2"x¼" GALVANIZED ANGLE BOLTED TO CONCRETE WITH ½" ANCHOR BOLTS
4	1	5 LF X" RESTRICTOR BRICKED IN PLACE
5	1	SCREEN HINGE
6	1	EXTREME EVENT EMERGENCY OVERFLOW
7	1	PIPE BY OTHERS
8	1	LIIFTING LUG (TYP)
9	1	NAMEPLATE INDICATING: MFG: ParkUSA 888-611-PARK WWW.PARKUSA.COM MODEL: DSHD-HC-XX DATE MANUFACTURED

IN COMPLIANCE WITH HARRIS COUNTY FLOOD CONTROL, 2012

DESIGN NOTES:
1. DESIGNED FOR ACCESSIBILITY BY MAINTENANCE PERSONNEL
2. SCREEN TO BE DESIGNED FOR HAND RAKING OF DEBRIS TO TOP OF STRUCTURE FOR DEWATERING & TRUCK PICK UP.
3. 4' MINIMUM CONCRETE PAVED ACCESS ON ALL SIDES FOR MAINTENANCE PERSONNEL. (BY OTHERS)
4. 3:1 MAXIMUM SLOPE FOR TRASH COLLECTION SCREEN & PAVING.
5. PROVIDE ALL-WEATHER ACCESS ROAD TO SCREEN & DEBRIS REMOVAL SITE. (BY OTHERS)
6. SCREEN SIZE & NET OPENING AREA TO ALLOW FLOW RATE OF 1.0 CFS THROUGH SCREEN, ASSUMING NO BLINDING, SIZE AREA BELOW RESTRICTOR WALL FOR 10 YEAR FLOW RATE & OVERALL SCREEN AREA FOR 100 YEAR FLOW RATE.
   MINIMUM SCREEN AREA (SQ FT) = Q (cfs) / 0.92
7. SCREEN DESIGN MAY REQUIRE MULTIPLE PANELS.

DSHD-HC-1

MODEL	D	SLOPE	SCREEN AREA SQ. FT.	W	L	T	E	WEIGHT
DSHD-HC-12-4	12"	4:1	4.25	1'-10"	4'-4"	5"	12"	2040
DSHD-HC-15-4	15"	4:1	6.54	2'-1¼"	5'-4"	5"	12"	2040
DSHD-HC-18-4	18"	4:1	9.32	2'-5¼"	6'-4"	5"	12"	2600
DSHD-HC-24-4	24"	4:1	16.32	2'-11½"	8'-4"	5"	12"	3880
DSHD-HC-30-4	30"	4:1	25.3	3'-5¼"	10'-4"	5"	12"	5400
DSHD-HC-36-4	36"	4:1	35.54	4'-3"	12'-0"	6"	12"	9040

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION INCLUDING WALLS AND FLOOR.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING AND PLACEMENT SHALL WITH THE LATEST ACI STANDARDS.

SCREEN: ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123

ASCE · ASTM C-913 · ASPE MEMBER · NPCA CERTIFIED PLANT

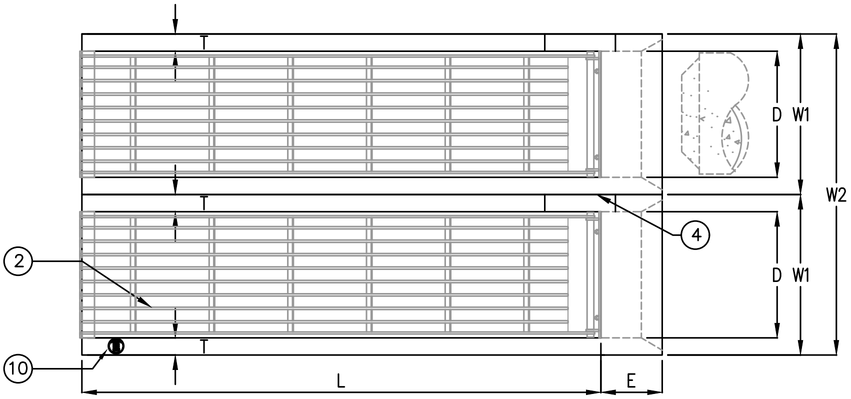
A	.	.	.
REV	DATE	BY	DESCRIPTION

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

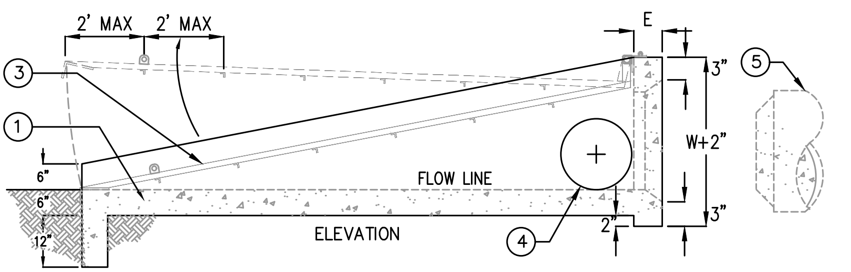
PARK USA®
www.parkusa.com 888-611-PARK

FLOATABLES COLLECTION SCREEN
MODEL 12 THRU 36

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.		
DATE	05/2019			DSHD-HC-1	A



PLAN



ELEVATION

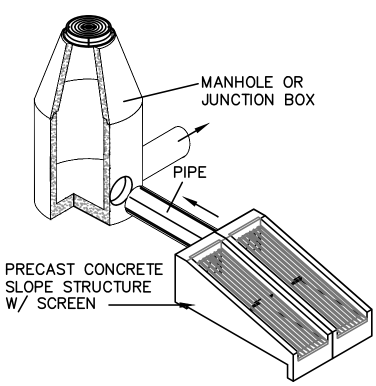
DESIGN NOTES:
1. DESIGN FOR ACCESSIBILITY BY HCFCD MAINTENANCE PERSONNEL
2. SCREEN TO BE DESIGNED FOR HAND RAKING OF DEBRIS TO TOP OF STRUCTURE FOR DEWATERING & TRUCK PICK UP.
3. 4' MINIMUM CONCRETE PAVED ACCESS ON ALL SIDES FOR MAINTENANCE PERSONNEL. (BY OTHERS)
4. 3:1 MAXIMUM SLOPE FOR TRASH COLLECTION SCREEN & PAVING.
5. PROVIDE ALL-WEATHER ACCESS ROAD TO SCREEN & DEBRIS REMOVAL SITE. (BY OTHERS)
6. SCREEN SIZE & NET OPENING AREA TO ALLOW FLOW RATE OF 1.0 CFS THROUGH SCREEN, ASSUMING NO BLINDING, SIZE AREA BELOW RESTRICTOR WALL FOR 10 YEAR FLOW RATE & OVERALL SCREEN ARE FOR 100 YEAR FLOW RATE.
   MINIMUM SCREEN AREA (SQ FT) = Q (cfs) / 0.92
7. SCREEN DESIGN MAY REQUIRE MULTIPLE SCREEN PANELS.

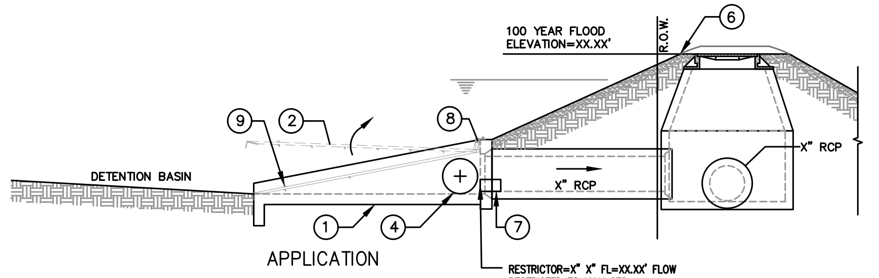
KEYED NOTES

MARK	QTY	DESCRIPTION
1	2	PRECAST CONCRETE SLOPE STRUCTURE
2	2	FLOATABLES COLLECTION SCREEN, GALVANIZED STEEL, 2" x 1/4" BARS @ 3" O.C., 2 3/4" CLEAR OPENING
3	2	2"x1/4" GALVANIZED ANGLE BOLTED TO CONCRETE WITH 1/2" ANCHOR BOLTS
4	1	INTERCONNECT PIPING
5	1	PIPE BY OTHERS
6	1	EXTREME EVENT EMERGENCY OVERFLOW
7	1	5 LF X" RESTRICTOR BRICKED IN PLACE
8	2	SCREEN HINGE
9	–	LIFTING LUG (TYP)
10	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: DSHD-HC-M2 DATE MANUFACTURED

MODEL	PIPE DIA D	SLOPE	SCREEN AREA SQ. FT.	W1	W2	L	T	E	WEIGHT LBS EA X 2
DSHD-HC-M2-12-2	12"	3:1	6.50	1'-10"	3'-8"	3'-3"	5"	12"	1680
DSHD-HC-M2-15-2	15"	3:1	10.00	2'-1"	4'-2"	4'-0"	5"	12"	1680
DSHD-HC-M2-18-2	18"	3:1	14.26	2'-5"	4'-10"	4'-9"	5"	12"	2120
DSHD-HC-M2-24-2	24"	3:1	25.00	3'-0"	6'-0"	6'-3"	5"	12"	3120
DSHD-HC-M2-30-2	30"	3:1	38.76	3'-6"	7'-0"	7'-9"	5"	12"	4280
DSHD-HC-M2-36-2	36"	3:1	60.00	4'-3"	8'-6"	10'-0"	6"	12"	6200

IN COMPLIANCE WITH HARRIS COUNTY FLOOD CONTROL, 2012





APPLICATION

DSHD-HC-M2

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION INCLUDING WALLS AND FLOOR.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING AND PLACEMENT SHALL WITH THE LATEST ACI STANDARDS.

SCREEN: ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123.

ASCE · NPCA CERTIFIED PLANT · AMERICAN SOCIETY OF SANITARY ENGINEERING · ASPE MEMBER · ASTM C-913

A	.	.	.
REV	DATE	BY	DESCRIPTION

STORM MANHOLE

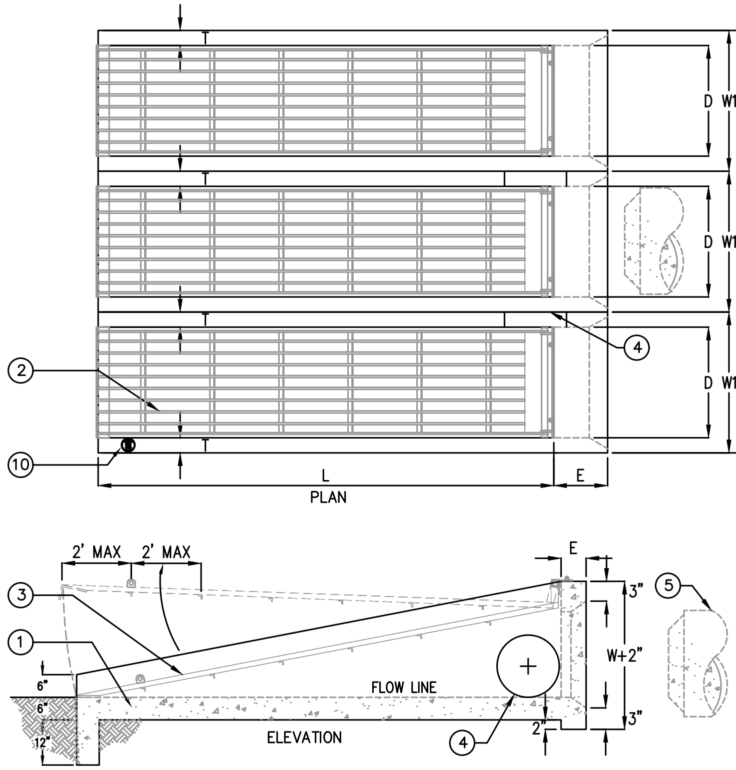
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

FLOATABLES COLLECTION SCREEN
MODEL DSHD-HC-M2 (MULTIPLE X2)

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.		
DATE	05/2019			DSHD-HC-M2	A

FLOATABLE COLLECTION



DESIGN NOTES:

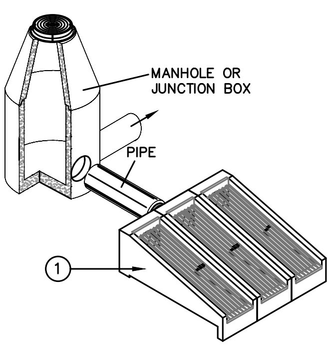
1. DESIGN FOR ACCESSIBILITY BY MAINTENANCE PERSONNEL
2. SCREEN TO BE DESIGNED FOR HAND RAKING OF DEBRIS TO TOP OF STRUCTURE FOR DEWATERING & TRUCK PICK UP.
3. 4' MINIMUM CONCRETE PAVED ACCESS ON ALL SIDES FOR MAINTENANCE PERSONNEL. (BY OTHERS)
4. 3:1 MAXIMUM SLOPE FOR TRASH COLLECTION SCREEN & PAVING.
5. PROVIDE ALL-WEATHER ACCESS ROAD TO SCREEN & DEBRIS REMOVAL SITE. (BY OTHERS)
6. SCREEN SIZE & NET OPENING AREA TO ALLOW FLOW RATE OF 1.0 CFS THROUGH SCREEN, ASSUMING NO BLINDING, SIZE AREA BELOW RESTRICTOR WALL FOR 10 YEAR FLOW RATE & OVERALL SCREEN AREA FOR 100 YEAR FLOW RATE.
   MINIMUM SCREEN AREA (SQ FT) = Q (cfs) / 0.92
7. SCREEN DESIGN MAY REQUIRE MULTIPLE SCREEN PANELS.

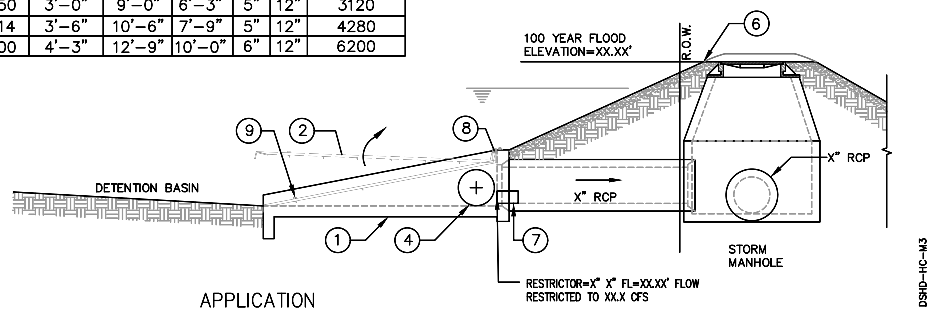
KEYED NOTES

MARK	QTY	DESCRIPTION
1	3	PRECAST CONCRETE SLOPE STRUCTURE
2	3	FLOATABLES COLLECTION SCREEN, GALVANIZED STEEL, 2"x1/4" BARS @ 3" O.C., 2 3/4" CLEAR OPENING
3	3	2"x1/4" GALVANIZED ANGLE BOLTED TO CONCRETE WITH 1/2" ANCHOR BOLTS
4	2	INTERCONNECT PIPING
5	1	PIPE BY OTHERS
6	1	EXTREME EVENT EMERGENCY OVERFLOW
7	1	5 LF X" RESTRICTOR BRICKED IN PLACE
8	3	SCREEN HINGE
9	–	LIFTING LUG (TYP)
10	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: DSHD-HC-M3 DATE MANUFACTURED

MODEL	PIPE DIA D	SLOPE	SCREEN AREA SQ. FT.	W1	W3	L	T	E	WEIGHT LBS EA X 3
DSHD-HC-M3-12-2	12"	3:1	9.75	1'-10"	5'-6"	3'-3"	5"	12"	1680
DSHD-HC-M3-15-2	15"	3:1	15.00	2'-1"	6'-3"	4'-0"	5"	12"	1680
DSHD-HC-M3-18-2	18"	3:1	21.39	2'-5"	7'-3"	4'-9"	5"	12"	2120
DSHD-HC-M3-24-2	24"	3:1	37.50	3'-0"	9'-0"	6'-3"	5"	12"	3120
DSHD-HC-M3-30-2	30"	3:1	58.14	3'-6"	10'-6"	7'-9"	5"	12"	4280
DSHD-HC-M3-36-2	36"	3:1	90.00	4'-3"	12'-9"	10'-0"	6"	12"	6200

IN COMPLIANCE WITH HARRIS COUNTY FLOOD CONTROL, 2012





APPLICATION

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION INCLUDING WALLS AND FLOOR.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING AND PLACEMENT SHALL WITH THE LATEST ACI STANDARDS.

SCREEN: ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123.

ASCE | NPCA CERTIFIED PLANT | AMERICAN SOCIETY OF SANITARY ENGINEERING | ASPE MEMBER | ASTM C-913

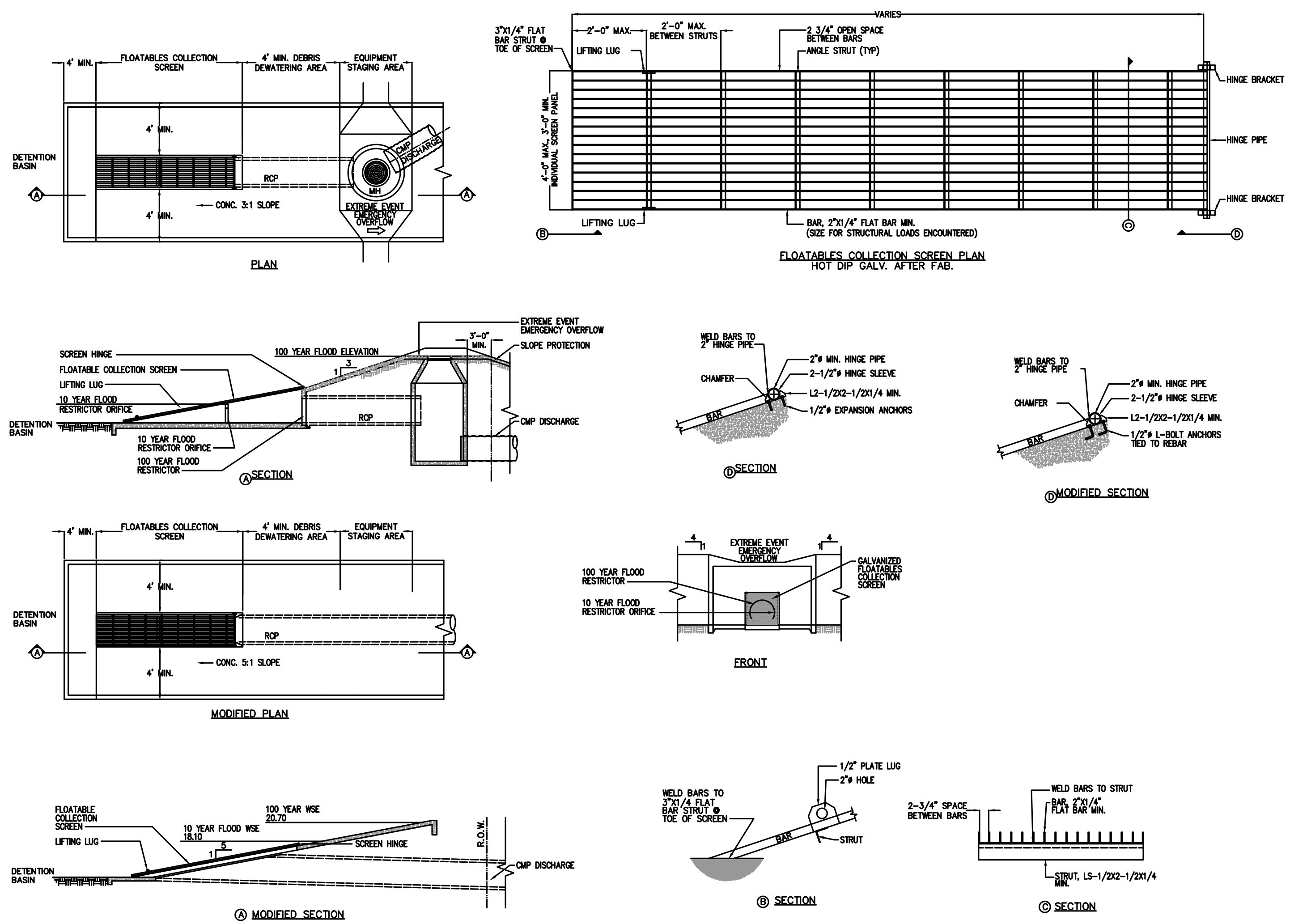
A	.	.	.
REV	DATE	BY	DESCRIPTION

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

FLOATABLES COLLECTION SCREEN
MODEL FCS-M3 (MULTIPLE X3)

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.		
DATE	05/2019			DSHD-HC-M3	A



DESIGN NOTES:

1. DESIGN FOR ACCESSIBILITY BY MAINTENANCE PERSONNEL.
2. SCREEN TO BE DESIGNED FOR HAND RAKING OF DEBRIS TO TOP OF STRUCTURE FOR DEWATERING & TRUCK PICK UP.
3. 4' MINIMUM CONCRETE PAVED ACCESS ON ALL SIDES FOR MAINTENANCE PERSONNEL.
4. 3:1 MAXIMUM SLOPE FOR TRASH COLLECTION SCREEN & CONCRETE PAVING. (BY OTHERS)
5. PROVIDE ALL-WEATHER ACCESS ROAD TO SCREEN AND DEBRIS REMOVAL SITE. (BY OTHERS)
6. SCREEN SIZE & NET OPENING AREA TO ALLOW FLOW RATE OF 1.0 CFS THROUGH SCREEN, ASSUMING NO BLINDING, SIZE AREA BELOW RESTRICTOR WALL FOR 10 YEAR FLOW RATE AND OVERALL SCREEN AREA FOR 100 YEAR FLOW RATE.

MINIMUM SCREEN AREA (SQ FT) = Q (CFS) / 0.92

7. SCREEN DESIGN MAY REQUIRE MULTIPLE 4' WIDE SCREEN PANELS.

IN COMPLIANCE WITH HARRIS COUNTY FLOOD CONTROL, 2012

DSHD-HC-DETAIL

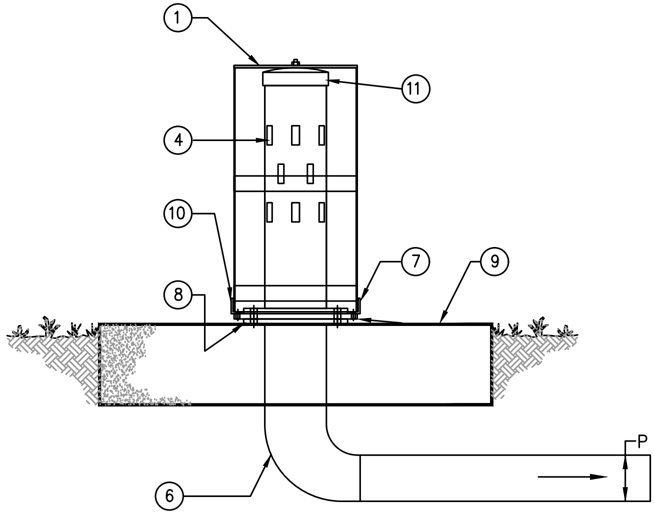
A	.	.	.
REV	DATE	BY	DESCRIPTION

PROJECT: .
CUSTOMER: .
ENGINEER: . S/N #: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK
FLOATABLE COLLECTION SCREEN
MODEL-FCS

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	DSHD-HC-DETAIL	A
DATE	05/2019				

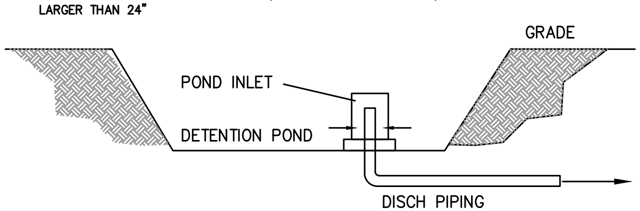
FLOATABLE COLLECTION



ELEVATION

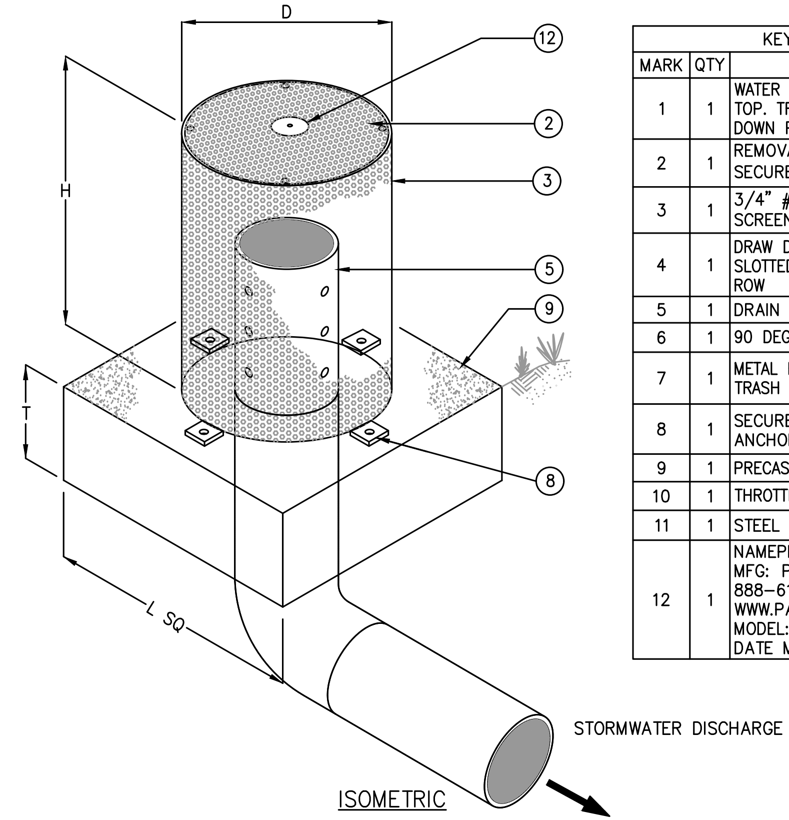
MODEL	PIPE SIZE [IN]	SCREEN AREA [SQ FT]	SCREEN DIAMETER, D [IN]	SCREEN HEIGHT, H [IN]	PAD LENGTH, L [IN]	PAD THICKNESS, T [IN]
SCHEDULE						
SWPI–EM–06	6	2.11	8	10.11	20	6
SWPI–EM–08	8	3.76	10	14.72	22	6
*SWPI–EM–10	10	5.87	16	12.81	28	6
*SWPI–EM–12	12	8.45	20	14.37	32	6
*SWPI–EM–15	15	13.21	26	16.78	38	8
*SWPI–EM–18	18	19.02	32	19.24	44	8
*SWPI–EM–24	24	33.81	42	26.39	54	8

*CONCRETE PAD DESIGN MAY VARY BY APPLICATION
NOTE: FLOATABLE COLLECTION SCREEN, MODELS FCS–1 OR HCFCS, RECOMMENDED FOR PIPES LARGER THAN 24"



TYPICAL APPLICATION

ASCE · NPCA CERTIFIED PLANT · AMERICAN SOCIETY OF SANITARY ENGINEERING · ASPE MEMBER · ASTM C–913



ISOMETRIC

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	WATER QUALITY POND SURFACE TOP. TRASH CAGE OVER DRAW DOWN PIPE
2	1	REMOVABLE COVER SCREEN SECURED W/ BOLTS
3	1	3/4" #9 EXPANDED METAL SCREEN, HDG
4	1	DRAW DOWN PIPE w/ 3 ROWS OF SLOTTED OPENINGS 6 SLOTS EACH ROW
5	1	DRAIN PIPING
6	1	90 DEGREE ELBOW (BY OTHERS)
7	1	METAL BRACKET BOLTED TO TRASH BASKET & THROTTLE PLATE
8	1	SECURE TO PAD W/ GALV 3/8" ANCHOR BOLTS
9	1	PRECAST CONCRETE PAD
10	1	THROTTLE PLATE W/ORIFICE
11	1	STEEL CAP
12	1	NAMEPLATE MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL: SWPI–EM DATE MANUFACTURED

SWPI–EM

SPECIFICATIONS

CONCRETE : CLASS 1 CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING AND PLACEMENT SHALL CONFORM THE LATEST ACI STANDARDS. UNIT SHALL CONFORM TO ASTM C915 – "PRECAST REINFORCED CONCRETE STRUCTURES".

SCREEN: ALL STEEL SHALL BE A36 STEEL WELDED IN ACCORDANCE TO AWS D1.1. ALL STEEL SHALL BE HOT–DIPPED GALVANIZED AFTER FABRICATION.

ENGINEERING DATA

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF STRUCTURE. USE DIMENSIONAL DATA AS SHOWN. DEVICE ALLOWS A 100GM MINIMUM FLOW RATE OF 1.0 cfs WITHOUT BINDING, AND ACCOUNDATES 100 GMS STORM EVENT FLOW NOTES USING MINIMUM SCREEN ARE = Q cfs/0.92

REV	DATE	BY	DESCRIPTION
A	.	.	.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA®
www.parkusa.com 888–611–PARK

STORMWATER POND INLET
MODEL SWPI–EM

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SWPI–EM	A
DATE 05/2019					

NOTES

FILTER BASIN™
STORMWATER DRAINAGE

Features

- Pre-engineered to fit any inlet basin or curb cut
- Stainless steel construction
- Overflow protection
- Low cost
- Easy installation and maintenance
- Made in the USA - Filterbasins are made in America and meet the requirements of the Buy America Act

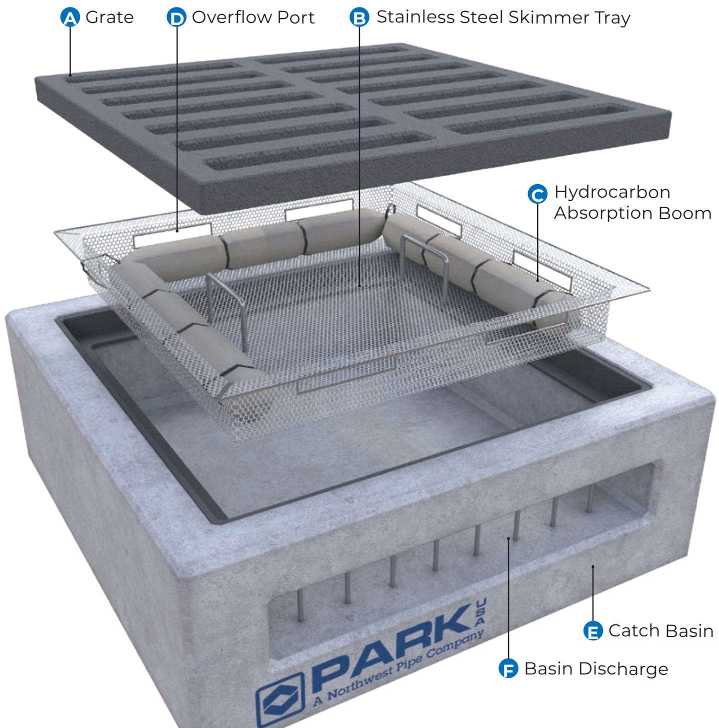
Filterbasin

The ParkUSA ® FilterBasin™ is a family of stormwater best management practice (BMP) devices designed to fit within common basin structures to provide an economical best management practice solution. In this way, stormwater runoff treatment provides protection from pollutants entering rain gardens, public waterways, streams, rivers, lakes and aquifers. Vehicles traveling over streets, driveways, and parking lots leave hydrocarbons from vehicle lubricant leaks, metals produced by brake pad wear, and tire residue. These pollutants are picked up by stormwater runoff during the storm's "first flush" event when pollutant concentration is highest. As rainwater accumulates on pavement, the stormwater will flow to the lowest point, where catchment structures like catch basins and curb inlets are typically installed. These basins present an opportunity to pre-filter the stormwater prior to discharging into rain gardens and storm sewers. The FilterBasin family of products provides the best solution to pre-filtration requirements on these types of events.

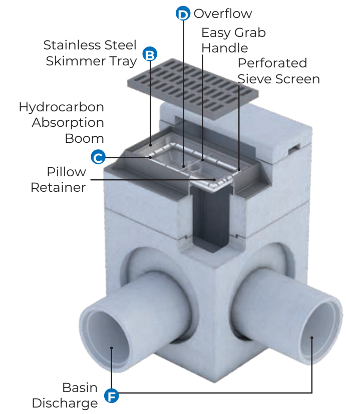
#BUILDING AMERICA!

SW | FILTERBASIN Standard

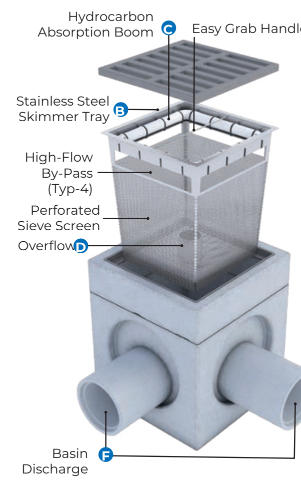
LEED® COMPLIANT · NPCA · Steel Tank Institute · ASPE American Society of Plumbing Engineers · ASTM · BMP® BEST MANAGEMENT PRACTICE · IPC® INTERNATIONAL PLUMBING CODE · UPC



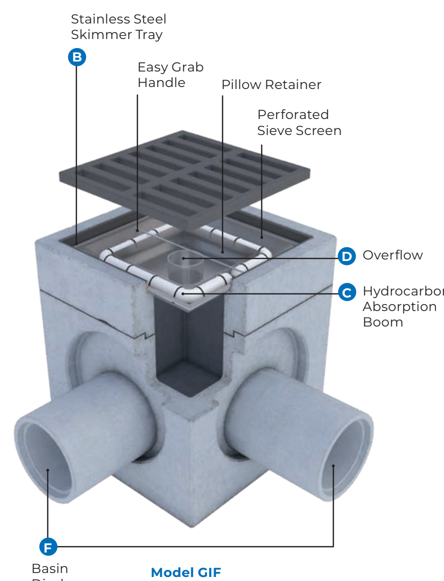
Model FBRG



Model CIF



Model GIFB



Model GIF

How it Works

As stormwater passes through the surface grating (A), debris larger than the grate openings are prevented from entering rain gardens or the storm sewer.

Flow goes through a skimmer tray (b) and encounters the hydrocarbon absorption boom (c).

The skimmer tray includes overflow ports (d) and easy grab handles.

The treated water goes into the catch basin (e) and flows out through the basin's discharge piping or opening of the basin (F).

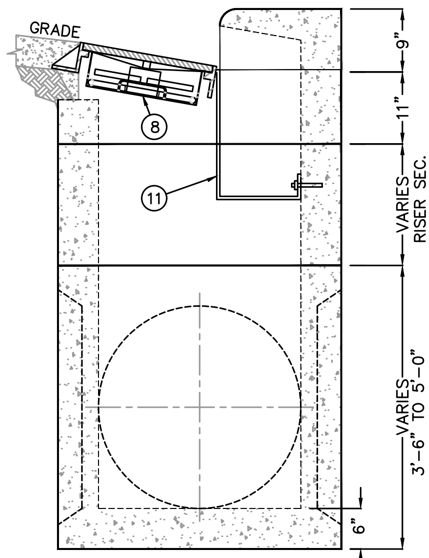
Finally, the collected debris dries after each storm event and can be removed for proper disposal.

Visit **filterbasin.parkusa.com** for more information and design assistance.

To request a quote or catalog, visit **request.parkusa.com.**

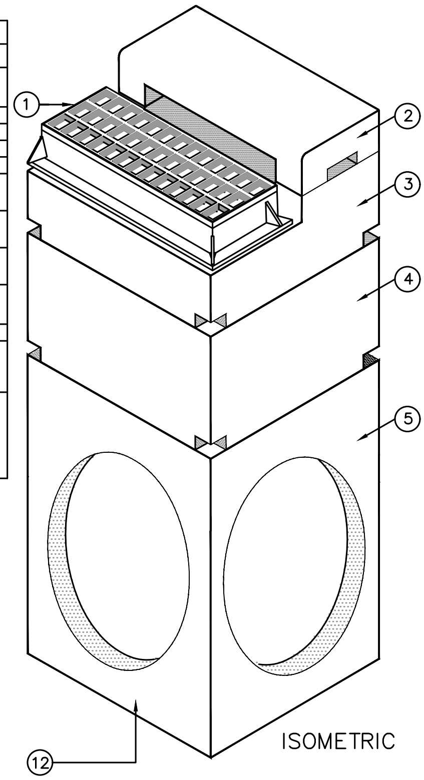
APPLICATIONS

- Good to use in BMPs
- Truck Terminals Railroads
- Parking Lots Streets & Highways
- Service Stations
- Auto Parts Salvage Yards
- Industrial

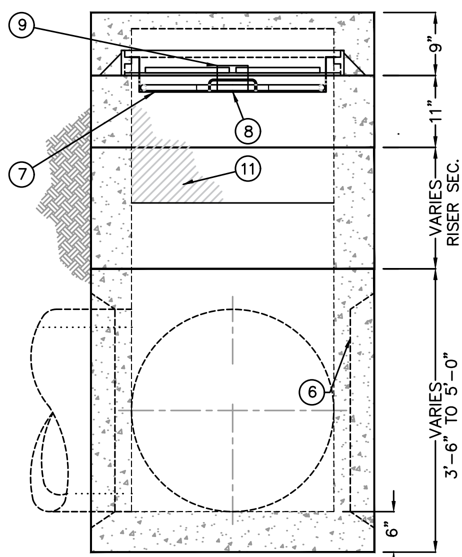


SIDE ELEVATION

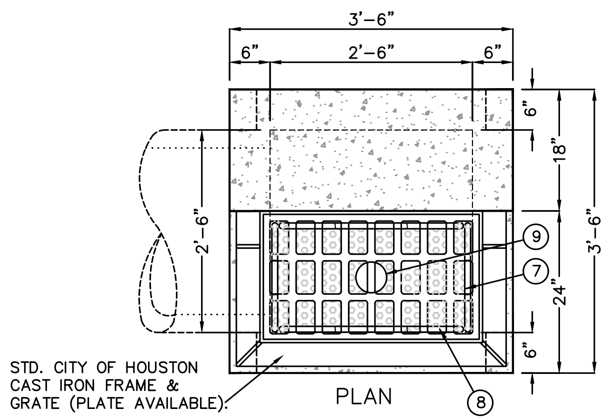
KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	STD. CITY OF HOUSTON C.I. FRAME & GRATE
2	1	TOP
3	1	MID-SECTION
4	1	RISER SECTION
5	1	BOTTOM SECTION
6	1	TYPICAL THIN WALL KNOCK-OUT AS REQ'D
7	4	HYDROPHOBIC MEDIA FILTER
8	1	PERFORATED SS304 DEBRIS BASKET
9	1	PERFORATED OVERFLOW W/ OPEN TOP
10	2	LIFT HANDLE
11	1	LARGE DEBRIS SCREEN BASKET, PERFORATED SS304
12	1	NAMEPLATE PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL CIF-1



ISOMETRIC

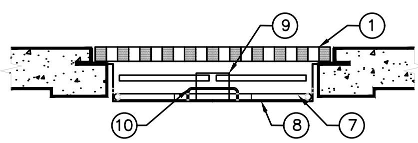


FRONT ELEVATION



PLAN

APPROVED FOR
CITY OF HOUSTON



FILTER DETAIL

ASPE MEMBER · NPCA CERTIFIED PLANT · ASTM C-913

CIF-01

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

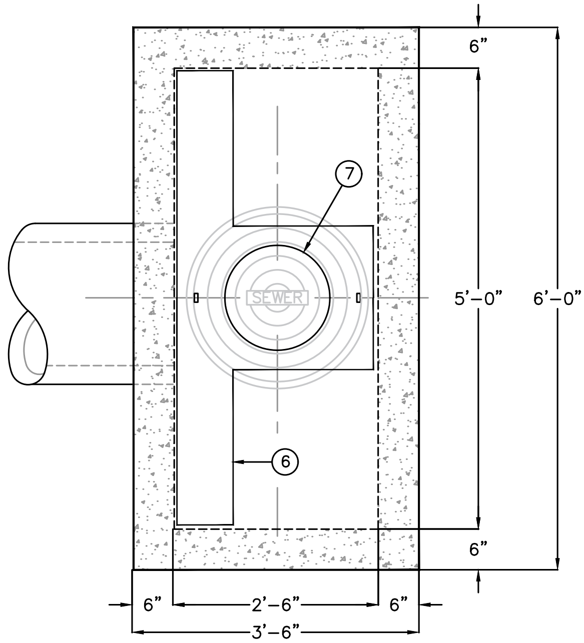
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

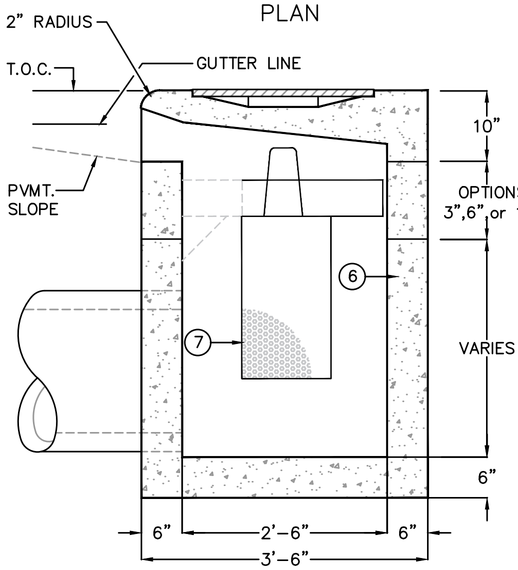
PARK USA
www.parkusa.com 888-611-PARK

CURB INLET FILTER
MODEL CIF

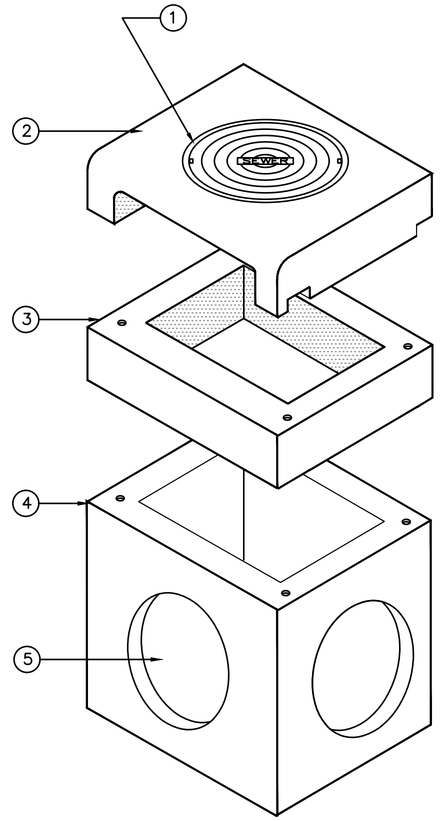
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CIF-01	A
DATE 05/2019					



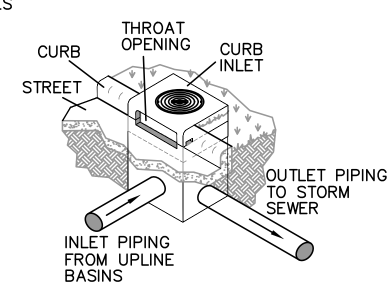
PLAN



SECTION



ISOMETRIC



KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	ACCESS FRAME AND COVER
2	1	TOP SECTION
3	1	RISER AS REQ'D
4	1	BASIN SECTION
5	1	THIN WALL KNOCKOUTS
6	1	FLOW DIVERSION TRAY, SS304
7	·	REMOVEABLE DEBRIS BASKET W/ HANDLE, SS304
6	1	NAMEPLATE MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL: CIFC–01

NOTE: BASE SIZE ADJUSTABLE FROM 30"X60" TO 60"X60"

CIFC–01

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

TYPE–H2 CURB INLET FILTER
MODEL CIFC–01

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CIFC–01	A
DATE 05/2019					

SPECIFICATIONS

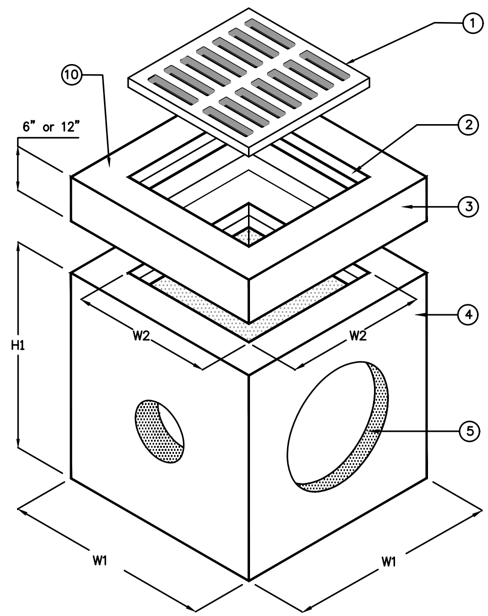
CONCRETE : CLASS II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

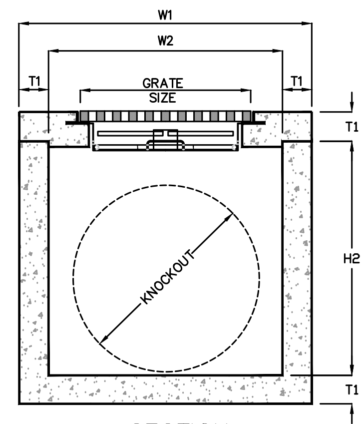
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

npca CERTIFIED PLANT   MEMBER   C–913

FLOATABLE COLLECTION

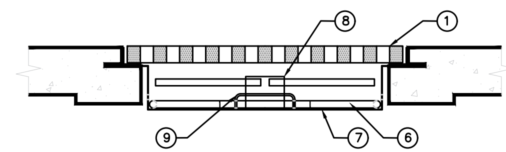


ISOMETRIC



SECTION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	GRATE OR COVER AS REQUESTED, SEE OPTIONS
2	1	CAST-IN STEEL FRAME
3	1	OPTIONAL TOP/EXTENSION 6" TO 18"
4	1	PRECAST CONCRETE BASIN SECTION
5	4	KNOCKOUTS (STD) AND PENETRATIONS (OPT) AS REQUIRED, SEE KO DIMENSION FOR MAXIMUM PIPE O.D.*
6	4	HYDROPHOBIC MEDIA FILTER
7	1	PERFORATED SS304 DEBRIS BASKET
8	1	PERFORATED OVERFLOW W/ OPEN TOP
9	1	LIFTING HANDLES
10	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: GIF-01 DATE MANUFACTURED

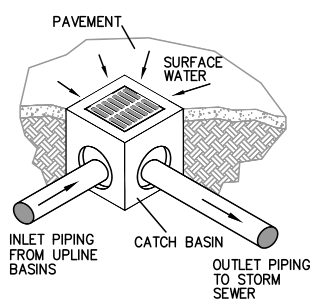


FILTER DETAIL

NOTE: KNOCKOUTS-STD, PENETRATIONS-OPTIONAL

MODEL	W1	W2	H1	H2	T1	T2	KO	GRATE SIZE	OPEN AREA SQ IN	WEIGHT LBS
GIF-12	15"	10"	21"	18"	3"	2.5"	10"	12"x12"x1"	90	180
GIF-14	20"	12"	28"	24"	4"	4"	12"	14"x14"x1½"	120	600
GIF-18	24"	16"	34"	30"	4"	4"	15"	18"x18"x1½"	168	1,000
GIF-20	26"	18"	34"	30"	4"	4"	17"	20"x20"x1½"	170	1,335
GIF-24	32"	22"	41"	36"	5"	5"	22"	24"x24"x2"	268	2,245
GIF-27	37"	25"	42"	36"	6"	6"	24"	27"x27"x2"	350	2,875
GIF-30	42"	30"	42"	36"	6"	6"	30"	32"x32"x2"	490	3,675
GIF-36	48"	36"	42"	36"	6"	6"	32"	38"x38"x2"	693	4,585
GIF-48	60"	48"	54"	48"	6"	6"	48"	38"x38"x2"	693	7,250
*GIF-60	72"	60"	66"	60"	6"	6"	60"	38"x38"x2"	693	10,500
*GIF-72	84"	72"	78"	72"	6"	6"	72"	38"x38"x2"	693	15,350
*GIF-84	96"	84"	78"	72"	6"	6"	72"	38"x38"x2"	693	19,500

*KNOCKOUTS NOT AVAILABLE



SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

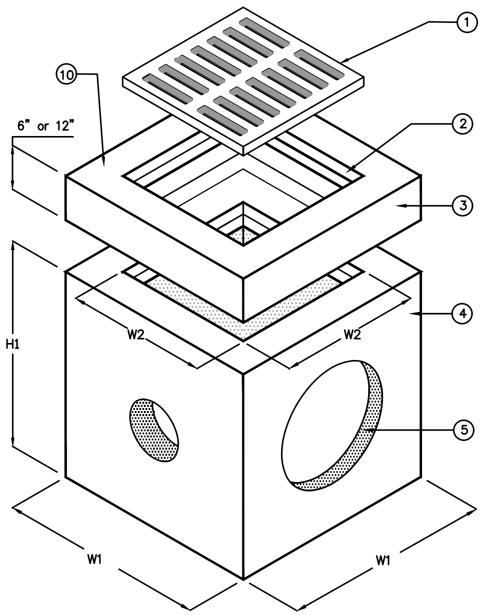
NPCA CERTIFIED PLANT   ASTM C-913   GIF-1

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: .   PROJ #: .
DATE: .   LOCATION: .

PARK USA
www.parkusa.com   888-611-PARK

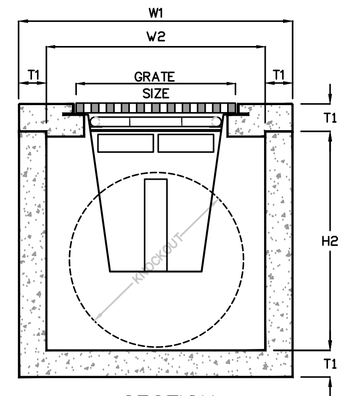
GRATE INLET FILTER
MODEL GIF – 12" THRU 84"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	GIF-1	.
DATE 05/2019					



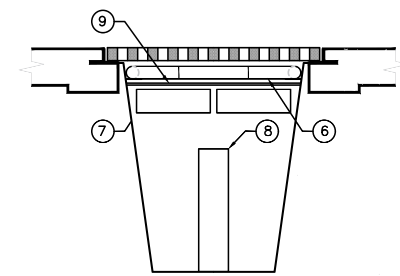
ISOMETRIC

NOTE: KNOCKOUTS–STD, PENETRATIONS–OPTIONAL

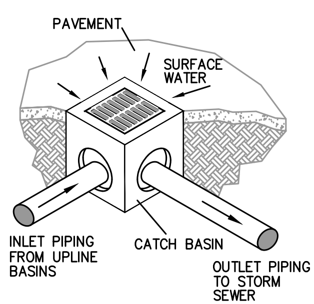


SECTION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	GRATE OR COVER AS REQUESTED, SEE OPTIONS
2	1	CAST–IN STEEL FRAME
3	1	OPTIONAL TOP/EXTENSION 6" TO 18"
4	1	PRECAST CONCRETE BASIN SECTION
5	4	KNOCKOUTS (STD) AND PENETRATIONS (OPT) AS REQUIRED, SEE KO DIMENSION FOR MAXIMUM PIPE O.D.*
6	4	HYDROPHOBIC MEDIA FILTER
7	1	PERFORATED SS304 DEBRIS BASKET
8	1	PERFORATED OVERFLOW W/ OPEN TOP
9	1	LIFTING HANDLES
10	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL: GIFB–01 DATE MANUFACTURED



BASKET DETAIL



MODEL	W1	W2	H1	H2	T1	T2	KO	GRATE SIZE	OPEN AREA SQ IN	WEIGHT LBS
GIFB–12	15"	10"	21"	18"	3"	2.5"	10"	12"x12"x1"	90	180
GIFB–14	20"	12"	28"	24"	4"	4"	12"	14"x14"x1½"	120	600
GIFB–18	24"	16"	34"	30"	4"	4"	15"	18"x18"x1½"	168	1,000
GIFB–20	26"	18"	34"	30"	4"	4"	17"	20"x20"x1½"	170	1,335
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GIFB–48	60"	48"	54"	48"	6"	6"	48"	38"x38"x2"	693	7,250
*GIFB–60	72"	60"	66"	60"	6"	6"	60"	38"x38"x2"	693	10,500
*GIFB–72	84"	72"	78"	72"	6"	6"	72"	38"x38"x2"	693	15,350
*GIFB–84	96"	84"	78"	72"	6"	6"	72"	38"x38"x2"	693	19,500

*KNOCKOUTS NOT AVAILABLE

SPECIFICATIONS

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C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

NPCA CERTIFIED PLANT ASTM C–913

GIFB–1

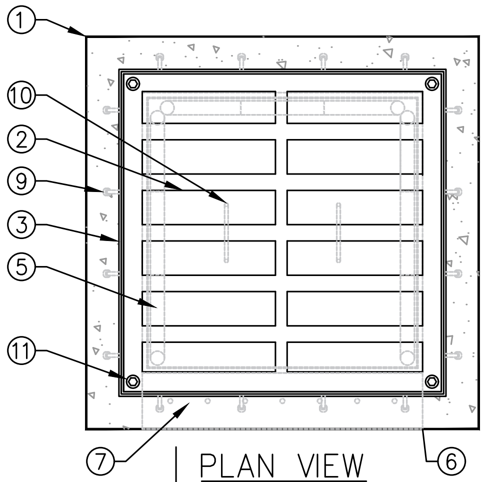
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA®
www.parkusa.com 888–611–PARK

GRATE INLET FILTER
MODEL GIF – 12" THRU 84"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	GIFB–1	.
DATE	05/2019				

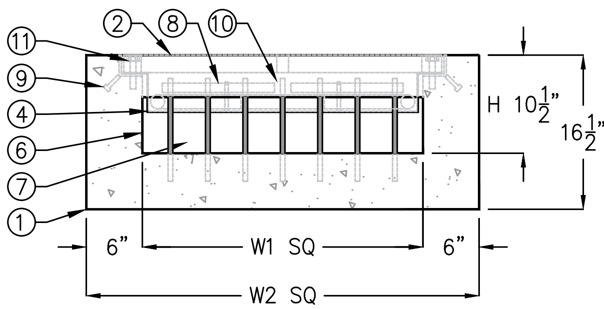
FLOATABLE COLLECTION



PLAN VIEW

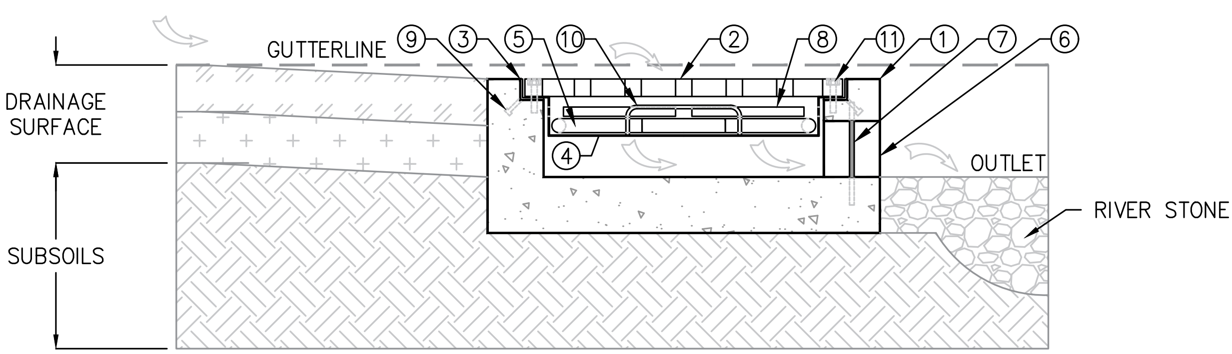
NAMEPLATE

KEYED NOTES		
MRK	QTY	DESCRIPTION
1	1	INLET BASIN
2	1	BOLT DOWN CAST IRON GRATE FOR LARGE DEBRIS
3	1	CAST IRON FRAME W/ FPT BOLT THREADS
4	1	REMOVEABLE PERFORATED SOLIDS SCREENING BASKET FOR SMALL DEBRIS
5	–	OIL ABSORBANT MEDIA (AS REQ'D)
6	1	SLOTTED OPENING FOR STORMWATER OUTLET
7	5	OUTLET SECURITY BARS
8	8	STORMWATER OVERFLOW ORIFICE
9	–	CONCRETE ANCHORS (AS REQ'D)
10	2	SCREENING BASKET HANDLES
11	–	GRATE BOLTS (AS REQ'D)
12	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL: FB–1 MFG DATE



ELEVATION VIEW

MODEL	W1	W2	H	T	WEIGHT
FBRG–30	30"	42"	$10\frac{1}{2}$"	6"	1613 LB
FBRG–36	36"	48"	$10\frac{1}{2}$"	6"	2006 LB



APPLICATION, SECTION A–A

SPECIFICATIONS

CONCRETE : CLASS 1 CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

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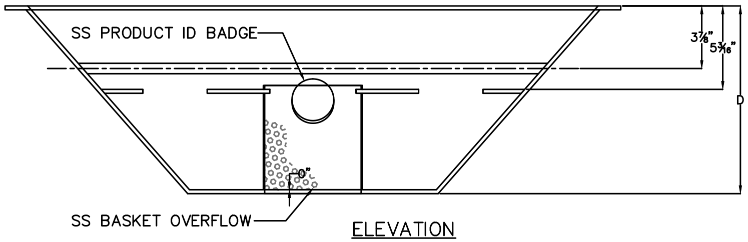
FBRG–01

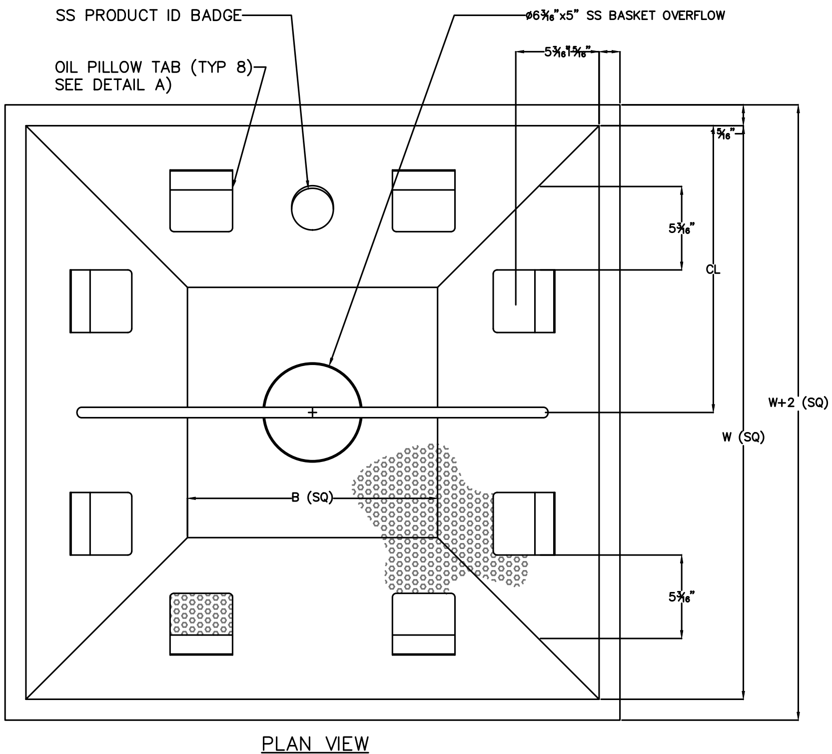
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

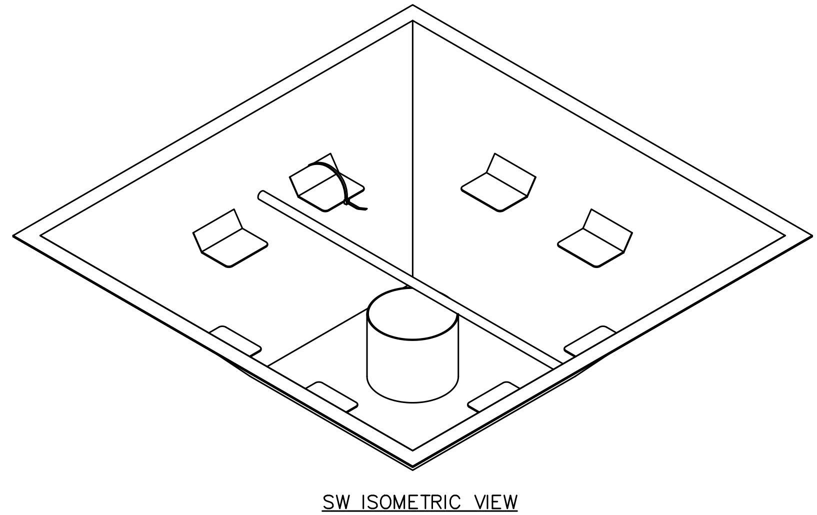
PARK USA
www.parkusa.com 888–611–PARK

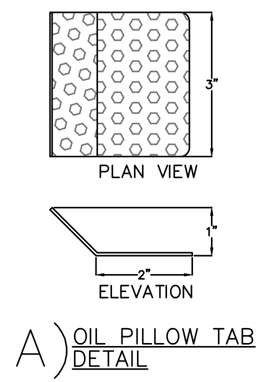
FILTER BASIN – RAIN GARDEN
MODEL FBRG

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FBRG–01	A
DATE 05/2019					









MODEL #:	FITS BASIN MODEL	W	B	D	W+2	CL
GIF-18	CB-18	15½"	12"	9"	17½"	7¾"
GIF-20	CB-20	17½"	12"	9"	19½"	8¾"
GIF-24	CB-24	21½"	12"	9"	23½"	10¾"
GIF-27	CB-27	24½"	12"	9"	26½"	12¼"
GIF-30a	CB-30a	27½"	12"	9"	29½"	13¾"
GIF-30	CB-30	29½"	12"	9"	31½"	14¾"
GIF-36	CB-36	35½"	12"	9"	37½"	16¾"

GIF-BASKET

SPECIFICATIONS

BASKET: BASKET AND TABS TO BE CONSTRUCTED OF 16GA SS 304 PERFORATED PLATE (¼" HOLES ON 5⁄16" STAGGER)

BASKET LIP: BASKET LIP TO CONSTRUCTED OF 14GA SS 304 PLATE

HANDLE: HANDLE TO CONSTRUCTED OF ½"ø SS 304 ROUND BAR

OVERFLOW: OVERFLOW ORIFICE TO BE CONSTRUCTED OF SS PERFORATED CYLINDER.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA®

www.parkusa.com 888–611–PARK

CATCHBASIN DEBRIS BASKET
MODEL – GIF-BASKET

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	GIF-BASKET	.
DATE 05/2019					

FLOATABLE COLLECTION

NOTES

RAINWATER HARVESTING

NOTES

Rain Trooper®

Rainwater Harvest System

BEST USE FOR:

STORMWATER

PARK USA

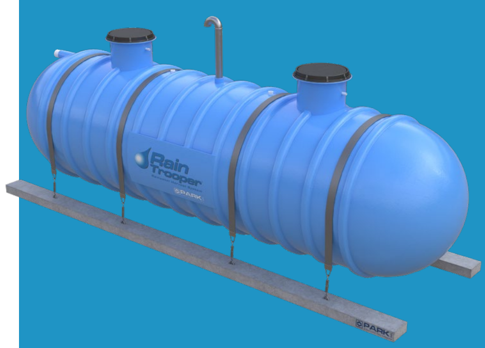
A Northwest Pipe Company

ENGINEERING **FACTS**

PARK USA
A Northwest Pipe Company

FEATURES
- Precast Concrete, Fiberglass, and Steel Models Available
- Overflow Design Available
- Inlet, Outlet, and Vent Connections
- Easy Installation and Maintenance
- Portable Model Available
- Meets all Building Codes

MODELS
ParkUSA® RainTrooper® is currently available in the following configurations shown in the table to the right.
- Model BPT
- Model RH



GENERAL INFORMATION
The continuous population growth and the growing number of extreme droughts across the world have led to a great increase in consumption of potable and non-potable water. Conservation of rainwater is becoming critical in parts of the United States to meet the growing water demands. Living in a country where water has always been readily available, most people do not realize that rainwater can be used for nearly all non-potable applications including irrigation, toilet flushing, bathroom sinks, mechanical systems, washing machines, car washing, custodial uses, and many more.

Rainwater harvesting is the collection, conveyance, and storage of rainwater. Systems can be as simple as a rain barrel for garden irrigation at the end of a downspout, or as complex as a domestic potable system or a multiple end-use system at a large corporate campus. ParkUSA's RainTrooper is a solution for both commercial and residential applications to conserve as much rain as possible to store for future use, and reduce consumption of limited treated municipal water.

CONFIGURATIONS AVAILABLE FOR THE RAINTROOPER

MATERIAL TYPE	FEATURES	BENEFITS
High Quality Precast Concrete rainwater storage tanks for underground installation provide the largest selection of tank sizes and configurations. The tanks are especially developed for storing rainwater and are equipped with optional liners or coatings to provide the desired level of water quality for a particular application.	• Floating Suction Screen • Makeup Water • Inlet/ Outlet/ Vent Connections • Calmed inlet • Overflow siphon	• The most economical of the material options • Suitable for all outdoor installations • Provide for heavy traffic durability
Steel Tanks are recommended for applications where the rainwater storage tanks are in a free-standing position, i.e., in a basement or on a slab above ground. The tanks can be constructed from carbon steel, stainless steel, or galvanized steel.	• Freeze Protection for cold environments • Makeup Water supply with Backflow Preventer • Inlet/Outlet/Vent Connections • Lifting lugs, gasketed access covers	• Extremely strong and can be coated to prevent corrosion and ensure water quality. • Ideal for outside storage of rainwater in buildings that wish to display their water conservation efforts.
Plastics - Rainwater storage tanks constructed of HDPE (High Density Polyethylene) or Fiberglass are available for underground installation in every size from 300 to 20,000 gallons. Above ground tanks are free-standing and require a firm level base. Options include tie-downs and freeze protection.	• Floating Suction Screen • Makeup Water • Inlet/Outlet/Vent Connections • Calmed inlet • Overflow siphon	• Suitable for residential or commercial applications • Light Weight • Easy to Install • Corrosive Resistant for use in chemical or heavy industrial areas.
Waterbags are available for basement, remote, or temporary storage of rainwater reuse. Manufactured of military grade materials, the water bag will provide years of service.	• Floating Suction Screen • Makeup Water • Inlet/Outlet/Vent Connections • Calmed inlet • Overflow siphon	• Fast & Easy Setup • Collapsible tank design • Rounded corners to redistribute shell stress uniformly • Portable

OPERATION

Rainwater harvesting, in its essence, is the collection, conveyance, and storage of rainwater. Systems can be as simple as a rain barrel for garden irrigation at the end of a downspout, or as complex as a domestic potable system or a multiple end-use system at a large corporate campus.

Once a maximum level is reached in the tank, the innovative overflow siphon (RTX-OVRFLW), with its skimmer effect, removes particles lighter than water (e.g. flower pollen, oils, etc.) that float slowly to the water surface. Removing this floating layer of surface pollutants through regular overflow from the tank is important in order to maintain high water quality and allowance of oxygen diffusion at the water surface. The narrow slits in the overflow siphon prevent rodents from entering the tank.

The Floating Intake with Hose (RTX-FSCF) has an air-filled ball that suspends the floating inlet filter just below the water surface where the cleanest water resides. A high quality one inch diameter flexible hose allows for connection of the floating inlet to a pump or suction line. The filter is made out of lead-free brass with a 0.047 inch stainless steel screen and a built-in check valve.

The Calmed Inlet feature prevents disturbance and re-suspension of fine sediments that gather on the bottom of the tank. Another important function of the inlet is the introduction of oxygen into the lower layers of the tank which maintains a fresh supply of water while preventing anaerobic conditions from forming.

SYSTEM COMPONENTS

Regardless of the complexity of the system, the rainwater harvesting system comprises the following basic components:

- Catchment surface – the collection surface from which rainfall runs off, typically a roof structure.
- Gutters and downspouts – The harvested rainwater is conveyed through the roof drains and piping to a single point of discharge.
- Rainwater Filter – At the point of discharge, the rainwater is transferred through a filter that removes large and fine debris. ParkUSA provides the following filters for this purpose:
  - Filter Collector (RTX-FILCA) – roofs up to 750 sq.ft.
  - Compact Filter (RTX-COMFLT) – roofs up to 2,100 sq.ft.
  - Volume Filter (RTX-VF) – roofs up to 4,500 sq.ft.
  - Vortex Fine Filter (RTX-VFF) – roofs up to 32,000 sq.ft.
- Make-Up Water Systems with backflow prevention devices
- Rainwater Storage Tanks, also known as cisterns

RAINWATER HARVESTING

DESIGN CONSIDERATIONS

Filters: As rainwater comes into the system from the roof or collection area, there is a need for a first flush or pre-filtration treatment. This is done to remove as much debris as possible from the rainwater before it enters the storage system.

With first flush systems, a volume of the rainwater is diverted to eliminate contaminates associated with it. There is no exact calculation to determine how much initial water needs to be diverted because there are a number of variables that would determine the effectiveness of washing the contaminants off the collection surface, just as there are variables determining the makeup of the contaminants themselves.

For example, the slope and smoothness of the collection surface, the intensity of the rain event, the length of time between events (which adds to the amount of accumulated contaminants), and the nature of the contaminants themselves add to the difficulty of determining just how much rain should be diverted during first flush. In order to effectively wash a collection surface, a rain intensity of one-tenth of an inch of rain per hour is needed to wash a sloped roof. A flat or near-flat collection surface requires 0.18 inches of rain per hour for an effective washing of the surface.

Park recommends pre-treatment through filtration which may prove more efficient than diverting the first flush of a rainwater harvesting system. If using a roof for a collection area that drains into gutters, calculate the amount of rainfall area that will be drained into every gutter feeding your system. If a gutter receives an amount of runoff that requires multiple downspouts, filtration devices should be installed for each downspout.

SIZING

A best management practice (BMP) for sizing a rainwater harvesting system is to determine the volume of water that can be captured and stored (the supply) and this should equal or exceed the volume of water used (the demand).

Another factor to consider is the loss of rainwater to first flush, evaporation, splash-out, or overshoot from the gutters in hard rains and leaks. Rough collection surfaces are less efficient at conveying water because water captured in pore spaces tends to be lost to evaporation. Also impacting achievable efficiency is the inability of the system to capture all water during intense rainfall events. For instance, if the flow-through capacity of a filter-type roof washer is exceeded, spillage may occur. Additionally, once storage tanks are full, rainwater is lost as overflow.

To solve for the average rainfall intensity "I", find the annual precipitation for the area then divide by 12 months to determine monthly average and ultimately the monthly supply. Consider seasonal adjustments depending on the application.

Monthly precipitation is the key calculation to the rainwater harvest supply as it must equal or exceed the monthly demand for water usage. Deficiencies in monthly precipitation are typically "made up" by piping costly city water to the system. No one can outguess the weather month to month so "make up" water piping and associated valves are necessary in any system. The trick is to minimize the use of make-up water through good planning during this phase of the sizing process. Under sizing a system defeats the purpose of this Green Building BMP and ultimately the owner will realize limited savings from the investment.

Supply: The Rational Method is used to calculate the potential supply of rainwater runoff:

$$Q = CIA \cdot 0.623$$

Where:

Q= Average Monthly Rainwater Runoff Rate from drainage area or Average Monthly Supply gal/month

C= Runoff Coefficient, the fraction of rainfall on the drainage area that becomes stormwater runoff. Runoff coefficients can range from as high as 0.80-0.85 (for a well-constructed corrugated-iron roof) to 0.10-0.20 (for a compacted soil surface).

I= Average Intensity of Rainfall (in/hr)

A= Drainage Area (sqft)

The following table can be utilized for selecting appropriate Runoff Coefficient (C):

AREA DESCRIPTION VS. RUNOFF COEFFICIENT

AREA DESCRIPTION	RUNOFF COEFFICIENT C
Business	
Downtown	0.70-0.95
Neighborhood	0.50-0.70
Residential	
Single-Family	0.30-0.50
Mulitunites, detached	0.40-0.60
Multiunites, attached	0.60-0.75
Residential (suburban)	0.25-0.40
Apartment	0.50-0.70
Industrial	
Light	0.50-0.80
Heavy	0.60-0.90
Parks, cemeteries	0.10-0.25
Playgrounds	0.20-0.35
Railroad yard	0.20-0.35
Unimproved	0.10-0.30
Characters of Surface	**Runoff Coefficient C**
Pavements	
Asphatic and contrete	0.70-0.95
Brick	0.70-0.85
Roofs	0.75-0.95
Lawns, sandy soil	
Flat, 2 percent	0.05-0.10
Average, 2-7 percent	0.10-0.15
Steep, 7 percent	0.15-0.20
Lawns, heavy soil	
Flat, 2 percent	0.13-0.17
Average, 2-7 percent	0.18-0.22
Steep, 7 percent	0.25-0.35

If the catchment area is comprised of a variety of different surfaces, with different runoff coefficients, then a weighted average value should be calculated.

A = Drainage Area (sq.ft.), the area that drains to the design point of interest

A conversion factor of 7.48 gallons of water per one cubic foot of area will be necessary to change the final result from cubic feet to gallons.

Determining Demand: There are two types of water demands:

Indoor demand includes the number of people in the building, the number of hours per day the building is occupied, the numbers and types of toilets/urinals in place, etc. Design considerations would be the same as the demand from a fresh water supply line. The additional concern would be the creation of required water pressure and any pretreatment from the rainwater storage tank. Call ParkUSA Engineering for design help.

Outdoor demand consists of the volume of water to be used for irrigation of grasses and landscaping, water fountains, or other water features. Different types of vegetation have different water requirements. Research is required for the specific design features of the system in question. See the example of sizing for demand for additional information regarding this aspect.

MAINTENANCE

ParkUSA's RainTrooper Systems are designed to be easily operated and maintained. Regular and on-going inspection of the system should be conducted, which includes visually inspecting all system components and cleaning of catchment area, gutters, and filters as needed. Pumping the first-flush system should be done quarterly initially, and then adjusted to a maintenance schedule based on site characteristics and environment. A pump truck may be utilized to remove grit and trash from the storage tank. Maintenance of the pump is done as required by pump manufacturer requirements. Typical pump maintenance includes cleaning of debris on the suction screens of the pump.

EXAMPLE OF SIZING

A warehouse facility in Houston, TX plans to use collected rainwater to irrigate the landscaping on the property site. The building is a rectangular structure, 150 ft x 50 ft, with a flat roof. The landscaping area consists of multiple flowerbeds and a large grassy region with a total combined area of 4,500 square feet. The runoff coefficient is determined to be 0.80. Annual precipitation from demographics of the region show 49.8 inches per year is received.

What is the optimum size for the rainwater storage tank?

To determine supply using the Rational Method equation:

$$Q = CIA$$

Runoff Coefficient (C) = 0.80

Rainfall Intensity (I) = 49.8 inches per year / 12 months = 4.15 inches/month

Roof area (A) = (150 x 50) = 7,500 sq.ft.

Conversion factor - 7.48 gallons of water per one cubic foot of area.

To determine the average monthly supply in gallons/month, first convert the rainfall intensity from 4.15 inches per month to feet per month

I = 4.15 in/mo. divided by 12 in/ft = 0.3458 ft/mo.

Therefore, Q = C x I x A, now can be calculated:

Q = 0.80 x 0.3458 ft/mo. x 7,500 sq.ft. x 7.48 gal / cu.ft. = 15,520 gallons / mo.

Q = 15,520 gallons per month – monthly supply of rainwater

To determine the demand for the rainwater, calculate the amount of water planned to be used in a one month period. While the amount of water needed for lawn maintenance varies depending on current weather factors, the climate for the area, and the time of year, the general rule of thumb is for the lawn to receive 1 inch of water per week during dry conditions. Using the following conversion calculation:

1 in/wk ÷ 12 in/ft x 7.48 gal/ft3 = 0.623 gal/ft2

This demand equates to 0.623 gallons per square foot of lawn area each week. Therefore, determine the average monthly demand in gallons/month:

Landscaping area = 4,500 square feet

Irrigation Rate = 0.623 gal/ft2 per week x 4,500 ft2 = 2,803 gallons/week

2,803 gal/wk x 4.2 wks per mo. = 11,773 gal/mo.

The average monthly demand for rainwater is approximately 11,775 gallons.

The supply of rainwater available each month exceeds the demand planned for its use.

Sizing a 16,000 gallon RainTrooper for this application would create a reserve of approximately 4,000 gallons per month.

Good to use in BMPs

Residential

Low Impact Development

APPLICATIONS

Green Infrastructure

Commercial

STORMWATER

Human life, as with all animal and plant life on the planet, depends upon water; at ParkUSA, we greatly value the importance of protecting this natural resource. To contribute our part in conservation and sustainability, ParkUSA offers a wide range of stormwater management products, which include stormwater quantity and stormwater quality units. We engineer advanced water technologies designed to combat pollution and control the flow of stormwater. These cleaning processes and water drainage methods provide breakthrough safety modifications for significant activities in day-to-day life. Most importantly, ParkUSA's mission is to offer innovative solutions to important stormwater management needs around the world. ParkUSA has been in the business of manufacturing stormwater infrastructure and water quality devices since the beginning of the Clean Water Act, providing sustainable solutions for today's stormwater issues. As always, we aim to impact people's lives and provide a safe quality of life for generations.

ParkUSA IS ALWAYS READY TO **DESIGN** AND **ENGINEER** PRODUCTS FOR YOUR UPCOMING PROJECTS!

OTHER STORMWATER PRODUCTS

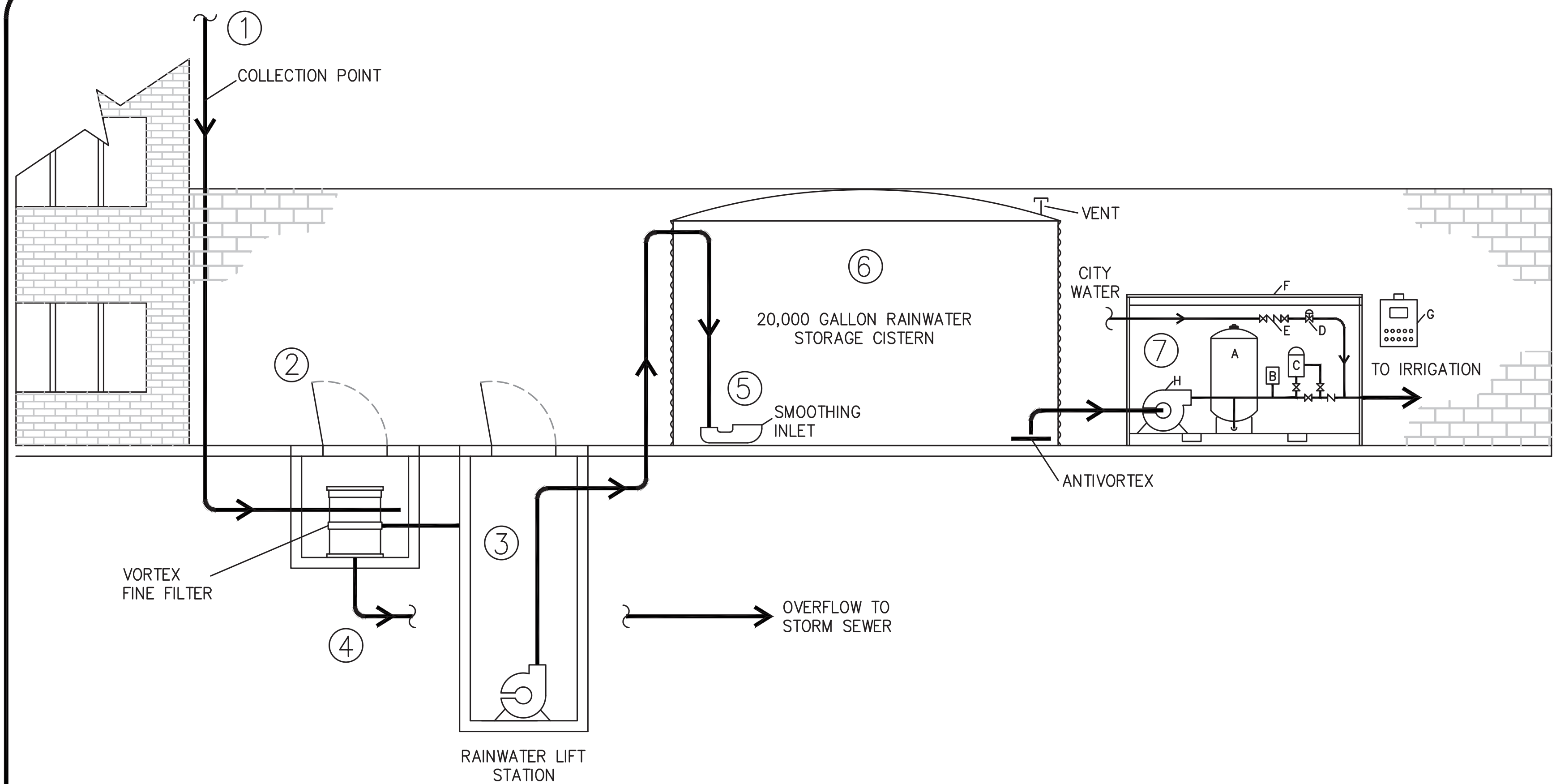
RAINTROOPER

TRASHTROOPER

CATCHBASIN

SALES@PARKUSA.COM
888-611-PARK

PARK USA A Northwest Pipe Company



RWHS -1

NOTES:
① RAINWATER COLLECTION POINT (ROOF DRAINS, GUTTERS, DOWN SPOUTS, ETC.)
② RAINWATER ENTERS THE VORTEX FILTER AND IS PROCESSED (POSSIBLE 90% DIVERTED TO CISTERN)
③ CAPTURED RAINWATER PASSES TO RAINWATER LIFT STATION
④ REMAINING WATER AND DEBRIS FROM VORTEX FILTER TO STORM SEWER OVERFLOW
⑤ SMOOTHING INLET – STAINLESS STEEL "FLOW CALMING" DEVICE TO MINIMIZE TURBULENCE
⑥ ABOVE GROUND WATER STORAGE CISTERN – 20K GALLONS
⑦ PUMP & FILTRATION ASSEMBLY
A – PRESSURE TANK
B – PRESSURE TRANSDUCER
C – SELF-CLEANING IRRIGATION FILTER
D – 30 PSI PRESSURE REGULATOR VALVE
E – REDUCED PRESSURE BACKFLOW PREVENTER
F – INSULATED ENCLOSURE SKID SYSTEM
G – CONTROL SYSTEM
H – SELF-PRIMING PUMP

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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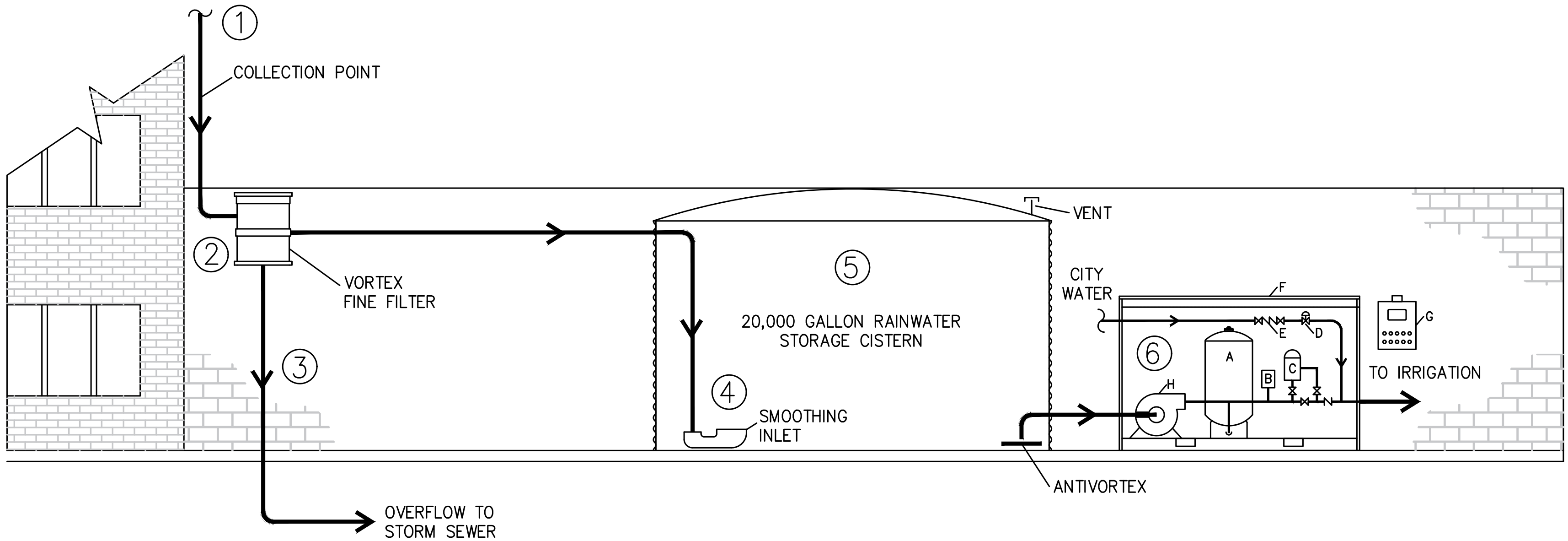
ABOVE GROUND CISTERN W/ PUMP BELOW GROUND VORTEX FILTER AND PUMP/FILTRATION SYSTEM

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RWHS -1	.
DATE 05/2019					

RAINWATER HARVESTING



NOTES:

① RAINWATER COLLECTION POINT (ROOF DRAINS, GUTTERS, DOWN SPOUTS, ETC.)
② RAINWATER ENTERS THE VORTEX FILTER AND IS PROCESSED (POSSIBLE 90% DIVERTED TO CISTERN)
③ REMAINING WATER AND DEBRIS FROM VORTEX FILTER TO STORM SEWER OVERFLOW
④ SMOOTHING INLET – STAINLESS STEEL "FLOW CALMING" DEVICE TO MINIMIZE TURBULENCE
⑤ ABOVE GROUND WATER STORAGE CISTERN – 20K GALLONS
⑥ PUMP & FILTRATION ASSEMBLY
  - A – PRESSURE TANK
  - B – PRESSURE TRANSDUCER
  - C – SELF-CLEANING IRRIGATION FILTER
  - D – 30 PSI PRESSURE REGULATOR VALVE
  - E – REDUCED PRESSURE BACKFLOW PREVENTER
  - F – INSULATED ENCLOSURE SKID SYSTEM
  - G – CONTROL SYSTEM
  - H – SELF-PRIMING PUMP

RWHS –2

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA

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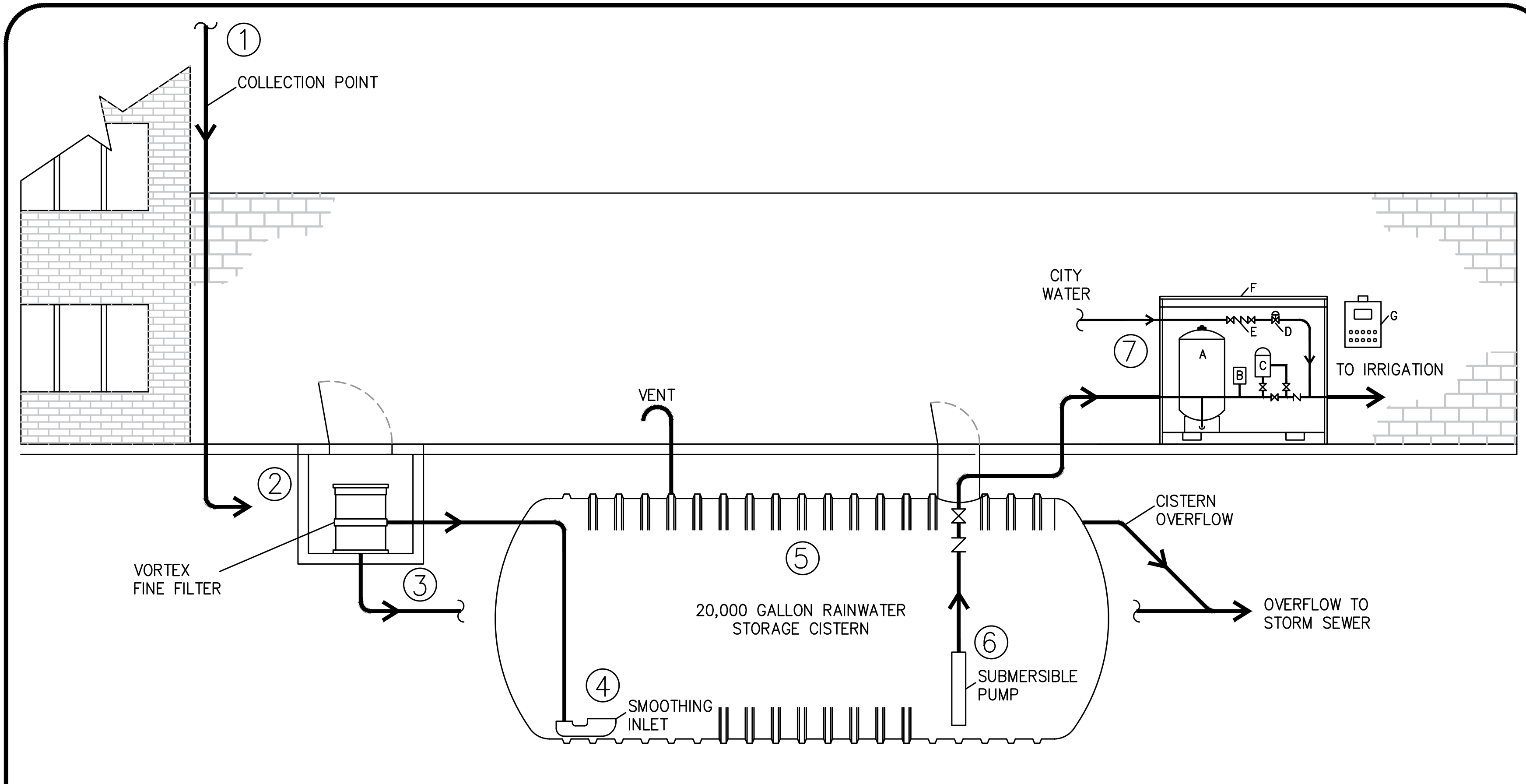
RAINWATER HARVESTING SYSTEM

ABOVE GROUND CISTERN W/ PUMP/FILTRATION SYSTEM

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RWHS –2	.
DATE 05/2019					



NOTES:

1. RAINWATER COLLECTION POINT (ROOF DRAINS, GUTTERS, DOWN SPOUTS, ETC.)
2. RAINWATER ENTERS THE VORTEX FILTER AND IS PROCESSED (POSSIBLE 90% DIVERTED TO CISTERN
3. REMAINING WATER AND DEBRIS FROM VORTEX FILTER TO OVERFLOW
4. SMOOTHING INLET – STAINLESS STEEL "FLOW CALMING" DEVICE TO MINIMIZE TURBULENCE
5. BELOW GROUND WATER STORAGE CISTERN – 20K GALLONS
6. SUBMERSIBLE MULTISTAGE PUMP
7. FILTRATION ASSEMBLY
   - A – PRESSURE TANK
   - B – PRESSURE TRANSDUCER
   - C – SELF-CLEANING IRRIGATION FILTER
   - D – 30 PSI PRESSURE REGULATOR VALVE
   - E – REDUCED PRESSURE BACKFLOW PREVENTER
   - F – INSULATED ENCLOSURE SKID SYSTEM
   - G – CONTROL SYSTEM

RWHS –3

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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RAINWATER HARVESTING SYSTEM

BELOW GROUND CISTERN W/ PUMP/FILTRATION SYSTEM

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RWHS –3	.
DATE 05/2019					

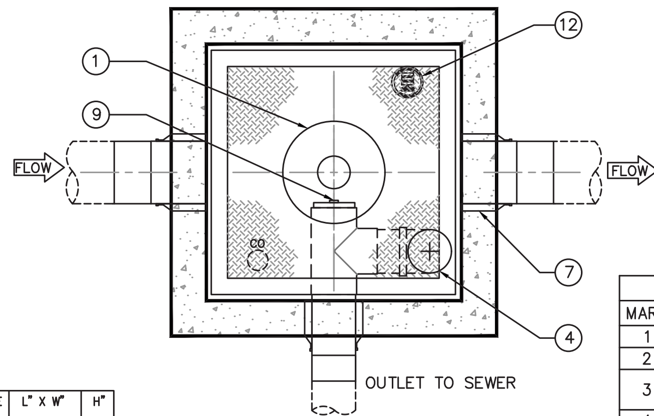
RAINWATER HARVESTING

APPLICATIONS:
TYPICAL APPLICATIONS FOR THE MODEL BFC INCLUDE:

- ☐ *RAIN HARVESTING*
- ☐ *FIRE PROTECTION*
- ☐ *EVAPORATIVE COOLING TOWER MAKE-UP*
- ☐ *PROCESS WATER*
- ☐ *NON-POTABLE WATER*
- ☐ *SITE IRRIGATION*

FEATURES:

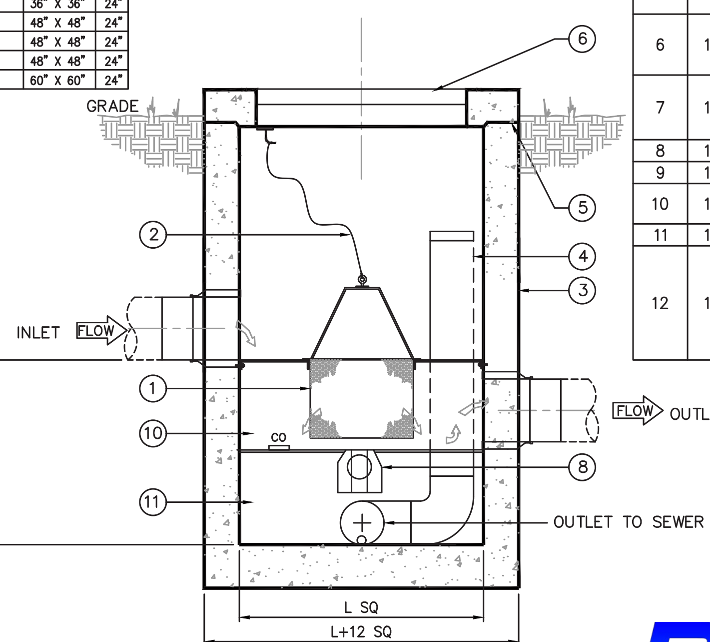
- ☐ *SELF-CLEANING FILTER*
- ☐ *3" THRU 15" CONNECTIUONS*
- ☐ *MAX 50,000 SQ/FT*



TOP VIEW

MODEL	NOMINAL FLOW (GPM)	FIRST FLUSH (GAL)	INLET OUTLET SIZE	DISCHARGE SIZE	L" X W"	H"
BFC-03	50	16	3"	2"	30" X 30"	24"
BFC-04	100	16	4"	3"	30" X 30"	24"
BFC-06	300	30	6"	4"	36" X 36"	24"
BFC-08	650	67	8"	4"	48" X 48"	24"
BFC-10	1200	67	10"	6"	48" X 48"	24"
BFC-12	1900	67	12"	6"	48" X 48"	24"
BFC-15	3400	120	15"	8"	60" X 60"	24"

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	SCREEN BASKET
2	1	SS RETRIEVAL CHAIN
3	1	PRECAST CONCRETE VAULT
4	1	OVERFLOW PORT
5	1	JOINTS TO BE SEALED W/ PLASTIC RAM-NEK GASKET
6	1	30" SQ GALV HATCHWAY H-20 RATED
7	1	RESILIENT RUBBER PIPE CONNECTION 'PRESS-SEAL' (TYP.)
8	1	FIRST FLUSH VALVE
9	1	ORIFICE
10	1	FILTERED WATER CHAMBER
11	1	FIRST FLUSH CHAMBER
12	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: BFC-1 DATE MANUFACTURED



ELEVATION

Rain Trooper™
Rainwater Harvest Systems

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 AND ASTM-C478 ON REQUIRED CENTERS OR EQUAL.

COVER & FRAME : ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123.

ENGINEERING DATA

INDUSTRIAL DUTY, HIGH EFFICIENCY, SELF-CLEANING, BELOW GROUND FILTRATION SYSTEM. THIS MODEL SHIPS WITH A CAST IRON LID FOR VEHICLE LOADING APPLICATIONS.

BFC-1

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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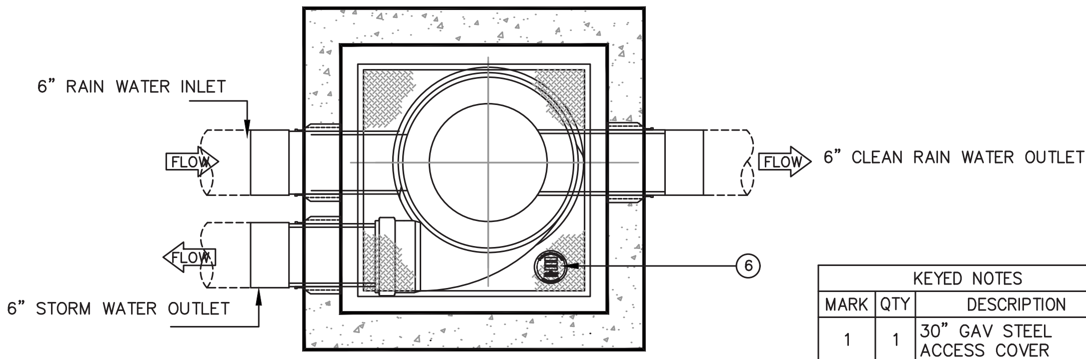
BASKET FILTER
MODEL BFC

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	BFC-1	.
DATE 05/2019					

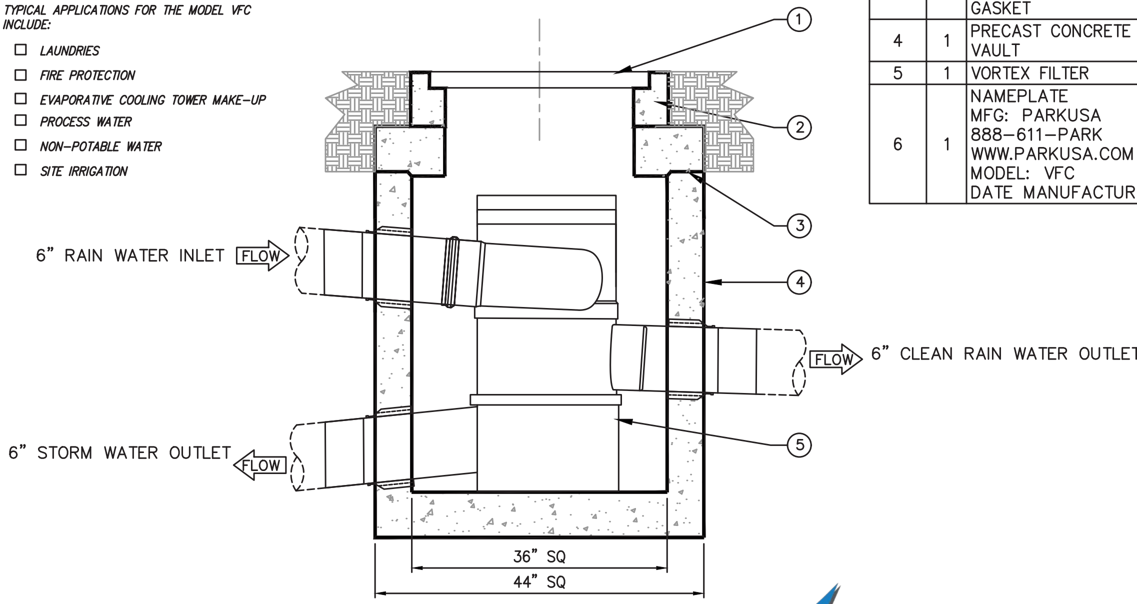


TOP VIEW

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	30" GAV STEEL ACCESS COVER
2	1	3" RISER EXTENSION
3	1	JOINTS TO BE SEALED W/ PLASTIC RAM-NEK GASKET
4	1	PRECAST CONCRETE VAULT
5	1	VORTEX FILTER
6	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: VFC DATE MANUFACTURED

APPLICATIONS:
TYPICAL APPLICATIONS FOR THE MODEL VFC INCLUDE:

- ☐ *LAUNDRIES*
- ☐ *FIRE PROTECTION*
- ☐ *EVAPORATIVE COOLING TOWER MAKE-UP*
- ☐ *PROCESS WATER*
- ☐ *NON-POTABLE WATER*
- ☐ *SITE IRRIGATION*



ELEVATION

Rain Trooper®
Rainwater Harvest System

PLEASE CALL FOR ADDITIONAL SIZES & DIMENSIONS.

SPECIFICATIONS

CONCRETE : CLASS 1 CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 AND ASTM-C478 ON REQUIRED CENTERS OR EQUAL.

COVER & FRAME : ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123.

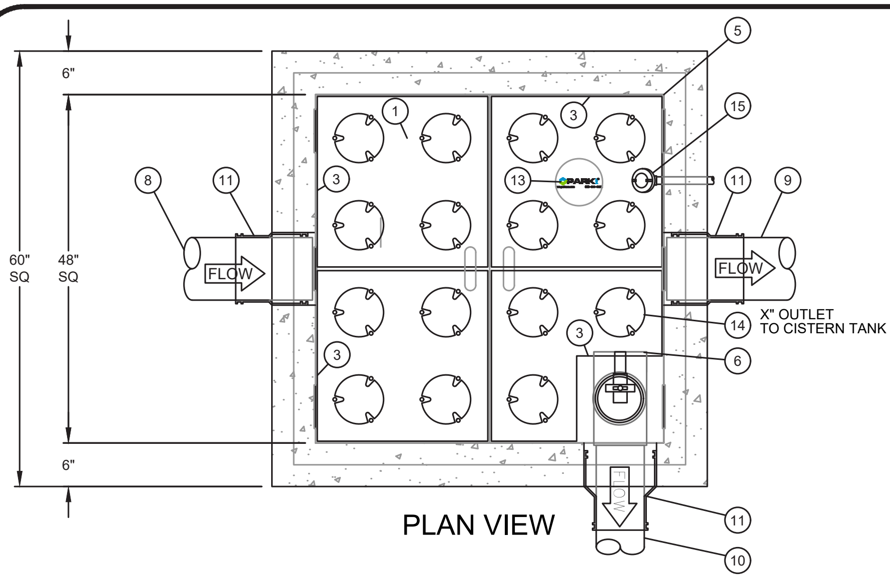
VFC-1

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA®
www.parkusa.com 888-611-PARK

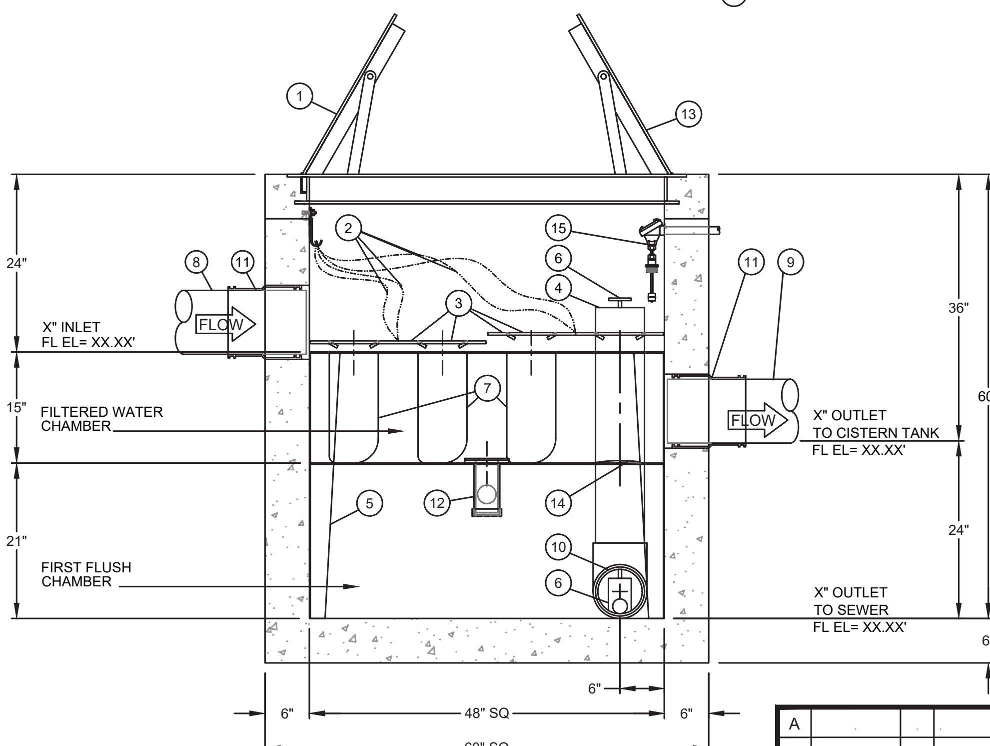
VORTEX FILTER
IN PRECAST CONCRETE VAULT

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	VFC-1	.
DATE 05/2019					



PLAN VIEW

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	48" SQ GALVANIZED STEEL HATCHWAY H20 RATED
2	1	SS RETRIEVAL CHAIN (TYP-4)
3	1	REMOVABLE RETAINER PLATES
4	1	X" OVER FLOW TO SEWER
5	1	FILTER STAND
6	1	1.5" ORIFICE FLOW CONTROL SLIDE GATE
7	1	400 MICRON BAG FILTER (TYP-15)
8	1	X" INLET
9	1	X" OUTLET (CISTERN)
10	1	X" OUTLET TO SEWER
11	1	RESILIENT RUBBER PIPE CONNECTION (PRESS-SEAL)
12	1	FIRST FLUSH VALVE W/ Ø2" FLANGE
13	1	SS PRODUCT ID BADGE
14	1	4" INSPECTION PORT w/ COVER
15	1	"A" SENSOR w/ CONDUIT HEAD



ELEVATION

Rain Trooper™
Rainwater Harvest Systems

PFS-01

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 AND ASTM-C478 ON REQUIRED CENTERS OR EQUAL.

COVER & FRAME : ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123.

ENGINEERING DATA

INDUSTRIAL DUTY, HIGH EFFICIENCY, SELF-CLEANING, BELOW GROUND FILTRATION SYSTEM. THIS MODEL SHIPS WITH A CAST IRON LID FOR VEHICLE LOADING APPLICATIONS.

REV	DATE	BY	DESCRIPTION
A			

PROJECT:
CUSTOMER:
ENGINEER:
ORDER #: PROJ #:
DATE: LOCATION:

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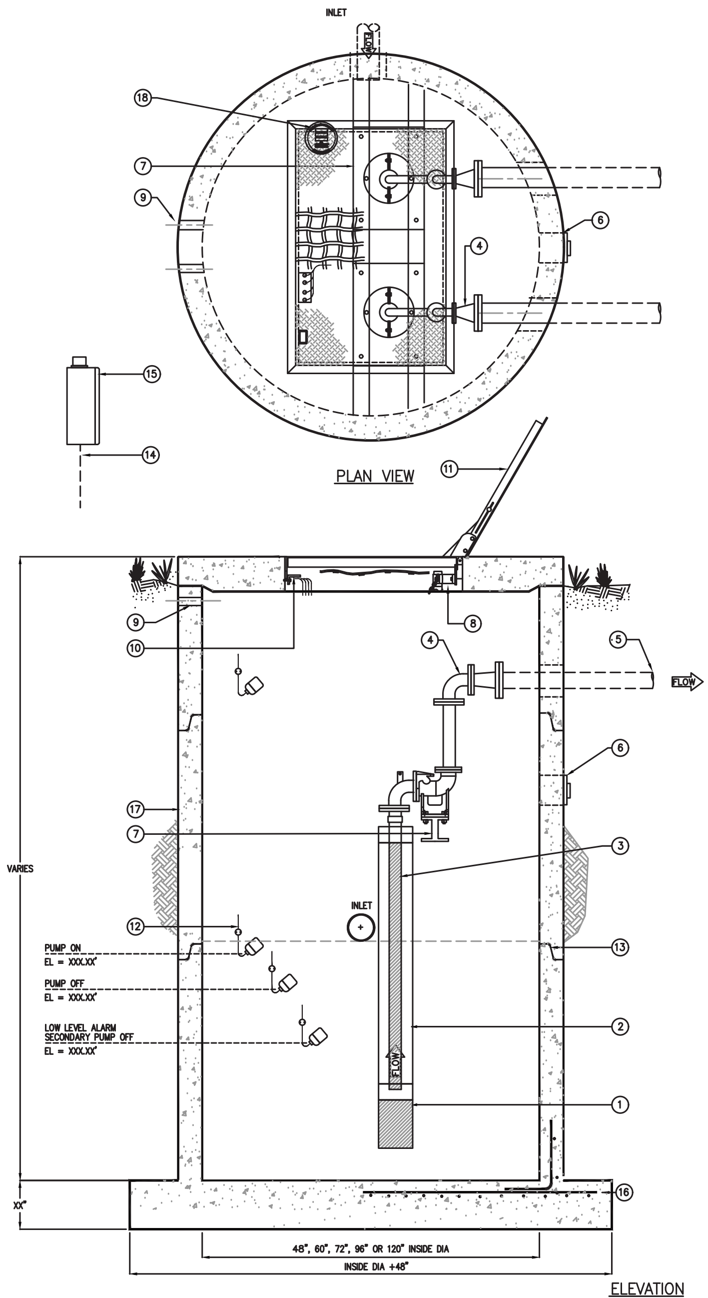
POLISHING FILTER SYSTEM
MODEL PFS–01

PM	PC	DRN	ENG	DWG. NO.	REV.
DATE	05/2019			PFS-01	A



NAMEPLATE

MODEL NUMBER: WWXX–RIDX–XXX–XXX–XXX–XX

WET WELL SIZE (ID)
48 – 48" DIA
60 – 60" DIA
72 – 72" DIA
96 – 96" DIA

PUMP CONFIGURATION
S – SIMPLEX
D – DUPLEX

PUMP DISCHARGE SIZE
3 – 3"
4 – 4"
6 – 6"
8 – 8"

FLOW RATE CAPACITY (GPM)
100 – 100 GPM
200 – 200 GPM
ETC...

POWER CHARACTERISTICS
43 – 460V/3PH/60Hz
23 – 230V/3PH/60Hz
21 – 230V/1PH/60Hz

PUMP MOTOR SIZE
020 – 2.0 HP
030 – 3.0 HP
050 – 5.0 HP
075 – 7.5 HP
100 – 10.0 HP
150 – 15.0 HP
200 – 20.0 HP

PUMP HEAD CAPACITY (TDH)
10 – 10' TOTAL DYNAMIC HEAD
20 – 20' TOTAL DYNAMIC HEAD
ETC...

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	2	S.S SCREEN
2	2	SHROUD
3	2	D.I. DISCHARGE PIPE
4	2	REDUCERS
5	2	D.I. PIPE
6	1	RESILENT BOOT FOR VALVE VAULT DRAIN
7	2	CHANNEL SUPPORT w/ PUMP MOUNTING SYSTEM
8	2	UPPER GUIDE BRACKET
9	2	ELEC. CPLG.
10	1	CONTROL CABLE BRACKET
11	1	SINGLE LEAF ALUMINUM HATCH w/ SS HINGES & LOCK HASP
12	4	LEVEL CONTROL FLOAT
13	–	ALL JOINTS MADE WATER–TIGHT W/ PLASTIC FLEXIBLE GASKET (RAM–NEK)
14	1	ELECTRICAL CABLE & CONDUIT (BY OTHERS)
15	1	NEMA 4X CONTROL PANEL (MOUNTED BY CONTRACTOR)
16	1	REBAR AS REQ'D
17	1	PRECAST CONCRETE WET WELL
18	1	NAMEPLATE MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL: WWXX–RID

NOTE:
ALL DASHED PIPING TO BE FURNISHED BY CONTRACTOR

NOTE:
VERIFY ALL ELEVATIONS PRIOR TO FABRICATION

SPECIFICATIONS

CONCRETE :

CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT:

GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ALUMINUM LID:

300 PSF RATED, 1/4" ALUMINUM SKID–RESISTANT FLOOR PLATE, STAINLESS STEEL TAMPERPROOF BOLTING & HINGES & SLAMLOCK.

PUMPS:

PUMPS SHALL BE CENTRIFUGAL SOLIDS HANDLING TYPE WITH SUBMERSIBLE TYPE MOTOR. PUMPS SHALL HAVE A CAPACITY AS FOLLOWS:

PUMP No.	TYPE	GPM	TDH	RPM	ELECTRICAL HP	V	PH	Hz
1	IRR	XXX	XXX	XXXX	X	XXX	X	60
2	IRR	XXX	XXX	XXXX	X	XXX	X	60

CONTROLS:

PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA–4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.

ENGINEERING DATA

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF ASSEMBLY. USE DIMENSIONAL DATA AS SHOWN. ALL PIPE, VALVES AND FITTINGS OF THE ASSEMBLY ARE APPROVED BY ONE OF THE FOLLOWING ASSOCIATIONS:

NPCA CERTIFIED PLANT
B64.5

DRAWING NOT FOR SUBMITTAL. CONTACT PARKUSA FOR LIFT STATION DESIGN ASSISTANCE.

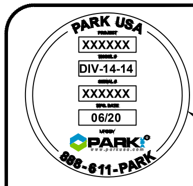
WW–RID

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

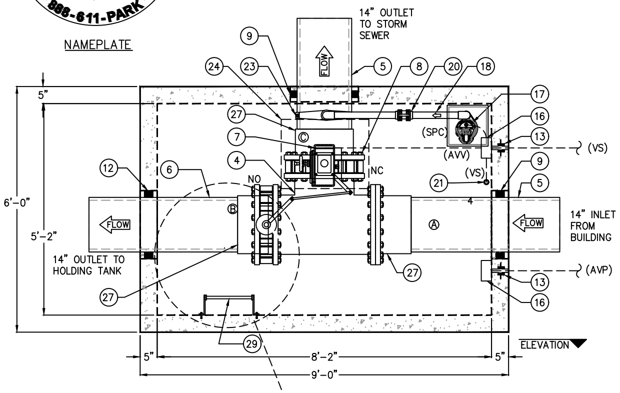
PARK USA
www.parkusa.com 888–611–PARK

RE–IRRIGATION DUPLEX LIFT STATION
WATER QUALITY PUMP STATION

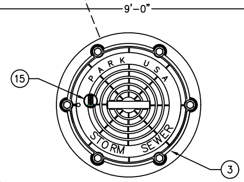
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WW–RID	.
DATE 05/2019					

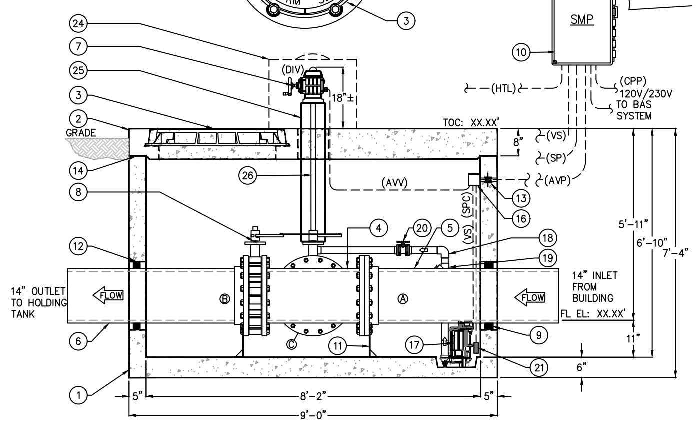


NAMEPLATE



PLAN VIEW





ELEVATION

SPECIFICATIONS

CONCRETE: CLASS I/II CEMENT WITH DESIGN STRENGTH OF 5000 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

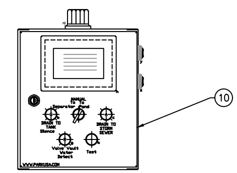
REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 AND ASTM-C478 ON REQUIRED CENTERS OR EQUAL.

D.I. CASTINGS: MANHOLE FRAMES, COVERS OR GRATES ARE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536, AASHTO M306, & AASHTO M105 STANDARDS. MANHOLE SHALL BE NOMINAL 24" DIAMETER AND BE HS-20 TRAFFIC DUTY.

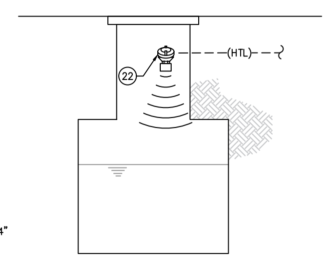
ENGINEERING DATA

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF INTERCEPTOR. USE DIMENSIONAL DATA AS SHOWN. UNIT SHALL BE STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO UPC AND ACI BUILDING CODES. MANUFACTURER SHALL ENSURE VAULT ASSEMBLY DESIGN ACCOUNTS FOR PREVENTION OF BUOYANCY EFFECT, IF WATER TABLE DEPTH IS PROVIDED.

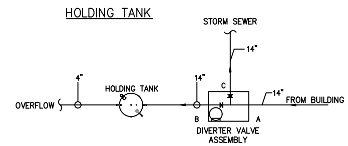
NOTES:
1. JOINTS TO BE SEALED w/ PLASTIC RAM-NEK GASKET
2. ALL DIMENSIONS ARE TO CENTER OF BLOCK-OUTS
3. LIFTING INSERTS AS REQUIRED
4. STRUCTURE TO BE PLACED ON MIN 6" STABALIZED BASE
5. RISER SECTIONS FURNISHED AS REQUIRED



CONTROL PANEL



HOLDING TANK



KEY PLAN

CONDUIT/WIRE LEGEND

MARK	DESCRIPTION	ELECT	WIRE SIZE	CONDUIT SIZE
AVP	ACTUATOR VALVE	120/230 VAC	(6) 14GA	1"
VS	VAULT WATER SENSOR	120/230 VAC	(2) 14GA	1"
AVV	ACTUATOR	120/230 VAC	(6) 14GA	SO CORD
SP	SUMP PUMP	120/230 VAC	(3) 12GA	1"
SPC	SUMP PUMP (INTERIOR)	120/230 VAC	(3) 12GA	SO CORD
HTL	HOLDING TANK (LEVEL SENSOR)	120/230 VAC	(3) 12GA	1"
OPP	CONTROL PANEL POWER	120/230 VAC	(3) 12GA	1"

NOTE: ALL WIRING/ CONDUIT SIZES ARE SUBJECT TO NEC AND ALL OTHER CODES

SPECIFICATIONS
STORMWATER DIVERTER SYSTEM

A. General Conditions:

A diverter valve shall be provided to direct flow from the building rainwater collection system, to either the holding tank or storm sewer system the sanitary sewer. The contractor shall furnish a diverter system including labor, materials and equipment which includes but is not limited to the containment tank, drain well, drainage, hatches, vent, supports, floats, valves, piping, shut off and check valves, protective coating, control panel and electric systems, access ladders, liquid level controls, internal wiring and all other required appurtenances for a completely operational stormwater diverter system.

B. Diverter Valve Assembly

The diverter valve shall be a 3-way butterfly valve that shall consist of ductile iron body with epoxy coating, EPDM o-ring seats and socket, and threaded end connections. The 3-way valve shall be fitted with an electric actuator that provides for a quarter-turn at a minimum torque of 300 in-lbs. The actuator shall include a housing that is designed to meet NEMA 4X environmental demands. A clutch-free manual override system to provide full-time override capabilities during powered or unpowered events shall be included. The diverter valve assembly shall be housed in a precast concrete vault suitable for direct burial. The vault shall include a manway access 30" in diameter. The access cover shall be ductile iron, bolted, and be watertight (pressure tested to 15 PSI). Provide water detection sensor and submersible sump pump with an integral float switch. The actuator shall have a stainless-steel extended valve stem/housing in order to extend the actuator 18" above grade to protect against moisture. Provide a weatherproof and removable aluminum or stainless-steel protective enclosure secured with security bolts. The enclosure shall have a glass window to allow a visual inspection of diverter valve position.

C. Diverter Control System:

Contractor shall furnish a diverter control panel that is manufactured by the diverter valve system manufacturer. Provide a ParkUSA RainTrooper Model RTV annunciation panel for the Diverter Valve that shall include audible alarms, visual alarms, holding tank continuous level data, diverter HOA switch, diverter position light indicators, push to test LED indicators, silence button for audible alarm, and dry contacts. Nameplates shall be affixed for pushbuttons, switches, and the indicator lights. Common 120V alarm buzzers with a silencing push button shall be included in the panel and activated for high and low water levels. The alarms can be interfaced and monitored by the Building Automation System (BAS). Provide auxiliary contacts for BAS interface. The panel shall be equipped with a configured HMI touch screen and programmable logic controller (PLC) for easy operator use. The panel shall be completely wired and tested prior to shipment. All components shall be IEC/UL approved. Complete electrical diagrams, dimensional drawings, and functional systems description shall be provided to the engineer for approval.

D. Control System Startup & Training:

A manufacturer's representative shall be available for final adjustment and start-up of the control system after installation is complete and to instruct the operating personnel in the use of the equipment. The manufacturer shall maintain spare parts for immediate availability.

ELECTRIC ACTUATOR WARNING

THE HOUSING FOR THE ELECTRIC ACTUATOR IS WEATHERPROOF (NEMA 4X RATED). THE ENCLOSURE IS NOT RATED FOR SUBMERSION. IF SUBMERSION OCCURS THE ELECTRIC ACTUATOR MAY BECOME DAMAGED AND NO LONGER FUNCTION AS INTENDED

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	6'-0" x 9'-0" x 5'-7" DEEP PRECAST CONCRETE VAULT
2	1	8" THK FLAT CONCRETE TOP
3	1	24" DIA DUCTILE IRON WATER-TIGHT RING & COVER
4	1	14" DUCTILE IRON TEE
5	2	14" SCH 80 PVC PIPE
6	1	14" SCH 80 PVC PIPE
7	1	ELECTRIC VALVE ACTUATOR (DIV)
8	2	14" TANDEM ACTUATED BUTTERFLY VALVES
9	2	18" DIA PIPE PENETRATION FOR 14" PVC PIPE w/ LINKSEAL LS475 x 21 PCS
10	1	STORMWATER MANAGEMENT PANEL SMP NEMA 4X (MOUNTED & WIRED BY CONTRACTOR)
11	3	GALVANIZED PIPE SUPPORT
12	1	18" DIA PIPE PENETRATION FOR 14" PVC PIPE w/ LINKSEAL LS575 x 16 PCS
13	2	3" DIA PIPE PENETRATION FOR 1" PVC ELEC CONDUIT w/ LINKSEAL LS300 X 4 PIECES
14	1	ALL JOINTS MADE WATER-TIGHT w/ PLASTIC FLEXIBLE GASKET (RAMNEK)
15	1	NAMEPLATE INDICATING: MFG: ParkUSA 888-611-PARK WWW.PARKUSA.COM MODEL: DIV-14-14 DATE MANUFACTURED
16	2	6"x6"x4" J-BOX
17	1	SUBMERSIBLE SUMP PUMP w/ INTEGRAL FLOAT SWITCH
18	2	1½" PVC PIPING TERMINATING IN STORM SEWER DISCHARGE FROM VAULT
19	1	1½" PVC CHECK VALVE
20	1	1½" PVC TRUE UNION BALL VALVE
21	1	WATER DETECTION SENSOR (E₁)
22	–	HOLDING TANK ULTRASONIC LEVEL TRANSDUCER (UT)
23	1	14"x1½" EPOXY COATED SADDLE
24	1	PROTECTIVE ENCLOSURE w/ DOME
25	1	SS MOUNTING BRACKET FOR ACTUATOR
26	1	EXTENDED VALVE STEM
27	3	14" SCH 80 PVC FLANGE
29	1	GALVANIZED LADDER

Rain Trooper
Rainwater Harvest System

RTV-14-14

REV	DATE	BY	DESCRIPTION
A	.	.	.

PROJECT: .
CUSTOMER: .
ENGINEER: . S/N #: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK
STORMWATER DIVERTER SYSTEM
MODEL RTV-14-2025630

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	NS	RTV-14-14	A
DATE	06/2020				

RAINFILTER™

Multi-Basket Filtration System

BEST USE FOR:

STORMWATER

PARK USA

A Northwest Pipe Company

ENGINEERING **FACTS**

GENERAL INFORMATION

In forested areas, the water balance or natural hydrology is altered only by rainfall and associated fluctuations in infiltration, evaporation, and transpiration from plant growth. But in urban areas, this natural hydrology is heavily modified because land has been cleared of vegetation and capped with “hard” or impervious surfaces. When it rains, most rainfall runs off of impervious surfaces such as roofs and roads and is then typically transported directly and quickly to waterways through a drainage system. As a result, stormwater reaches waterways more often, more quickly, and in greater volumes than waterways are naturally adapted to, as there are limited opportunities for infiltration, evaporation and transpiration via plants in the landscape.

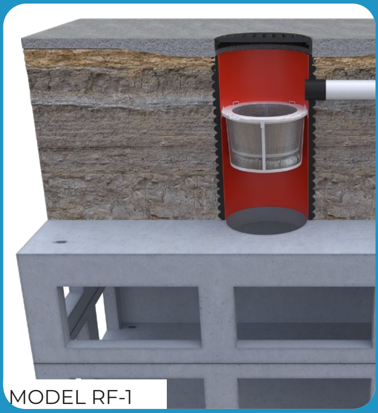
The ParkUSA® RainFilter™ is a complete system designed to remove total suspended solids (TSS), debris, and trash from stormwater runoff. It presents a low footprint and is of special use on leadership in energy and environmental design (LEED) projects and green developments, among others. It consists of a high-density polyethylene (HDPE) construction tank, an internal stainless steel filter, and an optimal storage system.

FEATURES

- Various Basket and Storage Equipment Designs Available
- Low Profile Design
- LEED Compliant
- Texas Manufactured
- Easy Installation and Maintenance

MODELS

Currently, there is one model available for the RainFilter system. However, this standard model varies with the basket and storage equipment configurations.



MODEL RF-1

STORMWATER STORAGE GRATES DIMENSIONS

TANK UNITS	SIZE IN FEET	SIZE IN INCHES	SIZE IN MILLIMETERS
ER-501 Single	1.48' x 1.34' x 2.25'	17.72" x 16.06" x 26.97"	450mm x 408mm x 685mm
ER-501 Double	2.89' x 1.34' x 2.25'	34.65" x 16.06" x 26.97"	880mm x 408mm x 685mm
ER-501 Triple	4.30' x 1.34' x 2.25'	51.57" x 16.06" x 26.97"	1,310mm x 408mm x 685mm
ER-501 Quad	5.71' x 1.34' x 2.25'	68.50" x 16.06" x 26.97"	1,740mm x 408mm x 685mm
ER-501 Pent	7.12' x 1.34' x 2.25'	85.40" x 16.06" x 26.97"	2,170mm x 408mm x 685mm

STORMWATER STORAGE GRATES DIMENSIONS

TANK UNITS	TANK VOLUME CUBIC FEET	TANK VOLUME GALLONS	WATER 97% STORAGE VOLUME CUBIC FEET	WATER 97% STORAGE VOLUME GALLONS
ER-501 Single	4.44	33.22	4.31	32.21
ER-501 Double	8.69	64.97	8.43	63.05
ER-501 Triple	12.93	96.72	12.54	93.81
ER-501 Quad	17.17	128.47	16.65	124.58
ER-501 Pent	21.42	160.21	20.78	155.41

OPERATION

ParkUSA's RainFilter captures unwanted floatable pollutants from stormwater systems. Inside of the unit, the influent encounters a floatable collection stainless-steel basket that traps floating debris as small as 2000 micron in size.

The separated effluent will exit the RainFilterr and continue through the optional stormwater storage system, leaving behind the debris in the product.

SYSTEM COMPONENTS

The RainFilter is designed with the following components:
- Stainless-steel Basket Screen
- HPDE Tank
- Stormwater Storage Equipment as Required
- Piping

DESIGN CONSIDERATIONS

Basin is constructed of high density polyethylene drainage pipe conforming to ASTM F1648. All extruded welding shall be per ASTM F2880. The basket and tabs are to be constructed of 16ga SS 304 perforated plate. The basket lip is constructed of 14ga 304 plate.

The Lower overflow orifice is constructed of a SS perforated cylinder. Finally, manhole frames, covers or grates area manufactured of grey cast iron conforming to ASTM A48 Class 30. Manhole is 24 inches inside diameter and rated traffic duty.

SIZING

Selecting the appropriate Rainfilter unit depends on three parts; HDPE basin configuration, SS basket dimensions, and if the application needs storage for stormwater.

For the HDPE basin, the standard is 19 inches inside diameter (slightly customizable), height varies with application. The SS basket depends on the basin ID, usually presents a 16 inch height and four concentrically merged baskets. And finally, for the stormwater storage grate, the sizes may vary for application as shown in the charts above.

MAINTENANCE

BMPs are typically designed to completely drain within 24 to 48 hours after the completion of a storm event. These BMPs are designed to mimic natural conditions by allowing water to soak into the ground and limiting the release of stormwater to other pipes or bodies of water. Monthly maintenance is advised in heavy weather months or after any major storm event (using one inch in 24 hours as a minimum guideline depending on non-structural controls of the site).

The frequency of cleaning any given installation will vary depending on its use. The Rainfilter should be cleaned routinely to prevent contamination of the effluent water. Collected debris should be removed before accumulation effectively reduce storage capacity and effluent flow rate out of the interceptor. A professional company familiar with regulations regarding proper disposal should maintain the interceptor.

STORMWATER

Human life, as with all animal and plant life on the planet, depends upon water; at ParkUSA, we greatly value the importance of protecting this natural resource. To contribute our part in conservation and sustainability, ParkUSA offers a wide range of stormwater management products, which include stormwater quantity and stormwater quality units. We engineer advanced water technologies designed to combat pollution and control the flow of stormwater. These cleaning processes and water drainage methods provide breakthrough safety modifications for significant activities in day-to-day life. Most importantly, ParkUSA's mission is to offer innovative solutions to important stormwater management needs around the world. ParkUSA has been in the business of manufacturing stormwater infrastructure and water quality devices since the beginning of the Clean Water Act, providing sustainable solutions for today's stormwater issues.
As always, we aim to impact people's lives and provide a safe quality of life for generations.

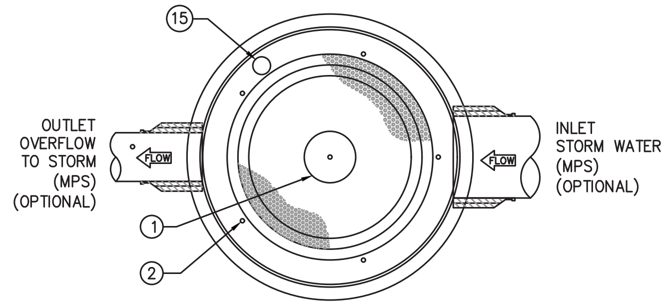
ParkUSA IS ALWAYS READY TO **DESIGN** AND **ENGINEER** PRODUCTS FOR YOUR UPCOMING PROJECTS!

OTHER STORMWATER PRODUCTS

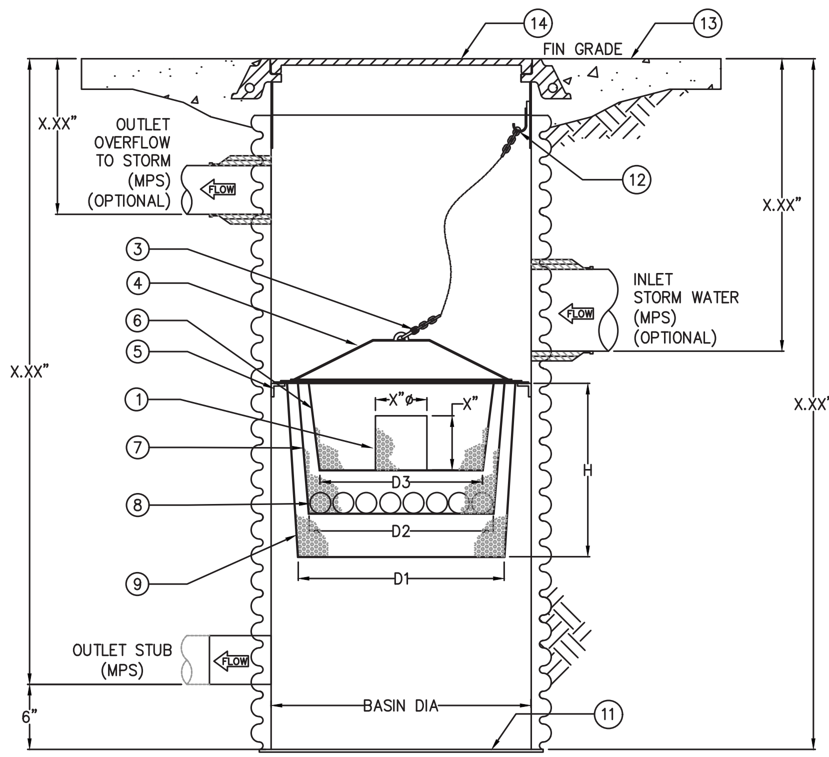
RAINBASIN

RAINTROOPER

NAMEPLATE



PLAN



ELEVATION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	SS BASKET OVERFLOW
2	1	3/8"ø HOLES TO ALLOW INFIILTRATION
3	1	SS LIFTING CHAIN
4	1	LIFT-OUT HANDLE
5	1	1-1/4" x 1-1/4" x 1/4" ROLLED SUPPORT
6	1	8000 MICRON SS FILTRATION BASKET
7	1	3000 MICRON SS FILTRATION BASKET
8	1	HYDROCARBON ABSORPTION PILLOW
9	1	2000 MICRON SS FILTRATION BASKET
10	1	NOT USED
11	1	BOTTOM TO CONTAIN (6) 3/8" HOLES TO ALLOW INFILTRATION
12	1	SS CABLE BRACKET
13	1	CONCRETE APRON (BY OTHERS)
14	1	24" DIA RING & COVER OR GRATE
15	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: RFH-1

RFH-1

MODEL #:	BASIN DIA	D1	D2	D3	H	CL	MAX FLOW Q_{FF} (CFS)	MPS = MAX PIPE SIZE	MAX TREATED FLOW Q_{FB} (CFS)
RFH-24	24"	19"	17"	15"	16"	9½"	9.12	12"	4.56
RFH-36	36"	31"	29"	27"	16"	16½"	16.22	15"	8.11
RFH-48	48"	43"	41"	39"	16"	22½"	22.30	18"	11.15

PLEASE CALL FOR ADDITIONAL SIZES & DIMENSIONS

SPECIFICATIONS

BASIN:	BASIN IS CONSTRUCTED OF HIGH DENSITY POLYETHYLENE DRAINAGE PIPE CONFORMING TO ASTM F1648. ALL EXTRUDED WELDING SHALL BE PER ASTM F2880.
BASKET:	BASKET AND TABS TO BE CONSTRUCTED OF 16GA SS 304 PERFORATED PLATE (⅛" HOLES ON 3/16" STAGGER)
BASKET LIP:	BASKET LIP TO CONSTRUCTED OF 14GA SS 304 PLATE
LIFT HANDLE:	HANDLE TO CONSTRUCTED OF ½"ø SS 304 ROUND BAR
OVERFLOW:	LOWER OVERFLOW ORIFICE TO BE CONSTRUCTED OF SS PERFORATED CYLINDER.

REV	DATE	BY	DESCRIPTION
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PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

RAIN WATER HARVEST FILTRATION SYS.
MODEL-RFH-1 24" THRU 48"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.		
DATE 05/2019				RFH-1	A

RAINWATER HARVESTING

NOTES

DRAINAGE

NOTES

STORMWATER DRAINAGE

BEST USE FOR:

STORMWATER

PARK USA
A Northwest Pipe Company

ENGINEERING FACTS

STORMWATER DRAINAGE

Stormwater drainage products are systems designed to mitigate damage and safety risks associated with normal and heavy stormwater accumulation events. These units perform multiple functions and operations from catchment points to containment for highly specialized units. Drainage products are an essential part of any stormwater project.

ParkUSA® offers a wide variety of stormwater drainage products, available in both standard and custom designed units. Precast concrete delivers strength, durability, and loading capacity needed for any application that requires these types of units. To complete any drainage system, a specifier, architect, or engineer needs a stormwater drainage unit that provides the solution to the corresponding project goal.

MANHOLES

Below-ground wastewater and stormwater sewer piping require openings to allow for access, connection points, and change-in-direction points. A manhole, or manway, is used for these activities. The manhole is a belowground round or square structure made of precast concrete. Sewer piping connects near the bottom of the manhole structure. At the street level, an iron access cover (often referred to as a “manhole cover”) is placed to permit access.

Sanitary Sewer Manholes: This manhole is used on sanitary sewer lines for the conveyance of sanitary sewage. The sanitary sewer manhole is typically 48 inches in diameter and varies in depth according the depth of the sanitary sewer. At the bottom of the manhole and at the pipe connections of the sewer, a channel (also called an “invert”) is formed so that the sewer flow is smooth and unimpeded. Since sanitary sewage can be corrosive, interior liners can be specified for the manhole interior.

Model PCM

Stormwater Manholes: This manhole is used on stormwater sewer lines for the conveyance of rainwater. The storm sewer manhole is generally characterized by its larger size, which is dictated by the sewer pipe connection sizes and orientation. Sizes of storm sewer manholes range from 48 inches to 120 inches in diameter and vary in depth according to the depth of the storm sewer.

APPLICATIONS

A manhole is widely used as an access point for making connections, inspections, valve adjustments, or to perform maintenance on underground utility vaults. They are used in both stormwater or wastewater applications, being found in urban areas, streets, and sidewalks. ParkUSA also offers custom manhole units in order to be suitable for almost any application.

Model PCMHIN

CATCH BASINS

Rainwater surface drainage is typically performed by catch basins, sometimes referred to as inlets. The catch basin is a belowground box structure with a horizontal opening at ground level, where a perforated grate is placed to allow rainwater to enter the catch basin box. The grate is made of a material that best fits the intended use of the surface level. For example, a parking lot would require a cast iron grate that is rated for vehicular weight and for pedestrian areas, a light-duty grate would be used.

Model GIS-01

During a rain event, stormwater drains from the surface area into the grate opening of the catch basin. This water then drains into a sewer pipe that leads from the catch basin box structure. The stormwater sewer piping is placed at a downward-sloping gradient to encourage water to flow through the piping; this is known as “gravity-flow”. Catch basins are linked to pipes creating a network of drainage points.

APPLICATIONS

The catch basin is a utility product which is an initial component in stormwater applications. It is also known as storm drain inlet or curb inlet. The catch basin is an opening to the storm drain system. It typically includes a grate or curb at street level where stormwater enters the unit and a sump captures sediment, debris, and associated pollutants. Catch basins are important because they prevent storm sewer blockages and minimize the amount of pollutants entering storm sewers.

Model CB-01

SAFETY END TREATMENTS

Safety end treatment (SET) structures are used along roadways to terminate stormwater piping that is installed under roadways or driveways. The safety end treatment (SET) prevents soil erosion and helps support the driveway. Driveways that cross an open ditch require SETs. Stormwater piping is placed below roadways or driveways to create a continuous waterway. SETs are normally installed in pairs; at the inlet and the exit of this piping.

Model SETH-1

As an important safety feature, the SET can be equipped with galvanized steel rails on top of the structure to provide a safer embankment to deflect an out-of-control oncoming vehicle away from the concrete structure. The SET equipped with rails saves lives. Typically, the county or the state determine the specifications for SET structures.

Optional features for SETs include multiple pipe configurations, transverse or parallel safety rails, trash screens, and flap valves.

APPLICATIONS

Safety end treatment (SET) products are ideal for applications near roadways or walkways. The unit provides solutions for erosion control and related issues. ParkUSA offers a wide range of configurations and sizes, making SET units suitable for several applications and zone configurations.

Model FCS-01

DRAINAGE PIPES

Drainage pipe, or reinforced concrete pipe (known as “RCP”) is the strongest and most reliable pipe used for underground stormwater sewers. Sizes range from 12 inches to 96 inches in diameter, and lengths up to eight feet. The RCP sections contain a male and female end for interconnecting the pipe segments. These connections are sealed watertight with a butyl gasket material or rubber o–ring.

Model RCP-01

CURB INLETS

When designing and building new streets and parking areas, a curb inlet is used to assist in the stormwater drainage of the street surface area. The curb inlet is a belowground box structure with a vertical throat opening at the street level. As the name implies, the opening is placed in the curb perimeter of the paved surface area. At the street level is an iron access cover, often referred to as a “manhole cover”. During a rain event, stormwater drains from the paved area into the throat opening of the curb inlet. This water then drains into a sewer pipe that is connected to the curb inlet box structure. The stormwater sewer piping is placed at a downward-sloping gradient to encourage water to flow through the piping; this is known as “gravity-flow”. The stormwater eventually flows into a stream, river, ocean, or type of public estuary.

Model BI

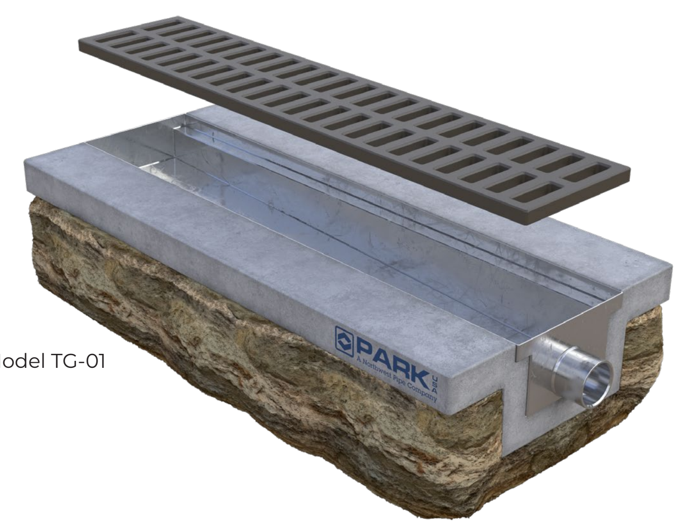
APPLICATION

Curb inlet filters are used to remove debris and pollutants from stormwater runoff before it enters the drainage waterways. Curb inlets are widely implemented in stormwater applications from rural to industrial zones, and act as a street-side inlet protection unit. ParkUSA offers both standard sizes and custom designs to fulfill any project needs.

Model BBI

TRENCH GRATES

ParkUSA FloTrench™ is a floor drain that is used for the rapid evacuation of surface water, containment of utility lines, or chemical spills. Employing a grating or solid cover that is flush with the adjoining surface, this drain may be made of concrete, polyethylene, steel, or fiberglass to aid in channel crafting and slope formation. To address the capture of debris, FloTrench includes the option of stainless steel debris screens. ParkUSA can manufacture trench drains in standard or custom configurations. ParkUSA’s project managers work with each customer to ensure that each trench drain meets the exact requirements for the application.



Model TG-01

HEADWALLS

Underground storm sewer piping will sometimes penetrate aboveground in the form of a drainage ditch, pond inlet, or discharge. There is a potential for soil erosion to occur around the pipe due to the unbridled nature of stormwater. To help prevent this erosion, a headwall is used to terminate the pipe. The headwall is a precast concrete structure with wings and a bottom to deflect the water away from the soil.

Headwalls are used to provide support for bridges and roadways by anchoring the piping to prevent movement beneath bridges and roadways caused by hydraulic and soil pressures. The headwall helps prevent soil erosion and scouring from turbulent stormwater and prevents adjacent soil from sloughing into the waterway.

Optional features for headwalls include trash screens, security screens, energy dissipators, flap valves, gate valves, stop logs, and handrails.

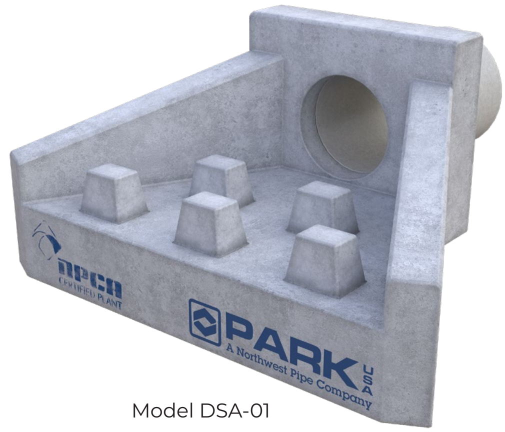
ParkUSA offers headwalls to meet the needs of varied project requirements. Components of an effective stormwater drainage network can include: catch basins, junction boxes, curb inlets, manholes, drainage pipes, headwalls, safety end treatments, detention basins, stormwater quality interceptors, and pump lift stations.

FEATURES

- Single-piece construction
- Easy installation of base section

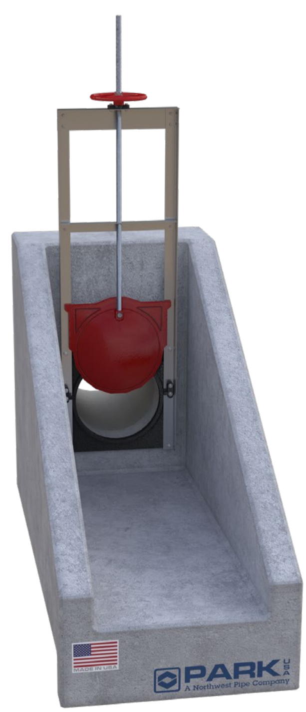
BENEFITS

- Offers rugged durability for storm [LJ2] water conveyance and erosion prevention
- Quick and easy installation
- Available in flared-end or three-sided construction to provide an opening for stormwater runoff
- Cylindrical flared-end sections are seamless pipe ends that taper open to the base
- Three-sided design fits the pipe end to a wall with wings and a flat base
- Terminates drainage pipe
- Variety of sizes available



Model DSA-01

Model DSB-01



Model SGH

DRAINAGE

STORMWATER

Human life, as with all animal and plant life on the planet, depends upon water; at ParkUSA, we greatly value the importance of protecting this natural resource. To contribute our part in conservation and sustainability, ParkUSA offers a wide range of stormwater management products, which include stormwater quantity and stormwater quality units. We engineer advanced water technologies designed to combat pollution and control the flow of stormwater. These cleaning processes and water drainage methods provide breakthrough safety modifications for significant activities in day-to-day life. Most importantly, ParkUSA's mission is to offer innovative solutions to important stormwater management needs around the world. ParkUSA has been in the business of manufacturing stormwater infrastructure and water quality devices since the beginning of the Clean Water Act, providing sustainable solutions for today's stormwater issues.
As always, we aim to impact people's lives and provide a safe quality of life for generations.

ParkUSA IS ALWAYS READY TO **DESIGN** AND **ENGINEER** PRODUCTS FOR YOUR UPCOMING PROJECTS!

OTHER STORMWATER PRODUCTS

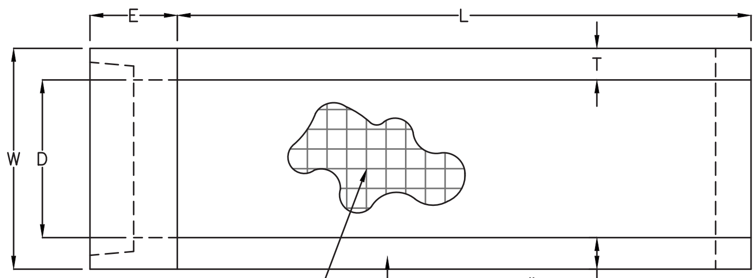
RAINTROOPER

TRASHTROOPER

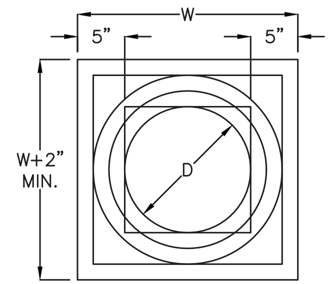
CANAL VALVE

SALES@PARKUSA.COM
888-611-PARK

PARK USA A Northwest Pipe Company



PLAN



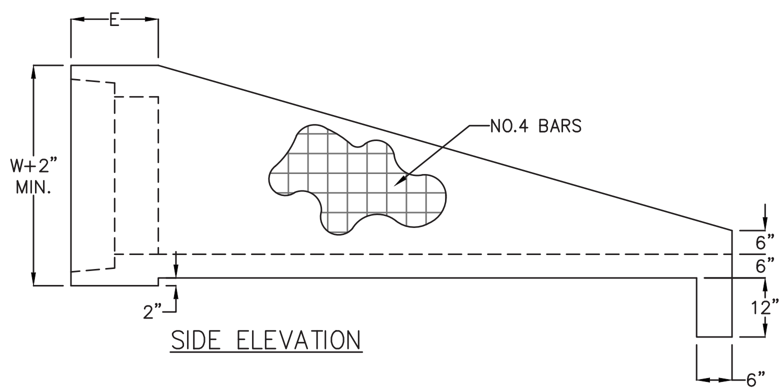
END VIEW

NOTES:

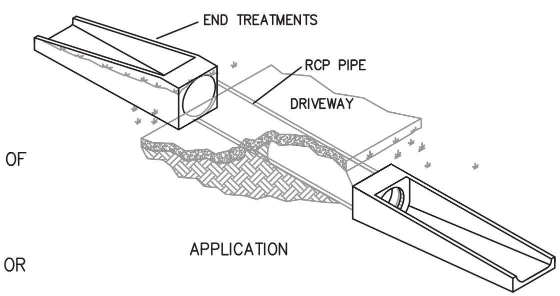
1. CLASS "C" CONCRETE
2. 12" ARE MADE WITH 12" KNOCK OUT FOR SMALLER PIPE IN 15" SET MOLD
3. 6" WALL IN 36" AS PER CHART
4. REINFORCEMENT:
   12"–24" #4 BARS @ 9" ℄ GRADE 60
   24"–36" #4 BARS @ 6" ℄ GRADE 60
5. REINFORCEMENT:
   1" MINIMUM COVER ON ALL REINFORCEMENT

MODEL	D	SLOPE	W	L	T	E	WEIGHT
SET123	12"	3:1	1'–10"	3'–3"	5"	12"	1680
SET124	12"	4:1	1'–10"	4'–4"	5"	12"	2040
SET126	12"	6:1	1'–10"	8'–0"	5"	12"	2760
SET153	15"	3:1	2'–1¼"	4'–0"	5"	12"	1680
SET154	15"	4:1	2'–1¼"	5'–4"	5"	12"	2040
SET156	15"	6:1	2'–1¼"	8'–0"	5"	12"	2760
SET183	18"	3:1	2'–5¼"	4'–9"	5"	12"	2120
SET184	18"	4:1	2'–5¼"	6'–4"	5"	12"	2600
SET186	18"	6:1	2'–5¼"	9'–6"	5"	12"	3560
SET243	24"	3:1	2'–11½"	6'–3"	5"	12"	3120
SET244	24"	4:1	2'–11½"	8'–4"	5"	12"	3880
SET246	24"	6:1	2'–11½"	12'–6"	5"	12"	5400
SET303	30"	3:1	3'–5¼"	7'–9"	5"	12"	4280
SET304	30"	4:1	3'–5¼"	10'–4"	5"	12"	5400
SET306	30"	6:1	3'–5¼"	15'–6"	5"	12"	7600
SET363	36"	3:1	4'–3"	10'–0"	6"	12"	6200
SET364	36"	4:1	4'–3"	12'–0"	6"	12"	9040
SET366	36"	6:1	4'–3"	18'–3"	6"	12"	13,000

NPCA CERTIFIED PLANT   ASTM C-858   SET-1



SIDE ELEVATION



APPLICATION

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION INCLUDING WALLS AND FLOOR.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

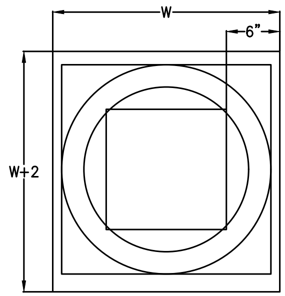
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA®
www.parkusa.com 888–611–PARK

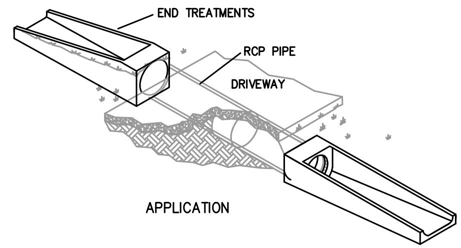
SAFETY END TREATMENT
MODEL SET – 12" THRU 36"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SET–1	.
DATE 05/2019					

DRAINAGE



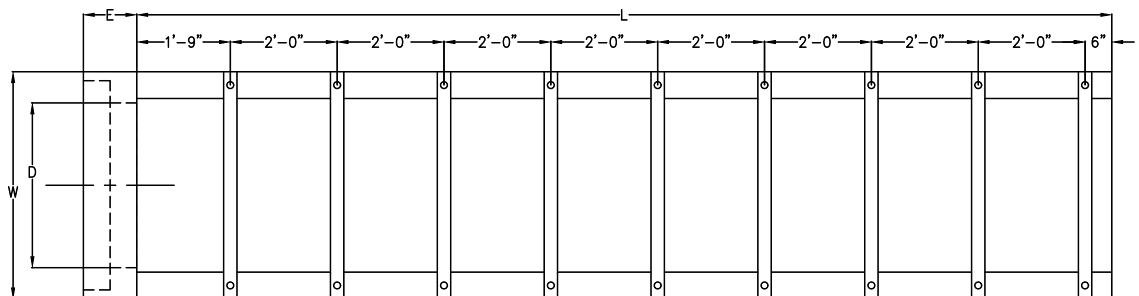
END VIEW
1" MINIMUM COVER ON
ALL REINFORCEMENT



APPLICATION

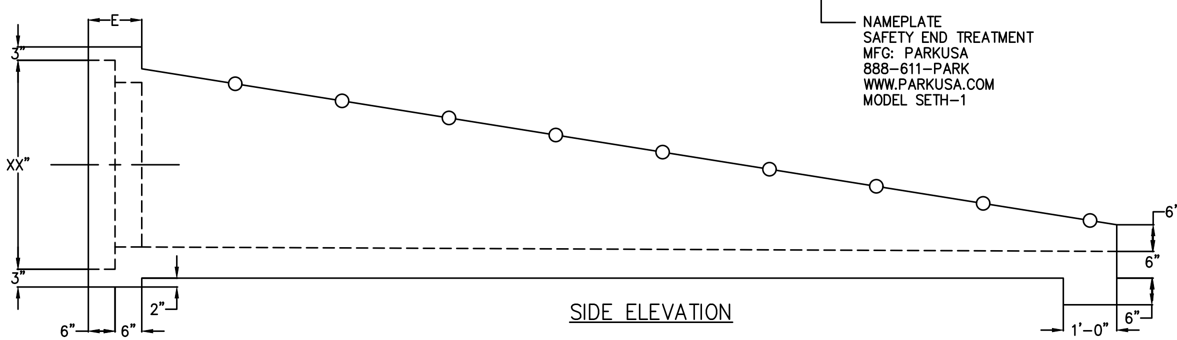
NOTES:
1. CLASS "C" CONCRETE
2. 12" ARE MADE WITH 12" KNOCK OUT FOR SMALLER PIPE IN 15" SET MOLD
3. 6" WALL IN 36" AS PER CHART
4. REINFORCEMENT:
12"–24" #4 BARS @ 9" ℅ GRADE 60
24"–36" #4 BARS @ 6" ℅ GRADE 60

SLOPE	D	SLOPE	W	L	T	E	WEIGHT
SETH–12–3	12"	3:1	1'–10"	3'–3"	5"	12"	1680
SETH–12–4	12"	4:1	1'–10"	4'–4"	5"	12"	2040
SETH–12–6	12"	6:1	1'–10"	8'–0"	5"	12"	2760
SETH–15–3	15"	3:1	2'–1r"	4'–0"	5"	12"	1680
SETH–15–4	15"	4:1	2'–1r"	5'–4"	5"	12"	2040
SETH–15–6	15"	6:1	2'–1r"	8'–0"	5"	12"	2760
SETH–18–3	18"	3:1	2'–5r"	4'–9"	5"	12"	2120
SETH–18–4	18"	4:1	2'–5r"	6'–4"	5"	12"	2600
SETH–18–6	18"	6:1	2'–5r"	9'–6"	5"	12"	3560
SETH–24–3	24"	3:1	2'–11i"	6'–3"	5"	12"	3120
SETH–24–4	24"	4:1	2'–11i"	8'–4"	5"	12"	3880
SETH–24–6	24"	6:1	2'–11i"	12'–6"	5"	12"	5400
SETH–30–3	30"	3:1	3'–5r"	7'–9"	5"	12"	4280
SETH–30–4	30"	4:1	3'–5r"	10'–4"	5"	12"	5400
SETH–30–6	30"	6:1	3'–5r"	15'–6"	5"	12"	7600
SETH–36–3	36"	3:1	4'–3"	10'–0"	6"	12"	6200
SETH–36–4	36"	4:1	4'–3"	12'–0"	6"	12"	9040
SETH–36–6	36"	6:1	4'–3"	18'–3"	6"	12"	13,000



PLAN

NAMEPLATE
SAFETY END TREATMENT
MFG: PARKUSA
888–611–PARK
WWW.PARKUSA.COM
MODEL SETH–1



SIDE ELEVATION

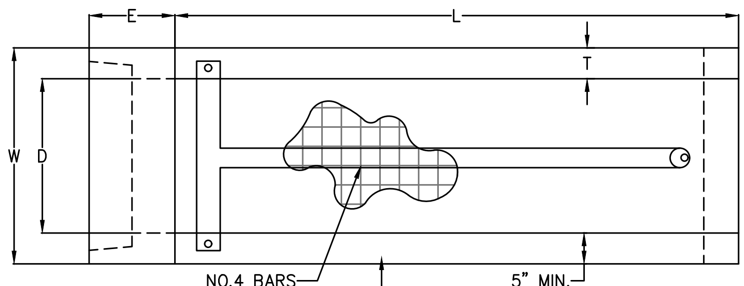
SETH–1

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

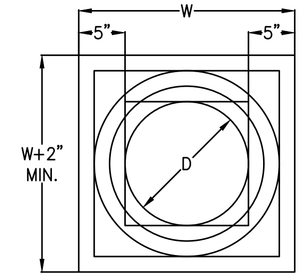
www.parkusa.com 888–611–PARK

SAFETY END TREATMENT w/ HARDWARE
MODEL SETH 12" THROUGH 36"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SETH–1	.
DATE 05/2019					



PLAN

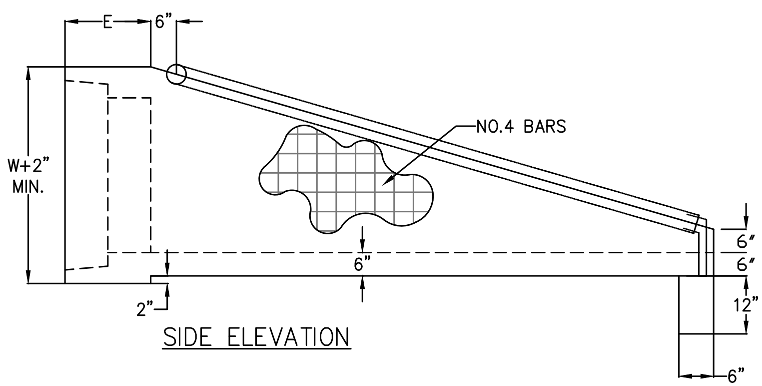


END VIEW

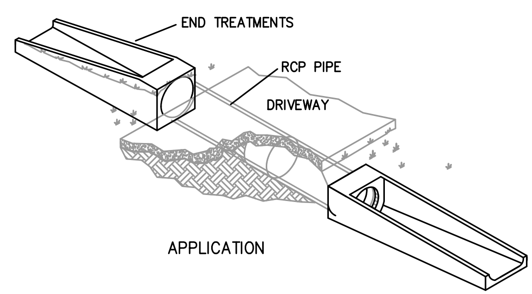
NOTES:

1. CLASS "C" CONCRETE
2. 12" ARE MADE WITH 12" KNOCK OUT FOR SMALLER PIPE IN 15" SET MOLD
3. 6" WALL IN 36" AS PER CHART
4. REINFORCEMENT:
   12"–24" #4 BARS @ 9" ℅ GRADE 60
   24"–36" #4 BARS @ 6" ℅ GRADE 60
5. REINFORCEMENT:
   1" MINIMUM COVER ON ALL REINFORCEMENT

SLOPE	D	SLOPE	W	L	T	E	WEIGHT
SETHC–12–3	12"	3:1	1'–10"	3'–3"	5"	12"	1680
SETHC–12–4	12"	4:1	1'–10"	4'–4"	5"	12"	2040
SETHC–12–6	12"	6:1	1'–10"	8'–0"	5"	12"	2760
SETHC–15–3	15"	3:1	2'–1r"	4'–0"	5"	12"	1680
SETHC–15–4	15"	4:1	2'–1r"	5'–4"	5"	12"	2040
SETHC–15–6	15"	6:1	2'–1r"	8'–0"	5"	12"	2760
SETHC–18–3	18"	3:1	2'–5r"	4'–9"	5"	12"	2120
SETHC–18–4	18"	4:1	2'–5r"	6'–4"	5"	12"	2600
SETHC–18–6	18"	6:1	2'–5r"	9'–6"	5"	12"	3560
SETHC–24–3	24"	3:1	2'–11i"	6'–3"	5"	12"	3120
SETHC–24–4	24"	4:1	2'–11i"	8'–4"	5"	12"	3880
SETHC–24–6	24"	6:1	2'–11i"	12'–6"	5"	12"	5400
SETHC–30–3	30"	3:1	3'–5r"	7'–9"	5"	12"	4280
SETHC–30–4	30"	4:1	3'–5r"	10'–4"	5"	12"	5400
SETHC–30–6	30"	6:1	3'–5r"	15'–6"	5"	12"	7600
SETHC–36–3	36"	3:1	4'–3"	10'–0"	6"	12"	6200
SETHC–36–4	36"	4:1	4'–3"	12'–0"	6"	12"	9040
SETHC–36–6	36"	6:1	4'–3"	18'–3"	6"	12"	13,000



SIDE ELEVATION



APPLICATION

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION INCLUDING WALLS AND FLOOR.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ASCE NPCA CERTIFIED PLANT ASTM C-913 SETHC-1

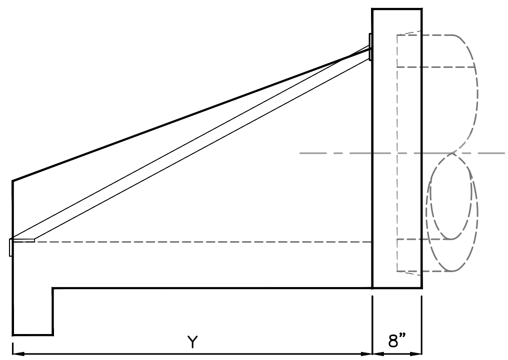
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

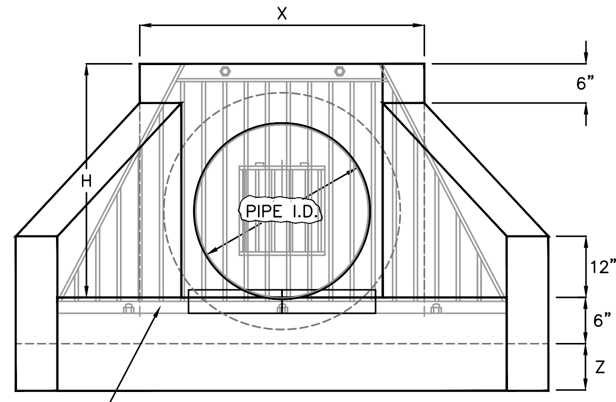
SAFETY END TREATMENT w/ HARDWARE
MODEL SETHC 12" THROUGH 36"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SETHC–1	.
DATE 05/2019					

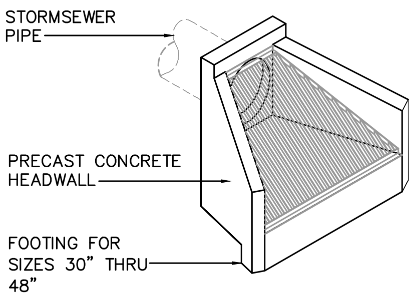
DRAINAGE



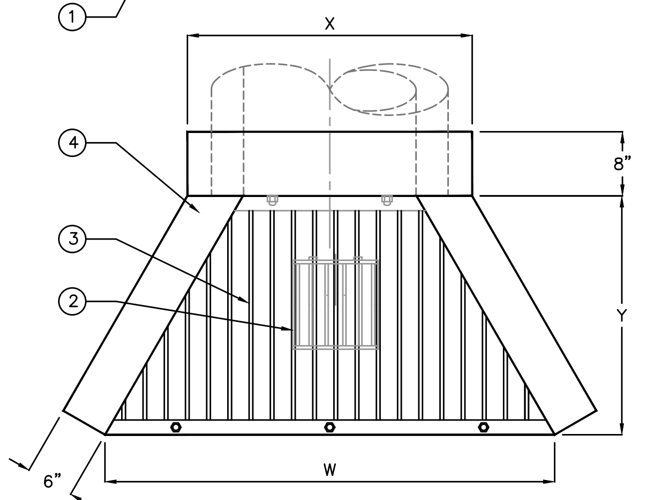
SIDE VIEW



FRONT VIEW



APPLICATION



TOP VIEW

MODEL	PIPE DIA	DIMENSIONS					
		H	W	X	Y	Z	WEIGHT (LBS)
DSA–12	12"	2'–6"	4'–3"	3'–0"	2'–0"	–	2,700
DSA–15	15"	2'–6"	4'–3"	3'–0"	2'–0"	–	2,700
DSA–18	18"	2'–6"	4'–3"	3'–0"	2'–0"	–	2,600
DSA–21	21"	3'–0"	5'–10"	3'–2"	3'–0"	–	4,300
DSA–24	24"	3'–0"	5'–10"	3'–2"	3'–0"	–	4,200
DSA–30	30"	3'–6'	7'–6"	4'–1"	4'–0"	9"	6,200
DSA–36	36"	4'–1"	9'–3"	4'–8"	5'–0"	9"	8,100
DSA–42	42"	4'–11"	12'–6"	5'–10"	6'–0"	12"	11,000
DSA–48	48"	4'–11"	12'–6"	5'–10"	6'–0"	12"	11,000

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	$1\frac{1}{2}$"x$\frac{1}{4}$" GALVANIZED ANGLE BOLTED TO CONCRETE WITH 1/2" ANCHOR BOLTS
2	1	12"x12" HINGED CLEAN OUT GRATE
3	1	GALVANIZED STEEL DEBRIS GRATE, $1\frac{1}{2}$"x$\frac{3}{16}$" BARS @ 2" O.C., 1" CLEAR OPENING
4	1	NAMEPLATE PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL DSA–1

DSA–1

NPCA CERTIFIED PLANT   ASTM C–858   AMERICAN SOCIETY OF SANITARY ENGINEERING   ASPE MEMBER

SPECIFICATIONS

CONCRETE : Class I/II concrete with of design strength of 4500 PSI at 28 days. Unit is of monolithic construction including walls and floor.

REINFORCEMENT: Grade 60 reinforced. No. 4 steel rebar to conform to ASTM A615 on required centers or equal. Bar bending and placement shall with the latest ACI standards.

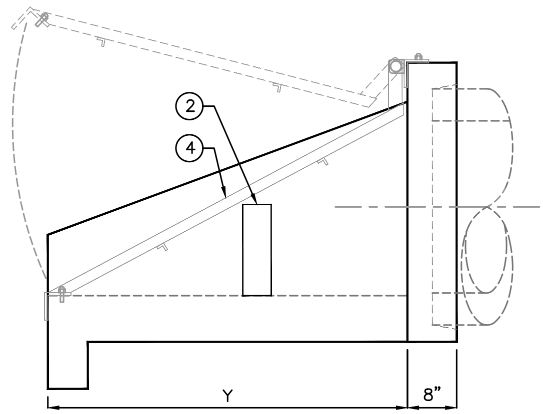
GRATING: All steel fabrication shall be in accordance to AWA D1.1. Steel shall be ASTM A36 carbon steel, and hot–dipped galvanized after fabrication in accordance to ASTM A123

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: .   PROJ #: .
DATE: .   LOCATION: .

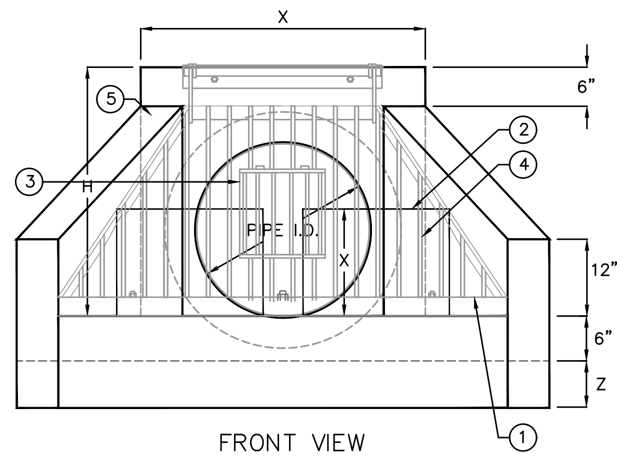
PARK USA
www.parkusa.com   888–611–PARK

DRAINAGE EXIT STRUCTURE
MODEL DSA 12" THRU 48"

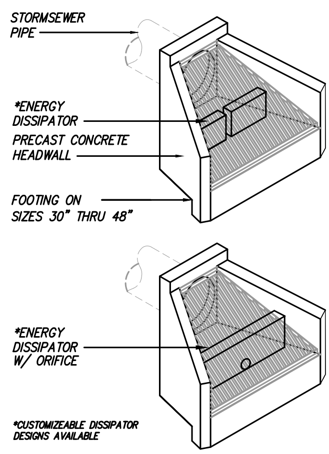
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	DSA–1	.
DATE 05/2019					



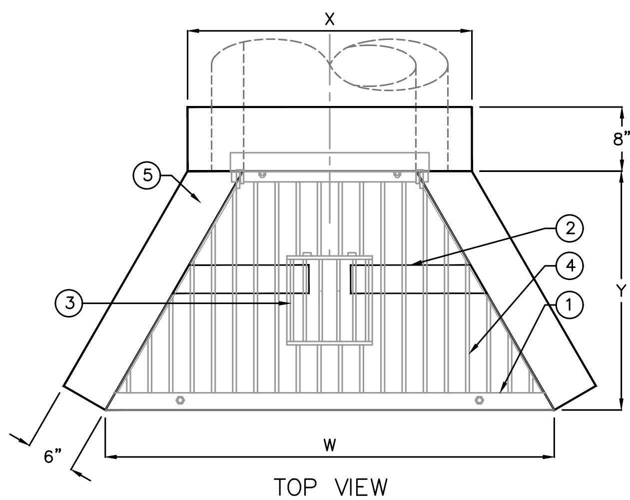
SIDE VIEW



FRONT VIEW



APPLICATIONS



TOP VIEW

MODEL	PIPE DIA	DIMENSIONS					WEIGHT (LBS)
		H	W	X	Y	Z	
DSB-12	12"	2'-6"	4'-3"	3'-0"	2'-0"	–	2,700
DSB-15	15"	2'-6"	4'-3"	3'-0"	2'-0"	–	2,700
DSB-18	18"	2'-6"	4'-3"	3'-0"	2'-0"	–	2,600
DSB-21	21"	3'-0"	5'-10"	3'-2"	3'-0"	–	4,300
DSB-24	24"	3'-0"	5'-10"	3'-2"	3'-0"	–	4,200
DSB-30	30"	3'-6"	7'-6"	4'-1"	4'-0"	9"	6,200
DSB-36	36"	4'-1"	9'-3"	4'-8"	5'-0"	9"	8,100
DSB-42	42"	4'-11"	12'-6"	5'-10"	6'-0"	12"	11,000
DSB-48	48"	4'-11"	12'-6"	5'-10"	6'-0"	12"	11,000

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	2" X 1/4" GALVANIZED ANGLE BOLTED TO CONCRETE WITH 1/2" ANCHOR BOLTS
2	1	ENERGY DISSIPATOR
3	1	12"x12" HINGED CLEANOUT GRATE
4	1	GALVANIZED STEEL DEBRIS GRATE, 2"x¼" BARS @ 2¾" O.C., 2½" CLEAR OPENING
5	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL DSB

NPCA CERTIFIED PLANT ASTM C-858

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION INCLUDING WALLS AND FLOOR.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING AND PLACEMENT SHALL WITH THE LATEST ACI STANDARDS.

GRATING: ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123

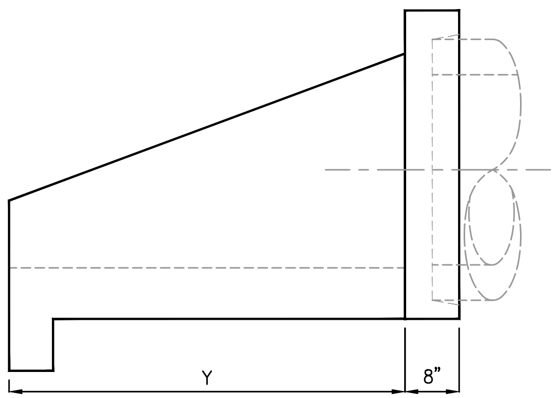
DSB-1

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

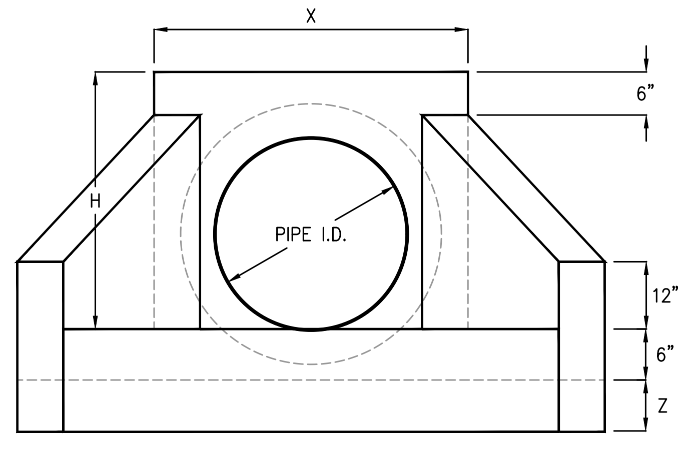
PARK USA®
www.parkusa.com 888-611-PARK

DRAINAGE EXIT STRUCTURE
MODEL DSB 12" THRU 48"

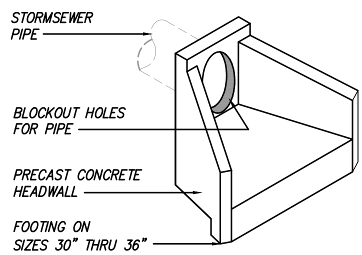
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.		
DATE	05/2019			DSB-1	.



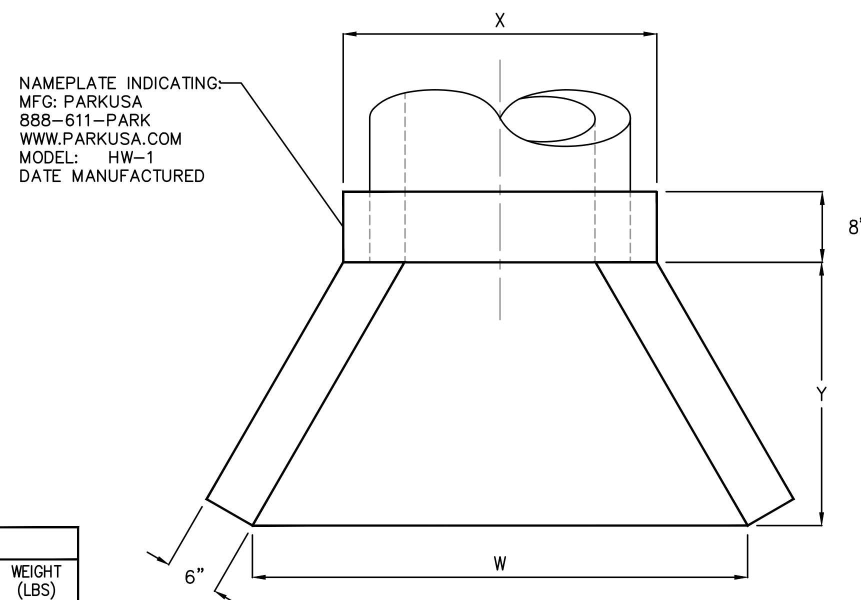
SIDE VIEW



FRONT VIEW



APPLICATION



TOP VIEW

MODEL	PIPE DIA	DIMENSIONS					WEIGHT (LBS)
		H	W	X	Y	Z	
HW–12	12"	2'–6"	4'–3"	3'–0"	2'–0"	N/A	2,700
HW–15	15"	2'–6"	4'–3"	3'–0"	2'–0"	N/A	2,700
HW–18	18"	2'–6"	4'–3"	3'–0"	2'–0"	N/A	2,600
HW–21	21"	3'–0"	5'–10"	3'–2"	3'–0"	N/A	4,300
HW–24	24"	3'–0"	5'–10"	3'–2"	3'–0"	N/A	4,200
HW–30	30"	3'–6'	7'–6"	4'–1"	4'–0"	9"	6,200
HW–36	36"	4'–1"	9'–3"	4'–8"	5'–0"	9"	8,100
HW–42	42"	4'–11"	12'–6"	5'–10"	6'–0"	12"	11,000
HW–48	48"	4'–11"	12'–6"	5'–10"	6'–0"	12"	11,000

NPCA CERTIFIED PLANT
ASTM C–858
MEMBER

HW–1

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

HEADWALL FOR STORMWATER PIPING
MODEL HW 12" THRU 48"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	HW–1	.
DATE 05/2019					

SPECIFICATIONS

CONCRETE: CLASS II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION INCLUDING WALLS AND FLOOR.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING AND PLACEMENT SHALL WITH THE LATEST ACI STANDARDS.

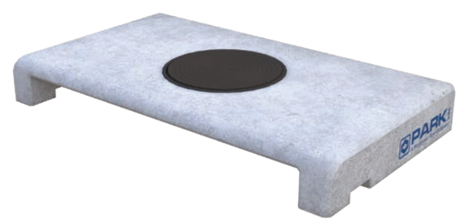
NOTES

PARK USA
A Northwest Pipe Company

CURB INLETS
STORMWATER DRAINAGE

Features

- Strong and durable precast construction
- Consists of top, riser, and bottom stages
- Optional knock-outs, block-outs, frames, covers and grates
- In stock and easy to install
- City & state approved models



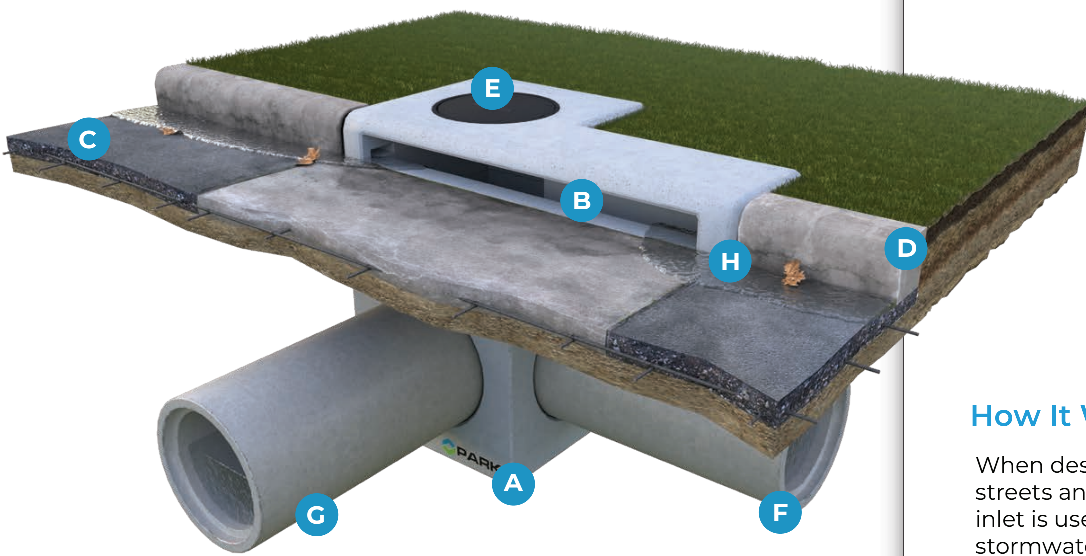
Curb Inlets

Stormwater infrastructure exists to manage excess water during rainfall events. Excessive stormwater can lead to flooding and potential public safety risk and property damage. Development and building projects require a properly designed drainage system to effectively move stormwater to a public stormwater sewer or body of water. A stormwater sewer is a complex system made up of many unique components for catchment, conveyance, detention, and quality treatment. Curb inlets are an important part of a properly designed stormwater management system — they allow water to flow directly from paved surfaces to a storm sewer.

#BUILDING AMERICA!

SW | CURBINLET Standard

LEED COMPLIANT | NPCA | Steel Tank Institute | ASPE American Society of Plumbing Engineers | ASTM | BMP BEST MANAGEMENT PRACTICE | IPC INTERNATIONAL PLUMBING CODE | UPC



Model CI

Model BBI

Model EI

Model BI

Options

Curb inlets can also be outfitted with optional devices to increase its pollution collection performance of debris, sediment, nutrients, and hydrocarbons.

How It Works

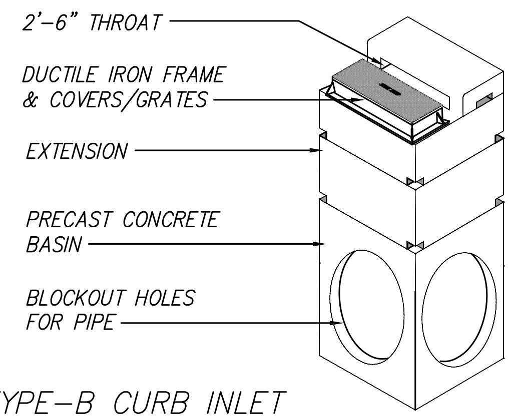
When designing or building new streets and parking areas, a curb inlet is used to assist in the stormwater drainage of the paved surface area. The curb inlet consists of a first-stage belowground box structure (**A**) with a second stage horizontal throat opening (**B**) that is flush with the paved surface (**C**). As the name implies, the throat opening is placed along the street curb perimeter (**D**). Internal access to the inlet structure is provided by an iron manhole cover (**E**). Storm sewer pipe (**F**) is connected to the inlet structure to provide for drainage out of the structure. Often, the curb inlet structure is used a junction point when an incoming drainage pipe (**G**) is connected. During a rain event, stormwater (**H**) drains from the street surface into the throat opening of the curb inlet. This water continues to drain into a sewer pipe that is connected to the curb inlet box structure. The stormwater sewer piping is placed at a downward-sloping gradient to encourage water to flow through the piping; this is also known as "gravity-flow." The stormwater eventually flows into a stream, river, ocean, or type of public estuary.

Visit **curbinlets.parkusa.com** for more information and design assistance.

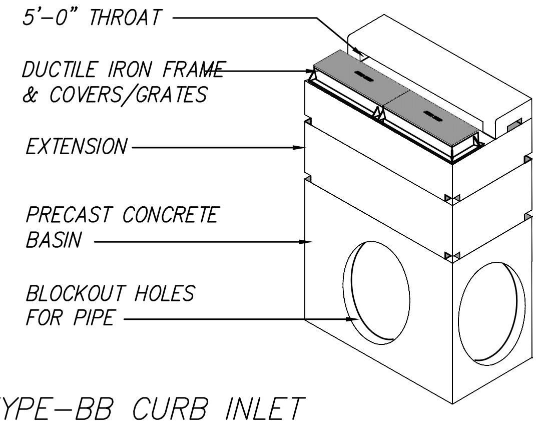
To request a quote or catalog, visit **request.parkusa.com.**

APPLICATIONS

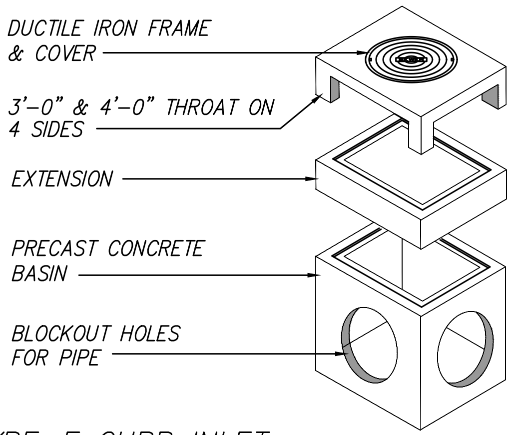
Good to use in BMPs | Commercial | Residential | Municipal | Industrial | Low Impact Development



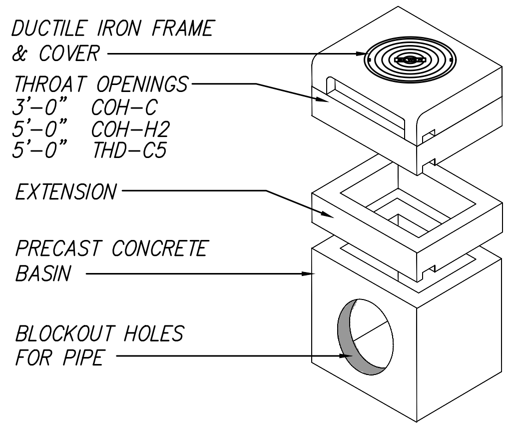
TYPE-B CURB INLET



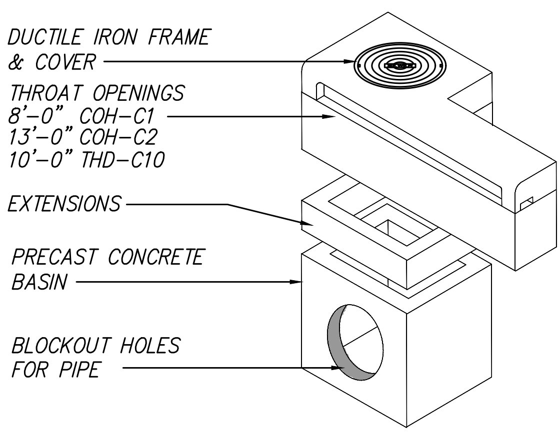
TYPE-BB CURB INLET



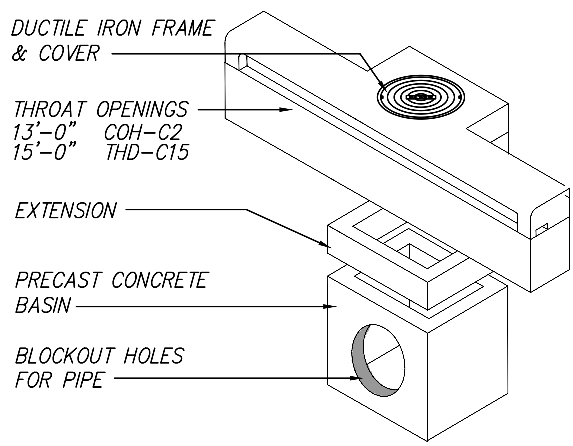
TYPE-E CURB INLET



TYPE-C, C5 & H2 CURB INLET



TYPE-C, C-1, C-10 CURB INLET



TYPE-C2, C15 CURB INLET

CBIN-1

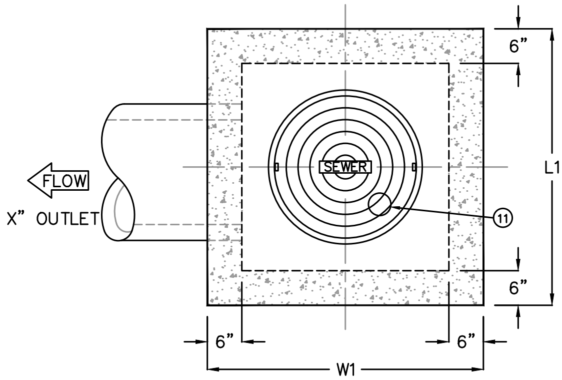
SPECIFICATIONS

CONCRETE :	CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.
REINFORCEMENT:	GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.
C.I. CASTINGS:	CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

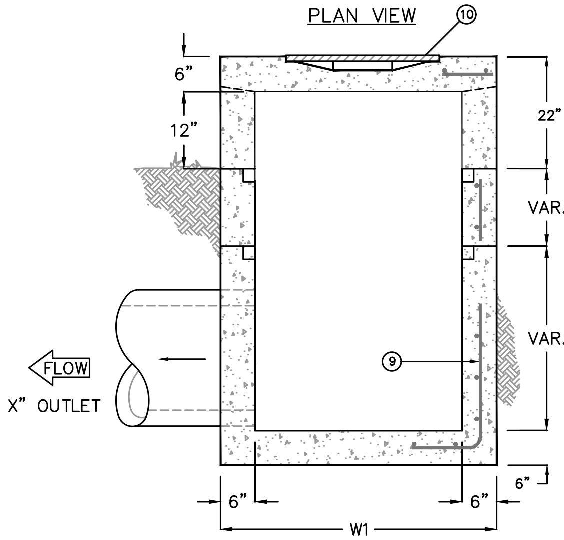
PARK USA®
www.parkusa.com 888-611-PARK

PRECAST CONCRETE CURB INLETS

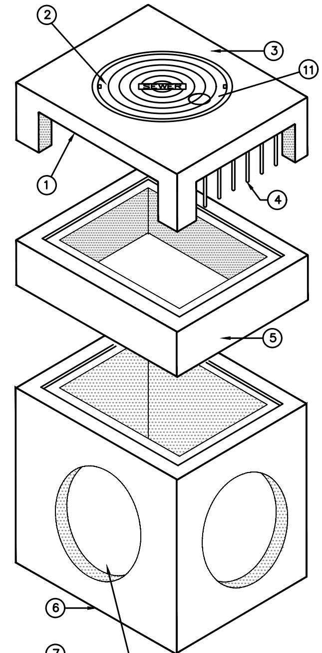
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CBIN-1	.
DATE 05/2019					



PLAN VIEW



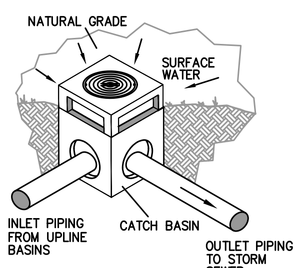
ELEVATION



ISOMETRIC

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	OPENING ALL FOUR SIDES (VERTICAL REBAR GRATE IF REQUIRED)
2	1	20” CAST–IN RING AND COVER
3	1	TOP SECTION
4	1	SAFETY BARS (OPTIONAL)
5	1	MUD SECTION
6	1	BASIN SECTION
7	1	THINWALL KNOCKOUT PIPE OPENING ”K” DIAMETER
8	1	NOT USED
9	–	REBAR AS REQUIRED
10	1	DUCTILE IRON RING AND COVER
11	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL: CBY–1 DATE MANUFACTURED

NPCA CERTIFIED PLAN   ASPE MEMBER   ASTM C-913



TYPE	L1	W1	K
CBY–36	4’–0”	4’–0”	32”
CBY–48	5’–0”	5’–0”	48”
CBY–60	6’–0”	6’–0”	60”
CBY–72	7’–0”	7’–0”	72”

CBY–1

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

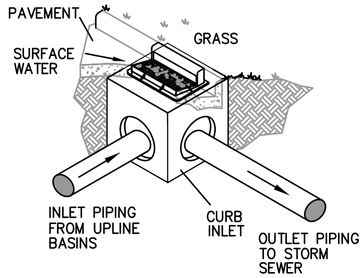
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

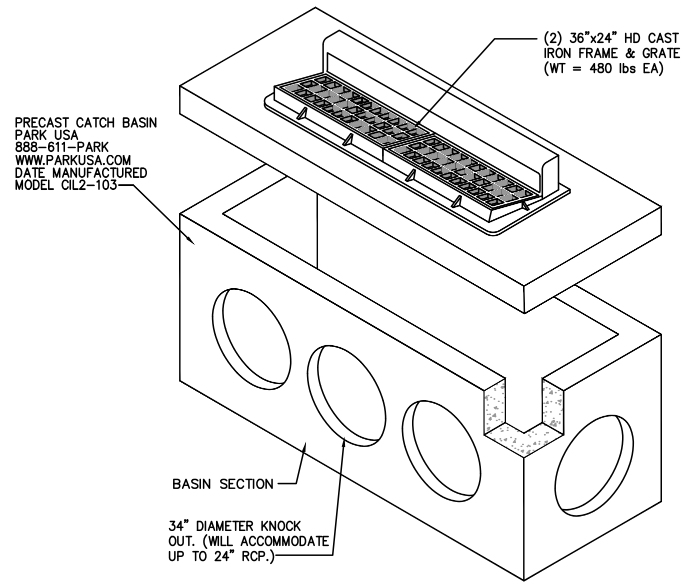
PARK USA
www.parkusa.com 888–611–PARK

TYPE–Y INLET
MODEL CBY 36” THRU 72”

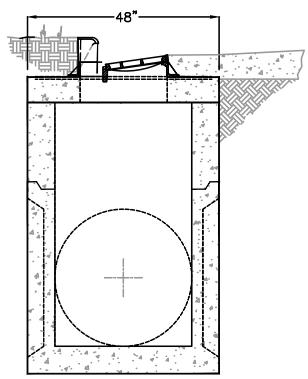
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CBY–1	.
DATE 05/2019					

DRAINAGE



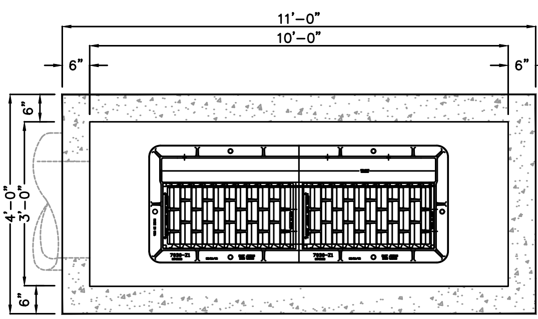


ISOMETRIC

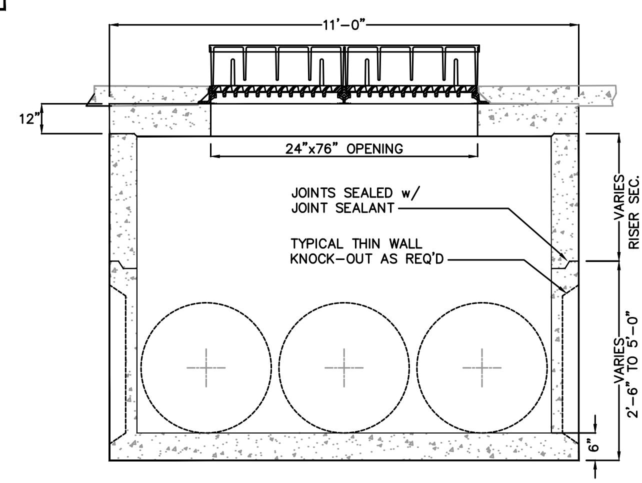


SIDE ELEVATION

APPROVED CITIES:
NORTH TEXAS



PLAN



FRONT ELEVATION

CIL2-103

NPCA CERTIFIED PLANT   ASTM C-913   AMERICAN SOCIETY OF SANITARY ENGINEERING   ASPE MEMBER

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

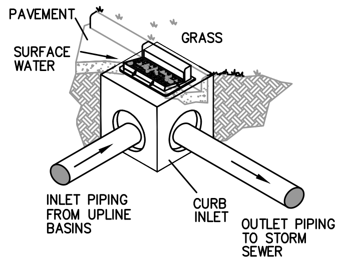
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

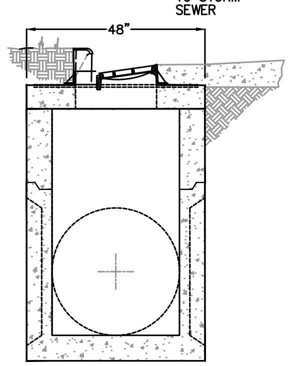
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: .   PROJ #: .
DATE: .   LOCATION: .

PARK USA
www.parkusa.com   888-611-PARK

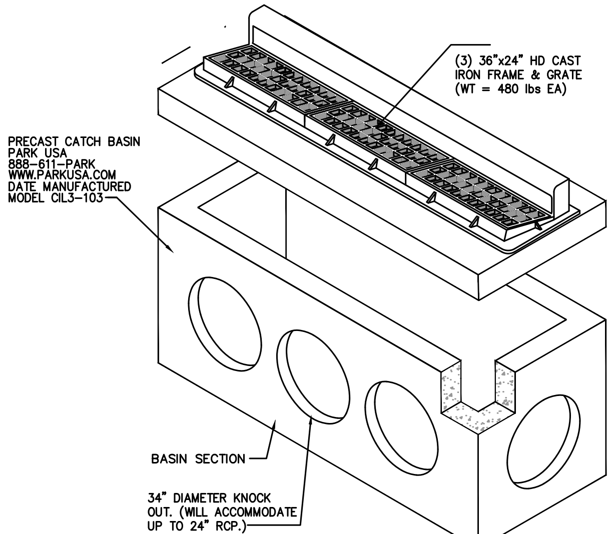
2-GRATE CURB INLET
MODEL CIL2-103

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CIL2-103	.
DATE 05/2019					



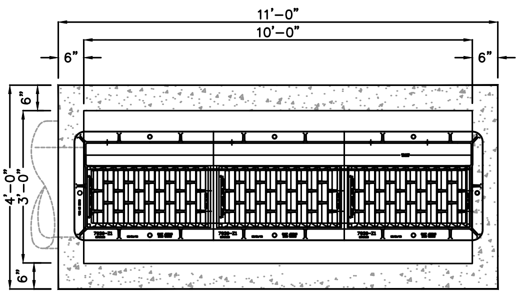


SIDE ELEVATION

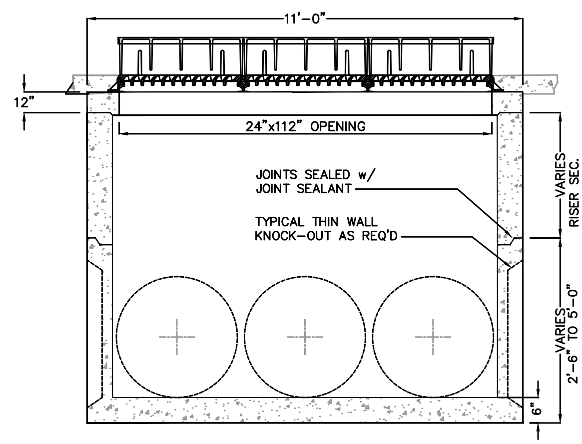


APPROVED FOR
NORTH TEXAS

ISOMETRIC VIEW



PLAN VIEW



FRONT ELEVATION

NPCA CERTIFIED PLANT   ASTM C–913   AMERICAN SOCIETY OF SANITARY ENGINEERING   ASPE MEMBER

CIL3–103

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: .   PROJ #: .
DATE: .   LOCATION: .

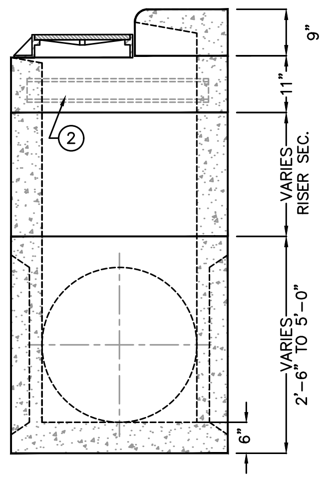
PARK USA
www.parkusa.com   888–611–PARK

3–GRATE CURB INLET
MODEL CIL3–103

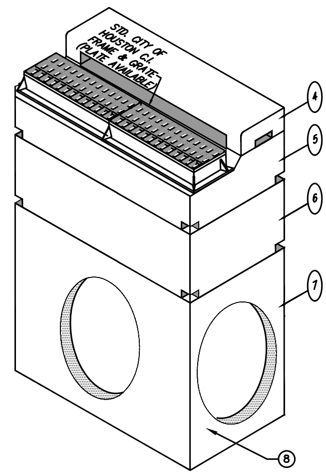
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CIL3–103	.
DATE 05/2019					

DRAINAGE

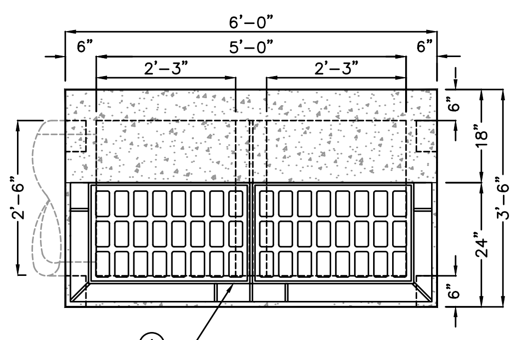
APPROVED FOR CITY OF HOUSTON



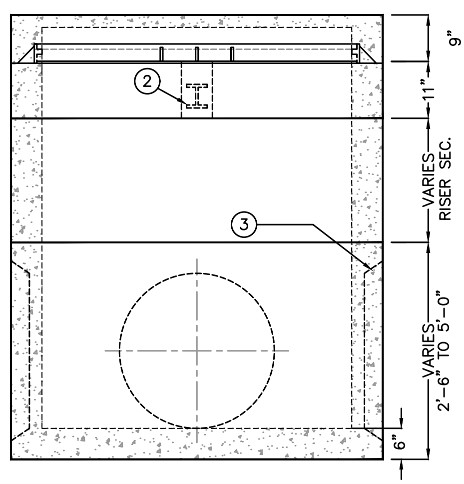
SIDE ELEVATION



ISOMETRIC



PLAN



FRONT ELEVATION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	STD. CITY OF HOUSTON CAST IRON GRATE (PLATE AVAILABLE)
2	1	CENTER I-BEAM SUPPORT
3	1	TYPICAL THIN WALL KNOCK-OUT AS REQ'D
4	1	TOP
5	1	MID-SECTION
6	1	RISER SECTION
7	1	BOTTOM SECTION
8	1	NAMEPLATE INDICATING: TYPE-BB CURB INLET PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL COHBBIG-2

COHBBIG-2

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

TYPE-BB CURB INLET-GRATES
CITY OF HOUSTON MODEL COHBBIG-2

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	COHBBIG-2	.
DATE 05/2019					

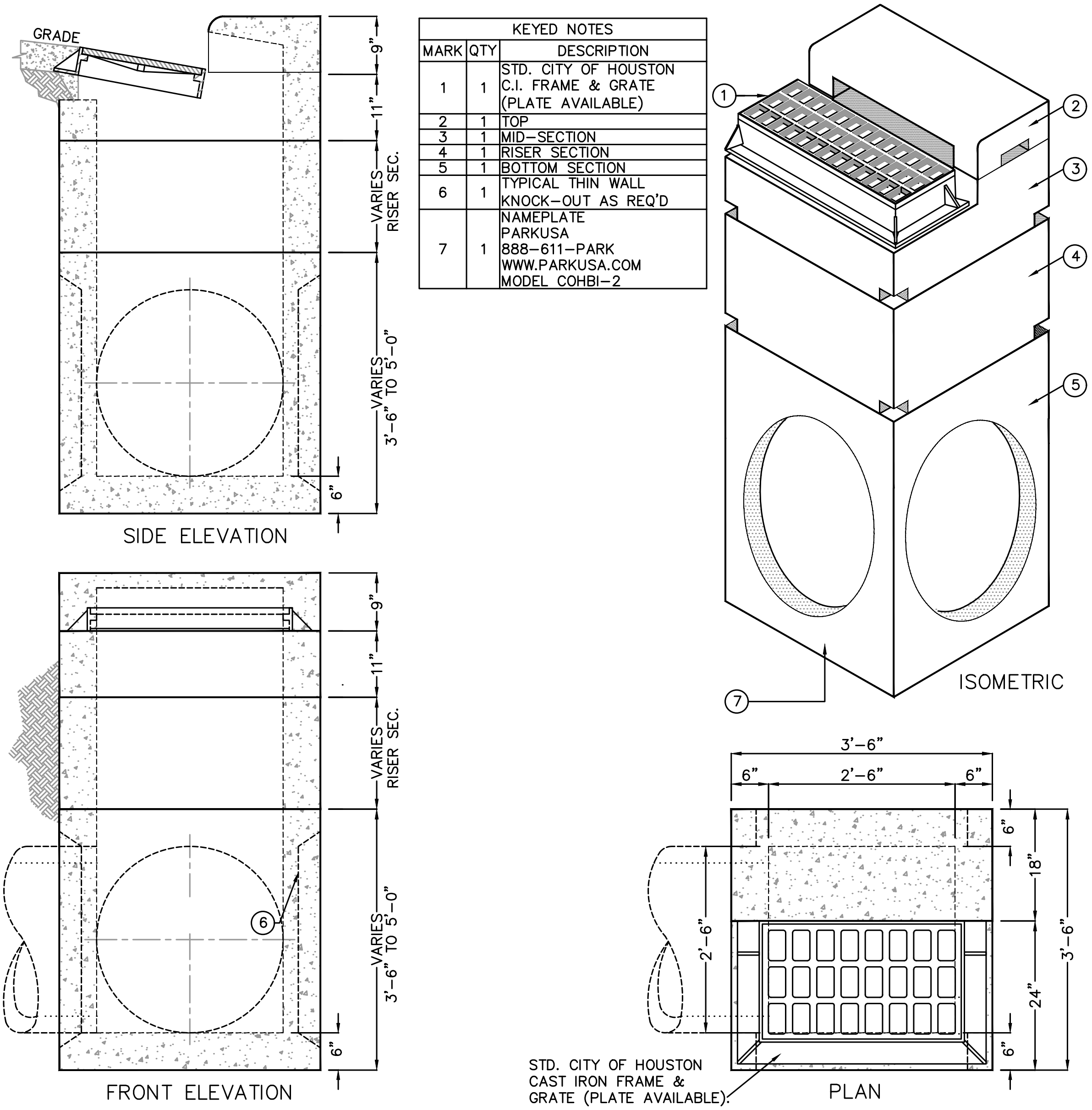
NPCA CERTIFIED PLANT
MEMBER ASPE
ASTM C-913

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.



KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	STD. CITY OF HOUSTON C.I. FRAME & GRATE (PLATE AVAILABLE)
2	1	TOP
3	1	MID-SECTION
4	1	RISER SECTION
5	1	BOTTOM SECTION
6	1	TYPICAL THIN WALL KNOCK-OUT AS REQ'D
7	1	NAMEPLATE PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL COHBI-2

APPROVED FOR CITY OF HOUSTON

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

ASPE MEMBER · AMERICAN SOCIETY OF SANITARY ENGINEERING · NPCA CERTIFIED PLANT · ASTM C-913

COHBI-2

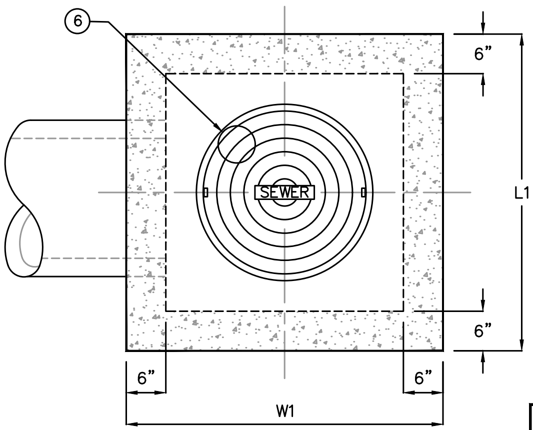
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

TYPE-B CURB INLET
CITY OF HOUSTON – MODEL COHBI-2

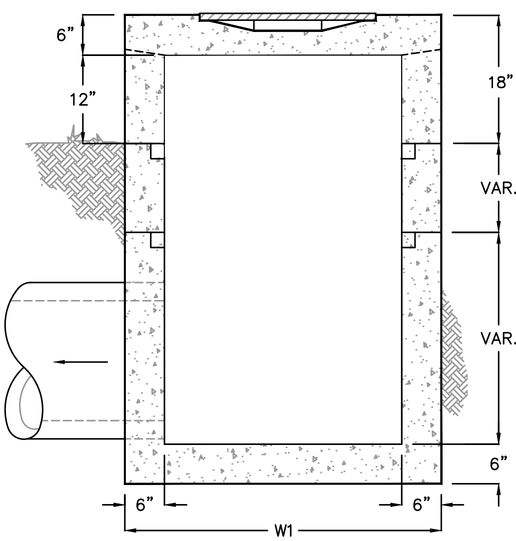
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	COHBI-2	.
DATE 05/2019					

DRAINAGE

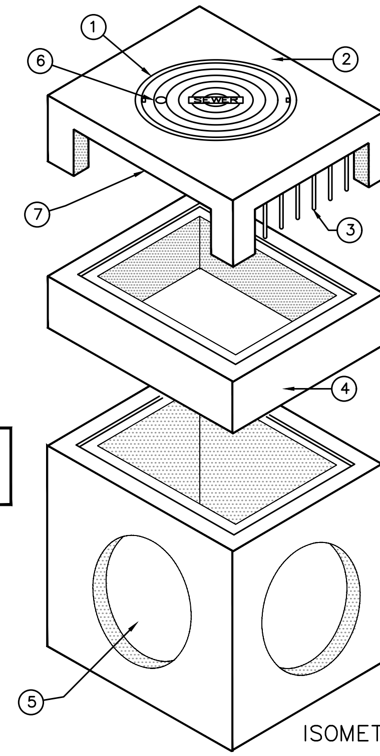


PLAN

APPROVED FOR CITY OF HOUSTON



SECTION



ISOMETRIC

TYPE	L1	W1	K
E–3’	4’–0”	4’–0”	32”
E–4’	5’–0”	5’–0”	48”

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IN "CITY OF HOUSTON" FRAME & COVER
2	1	TOP SECTION
3	–	SAFETY BARS (OPTIONAL)
4	1	MID SECTION
5	4	THIN WALL KNOCKOUT ON ALL 4 SIDES, SEE KO DIMENSION FOR MAXIMUM PIPE O.D.
6	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL: COHE31–2 DATE MANUFACTURED
7	–	OPENINGS ON THREE SIDES

NPCA CERTIFIED PLANT ASPE MEMBER ASTM C-913

COHE31-2

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

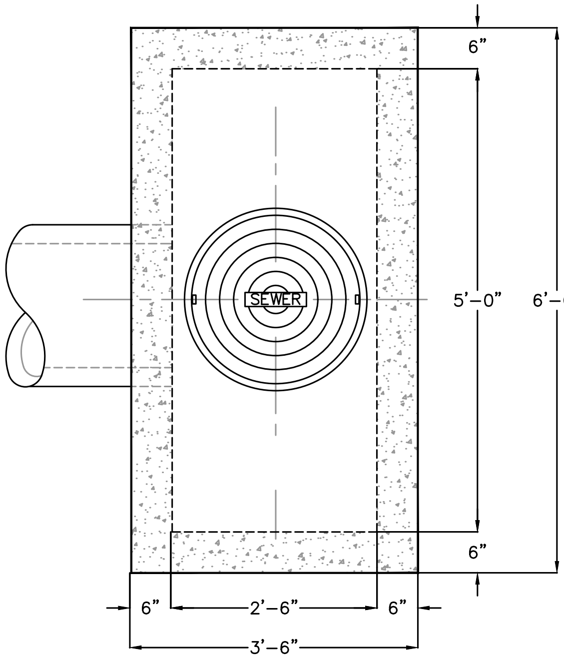
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

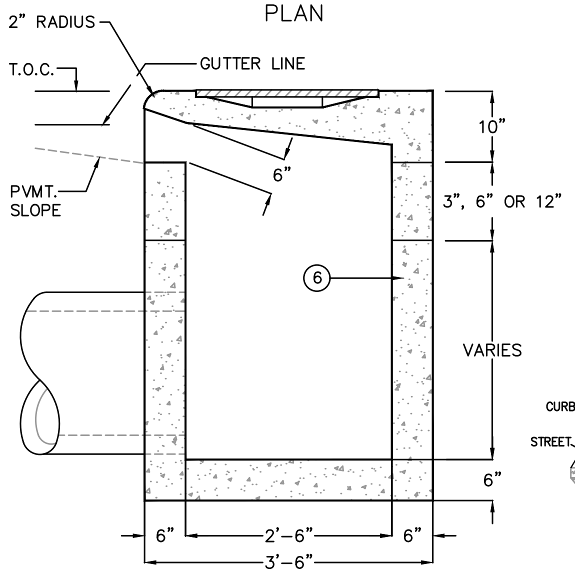
PARK USA
www.parkusa.com 888–611–PARK

TYPE–E AREA INLET
CITY OF HOUSTON – MODEL COHE31–2

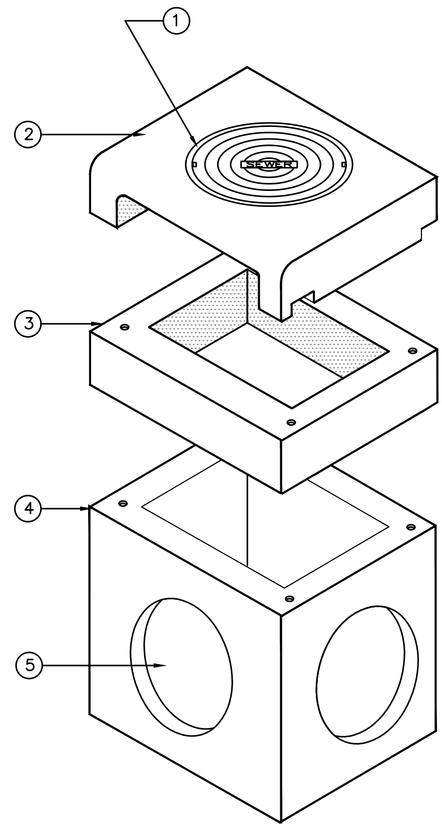
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	COHE31–2	.
DATE 05/2019					



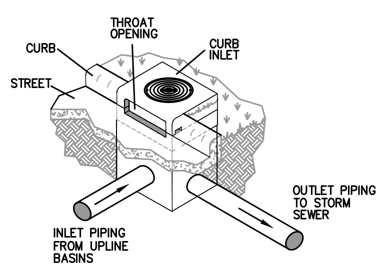
PLAN



SECTION



ISOMETRIC



KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IN CITY OF HOUSTON RING AND COVER
2	1	TOP SECTION
3	1	RISER AS REQ'D
4	1	BASIN SECTION
5	1	THINWALL KNOCKOUTS
6	1	NAMEPLATE MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL: COHH2I–2

NOTE: BASE SIZE ADJUSTABLE FROM 30”X60” TO 60”X60”.

COHH2I–2

NPCA CERTIFIED PLAN   AMERICAN SOCIETY OF SANITARY ENGINEERING   ASPE MEMBER   ASTM C–913

SPECIFICATIONS

CONCRETE : CLASS II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

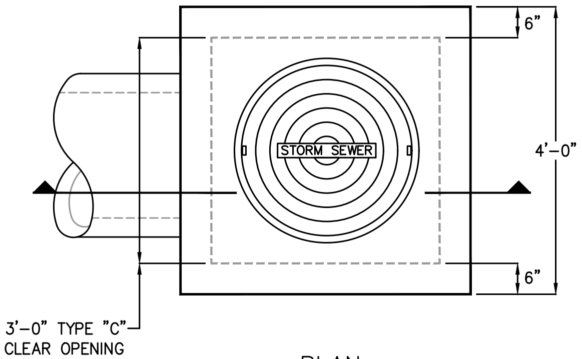
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

TYPE–H2 CURB INLET
CITY OF HOUSTON – MODEL COHH2I–2

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	COHH2I–2	.
DATE 05/2019					

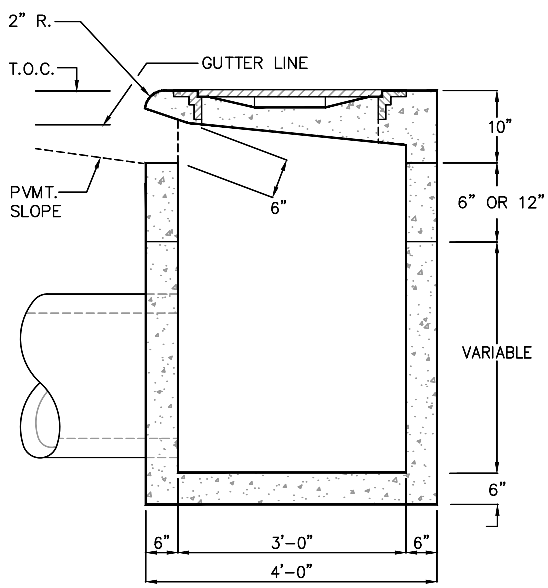


PLAN

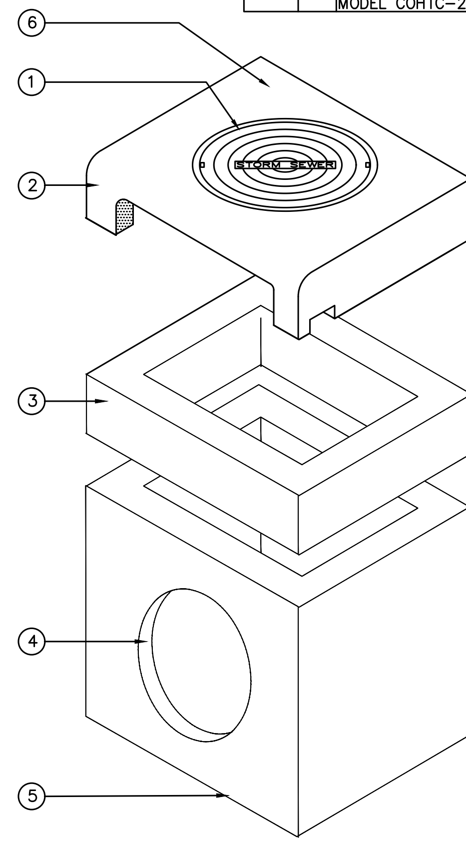
NOTES:

1. SOME INLETS MAY USE COMBINATION OF TOP SECTION ONLY/TOP + CENTER SECTION/ OR TOP + BOTTOM SECTION, DEPENDING ON INLET DEPTH.

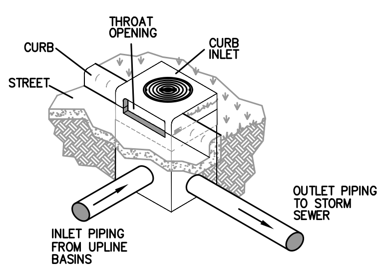
KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	24" DIA CAST IRON FRAME & COVER AS REQUIRED
2	1	TOP SECTION
3	1	RISERS AS REQUIRED
4	1	THINWALL KNOCKOUTS
5	1	BOTTOM SECTION
6	1	NAMEPLATE MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL COHTC–2



SECTION



ISOMETRIC



APPLICATION

SPECIFICATIONS

CONCRETE:	CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.
REINFORCEMENT:	GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.
C.I. CASTINGS:	CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

NPCA CERTIFIED PLANT · MEMBER · C-913

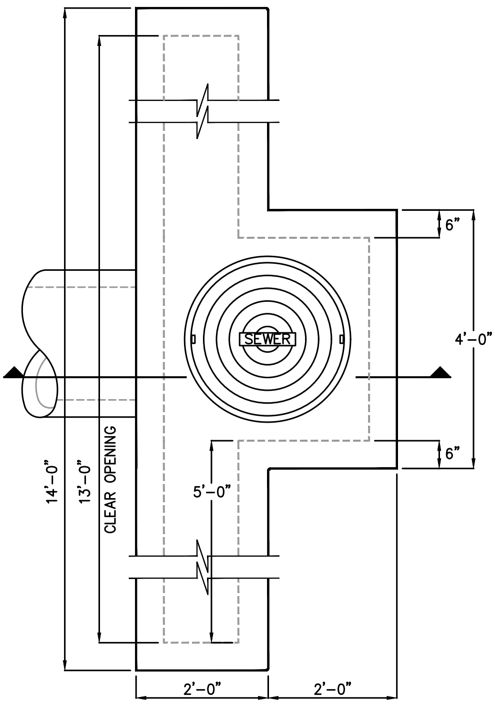
COHTC–2

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

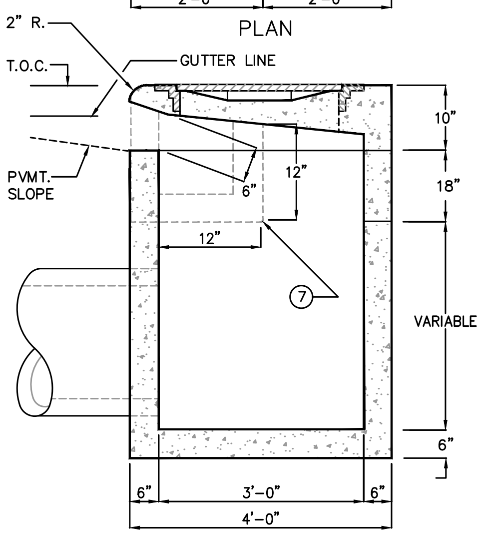
PARK USA
www.parkusa.com 888–611–PARK

TYPE–C CURB INLET
CITY OF HOUSTON MODEL COHTC–2

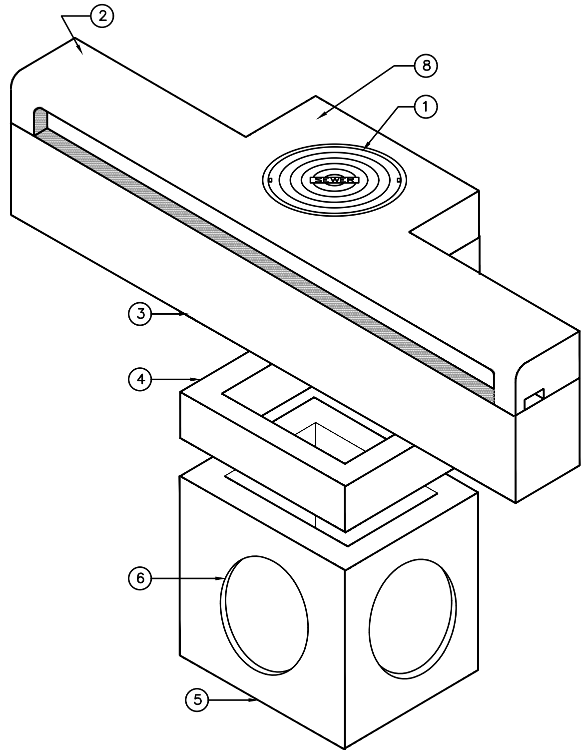
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	COHTC–2	.
DATE 05/2019					



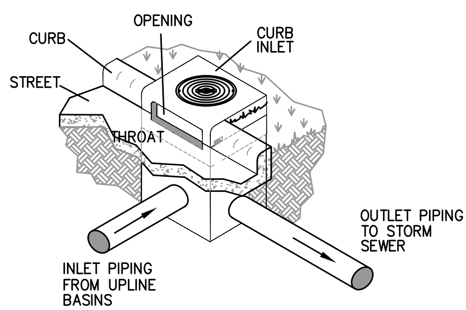
PLAN



SECTION



ISOMETRIC



APPLICATION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	24” CAST IRON RING & COVER AS REQUIRED
2	1	TOP SECTION
3	1	CENTER SECTION
4	1	RISERS AS REQUIRED
5	1	BOTTOM SECTION
6	1	THINWALL KNOCKOUTS
7	1	EXTENSION BEYOND
8	1	NAMEPLATE MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL COHTC2–2

NOTES:

1. SOME INLETS MAY USE COMBINATION OF TOP SECTION ONLY/TOP + CENTER SECTION/ OR TOP + CENTER + BOTTOM SECTION, DEPENDING ON INLET DEPTH.

COHTC2–2

npca CERTIFIED PLAN | AMERICAN SOCIETY OF SANITARY ENGINEERING | ASPE MEMBER | ASTM C-913

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

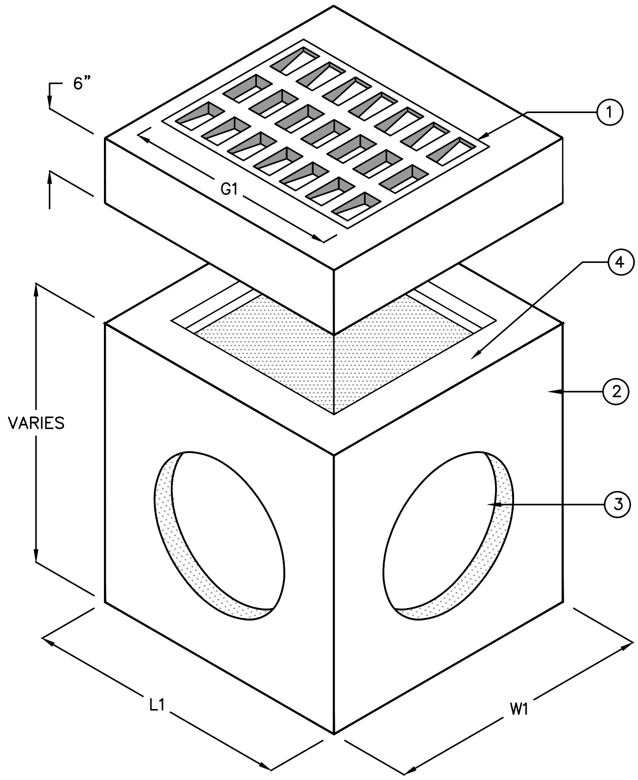
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA®

www.parkusa.com 888–611–PARK

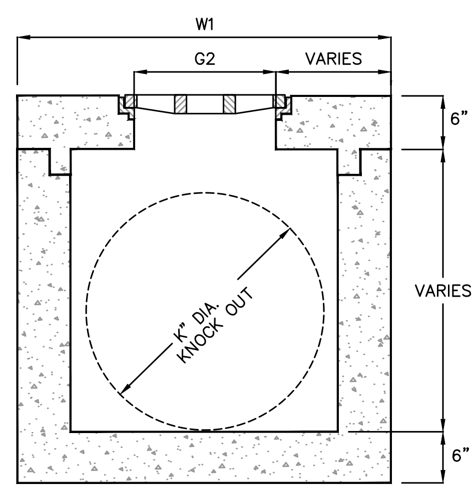
TYPE–C2 CURB INLET
CITY OF HOUSTON – MODEL COHTC2–2

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	COHTC2–2	.
DATE 05/2019					



KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IN "CITY OF HOUSTON" FRAME & COVER
2	1	BASIN SECTION
3	4	THIN WALL KNOCKOUT ON ALL 4 SIDES, SEE K DIMENSION FOR MAXIMUM PIPE O.D.
4	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL: COHTD–2 DATE MANUFACTURED

APPROVED FOR
CITY OF HOUSTON



SECTION

TYPE	L1	W1	G1	G2	K	WEIGHT LBS
D	4'–0"	4'–0"	38 1/2"	17"	32"	4,200
D–1	3'–6"	3'–6"	29 5/8"	15"	30"	4,200

NPCA CERTIFIED PLAN   ASPE MEMBER   ASTM C–913

COHTD–2

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

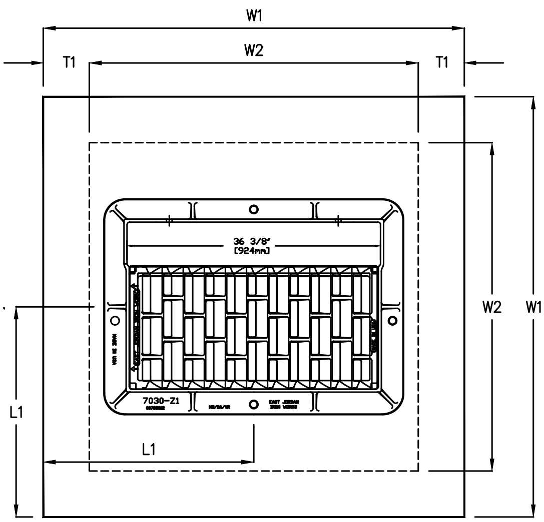
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

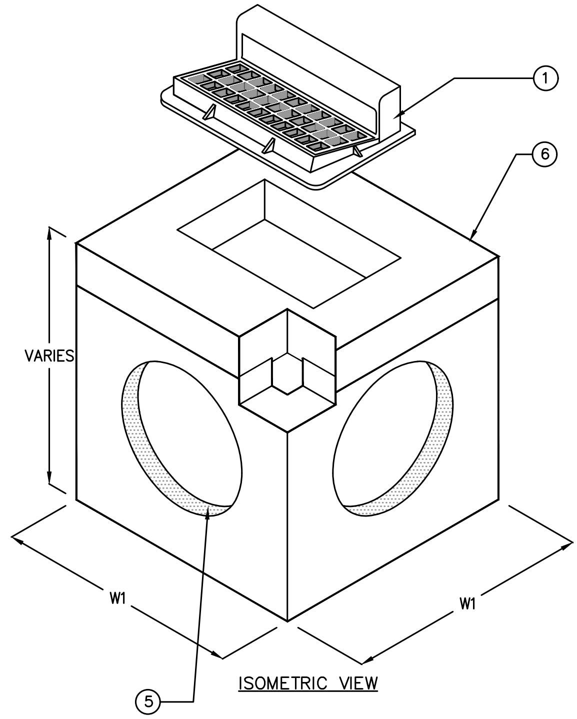
PARK USA
www.parkusa.com 888–611–PARK

TYPE–D & D–1 GRATE INLET
CITY OF HOUSTON – MODEL COHTD–2

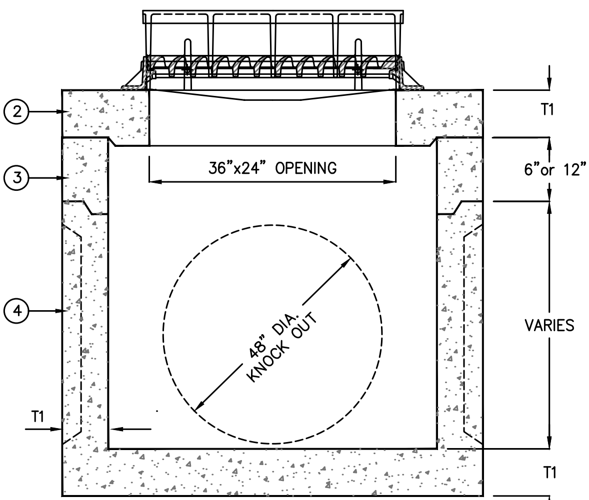
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	COHTD–2	.
DATE 05/2019					



PLAN VIEW

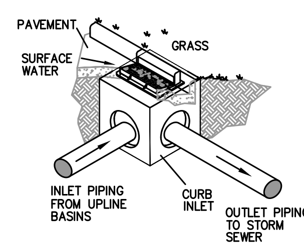


ISOMETRIC VIEW



ELEVATION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	36"x24" HD CAST IRON FRAME & GRATE
2	1	LID SECTION
3	1	RISER SECTION
4	1	BASIN SECTION
5	1	48" DIAMETER KNOCK OUT. (WILL FIT UP TO 36" RCP.)
6	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM DATE MANUFACTURED MODEL CIL1-103



MODEL	W1	W2	L1	T1
CIL-44	5'	4'	2'6"	6"
CIL-66	7'	6'	3'6"	6"

APPROVED FOR NORTH TEXAS

CIL1-103

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

CURB INLET
MODEL CIL1-103

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CIL1-103	.
DATE 05/2019					

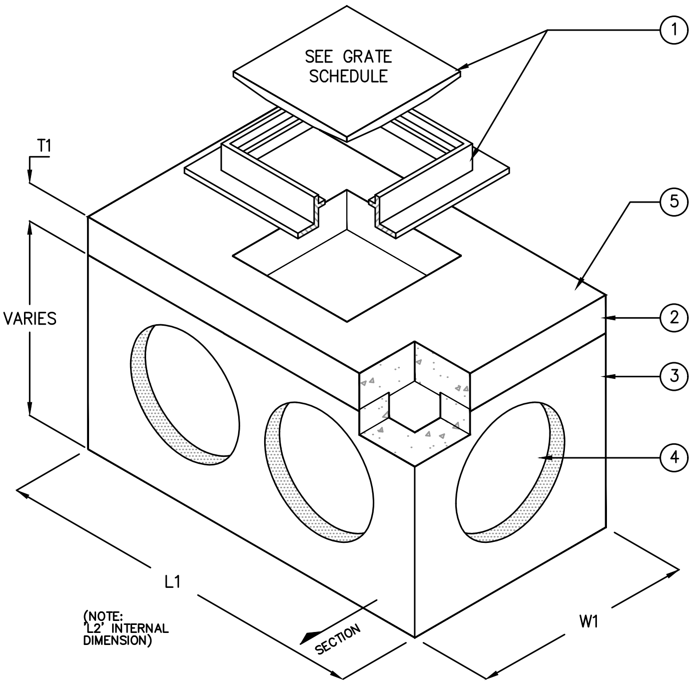
SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

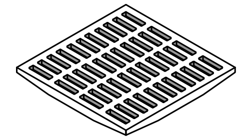
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

NPCA CERTIFIED PLANT
ASTM C-913



ISOMETRIC

GRATE SCHEDULE

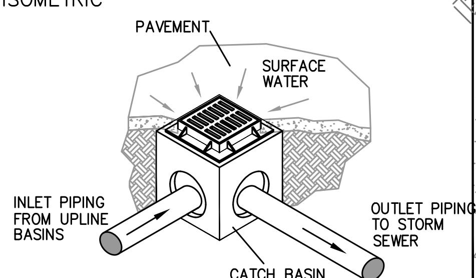


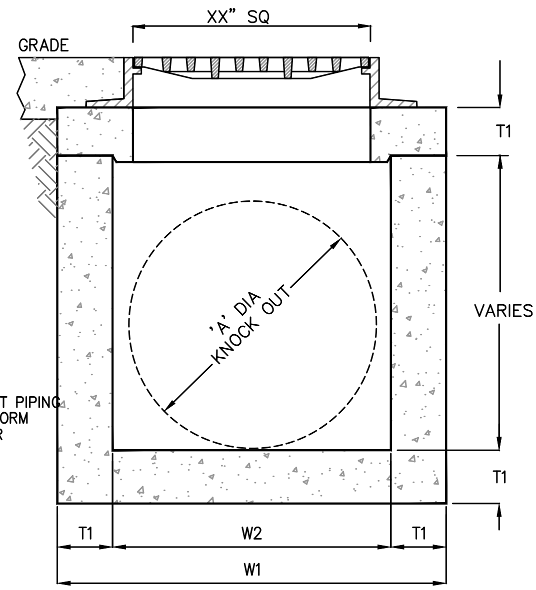
GRATE/FRAME = 1215 lbs
OPEN AREA = 1210 in²

MODEL No. V–5648

Flowrate Q cfs	Water Depth Over Grate
13.04	1"
18.44	2"
22.59	3"
26.08	4"
29.16	5"
31.95	6"

The orifice equation is for flow through a grate under ponding conditions is used.





SECTION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IRON FRAME & GRATE
2	1	TOP SECTION
3	1	BASIN SECTION
4	1	BLOCKOUT AS REQ'D (MAX. SIZE 'W2' DIA)
5	1	NAMEPLATE: PRECAST CATCHBASIN MODEL GIHF–XX PARK USA 888–611–PARK WWW.PARKUSA.COM

DIMENSIONS

MODEL #	L1	L2	W1	W2	T1	GRATE SIZE	WEIGHT LBS
GIHF–86	94"	86"	54"	46"	4"	48"X48"	9,000
GIHF–96	108"	96"	72"	60"	6"	48"X48"	11,000
GIHF–120	132"	120"	72"	60"	6"	48"X48"	15,000
GIHF–144	156"	144"	84"	72"	6"	48"X48"	20,000

C–913

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

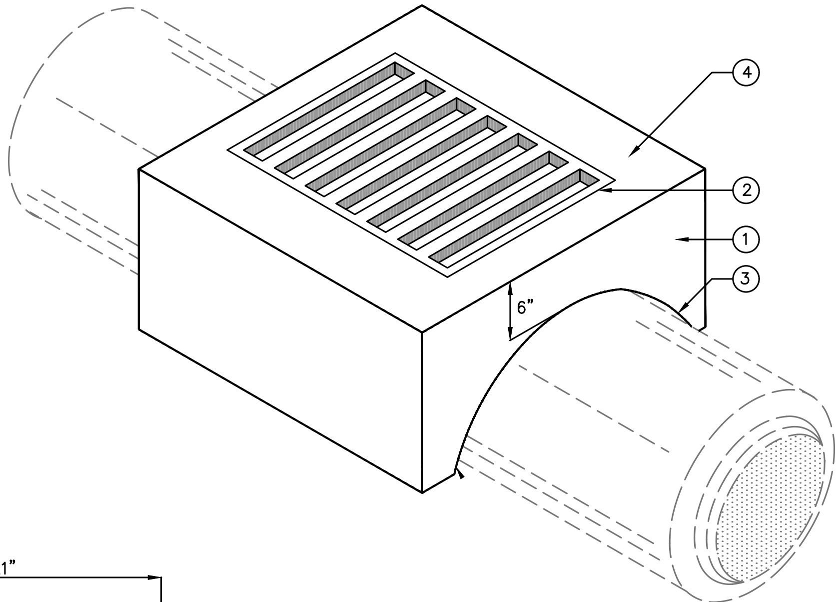
GIHF–1

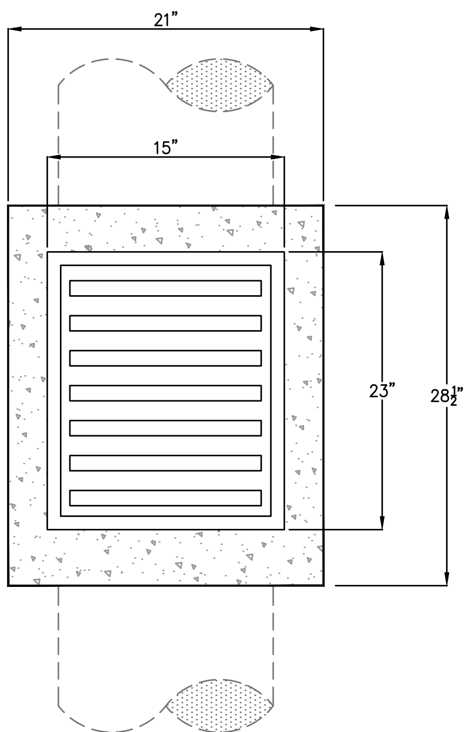
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

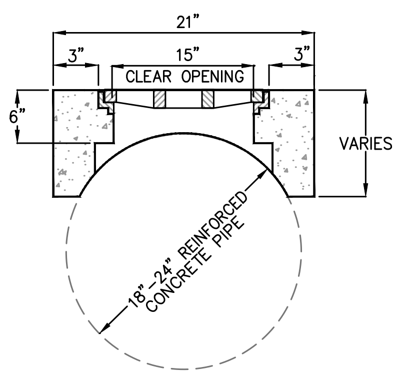
HIGH FLOW CAPACITY GRATE INLET
MODEL GIHF – 86" THRU 144"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	GIHF–1	.
DATE 05/2019					





APPROVED FOR
HOUSTON, TX



SECTION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CONCRETE SADDLE (WEIGHT 1,000 lbs.)
2	1	CAST IN GRATE
3	1	BLOCK–OUT ARCH, WILL ACCOMODATE UP TO 24" RCP.
4	1	NAMEPLATE MFG: PARKUSA SADDLE GRATE INLET 888–611–PARK WWW.PARKUSA.COM MODEL SGI30–1

NOTE: LARGER SIZES AVAILABLE. CONTACT ParkUSA FOR MORE INFORMATION.

SGI30–1

npca CERTIFIED PLANT   ASTM C–478   AMERICAN SOCIETY OF SANITARY ENGINEERING   ASPE MEMBER

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

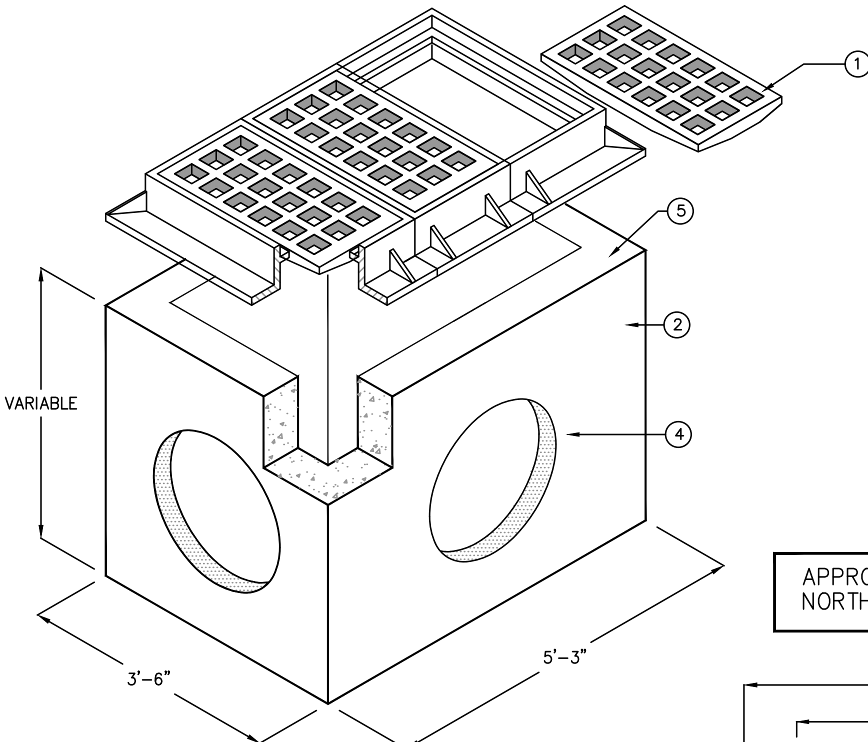
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA®
www.parkusa.com 888–611–PARK

TYPE "C" SADDLE GRATE INLET
MODEL SGI30

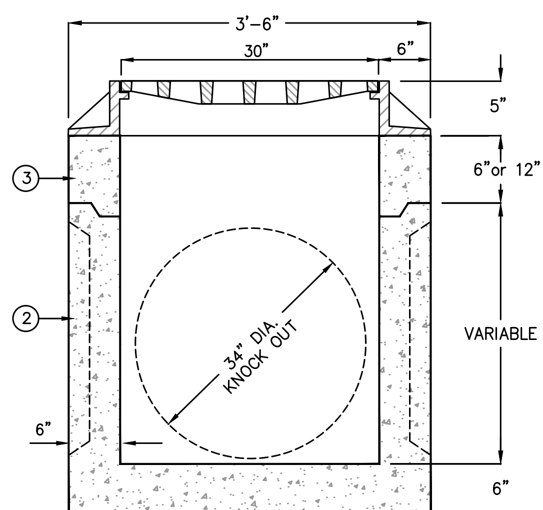
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SGI30–1	.
DATE 05/2019					



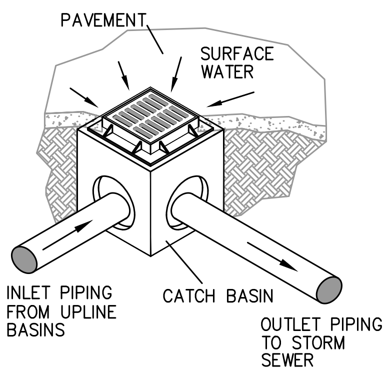
ISOMETRIC

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	3	30"x17" HD CAST IRON FRAME & GRATE (TOTAL WT = 1,120 lbs)
2	1	BASIN SECTION (WEIGHT 3,300 lbs.)
3	1	RISER SECTION
4	1	34" DIAMETER KNOCK OUT. (WILL ACCOMMODATE UP TO 24" RCP.)
5	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM DATE MANUFACTURED MODEL GI3

APPROVED FOR
NORTH TEXAS



SECTION



npca CERTIFIED PLANT
ASTM C-913
AMERICAN SOCIETY OF SANITARY ENGINEERING
ASPE MEMBER
GI3-1

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

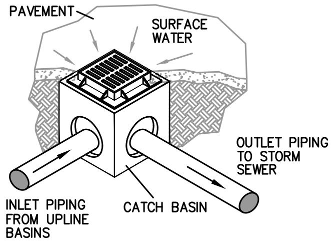
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

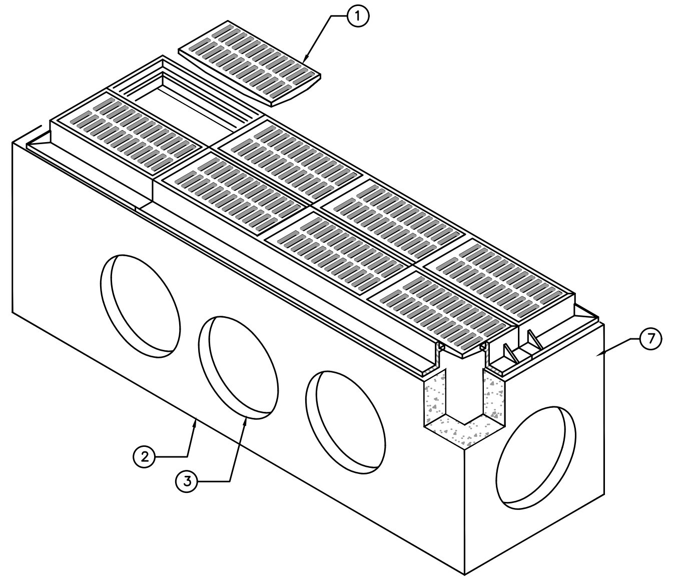
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

3-GRATE INLET
MODEL - GI3-1

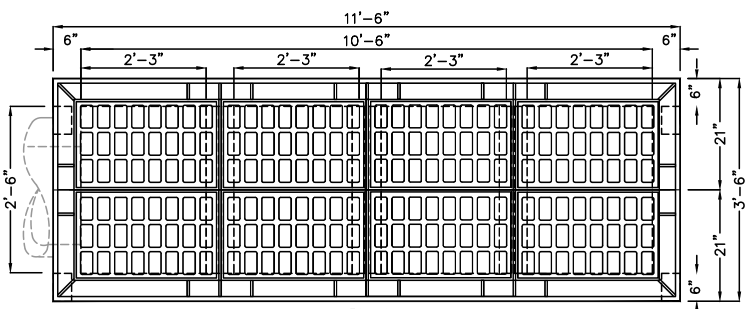
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	GI3-1	.
DATE 05/2019					





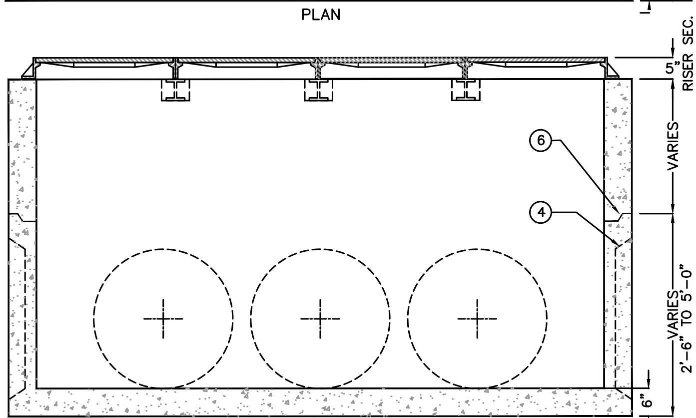
ISOMETRIC

APPROVED FOR
NORTH TEXAS

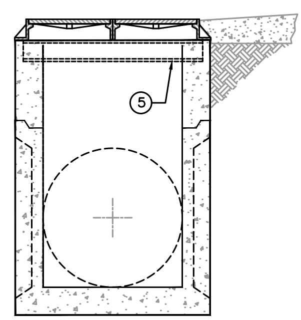


PLAN

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	8	30"x17" HD CAST IRON FRAME & GRATE (TOTAL WT = 2,984 lbs)
2	1	BASIN SECTION
3	8	34" DIAMETER KNOCK OUT. (WILL ACCOMMODATE UP TO 24" RCP.)
4	1	TYPICAL THIN WALL KNOCK–OUT AS REQ'D
5	1	CENTER I–BEAM SUPPORT
6	1	JOINTS SEALED w/ JOINT SEALANT
7	1	NAMEPLATE MFG: PARK USA 888–611–PARK WWW.PARKUSA.COM DATE MANUFACTURED



FRONT ELEVATION



SIDE ELEVATION

GI8-1

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

8–GRATE INLET
MODEL GI8

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	GI8–1	.
DATE 05/2019					

NPCA CERTIFIED PLANT
ASTM C–913
AMERICAN SOCIETY OF SANITARY ENGINEERING
ASPE MEMBER

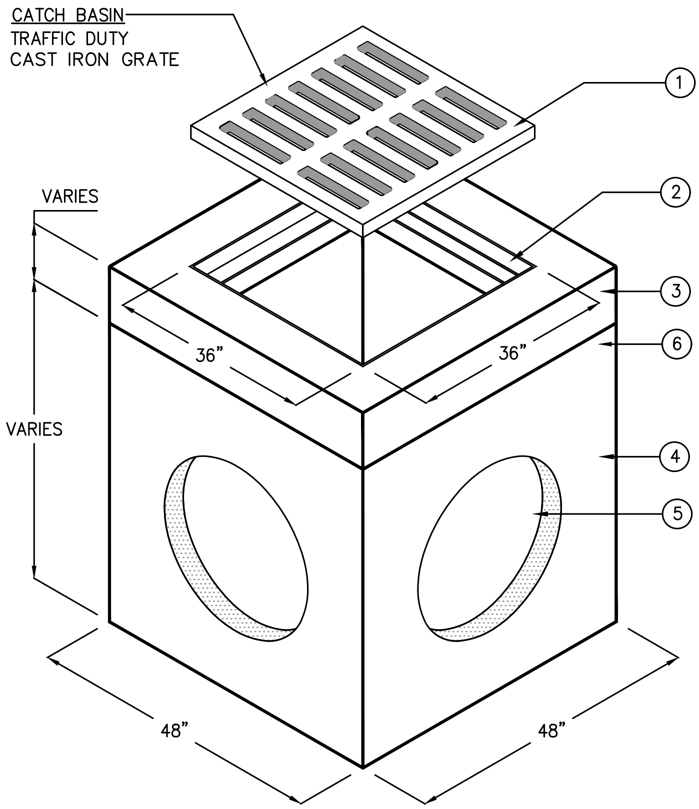
SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

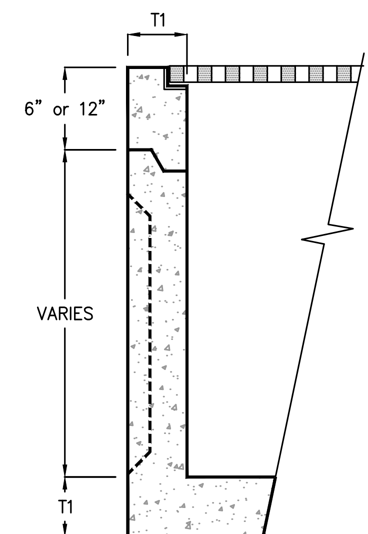
REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

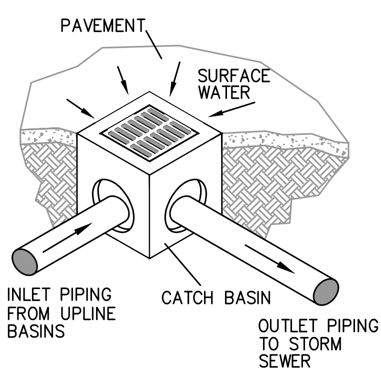
DRAINAGE



KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	37–1/2"x 37–1/2" x 1–1/2" THK GRATE w/STEEL FRAME
2	1	CAST–IN STEEL FRAME
3	1	PRECAST CONCRETE EXTENSION SECTION
4	1	PRECAST CONCRETE BASIN SECTION
5	4	THIN WALL BLOCKOUT ON ALL 4 SIDES
6	1	NAMEPLATE MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM DATE MANUFACTURED MODEL GIVCC–33



PARTIAL SECTION



APPROVED FOR
CORPUS CHRISTI, TX

GIVCC–33

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

npca CERTIFIED PLANT   ASTM C–913   AMERICAN SOCIETY OF SANITARY ENGINEERING ASSE   ASPE MEMBER

A	.	.	.
REV	DATE	BY	DESCRIPTION

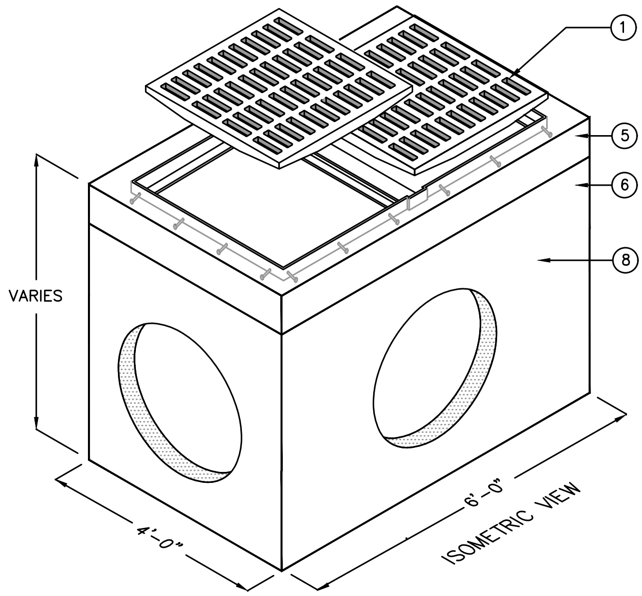
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA®
www.parkusa.com 888–611–PARK

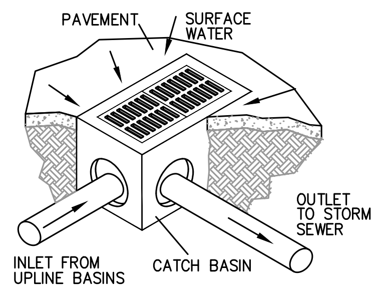
TYPE C GRATE INLET
MODEL GIVCC–33

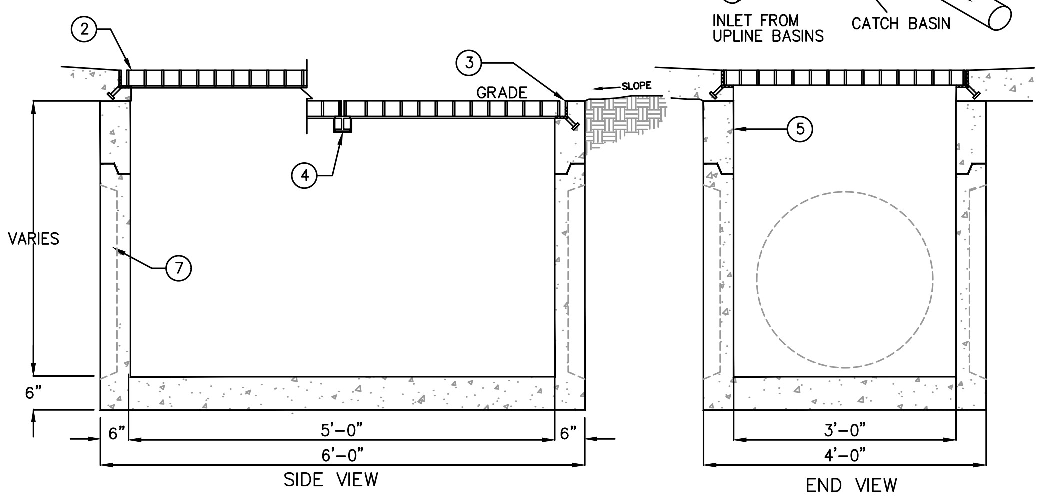
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	GIVCC–33	A
DATE 05/2019					

APPROVED FOR
CORPUS CHRISTI, TX



KEYED NOTES		
MARK	QTY	DESCRIPTION
1	2	37-3/4"x31-3/4"x2-3/4" THK 2-PIECE CAST IRON GRATE w/ STEEL FRAME & I BEAM SUPPORT
2	1	LOOSE FRAME W/ GRATE FOR CONCRETE PAVING
3	1	CAST-IN FRAME W/ GRATE FOR ASPHALT PAVING
4	1	GALV STEEL FRAME w/ I-BEAM CENTER SUPPORT
5	1	PRECAST CONCRETE EXTENSION SECTION
6	1	PRECAST CONCRETE BASIN SECTION
7	4	TYPICAL PIPE BLOCKOUT ON ALL 4 SIDES
8	1	NAMEPLATE MFG: ParkUSA 888-611-PARK WWW.PARKUSA.COM DATE MANUFACTURED MODEL: GIVCC-35





GIVCC-35

npca CERTIFIED PLANT
ASTM C-913
MEMBER

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

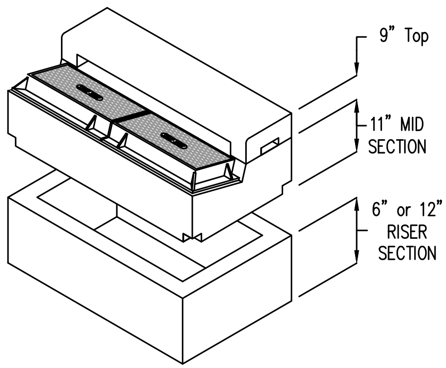
TYPE CC GRATE INLET
MODEL GIVCC-35

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	GIVCC-35	.
DATE 05/2019					

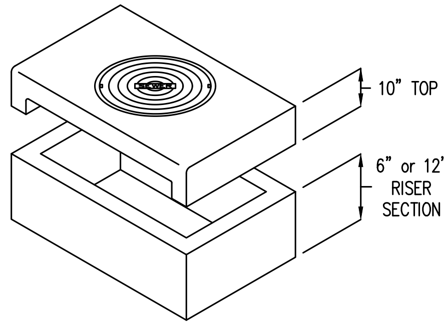
DRAINAGE

I.D. Size	O.D. Dim "A"	"B" (in)	Top/Bot. Thickness (in)	Largest RCP Allowed (No Angle, Straight In)	Largest Box Culvert Allowed (No Angle, Straight In)
4' x 4'	5' x 5'	6"	6"	36"	3' x 3'
5' x 5'	6' x 6'	6"	6"	42"	4' x 4'
6' x 6'	7' x 7'	8"	8"	54"	4' x 4'
7' x 7'	8' x 8'	8"	8"	66"	5' x 5'
8' x 8'	9' x 9'	8"	8"	78"	6' x 6'
9' x 9'	10' x 10'	8"	8"	84"	7' x 7'

SHOWN AS A "BB" INLET



SHOWN AS A "H-2" INLET AND/OR "C" INLET



PARK MODEL NO.
TXX-XX-X-XXXX-XX

TYPE OF STRUCTURE
- BB - BB Inlet
- CI - C Inlet
- H2 - H2 Inlet
- OT - Other

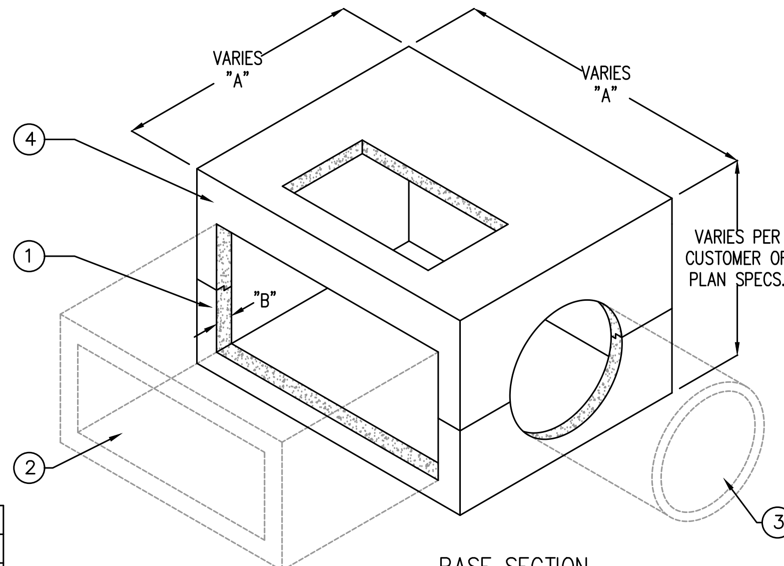
BASE SECTION SIZE
- 4 - 4'
- 5 - 5'
- 6 - 6'
- 7 - 7'
- 8 - 8'

RISER SECTION
- 1 - 1'
- 2 - 2'
- 3 - 3'
- 4 - 4'

SIZE OF R/C OR F/G (DIA., SQUARE, OR RECTANGLE)
- 01 - 24"
- 02 - 32"
- 03 - 30"
- 04 - 36"
- 05 - 42"
- 06 - 48"
- 07 - Other

CASTING TYPE
- DI - Ductile Iron
- CI - Cast Iron

CASTING STYLE
- RC - Ring & Cover
- RG - Ring & Grate
- DG - Dome Grate
- FG - Frame & Grate
- FC - Frame & Cover



BASE SECTION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	BLOCKOUT TYPE, SIZE, AND LOCATION WILL VARY PER CUSTOMER AND/OR PLAN SPECIFICATIONS
2	1	BOX CULVERT (BY OTHERS)
3	1	RCP (BY OTHERS)
4	1	NAMEPLATE MFG: ParkUSA 888-611-PARK WWW.PARKUSA.COM DATE MANUFACTURED

SPECIFICATIONS

CONCRETE : CLASS II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

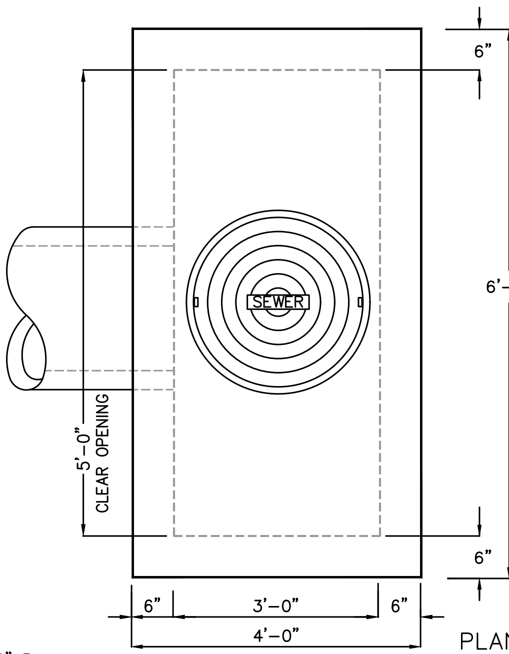
NPCA CERTIFIED PLAN
MEMBER
ASTM C-913
TCI-1

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

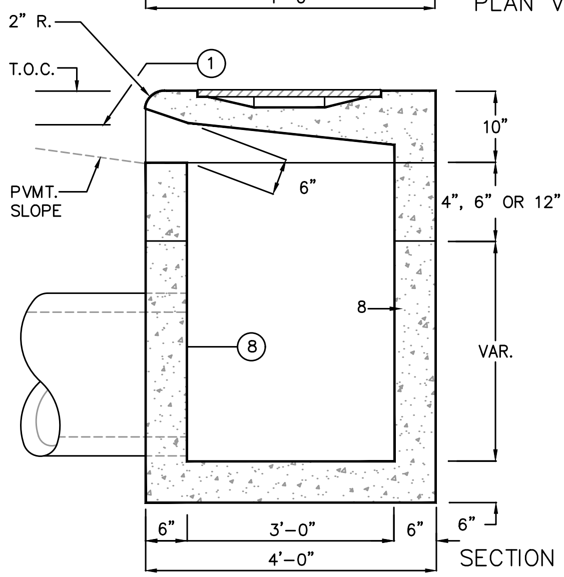
PARK USA
www.parkusa.com 888-611-PARK

TRANSITIONAL CURB INLET
.

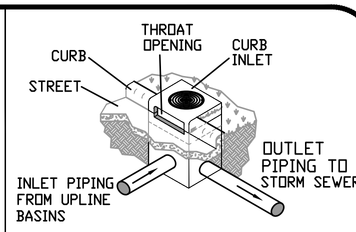
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	TCI-1	.
DATE	05/2019				



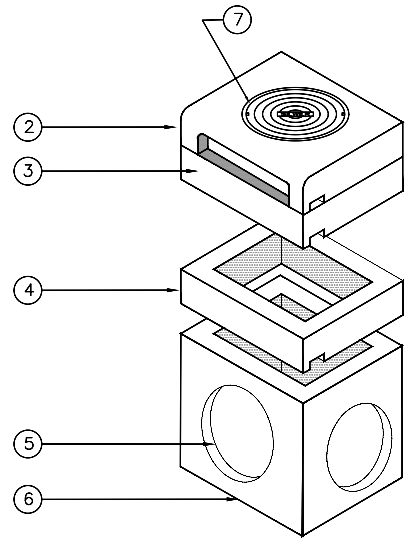
PLAN VIEW



SECTION VIEW



APPLICATION



ISOMETRIC

NOTES:

1. SOME INLETS MAY USE COMBINATION OF TOP SECTION ONLY/TOP + CENTER SECTION/ OR TOP + CENTER + BOTTOM SECTION, DEPENDING ON INLET DEPTH.

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	GUTTER LINE
2	1	TOP SECTION
3	1	CENTER SECTION
4	1	RISERS AS REQUIRED
5	1	THINWALL KNOCKOUTS
6	1	BOTTOM SECTION
7	1	CAST IRON RING & COVER AS REQUIRED
8	1	NAMEPLATE INDICATING: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL THDC3505

THDC3505

npca CERTIFIED PLAN   AMERICAN SOCIETY OF SANITARY ENGINEERING   ASPE MEMBER   ASTM C–913

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

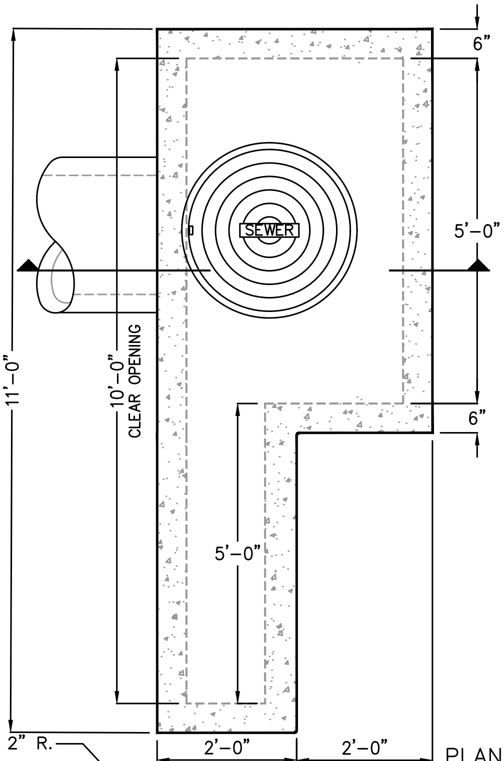
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: .   PROJ #: .
DATE: .   LOCATION: .

PARK USA
www.parkusa.com   888–611–PARK

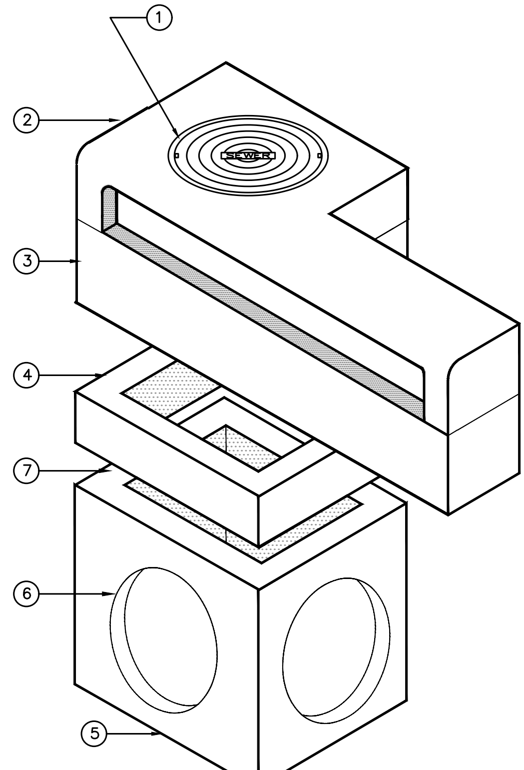
TYPE–C 5'–0" CURB INLET
TEXAS HIGHWAY DEPARTMENT MODEL THDC 3505

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	THDC3505	.
DATE 05/2019					

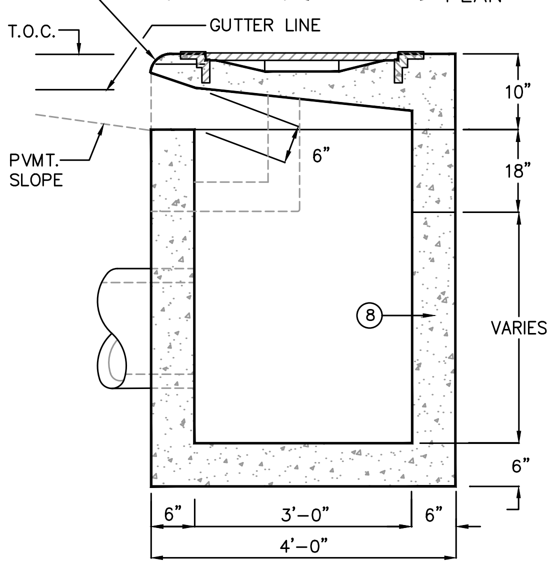
DRAINAGE



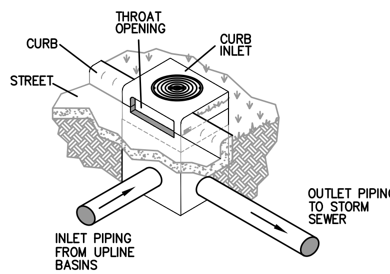
PLAN



ISOMETRIC



SECTION



APPLICATION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IRON FRAME & COVER AS REQ'D
2	1	TOP SECTION
3	1	CENTER SECTION
4	1	TRANSITION LID
5	1	BOTTOM SECTION
6	1	THINWALL KNOCKOUTS
7	1	GROUT OR RAMNEK BY CONTRACTOR
8	1	PRECAST CATCH BASIN PARK USA 888–611–PARK WWW.PARKUSA.COM MODEL THDC3510

NOTES:

1. SOME INLETS MAY USE COMBINATION OF TOP SECTION ONLY/TOP + CENTER SECTION/ OR TOP + CENTER + BOTTOM SECTION, DEPENDING ON INLET DEPTH.

THDC3510

NPCA CERTIFIED PLAN · AMERICAN SOCIETY OF SANITARY ENGINEERING · ASPE MEMBER · ASTM C-913

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

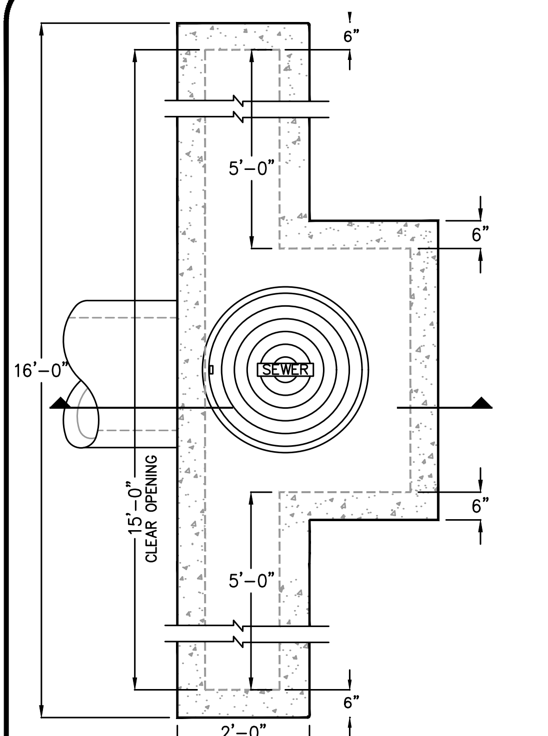
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

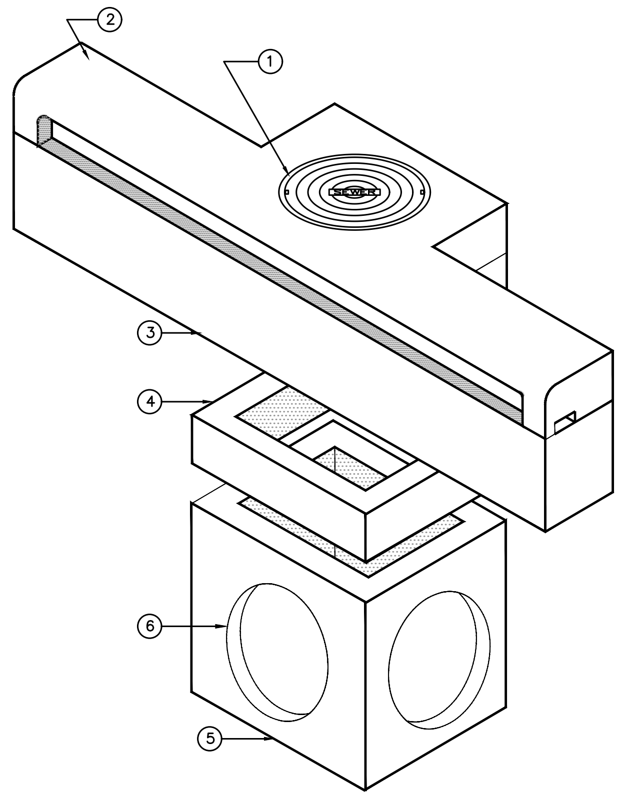
PARK USA®
www.parkusa.com 888–611–PARK

TYPE–C 10'–0" CURB INLET
TEXAS HIGHWAY DEPARTMENT – MODEL THDC3510

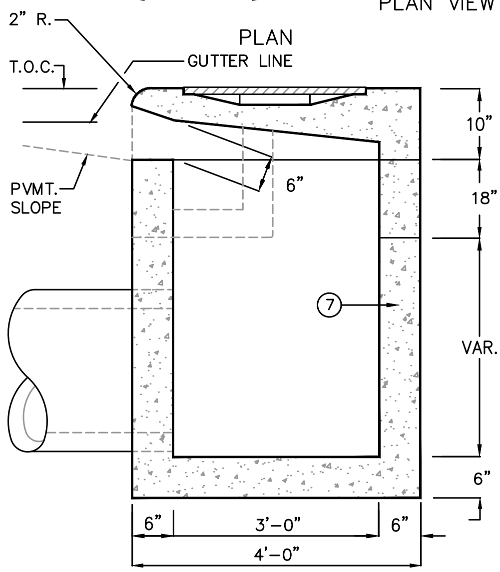
PM . | PC . | DRN . | ENG . | DWG. NO. THDC3510 | REV. .
DATE 05/2019



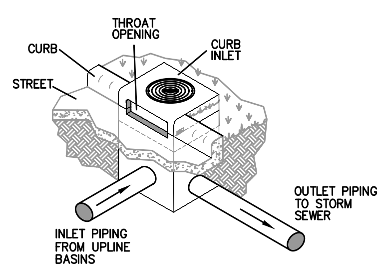
PLAN VIEW



ISOMETRIC



SECTION VIEW



APPLICATION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IRON RING & COVER AS REQUIRED
2	1	TOP SECTION
3	1	CENTER SECTION
4	1	TRANSITION LID
5	1	BOTTOM SECTION
6	1	THINWALL KNOCKOUTS
7	1	NAMEPLATE MFG: PARK USA 888–611–PARK WWW.PARKUSA.COM MODEL THDC3515

NOTES:

1. SOME INLETS MAY USE COMBINATION OF TOP SECTION ONLY/TOP + CENTER SECTION/ OR TOP + CENTER + BOTTOM SECTION, DEPENDING ON INLET DEPTH.

THDC3515

npca CERTIFIED PLANT — AMERICAN SOCIETY OF SANITARY ENGINEERING — ASPE MEMBER — ASTM C-913

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

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C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA®
www.parkusa.com 888–611–PARK

TYPE–C 15'–0" CURB INLET
TEXAS HIGHWAY DEPARTMENT – MODEL THDC3515

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	THDC3515	.
DATE 05/2019					

CATCHBASIN
STORMWATER DRAINAGE

Features

- Strong and Durable Precast Construction
- Consists of Top, Riser and Bottom Stages
- Optional Knock-outs, Block-outs Frames, Covers & Grates
- In Stock & Easy to Install
- City & State Approved Models

Catchbasins

Stormwater infrastructure exists to manage stormwater during stormwater accumulation events. Excessive stormwater can lead to flooding and potential public safety risk and property damage. Development and building projects require a properly designed drainage system to efficiently move stormwater to a public stormwater sewer. A stormwater system is made of many unique components for catchment, conveyance, detention, and quality treatment. Catchbasins and Grate Inlets are an important part of a properly designed stormwater management system.

ParkUSA® offers a wide variety of stormwater drainage products essential for all stormwater drainage applications.

#BUILDING AMERICA!

SW | CATCHBASIN Standard

Options

A catch basin can also be outfitted with optional devices to increase its pollution collection performance of debris, sediment, nutrients, and hydrocarbons.

Visit **catchbasin.parkusa.com** for more information and design assistance.

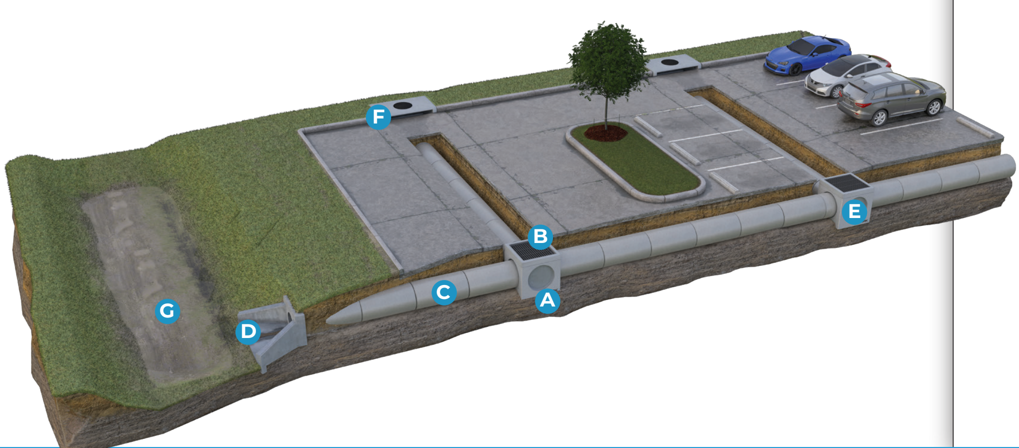
To request a quote or catalog, visit **request.parkusa.com.**

Model CB

Model A

Model CB

Saddle Inlet



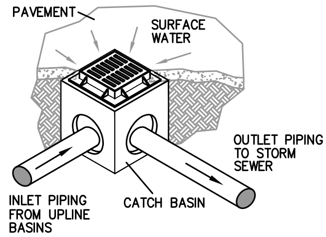
Options

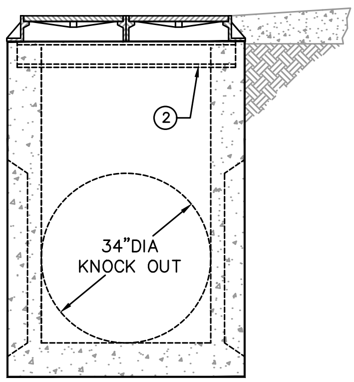
When designing and building new sidewalks, streets and parking areas, a Catchbasin is used to assist in the stormwater drainage of the catchment surface area.

A Catch Basin **(A)** is a precast concrete box with a perforated metal grate. The catch basin (also referred to as a drop inlet) is an important component in a stormwater drainage system. It is strategically placed underground to prevent flooding of pavement, landscaping, and property. During a rain event, rainwater hits the ground (becoming stormwater) and drains towards the lowest point, the catchbasin. As stormwater flows down through the grate **(B)**, the basin fills. A connected drainage pipe **(C)** then carries the water downstream. The drainage piping is placed on a progressively downward sloping gradient to encourage stormwater **(D)** to flow; this is also known as gravity-flow. Multiple catch basins **(E)** and curb inlets **(F)** are often used and linked with pipe to create a network of drainage points and piping; called a stormwater sewer. The stormwater finally flows off-site through its watershed of public storm sewers **(G)**, and eventually into ditches, Saddle Inlet estuary, rivers, lakes, and oceans.

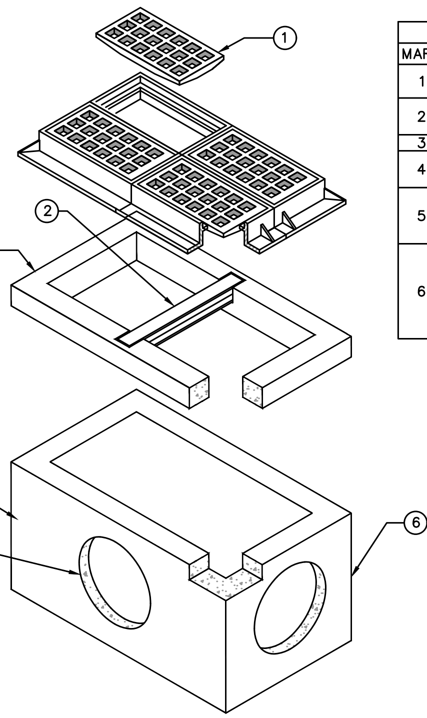
APPLICATIONS

Good to use in BMPs | Commercial | Residential | Municipal | Industrial | Low Impact Development



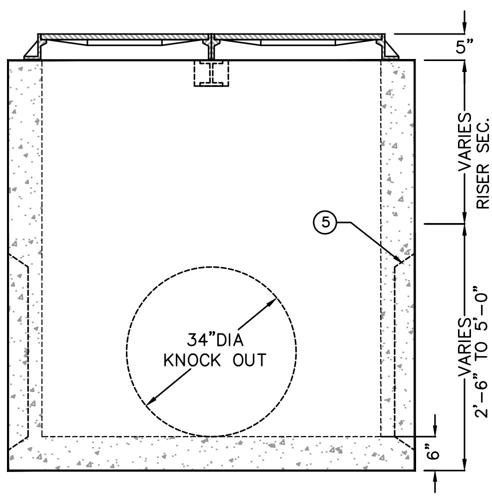


SIDE ELEVATION

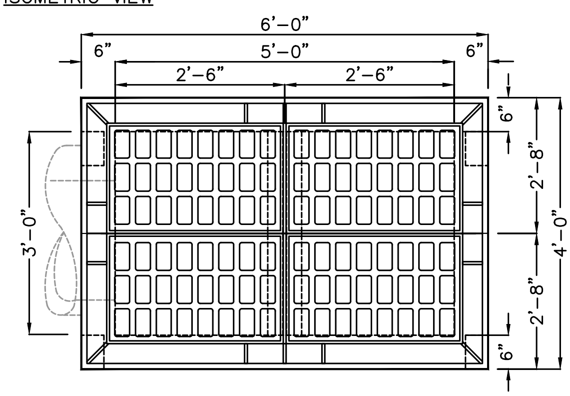


ISOMETRIC VIEW

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	4	30"x17" HD CAST IRON FRAME & GRATE
2	1	CENTER I-BEAM SUPPORT (OPTIONAL)
3	1	BASIN SECTION
4	1	CONRETE RISER (OPTIONAL)
5	4	34" DIAMETER KNOCK OUT (WILL ACCOMMODATE UP TO 24" RCP)
6	1	NAMEPLATE MFG: ParkUSA 888-611-PARK WWW.PARKUSA.COM DATE MANUFACTURED MODEL: BBGI-1



FRONT ELEVATION



PLAN VIEW

C-913

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

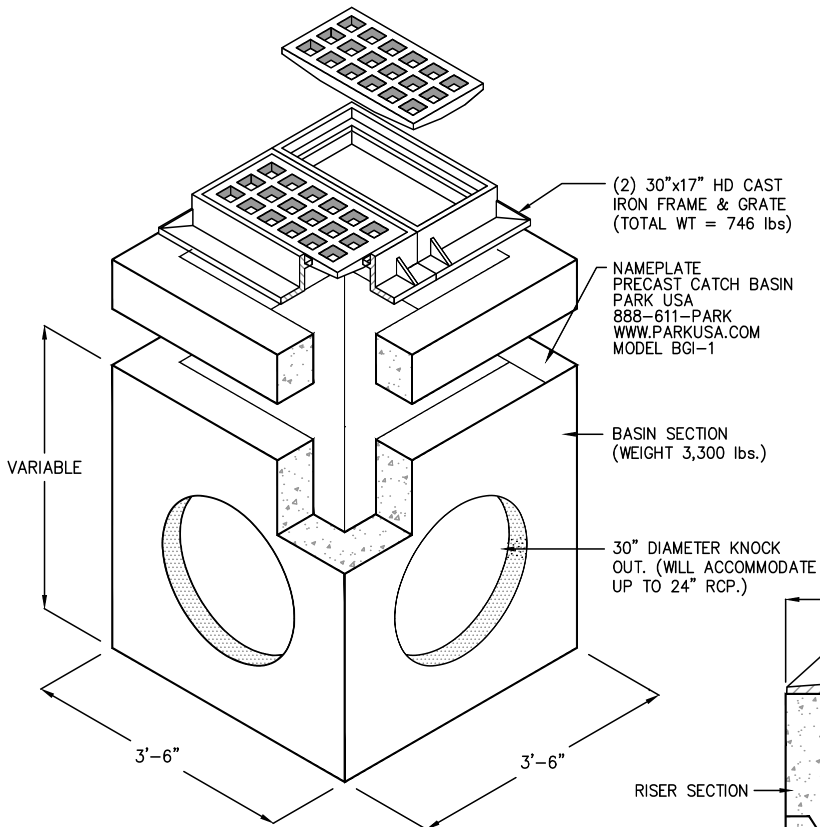
BBGI-1

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

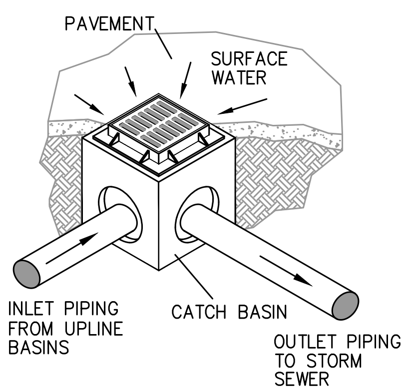
PARK USA
www.parkusa.com 888-611-PARK

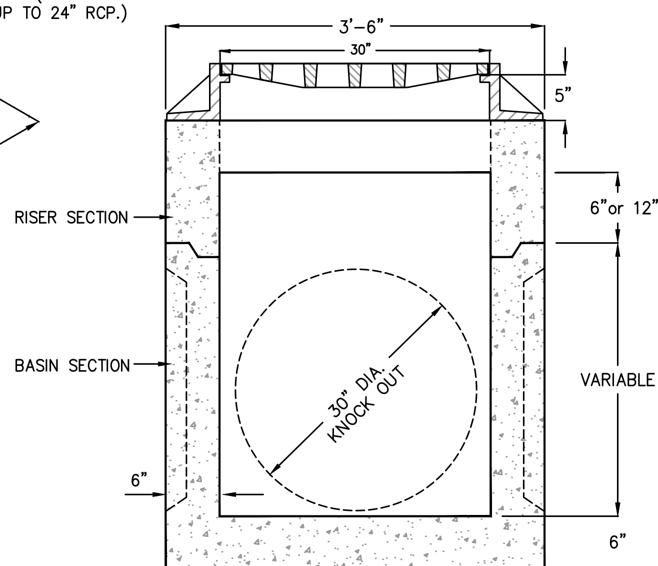
TYPE-BB GRATE INLET
MODEL BBGI-1

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	BBGI-1	.
DATE 05/2019					



ISOMETRIC VIEW





SECTION VIEW

BGI-1

NPCA CERTIFIED PLANT | AMERICAN SOCIETY OF SANITARY ENGINEERING | ASPE MEMBER | ASTM C-913

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

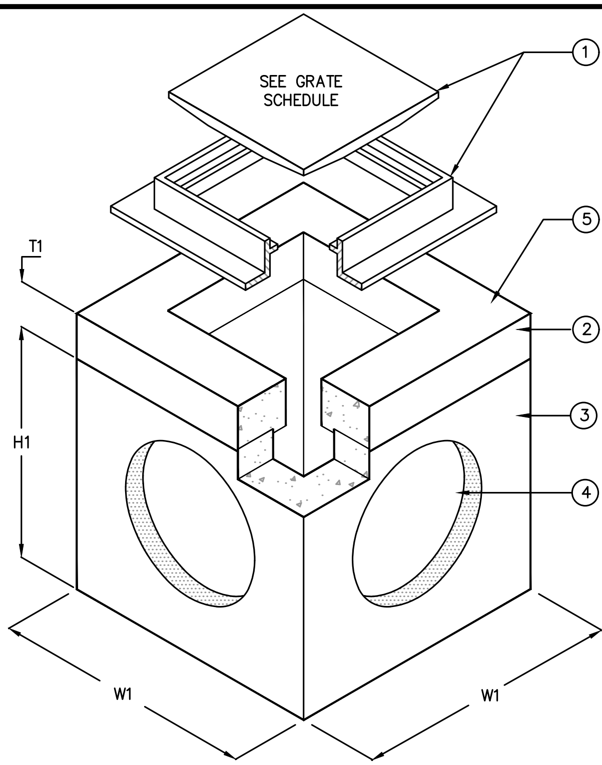
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

TYPE-B GRATE INLET
MODEL BGI-1

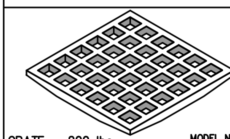
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	BGI-1	.
DATE 05/2019					

DRAINAGE

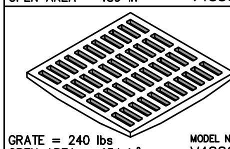


ISOMETRIC VIEW

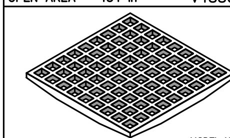
GRATE SCHEDULE



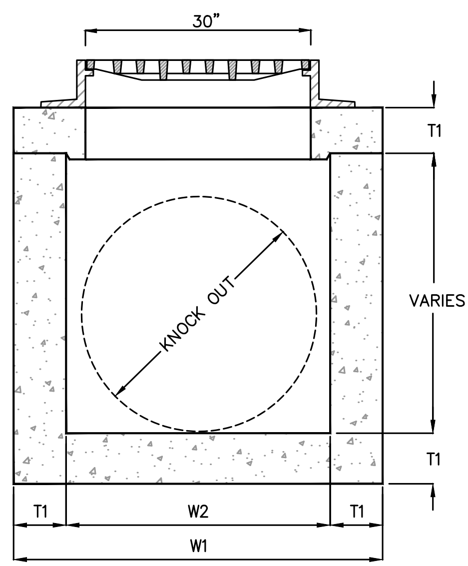
GRATE = 200 lbs
OPEN AREA = 489 in²
MODEL No. V4880–1



GRATE = 240 lbs
OPEN AREA = 434 in²
MODEL No. V4880–3

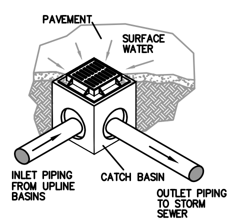


GRATE = 270 lbs
OPEN AREA = 387 in²
MODEL No. V4880–4



SECTION VIEW

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IRON FRAME & GRATE
2	1	TOP SECTION
3	1	PRECAST CONCRETE BASIN SECTION
4	4	THIN WALL KNOCKOUT ON ALL 4 SIDES, SEE KO DIMENSION FOR MAXIMUM PIPE O.D.
5	1	NAMEPLATE MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL: CB4880



NOTE:
RISER SECTION AVAILABLE
IN 6" TO 12" DEPTHS.

NPCA CERTIFIED PLANT ASTM C–913 AMERICAN SOCIETY OF SANITARY ENGINEERING ASPE MEMBER

CB4880–1

MODEL	W1	W2	H1	H2	T1	T2	KO	GRATE SIZE	OPEN AREA	WEIGHT LBS
CB–30	42"	30"	42"	36"	6"	6"	30"	30"x30"x2"	490	3,675
CB–36	48"	36"	42"	36"	6"	6"	32"	30"x30"x2"	693	4,585
CB–48	60"	48"	54"	48"	6"	6"	48"	30"x30"x2"	693	7,250
CB–60	72"	60"	66"	60"	6"	6"	60"	30"x30"x2"	693	10,500
CB–72	84"	72"	78"	72"	6"	6"	72"	30"x30"x2"	693	15,350
CB–84	96"	84"	78"	72"	6"	6"	72"	30"x30"x2"	693	19,500

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

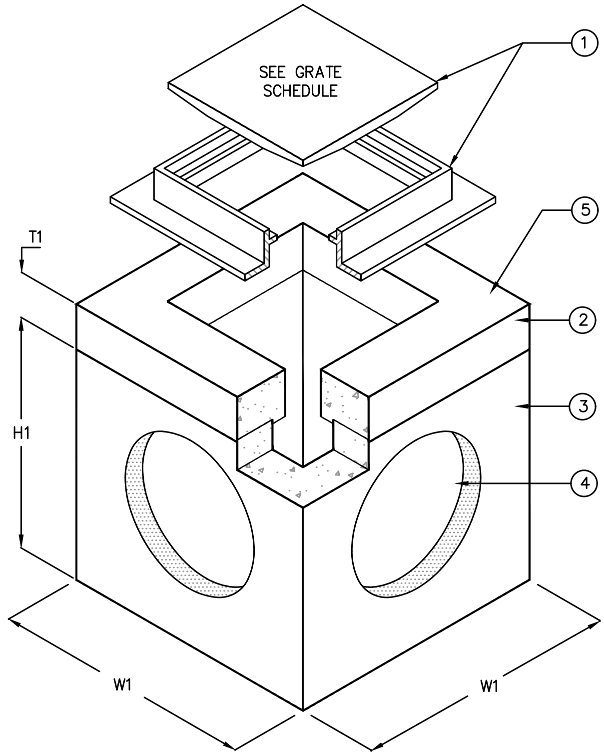
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

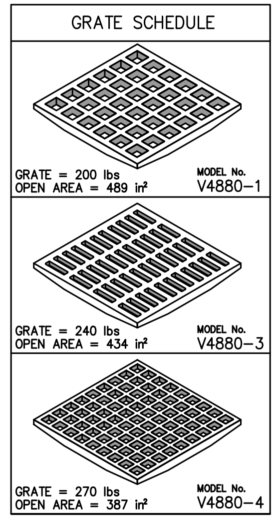
PARK USA
www.parkusa.com 888–611–PARK

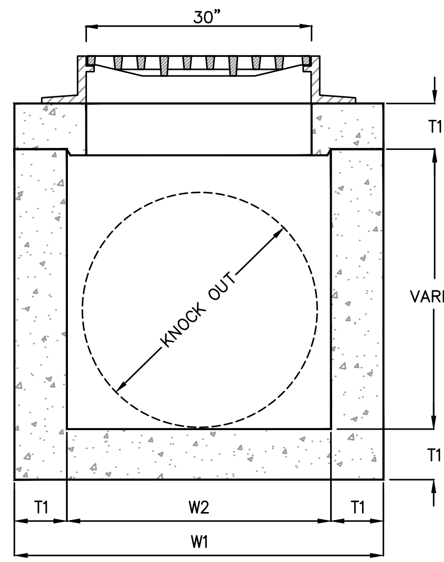
TYPE–A GRATE INLET
MODEL CB4880 30" THRU 84"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CB4880–1	.
DATE 12/2020					



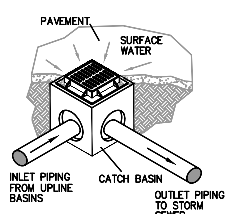
ISOMETRIC VIEW





SECTION VIEW

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IRON FRAME & GRATE
2	1	TOP SECTION
3	1	PRECAST CONCRETE BASIN SECTION
4	1	THIN WALL KNOCKOUT ON ALL 4 SIDES, SEE KO DIMENSION FOR MAXIMUM PIPE O.D.
5	1	PRECAST CATCH BASIN MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL: CB5600–1



NOTE:
RISER SECTION AVAILABLE IN 6" TO 12" DEPTHS.

MODEL	W1	W2	H1	H2	T1	T2	KO	GRATE SIZE	OPEN AREA	WEIGHT LBS
CB–12	15"	10"	21"	18"	3"	2i"	10"	12"x12"x1"	90	180
CB–14	20"	12"	28"	24"	4"	4"	12"	14"x14"x1½"	120	600
CB–18	24"	16"	34"	30"	4"	4"	15"	18"x18"x1½"	168	1,000
CB–20	26"	18"	34"	30"	4"	4"	17"	20"x20"x1½"	170	1,335
CB–24	32"	22"	41"	36"	5"	5"	22"	24"x24"x2"	268	2,245
CB–27	37"	25"	42"	36"	6"	6"	24"	27"x27"x2"	350	2,875

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

NPCA CERTIFIED PLANT   C–913   MEMBER   CB5600–1

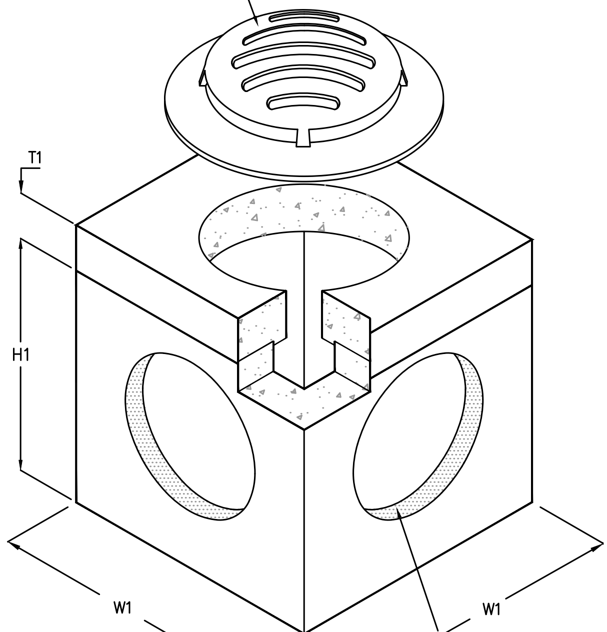
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: .   PROJ #: .
DATE: .   LOCATION: .

PARK USA
www.parkusa.com   888–611–PARK

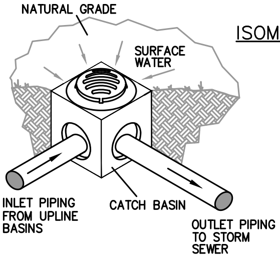
TYPE–A GRATE INLET
MODEL CB5600 12" THRU 27"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CB5600–1	.
DATE 05/2019					

DRAINAGE



ISOMETRIC VIEW



HYDRAULIC CALCULATIONS

$Q = CA\sqrt{2gd}$

WHERE
- Q = FLOW, cfs
- C = ORIFICE COEFFICIENT, .67
- A = CLEAR OPENING, 220 in^2
- g = GRAVITY, 32.2 ft/sec^2
- d = DEPTH OF WATER, in

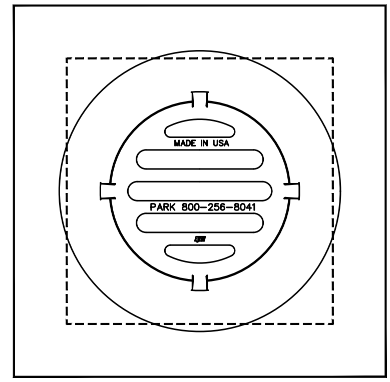
TO SOLVE FOR MAX FLOW – Q (cfs)

$Q = 2.376\sqrt{d}$

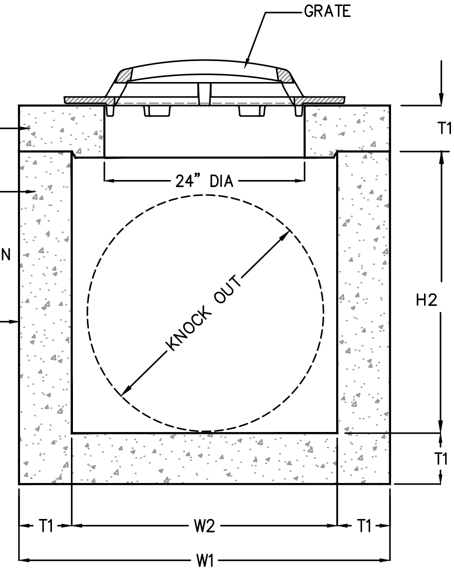
TO SOLVE FOR HEIGHT OF WATER – d (in)

$d = \left(\frac{Q}{2.376}\right)^2$

NOTE: THIS EQUATION IS VALID FOR WATER DEPTHS 4" OR GREATER, AND DOES NOT COMPENSATE FOR ANY REDUCTION IN FLOW DUE TO CLOGGING BY DEBRIS.



TOP VIEW



TOP SECTION

BASIN SECTION

NAMEPLATE
PRECAST CATCH BASIN
PARK USA
888-611-PARK
WWW.PARKUSA.COM
MODEL CBDG

PLAN VIEW

NOTE:
RISER SECTION AVAILABLE IN 6" TO 12" DEPTHS.

DIMENSIONS

MODEL #	W1	W2	H1	H2	T1	K.O.	GRATE SIZE	WEIGHT IBS
CBDG36	48"	36"	42"	36"	6"	36"	22"ø	4,585
CBDG48	60"	48"	54"	48"	6"	48"	22"ø	8,900
CBDG60	72"	60"	66"	60"	6"	60"	22"ø	13,650
CBDG72	84"	72"	78"	72"	6"	72"	22"ø	19,000
CBDG84	96"	83"	78"	72"	6"	84"	22"ø	23,000

NPCA CERTIFIED PLANT ASTM C-913 AMERICAN SOCIETY OF SANITARY ENGINEERING ASPE MEMBER

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

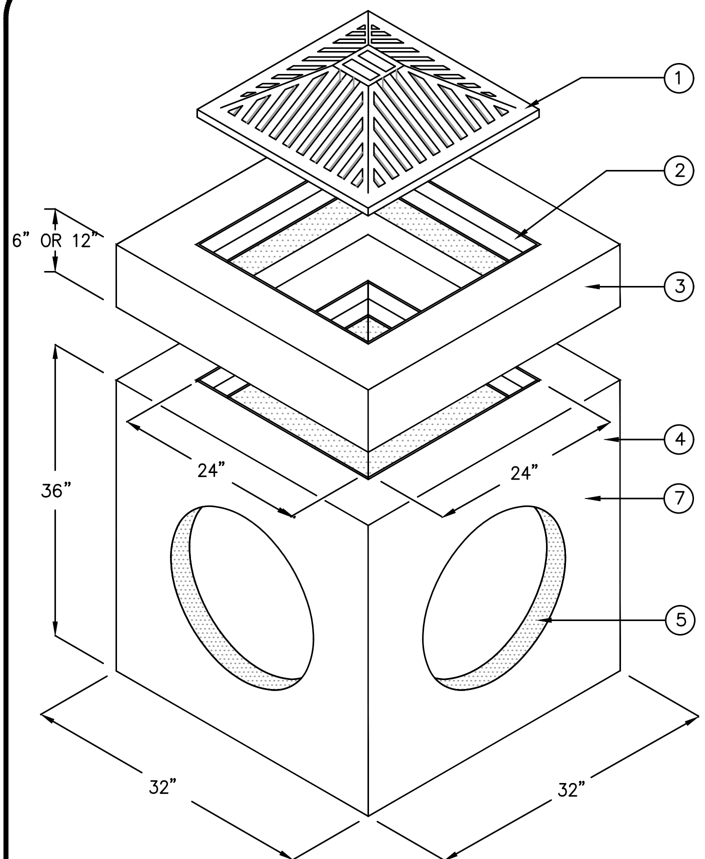
CBDG

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

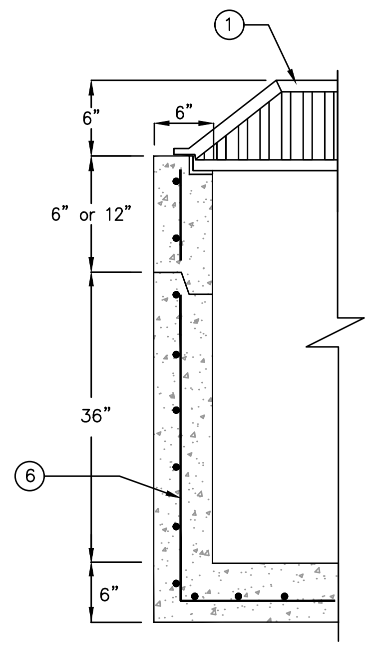
PARK USA
www.parkusa.com 888-611-PARK

DITCH GRATE INLET
MODEL CBDG – 36" THRU 84"

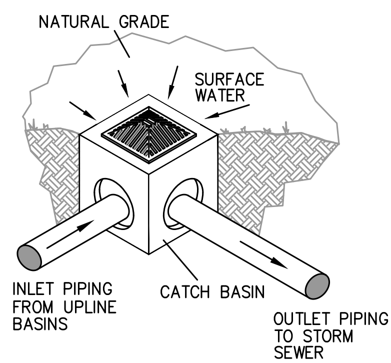
PM . | PC . | DRN . | ENG . | DWG. NO. CBDG | REV. .
DATE 01/2019



KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	EAST JORDAN MODEL V6500 HEAVY DUTY DITCH GRATE (WEIGHT 200 lbs.)
2	1	CAST IN STEEL FRAME
3	1	OPTIONAL EXTENSION (WEIGHT 6" 440 lbs.) (WEIGHT 12" 875 lbs>)
4	1	BASIN SECTION (WEIGHT 2700 lbs.)
5	1	24" DIAMETER KNOCK OUT (WILL ACCOMMODATE UP TO 18" RCP OR 20" PVC)
6	1	REBAR AS REQ'D
7	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL CBDG6500-24



PARTIAL SECTION



NPCA CERTIFIED PLANT
ASTM C-913
AMERICAN SOCIETY OF SANITARY ENGINEERING
ASPE MEMBER

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

CBDG6500-24

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

www.parkusa.com 888-611-PARK

DITCH GRATE INLET w/ V6500 GRATE
MODEL CBDG6500-24

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CBDG6500-24	.
DATE 05/2019					

DRAINAGE

Catchbasin / Inlets Take-Off Sheet

Sheet:____of ____

Manhole Type	Joint Type	Options	Pipe Connection	Access Cover
☐ Sanitary Sewer	☐ Tongue/Groove	☐ Micro-Silica	☐ Blockout	☐ Std. Manhole Cover
☐ Storm Sewer	☐ O-Ring Gasket	☐ Epoxy Lined	☐ Rubber Boot	☐ Bolt-Down Cover
☐ ________	☐ ________	☐ ________	☐ ________	☐ ________

0° 270° 90° 180°

Tag# ________
Inside Dia________
Tor El.________
Penetrations
Pipe Type: ________
① Size_____Fl_______
② Size_____Fl_______
③ Size_____Fl_______
④ Size_____Fl_______

0° 270° 90° 180°

Tag# ________
Inside Dia________
Tor El.________
Penetrations
Pipe Type: ________
① Size_____Fl_______
② Size_____Fl_______
③ Size_____Fl_______
④ Size_____Fl_______

0° 270° 90° 180°

Tag# ________
Inside Dia________
Tor El.________
Penetrations
Pipe Type: ________
① Size_____Fl_______
② Size_____Fl_______
③ Size_____Fl_______
④ Size_____Fl_______

0° 270° 90° 180°

Tag# ________
Inside Dia________
Tor El.________
Penetrations
Pipe Type: ________
① Size_____Fl_______
② Size_____Fl_______
③ Size_____Fl_______
④ Size_____Fl_______

0° 270° 90° 180°

Tag# ________
Inside Dia________
Tor El.________
Penetrations
Pipe Type: ________
① Size_____Fl_______
② Size_____Fl_______
③ Size_____Fl_______
④ Size_____Fl_______

0° 270° 90° 180°

Tag# ________
Inside Dia________
Tor El.________
Penetrations
Pipe Type: ________
① Size_____Fl_______
② Size_____Fl_______
③ Size_____Fl_______
④ Size_____Fl_______

0° 270° 90° 180°

Tag# ________
Inside Dia________
Tor El.________
Penetrations
Pipe Type: ________
① Size_____Fl_______
② Size_____Fl_______
③ Size_____Fl_______
④ Size_____Fl_______

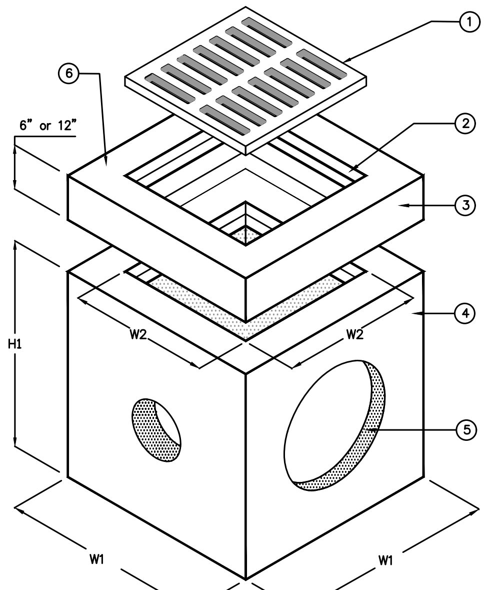
0° 270° 90° 180°

Tag# ________
Inside Dia________
Tor El.________
Penetrations
Pipe Type: ________
① Size_____Fl_______
② Size_____Fl_______
③ Size_____Fl_______
④ Size_____Fl_______

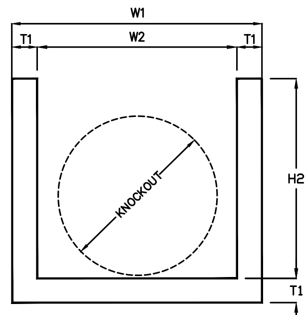
est-01

Project:________________Bid Date:________
Company:________________
By:__________Tel:________Fax:________

For Estimating & Sales Contact
PARK USA®
www.ParkUSA.com • 888.611.PARK



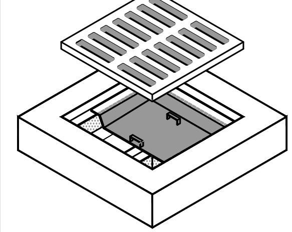
CAST–IN FRAME ISOMETRIC



BASIN SECTION

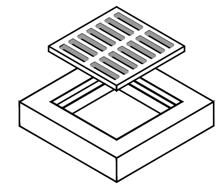
SCREEN OPTIONS

REMOVABLE DEBRIS SCREEN w/ (2) LIFT HANDLES, 304 STAINLESS STEEL, ¼" HOLES @ 5⁄16" O.C. (50% FREE OPEN AREA)



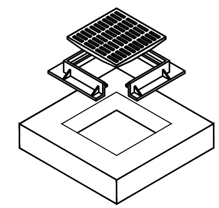
GRATE OPTIONS

TYPE–C
TRAFFIC DUTY CAST IRON GRATE



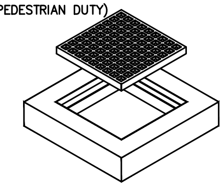
C.I. CASTINGS: MANHOLE FRAMES AND GRATES ARE MANUFACTURED OF GREY IRON CONFORMING TO ASTM A48–76 CLASS 30.

TYPE–V
V5600–SERIES CAST IRON FRAME & GRATE



D.I. CASTINGS: MANHOLE FRAMES, COVERS OR GRATES ARE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536, AASHTO M306, & AASHTO M105 STANDARDS.

TYPE–F
ACID RESISTANT FRP GRATING, w/ STAINLESS STEEL FRAME (PEDESTRIAN DUTY)



GRATING: GRATING SHALL BE ACID–RESISTANT FIBERGLASS GRATING W/ STAINLESS STEEL ANGLE FRAME.

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	GRATE OR COVER AS REQUESTED, SEE OPTIONS
2	1	CAST–IN STEEL FRAME
3	1	OPTIONAL TOP/EXTENSION 6" TO 12"
4	1	PRECAST CONCRETE BASIN SECTION
5	4	KNOCKOUTS (STD) AND PENETRATIONS (OPT) AS REQUIRED, SEE KO DIMENSION FOR MAXIMUM PIPE O.D.*
6	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL: CB–1 DATE MANUFACTURED

PARK MODEL NO.
CB–X–X–X

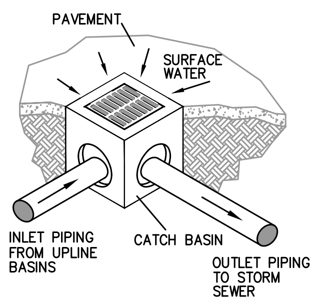
GRATE TYPE
C – CAST IRON W/ CAST–IN FRAME
V – V5600 SERIES W/ LOOSE FRAME
F – FRP W/ CAST–IN STAINLESS STEEL FRAME

LOAD RATING
P – PEDESTRIAN
T – H–20 TRAFFIC
H – HEAVY DUTY TRAFFIC
A – AIRCRAFT

SCREEN OPTION
S – DEBRIS SCREEN

MODEL	W1	W2	H1	H2	T1	T2	KO	GRATE SIZE	OPEN AREA SQ IN	WEIGHT LBS
*CB–12	15"	10"	21"	18"	3"	2.5"	10"	12"x12"x1"	90	180
CB–14	20"	12"	28"	24"	4"	4"	12"	14"x14"x1½"	120	600
CB–18	24"	16"	34"	30"	4"	4"	15"	18"x18"x1½"	168	1,000
CB–20	26"	18"	34"	30"	4"	4"	17"	20"x20"x1½"	170	1,335
CB–24	32"	22"	41"	36"	5"	5"	22"	24"x24"x2"	268	2,245
CB–27	37"	25"	42"	36"	6"	6"	24"	27"x27"x2"	350	2,875
CB–30	42"	30"	42"	36"	6"	6"	30"	32"x32"x2"	490	3,675
CB–36	48"	36"	42"	36"	6"	6"	32"	38"x38"x2"	693	4,585
CB–48	60"	48"	54"	48"	6"	6"	48"	38"x38"x2"	693	7,250
**CB–60	72"	60"	66"	60"	6"	6"	60"	38"x38"x2"	693	10,500
**CB–72	84"	72"	78"	72"	6"	6"	72"	38"x38"x2"	693	15,350
**CB–84	96"	84"	78"	72"	6"	6"	72"	38"x38"x2"	693	19,500

*ONLY PEDESTRIAN LOAD RATED GRATES AVAILABLE
**KNOCKOUTS NOT AVAILABLE



SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

CB–1

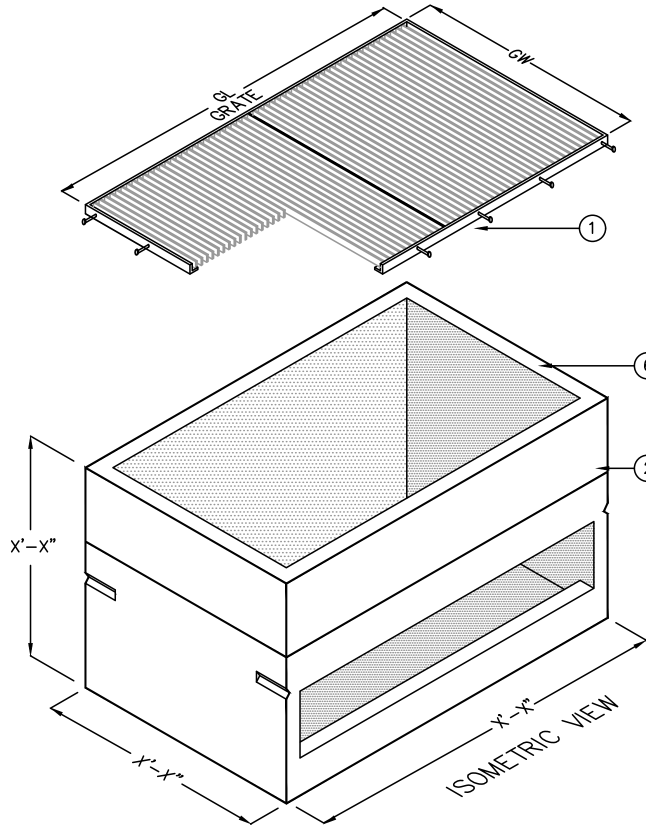
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

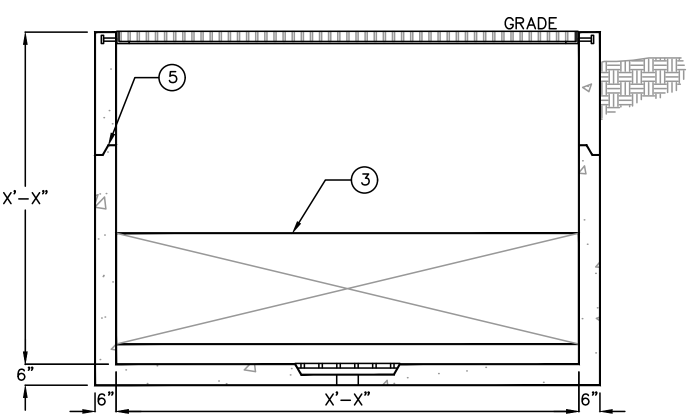
CATCH BASIN
MODEL CB – 12" THRU 84"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CB–1	.
DATE 05/2019					

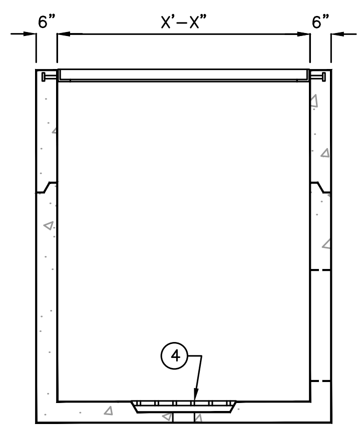
DRAINAGE



KEYED NOTES		
MARK	QTY	DESCRIPTION
1	2	GALVANIZED BAR GRATING W/ STEEL FRAME
2	1	PRECAST CONCRETE BASIN SECTION
3	1	SLOTTED OPENING
4	1	12"x12"x3" SUMP W/ CI GRATE & PVC COUPLING
5	1	ALL JOINTS MADE WATER–TIGHT W/ PLASTIC FLEXIBLE GASKET (RAM–NEK)
6	1	NAMEPLATE MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL CB–VLT



SIDE VIEW



END VIEW

CB–VLT

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

CATALOG BASIN–VAULT
MODEL CB–VLT

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CB–VLT	.
DATE 05/2019					

NPCA CERTIFIED PLANT ASTM C–913 MEMBER

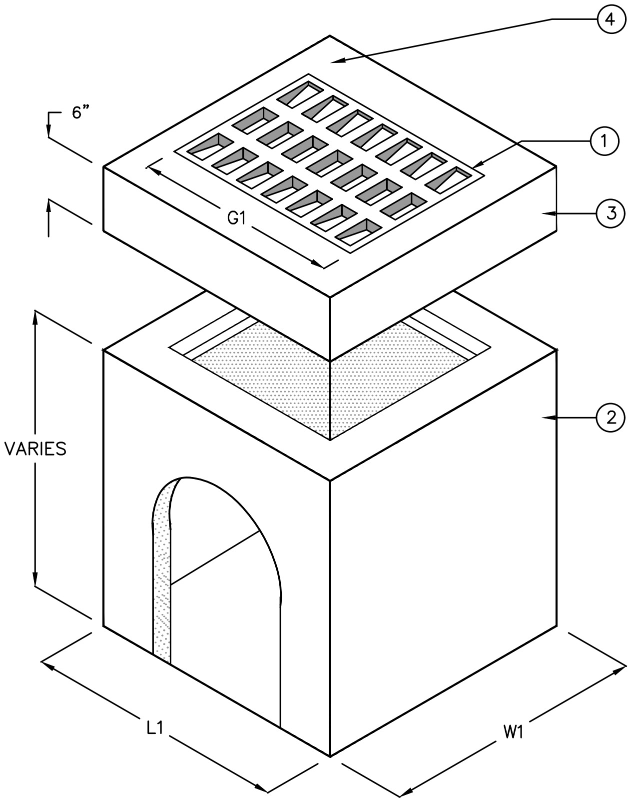
SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

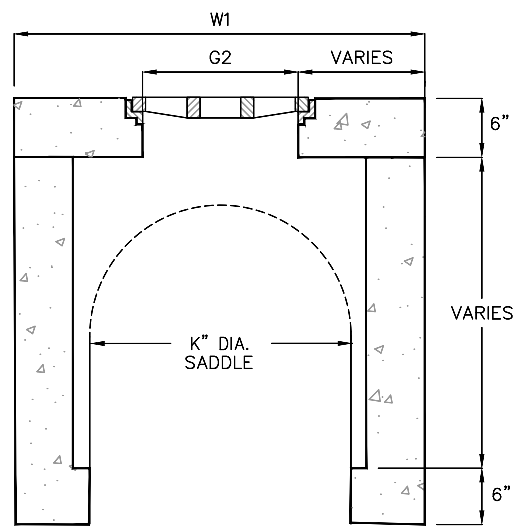
REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

GRATING: ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT–DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IN "CITY OF HOUSTON" FRAME & GRATE TYPE D V4855-1
2	1	BASIN SECTION
3	1	LID SECTION
4	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: COHTD-3 DATE MANUFACTURED



ISOMETRIC VIEW



SECTION VIEW

TYPE	L1	W1	G1	G2	K
COHTD-36	4'-0"	4'-0"	38½"	17"	32"
COHTD-48	5'-0"	5'-0"	38½"	17"	44"
COHTD-60	6'-0"	6'-0"	38½"	17"	66"
COHTD-72	7'-0"	7'-0"	38½"	17"	78"

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

ASCE npca CERTIFIED PLANT ASPE MEMBER

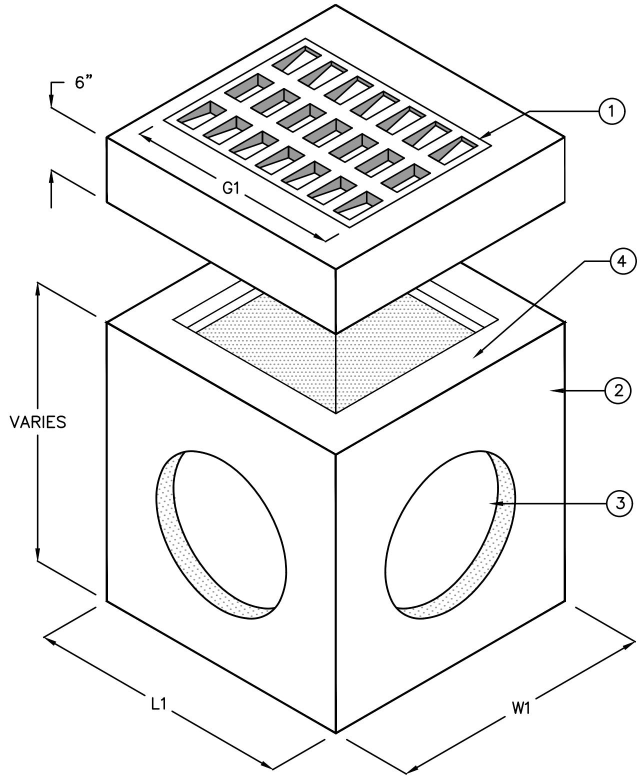
COHTD-1

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

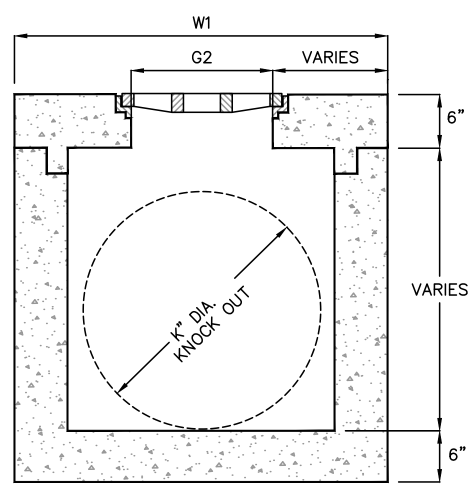
TYPE-D SADDLE GRATE INLET
CITY OF HOUSTON

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	COHTD-1	.
DATE 05/2019					



KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IN "CITY OF HOUSTON" FRAME & COVER
2	1	BASIN SECTION
3	4	THIN WALL KNOCKOUT ON ALL 4 SIDES, SEE K DIMENSION FOR MAXIMUM PIPE O.D.
4	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL: COHTD–2 DATE MANUFACTURED

APPROVED FOR
CITY OF HOUSTON



SECTION

TYPE	L1	W1	G1	G2	K	WEIGHT LBS
D	4'–0"	4'–0"	38½"	17"	32"	4,200
D–1	3'–6"	3'–6"	29⅝"	15"	30"	4,200

NPCA CERTIFIED PLANT
ASPE MEMBER
ASTM C–913

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

COHTD–2

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

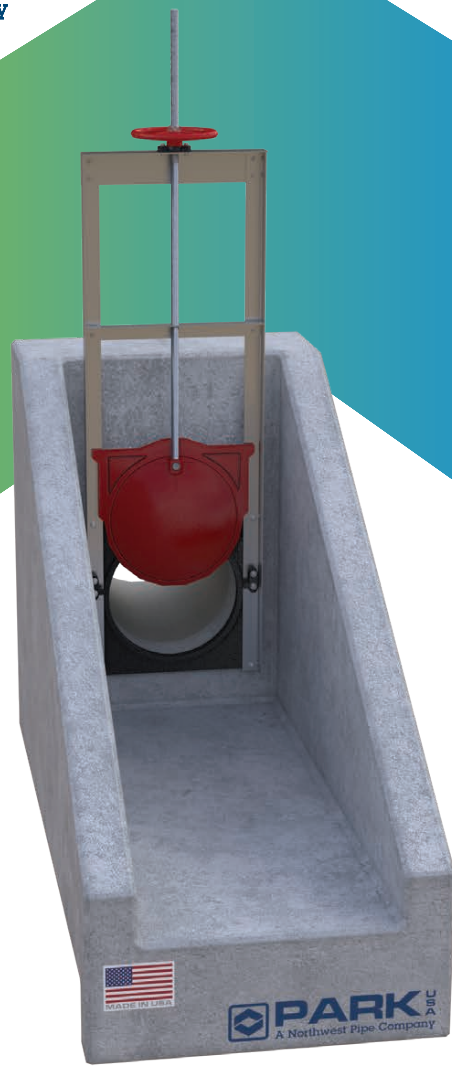
TYPE–D & D–1 GRATE INLET
CITY OF HOUSTON – MODEL COHTD–2

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	COHTD–2	.
DATE 05/2019					

NOTES

PARK USA
A Northwest Pipe Company

CANAL™ VALVE



Features

- Pre-engineered & prefabricated
- Durable concrete construction
- Low cost
- Easy installation and maintenance

Water Control Systems

TThe ParkUSA® CanalValveTM is a valve system that provides control of water for drainage/flood control, irrigation, wastewater treatment, environmental management. The CanalValveTM line of products include gate valves, check valve systems, and stop systems that are pre-engineered and contained in a precast concrete structure for direct burial. The turnkey CanalValveTM system can be an important component for EPA Stormwater Quality, a SPCC management program, or a wastewater treatment application.

Products Include:

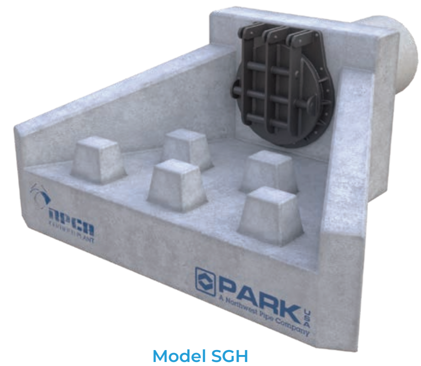
- Canal Gate Valves
- Sluice Gate Valves
- Flap / Duckbill Backflow Valves
- Stop Logs

#BUILDING AMERICA!

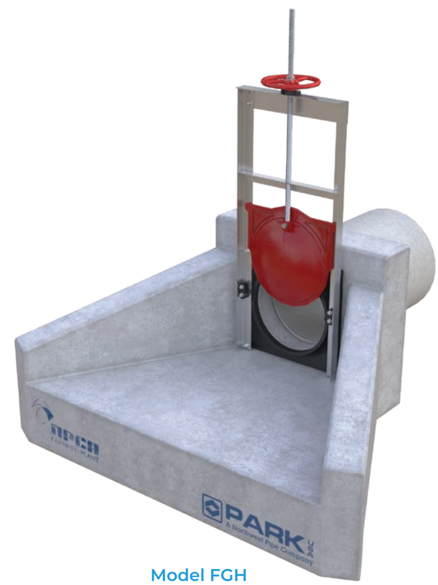
SW | CANALVALVE Standard

Model SGS

Model SGV



Model SGH



Model FGH

How it Works

The ParkUSA CanalValveTM systems provides for manual or automatic water control of water bodies. Systems are available in a variety of structural configurations including; Tanks, Headwalls, End Treatments, and Vaults.

Slide gate/sluice valves operate with a mechanical screw assembly that easily opens or closes the valve, and can be seated in the open or closed position depending on the desired position. The valve screw assembly provides unrestricted flow, trouble free simplicity and quick opening and closing of the valve.

Stop Logs provide for in-channel flow or level control. Logs are beams with a rubber seal that are inserted in grooves cast in a channel wall. The logs are stacked or unstacked to permit incremental changes in water level that are not possible using stop gates or slide gates.

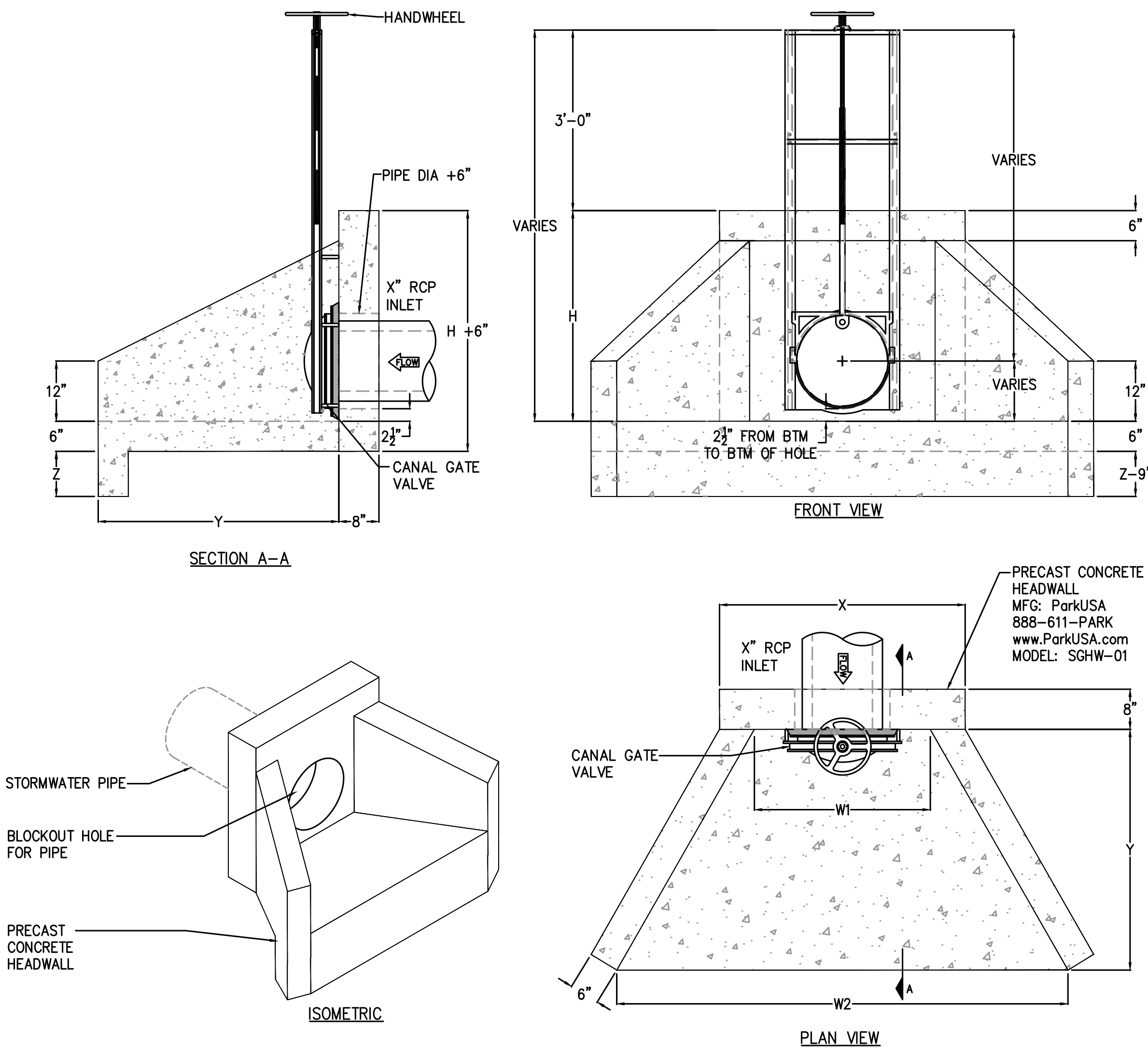
Flap and duckbill check valves allow water to flow only one direction. They can provide for water gravity-drainage while preventing water from backflowing upstream.

Visit **canalvalve.parkusa.com** for more information and design assistance.

To request a quote or catalog, visit **request.parkusa.com.**

APPLICATIONS

Stormwater Ponds | Agriculture & Hatcheries | Wastewater Treatment Plants | Auto Parts Salvage Yards | Irrigation Canals | Refineries & Tank Storage



MODEL	LARGEST PIPE	DIMENSIONS					
		W1	H	W2	X	Y	Z
SGHW–1218	12"	21"	2'–6"	4'–3"	3'–0"	2'–0"	–
SGHW–1824	18"	24"	3'–0"	5'–10"	3'–2"	3'–0"	–
SGHW–2436	24"	36"	5'–0"	9'–3"	4'–8"	5'–0"	9"
SGHW–4248	42"	48"	5'–3"	12'–9"	5'–10"	7'–0"	12"

npca CERTIFIED PLANT C–478 ASTM ASPE MEMBER

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION INCLUDING WALLS AND FLOOR.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

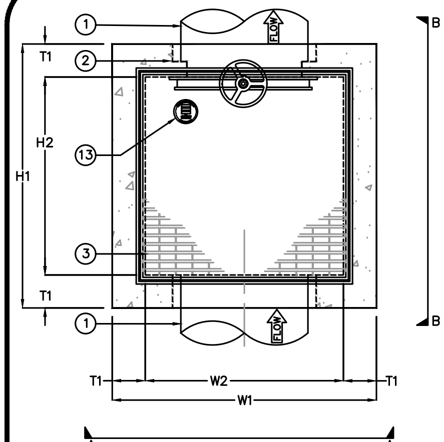
SGHW–02

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

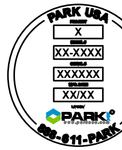
PARK USA
www.parkusa.com 888–611–PARK

HEADWALL w/ SLIDE GATE VALVE
MODEL SGHW 12" THRU 48"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SGHW–02	.
DATE 05/2019					



PLAN VIEW



GENERAL INFORMATION

THIS GATE ASSEMBLY IS DESIGNED FOR USE ON BELOW-GRADE CANAL AND PIPELINE SYSTEMS WHICH OPERATE AT LOW "HEADS" AND WHERE A MODERATELY PRICED GATE IS DESIRED. THE GATE VALVE IS PROTECTED BY A PRECAST CONCRETE ENCLOSURE WITH SAFETY GRATING AT THE GROUND SURFACE.

TYPICAL INSTALLATIONS INCLUDE: FARM TURNOUTS, CONTROL OF INDUSTRIAL WASTES, RAINAGE AND FOR TIDE CONTROL.

CONSTRUCTION IS OF GREY IRON WITH AN ALL-BOLTED STEEL FRAME WITH 1/4" MINIMUM THICKNESS. THE STANDARD STEM IS OF A SPECIAL LEADED STEEL WHICH RESISTS CORROSION. THE STEM IS OPERATED AT THE STRUCTURAL FRAME TOP BY A HEAVY CAST-BRONZE LIFT NUT AND A CAST IRON WHEEL.

ADJUSTABLE CAST IRON WEDGE BLOCKS, HELD SECURELY IN PLACE BY TWO MACHINE BOLTS, ASSURE A DEPENDABLE SEATING CLOSURE WITH A PRACTICAL DEGREE OF WATER TIGHTNESS. THE CAST IRON SEATS ARE MACHINED OR GROUND. A SOLID RIM "EASY-GRIP" HANDWHEEL IS STANDARD.

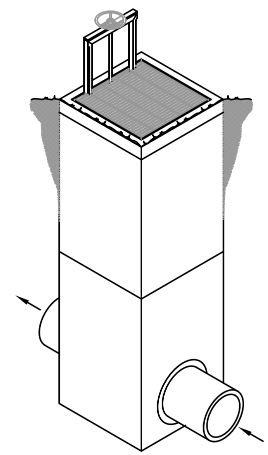
OPTIONAL MATERIALS INCLUDE: BRONZE SEATS; STAINLESS STEEL STRUCTURAL FRAME AND BOLTS; STAINLESS STEEL OR BRASS STEMS; AND SPECIAL EPOXY, COAL TAR OR ASTM GALVANIZED COATINGS.

SG SERIES – SCHEDULE

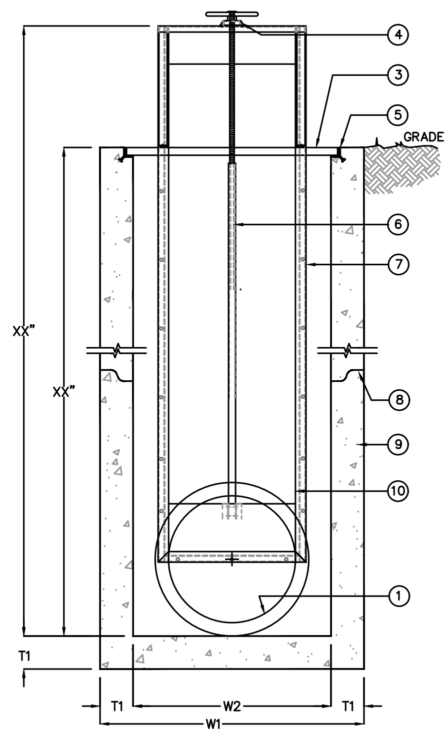
MODEL #	DIMENSIONS								
	W1	W2	H1	H2	T1	MAX PIPE OD	GRATE SIZE	MAX GATE SIZE (SQ)	WEIGHT LBS
SG-12	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SG-18	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SG-20	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SG-24	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SG-27	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SG-30	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SG-36	48"	36"	42"	36"	6"	32"	38"x38"x2"	24"	4,585
SG-48	60"	48"	54"	48"	6"	48"	38"x38"x2"	36"	8,900
SG-60	72"	60"	66"	60"	6"	60"	38"x38"x2"	48"	13,650
SG-72	84"	72"	78"	72"	6"	72"	38"x38"x2"	60"	19,000

KEYED NOTES

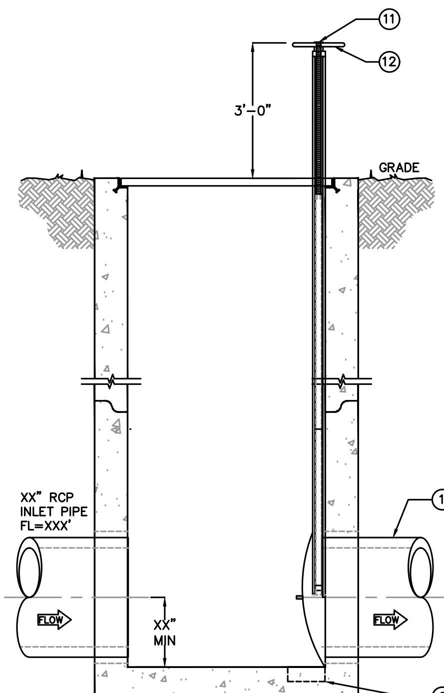
MARK	QTY	DESCRIPTION
1	1	XX" DRAINAGE PIPE
2	1	XX" x XX" DIA BLOCKOUT RECESS BLOCKOUT AREA FOR VALVE
3	1	GALVANIZED STEEL BAR GRATING
4	1	ENCLOSED BEARING
5	1	GALVANIZED STEEL FRAME w/ EMBED ANCHORS
6	1	ACME THREADED ROD
7	1	GALVANIZED STEEL FRAME
8	1	SECTIONAL JOINT SEALED w/ RAM-NEK
9	1	PRECAST CONCRETE BASIN MFG BY PARKUSA
10	1	HEAVY DUTY SLIDE GATE VALVE
11	1	RISING STEM
12	1	HANDWHEEL
13	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: SG-XX DATE MANUFACTURED



ISOMETRIC



VIEW A–A
FRONT ELEVATION



VIEW B–B
LEFT ELEVATION

SPECIFICATIONS

CONCRETE :
CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT :
GRADE 60 REINFORCED NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

GRATING :
ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123. GRATE SHALL BE PEDESTRIAN RATED.

GATE VALVE :
SLIDE GATE VALVE SHALL BE CAST IRON W/ MACHINED SEATS, GALVANIZED STEEL FRAME W/ FLANGE BACK FOR MOUNTING ON FLAT WALL, CARBON STEEL STEM, ACME TYPE THREADS, BRONZE NUT, AND HAND WHEEL OPERATOR.

SG-1

REV	DATE	BY	DESCRIPTION
A	.	.	.

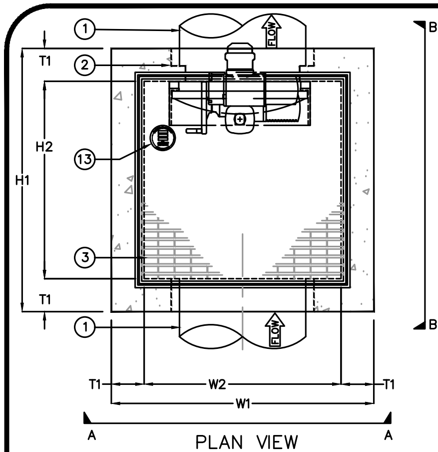
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK
SLIDE GATE VALVE SERIES-SG
ASSEMBLY MODEL 12 THRU 72

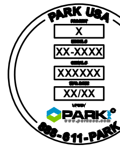
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SG-1	A
DATE 05/2019					

ASTM C-913 · ASSPP MEMBER · AMERICAN SOCIETY OF SANITARY ENGINEERS · NPCA CERTIFIED PLANT

DRAINAGE



PLAN VIEW



GENERAL INFORMATION

THIS GATE ASSEMBLY IS DESIGNED FOR USE ON BELOW-GRADE CANAL AND PIPELINE SYSTEMS WHICH OPERATE AT LOW "HEADS" AND WHERE A MODERATELY PRICED GATE IS DESIRED. THE GATE VALVE IS PROTECTED BY A PRECAST CONCRETE ENCLOSURE WITH SAFETY GRATING AT THE GROUND SURFACE.

TYPICAL INSTALLATIONS INCLUDE: FARM TURNOUTS, CONTROL OF INDUSTRIAL WASTES, RAINAGE AND FOR TIDE CONTROL.

CONSTRUCTION IS OF GREY IRON WITH AN ALL-BOLTED STEEL FRAME WITH 1/4" MINIMUM THICKNESS. THE STANDARD STEM IS OF A SPECIAL LEADED STEEL WHICH RESISTS CORROSION. THE STEM IS OPERATED AT THE STRUCTURAL FRAME TOP BY A HEAVY CAST-BRONZE LIFT NUT AND A CAST IRON WHEEL.

ADJUSTABLE CAST IRON WEDGE BLOCKS, HELD SECURELY IN PLACE BY TWO MACHINE BOLTS, ASSURE A DEPENDABLE SEATING CLOSURE WITH A PRACTICAL DEGREE OF WATER TIGHTNESS. THE CAST IRON SEATS ARE MACHINED OR GROUND. A SOLID RIM "EASY-GRIP" HANDWHEEL IS STANDARD.

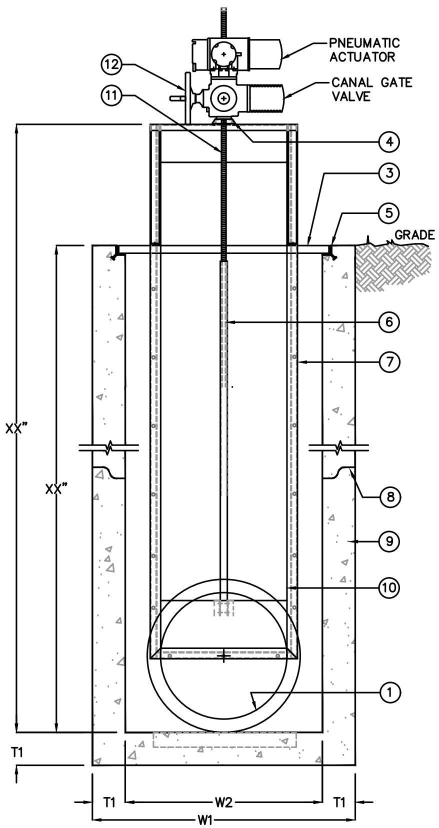
OPTIONAL MATERIALS INCLUDE: BRONZE SEATS; STAINLESS STEEL STRUCTURAL FRAME AND BOLTS; STAINLESS STEEL OR BRASS STEMS; AND SPECIAL EPOXY, COAL TAR OR ASTM GALVANIZED COATINGS.

SG SERIES – SCHEDULE

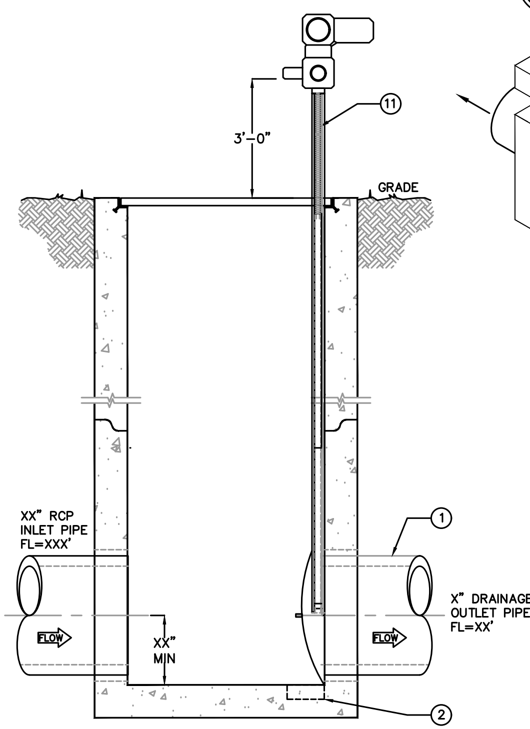
MODEL #	DIMENSIONS								
	W1	W2	H1	H2	T1	MAX PIPE OD	GRATE SIZE	MAX GATE SIZE (SQ)	WEIGHT LBS
SGVA-12	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SGVA-18	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SGVA-20	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SGVA-24	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SGVA-27	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SGVA-30	42"	30"	42"	30"	6"	30"	32"x32"x2"	20"	3,675
SGVA-36	48"	36"	42"	36"	6"	32"	38"x38"x2"	24"	4,585
SGVA-48	60"	48"	54"	48"	6"	48"	38"x38"x2"	36"	8,900
SGVA-60	72"	60"	66"	60"	6"	60"	38"x38"x2"	48"	13,650
SGVA-72	84"	72"	78"	72"	6"	72"	38"x38"x2"	60"	19,000

KEYED NOTES

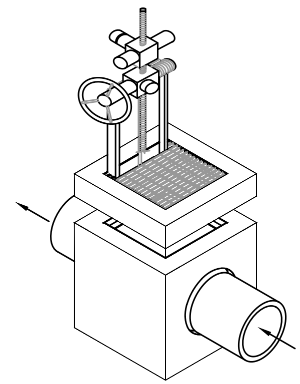
MARK	QTY	DESCRIPTION
1	1	XX" DRAINAGE PIPE
2	1	XX" x XX" DIA BLOCKOUT RECESS BLOCKOUT AREA FOR VALVE
3	1	GALVANIZED STEEL BAR GRATING
4	1	ENCLOSED BEARING
5	1	GALVANIZED STEEL FRAME w/ EMBED ANCHORS
6	1	THREADED ROD
7	1	GALVANIZED STEEL FRAME
8	1	SECTIONAL JOINT SEALED w/ RAM-NEK
9	1	PRECAST CONCRETE BASIN MFG BY PARKUSA
10	1	HEAVY DUTY SLIDE GATE VALVE
11	1	RISING STEM
12	1	HANDWHEEL
13	1	NAMEPLATE INDICATING: MFG: ParkUSA 888-611-PARK WWW.PARKUSA.COM MODEL: SGVA-XX DATE MANUFACTURED



VIEW A–A
FRONT ELEVATION



VIEW B–B
LEFT ELEVATION



ISOMETRIC

SPECIFICATIONS

CONCRETE :
CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT :
GRADE 60 REINFORCED NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

GRATING :
ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123. GRATE SHALL BE PEDESTRIAN RATED.

GATE VALVE :
SLIDE GATE VALVE SHALL BE CAST IRON W/ MACHINED SEATS, GALVANIZED STEEL FRAME W/ FLANGE BACK FOR MOUNTING ON FLAT WALL, CARBON STEEL STEM, ACME TYPE THREADS, BRONZE NUT, AND HAND WHEEL OPERATOR.

SGVA-1

A	.	.	.
REV	DATE	BY	DESCRIPTION

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

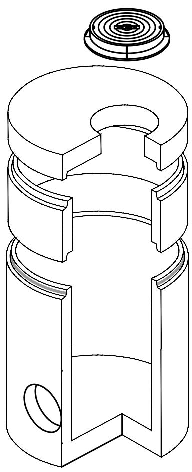
www.parkusa.com 888–611–PARK

SLIDE GATE VALVE ASSEMBLY
CAST IRON SLIDE GATE VALVE

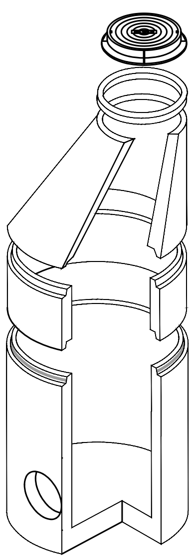
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SGVA–1	A
DATE	05/2019				

C-913

NOTES



SHOWN w/ FLAT TOP



SHOWN w/ ECCENTRIC CONE

OPTIONS

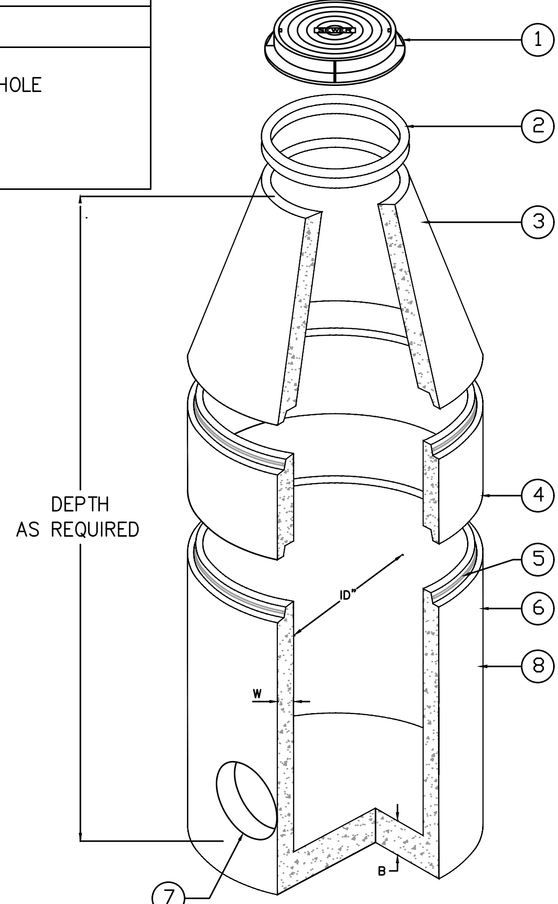
* STEPS
* EXTENDED LIP BASE
* COATINGS
* BOTTOM

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IRON MANHOLE FRAME & COVER
2	1	3" THICK ADJUSTMENT RINGS AS REQUIRED. FLAT TOPS ARE ARE AVAILABLE.
3	1	CONCENTRIC CONE
4	1	RISER SECTIONS AVAILABLE IN VARYING HEIGHTS.
5	1	48" USES O'RING, OTHER SIZES USE RAMNEK JOINT SEALANT
6	1	BASE SECTION, KNOCKOUTS AS REQUIRED.
7	1	HOLES AS REQUIRED
8	1	NAMEPLATE INDICATING: PRECAST CONCRETE MANHOLE MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL PCMHST

DIMENSIONS AND WEIGHTS			
I.D. SIZE (in)	W (in)	B* (in)	RISER WT/LF (lb)
48"	5"	6"	868
60"	6"	6"	1300
72"	6"	6"	1811
84"	6"	6"	2350
96"	6"	6"	3090
120"	8"	6"	3500
120"	8"	6"	3500

* MIN. THICKNESS BELOW INVERT

1. LIFTING INSERTS AS REQUIRED.
2. ALL JOINTS SHALL BE SEALED w/ RAM–NEK JOINT SEALANT
3. STRUCTURE TO BE PLACED ON MIN. 6" STABILIZED BASE.



SHOWN w/ CONCENTRIC CONE

PC MHST–1

SPECIFICATIONS

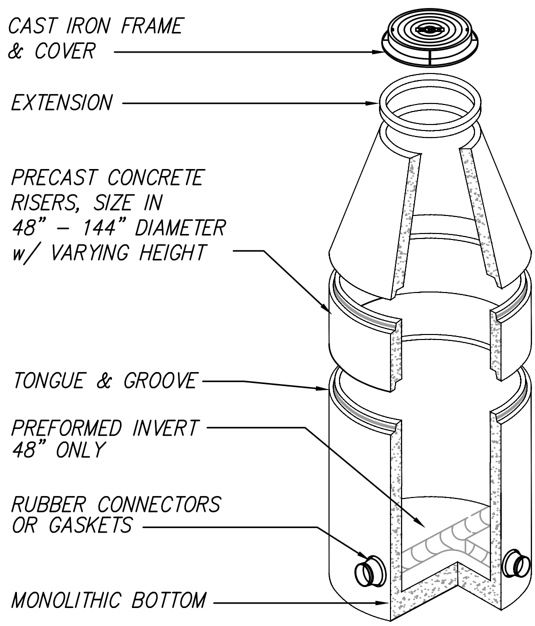
CONCRETE :	CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. RATED FOR H–20 LOADING.
REINFORCEMENT:	STRUCTURAL REINFORCEMENT CONFORMING TO ASTM–C–478.
C.I. CASTINGS:	CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

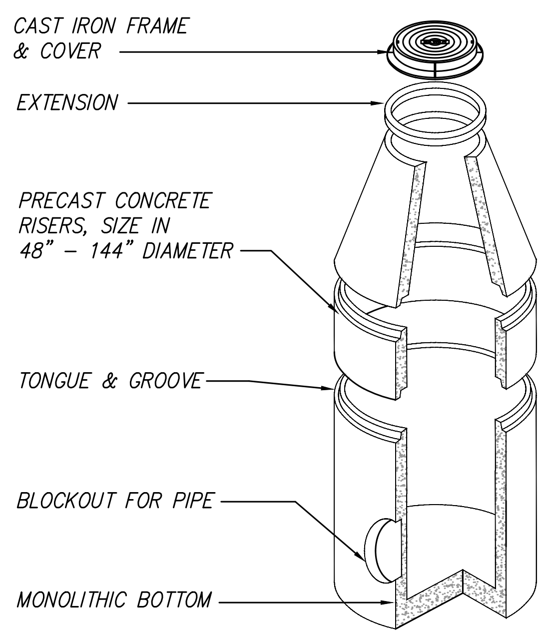
PARK USA
www.parkusa.com 888–611–PARK

PRECAST CONCRETE MANHOLE
STORM SEWER–MODEL PC MHST – 48" THRU 120"

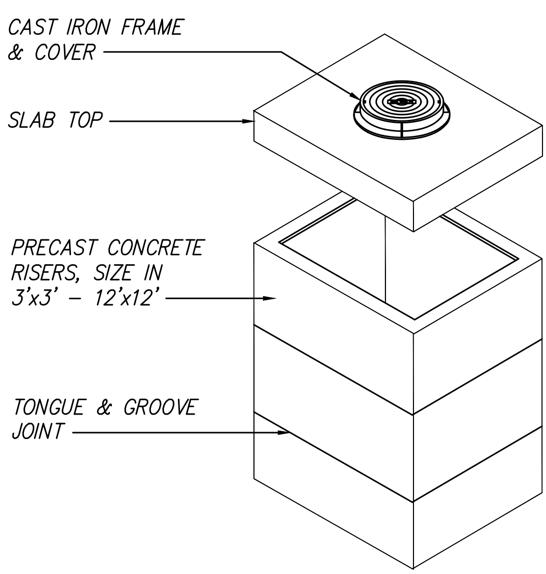
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	PC MHST–1	.
DATE 01/2019					



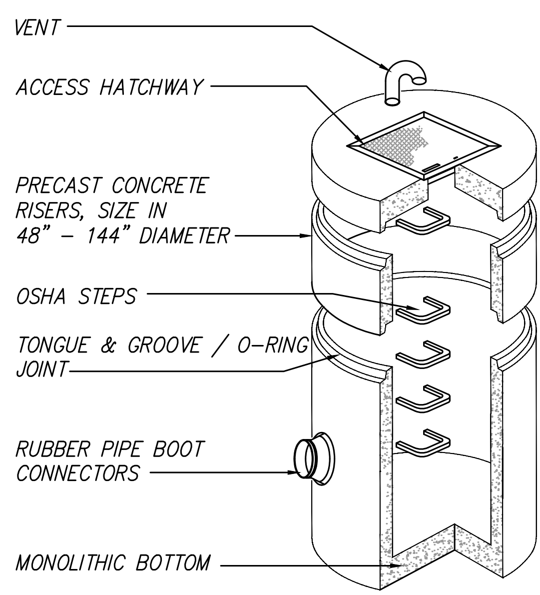
MANHOLE – SANITARY SEWER



MANHOLE – STORM SEWER



WET WELL – MULTI-PURPOSE



WET WELL – FOR PUMP STATION

MHWW-1

CLASS II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. RATED FOR H–20 LOADING.

STRUCTURAL REINFORCEMENT CONFORMING TO ASTM–C–478.

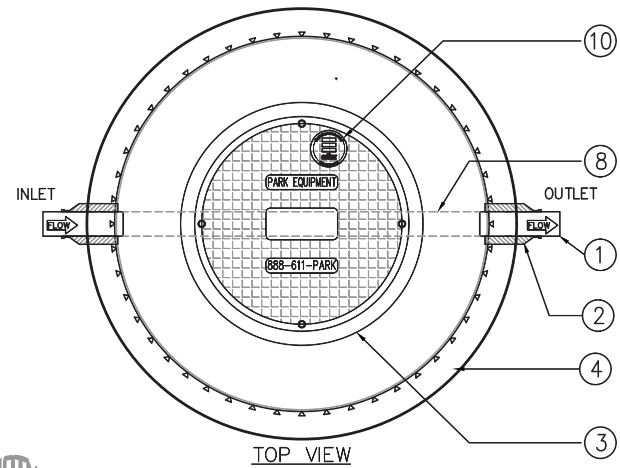
CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

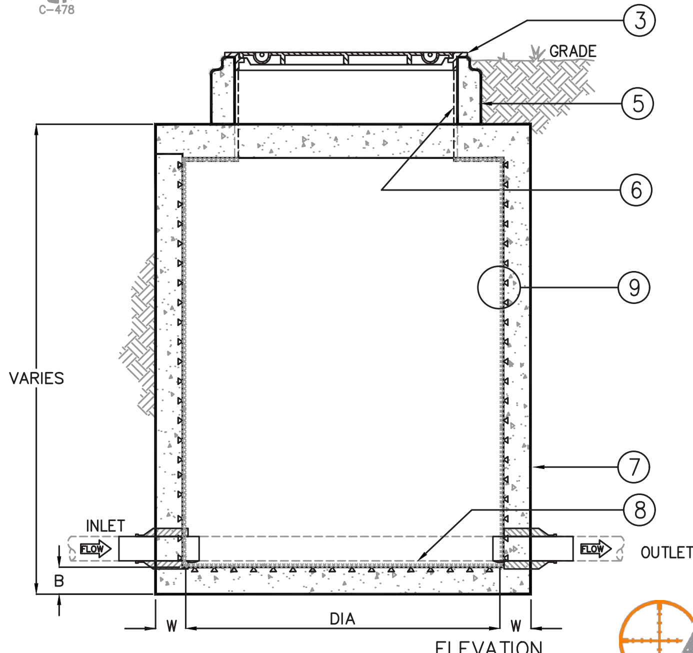
PARK USA®
www.parkusa.com 888–611–PARK

PRECAST CONCRETE MANHOLES
AND WET WELLS

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	MHWW–1	.
DATE 05/2019					

DRAINAGE





DIMENSIONS AND WEIGHTS				
MODEL	DIA (in)	W (in)	B (in)	RISER WT/LF (lb)
MHL-48	48	5	6	868
MHL-60	60	6	6	1300
MHL-72	72	6	6	1811
MHL-84	84	6	6	2350
MHL-96	96	6	6	3090
MHL-120	120	8	6	3500
MHL-144	144	8	8	4000

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	WASTEWATER PIPING
2	2	RUBBER FLEXIBLE PIPE CONNECTION (TYP)
3	1	24" DIA OR 32" DUCTILE IRON RING/COVER BOLTED WITH SS BOLTS
4	1	PRECASE CONCRETE OUTER SHELL BE MONOLITHIC CONSTRUCTION AT BOTTOM SECTION
5	–	CONCRETE EXTENSION TO BE USED TO RAISE TO GRADE LEVEL
6	1	NON-WETTED INTERIOR OF TANK TO BE COATED W/ ACID RESISTANT EPOXY
7	1	EXTERIOR OF TANK TO BE COATED WITH BITUMASTIC VAPOR BARRIER
8	1	INVERT CHANNEL
9	1	INTERIOR OF MANHOLE (WALLS & BOTTOM) SHALL BE LINED WITH AN INTERIOR ____ LINER HAVING AN APPROVED CONCRETE ANCHOR SYSTEM (ENGINEER TO CHOOSE ONE) ☐ EPOXY/RHINO LINER ☐ POLYVINYL CHLORIDE (PVC) ☐ HIGH DENSITY POLYETHYLENE (HDPE)
10	1	NAMEPLATE INDICATING: MFG: PARKUSA (888) 611-PARK WWW.PARKUSA.COM MODEL: MHL DATE MANUFACTURED

MANHOLE OVERFLOW PROTECTION SYSTEM OPS™

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

ENGINEERING DATA

MANHOLES SHALL BE IS STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO ASTM-C478. REFER TO SIZING TABLE FOR DIMENSIONS.

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF INTERCEPTOR. USE DIMENSIONAL DATA AS SHOWN.

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

888.611.PARK®
PARK USA
www.ParkUSA.com

PRECAST CONCRETE MANHOLE w/ INTERNAL LINER
MODEL MHL – 48" THRU 144"

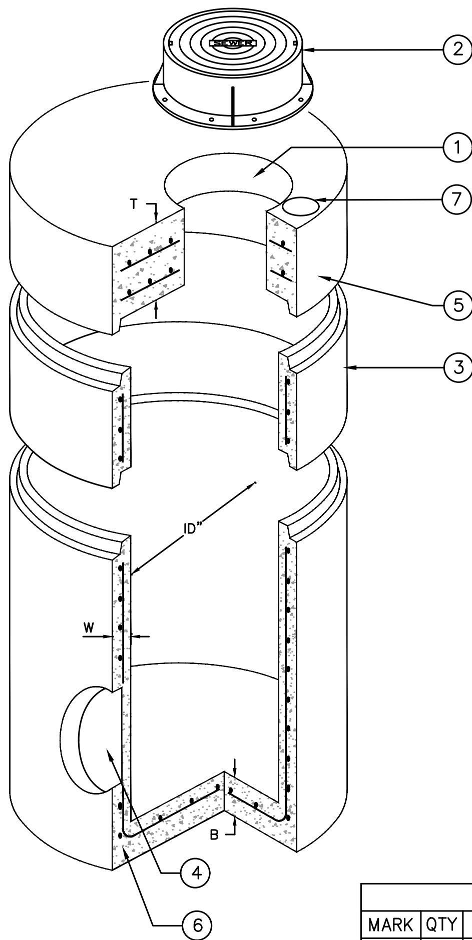
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	MHL-1	A
DATE 07/2018					

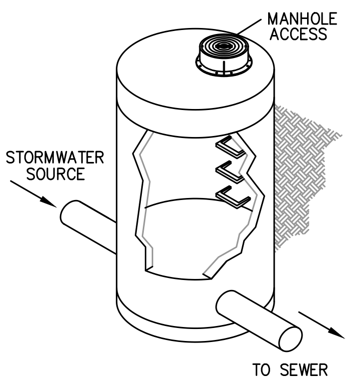
MHL-1

DIMENSIONS AND WEIGHTS					
MODEL NO	I.D. SIZE (in)	W (in)	B (in)	T (in)	RISER WT/LF (lb)
MHHD–48	48	5	8	10	868
MHHD–60	60	6	8	10	1300
MHHD–72	72	6	10	10	1811
MHHD–84	84	6	12	12	2350
MHHD–96	96	6	12	12	3090
MHHD–120	120	8	12	14	3500
MHHD–144	144	8	12	14	4000

APPLICATIONS

- *AIRPORTS*
- *CARGO LOADING AREAS*
- *HEAVY INDUSTRIAL PLANTS*





NPCA CERTIFIED PLANT

ASPE MEMBER

ASTM C–478

NOTES:

1. JOINTS TO BE SEALED W/ PLASTIC RAM–NEK GASKET.
2. ALL DIMENSIONS ARE TO CENTER OF BLOCK–OUTS.
3. ALL PIPING BY OTHERS
4. LIFTING INSERTS AS REQUIRED.
5. STRUCTURE TO BE PLACED ON MIN. 6" STABILIZED BASE.
6. RISER SECTIONS FURNISHED AS REQUIRED

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	TRANSITION LID OPENING AS REQUIRED
2	1	24" OR 30" DIA CAST IRON MANHOLE COVER, FURNISHED LOOSE OR CAST–IN, COVER SHALL BE RATED FOR 200,000 LBS
3	1	RISERS AS REQUIRED 12"/24"/36"/48" HEIGHTS
4	1	BLOCKOUTS AS REQUIRED
5	1	TOP–SECTION
6	1	BOTTOM (OPTIONAL)
7	1	NAMEPLATE INDICATING: MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL MHHD

MHHD–1

SPECIFICATIONS

CONCRETE : CLASS 1 CONCRETE WITH DESIGN STRENGTH OF 5000 PSI OR RECOMMENDED AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. MANHOLE TO CONFORM TO ASTM–C478 SPECIFICATIONS.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

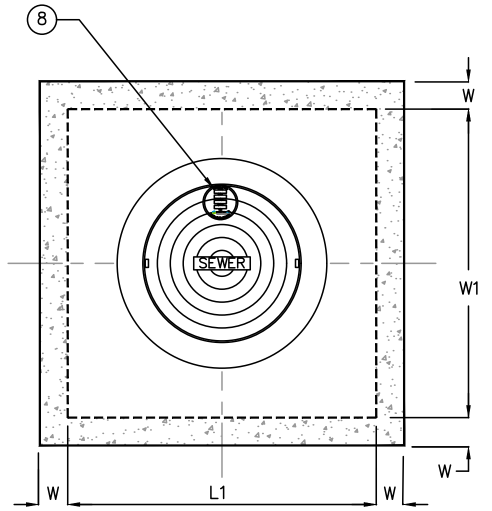
PARK USA®

www.parkusa.com 888–611–PARK

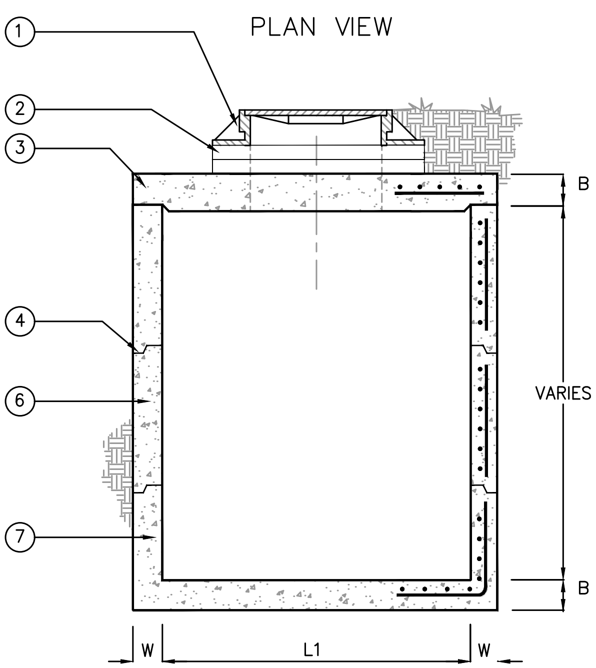
MANHOLE –EXTRA HEAVY–DUTY
MODEL MHHD – 48" THRU 144"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	MHHD–1	.
DATE 05/2019					

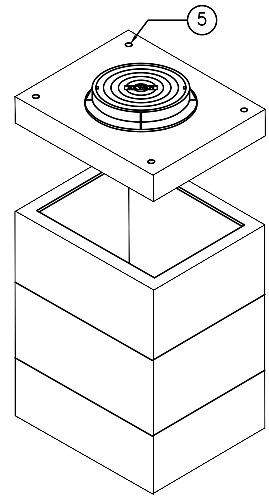
DRAINAGE



PLAN VIEW



SECTION VIEW



ISOMETRIC VIEW

MODEL	DIMENSIONS L1xW1 ID (in)	W (in)	B (in)
MHSQ–36	36	6	6
MHSQ–48	48	6	6
MHSQ–60	60	6	6
MHSQ–72	72	6	6
MHSQ–84	84	6	6
MHSQ–96	96	8	8

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	24" OR 30" CAST IRON RING & COVER
2	1	GRADE RINGS AS REQUIRED
3	1	FLAT TOP
4	1	ALL JOINTS SEALED WATER TIGHT WITH RAM–NEKVVV
5	1	LIFTING LUGS AS REQUIRED (TYP 4)
6	1	RISER SECTION
7	1	BOTTOM SECTION
8	1	NAMEPLATE INDICATING: MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL MHSQ DATE MANUFACTURED

npca CERTIFIED PLAN
AMERICAN SOCIETY OF SANITARY ENGINEERING
ASPE MEMBER
ASTM C–478

MHSQ–1

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

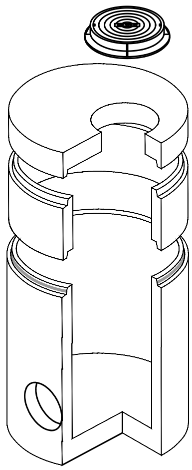
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

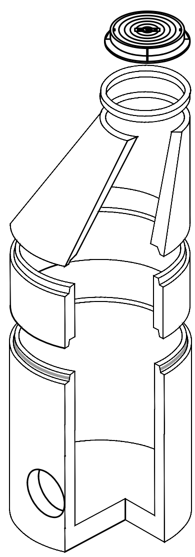
PARK USA
www.parkusa.com 888–611–PARK

PRECAST CONCRETE SQUARE MANHOLE
MODEL MHSQ – SIZES 36" THRU 96"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	MHSQ–1	.
DATE 05/2019					



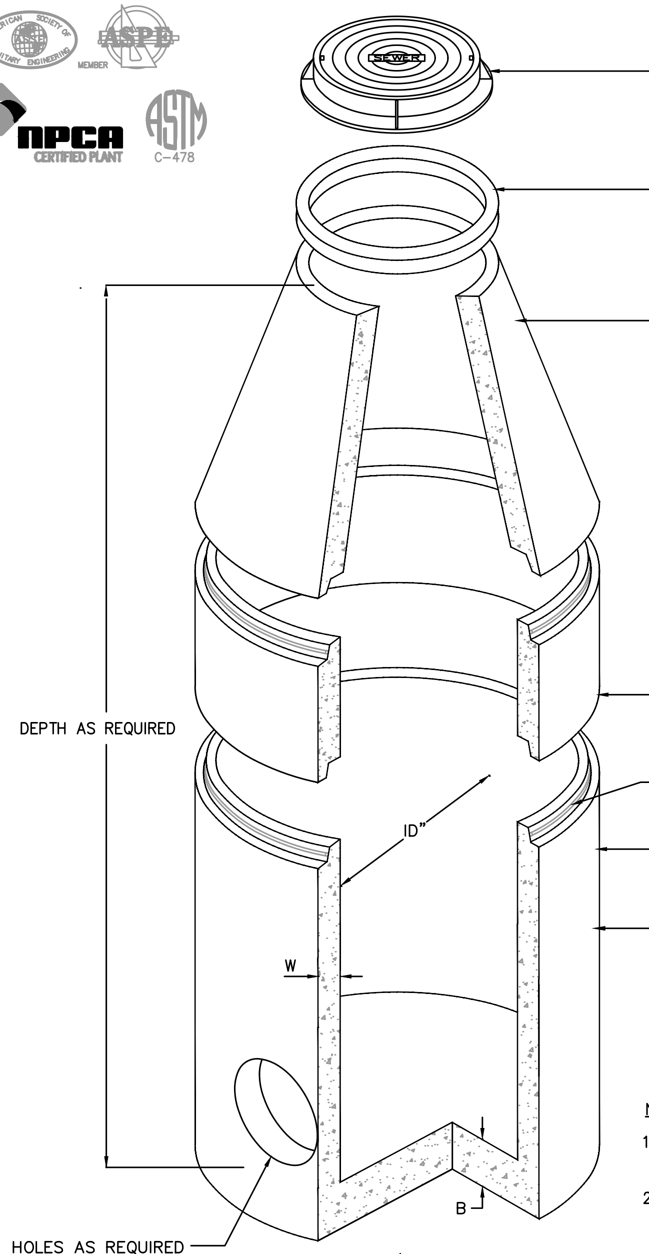
SHOWN w/ FLAT TOP



SHOWN w/ ECCENTRIC CONE

OPTIONS

* STEPS
* EXTENDED LIP BASE
* COATINGS
* BOTTOM



SHOWN w/ CONCENTRIC CONE

DIMENSIONS AND WEIGHTS			
I.D. SIZE (in)	W (in)	B* (in)	RISER WT/LF (lb)
48"	5"	6"	868
60"	6"	6"	1300
72"	6"	6"	1811
84"	6"	6"	2350
96"	6"	6"	3090
120"	8"	6"	3500
120"	8"	6"	3500

* MIN. THICKNESS BELOW INVERT

NOTES

1. LIFTING INSERTS AS REQUIRED.
2. ALL JOINTS SHALL BE SEALED w/ RAM-NEK JOINT SEALANT
3. STRUCTURE TO BE PLACED ON MIN. 6" STABILIZED BASE.

MHST-1

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. RATED FOR H-20 LOADING.

REINFORCEMENT: STRUCTURAL REINFORCEMENT CONFORMING TO ASTM-C-478.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

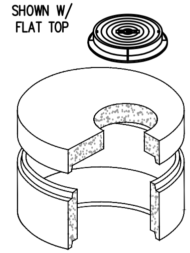
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

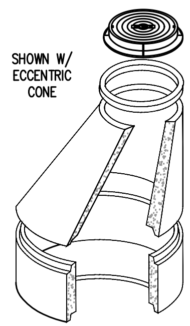
PRECAST CONCRETE MANHOLE
STORM SEWER – MODEL MHST – 48" THRU 120"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	MHST-1	.
DATE 01/2019					

SHOWN W/
FLAT TOP



SHOWN W/
ECCENTRIC
CONE



PARK MODEL NO.
TXX–XX–X–XXXX–XX

TYPE OF STRUCTURE
- JB – Junction Box
- MH – Manhole

Base Section Size
- 4 – 4'
- 5 – 5'
- 6 – 6'
- 7 – 7'
- 8 – 8'

RISER SECTION SIZE
- 1 – 1'
- 2 – 2'
- 3 – 3'
- 4 – 4'

SIZE OF R/C OR R/G (DIA.)
- 01 – 24" 05 – 42"
- 02 – 32" 06 – 48"
- 03 – 30" 07 – Other
- 04 – 36"

CASTING TYPE
- DI – Ductile Iron
- CI – Cast Iron

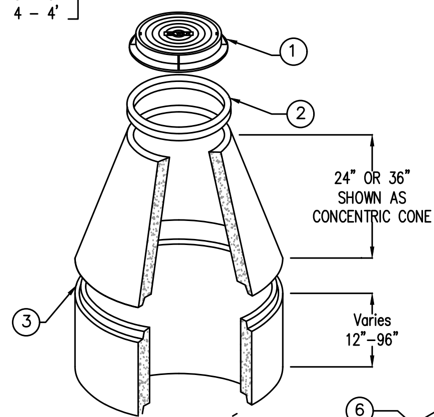
CASTING STYLE
- RC – Ring & Cover
- RG – Ring & Grate
- DG – Dome Grate

DIMENSIONS

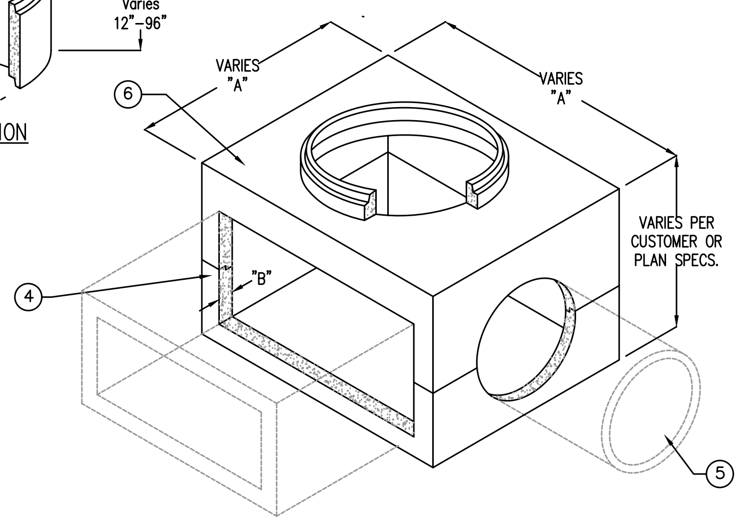
I.D. Size	O.D. Dim "A"	"B" (in)	Top/Bot. Thickness (in)	Largest RCP Allowed (No Angle, Straight In)	Largest Box Culvert Allowed (No Angle, Straight In)
4' x 4'	5' x 5'	6"	6"	36"	3' x 3'
5' x 5'	6' x 6'	6"	6"	48"	4' x 4'
6' x 6'	7'–4" x 7'–4"	8"	8"	54"	4' x 4'
7' x 7'	8'–4" x 8'–4"	8"	8"	66"	5' x 5'
8' x 8'	9'–4" x 9'–4"	8"	8"	78"	6' x 6'
9' x 9'	10'–4" x 10'–4"	8"	8"	84"	7' x 7'

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	CASTING TO BE 24" OR 32" RING AND COVER (AS REQ'D)
2	1	GRADE RINGS (AS REQ'D)
3	1	RAMNEK JOINT
4	1	BLOCKOUT TYPE, SIZE, AND LOCATION WILL VARY PER CUSTOMER AND/OR PLAN SPECIFICATIONS
5	1	RCP (BY OTHERS)
6	1	TRANSITIONAL MANHOLE PARK ENVIRONMENAL WWW.PARKUSA.COM MODEL: TMH



RISER SECTION



BASE SECTION

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

NPCA CERTIFIED PLAN | AMERICAN SOCIETY OF SANITARY ENGINEERING | ASPE MEMBER | ASTM C-478

TMH-1

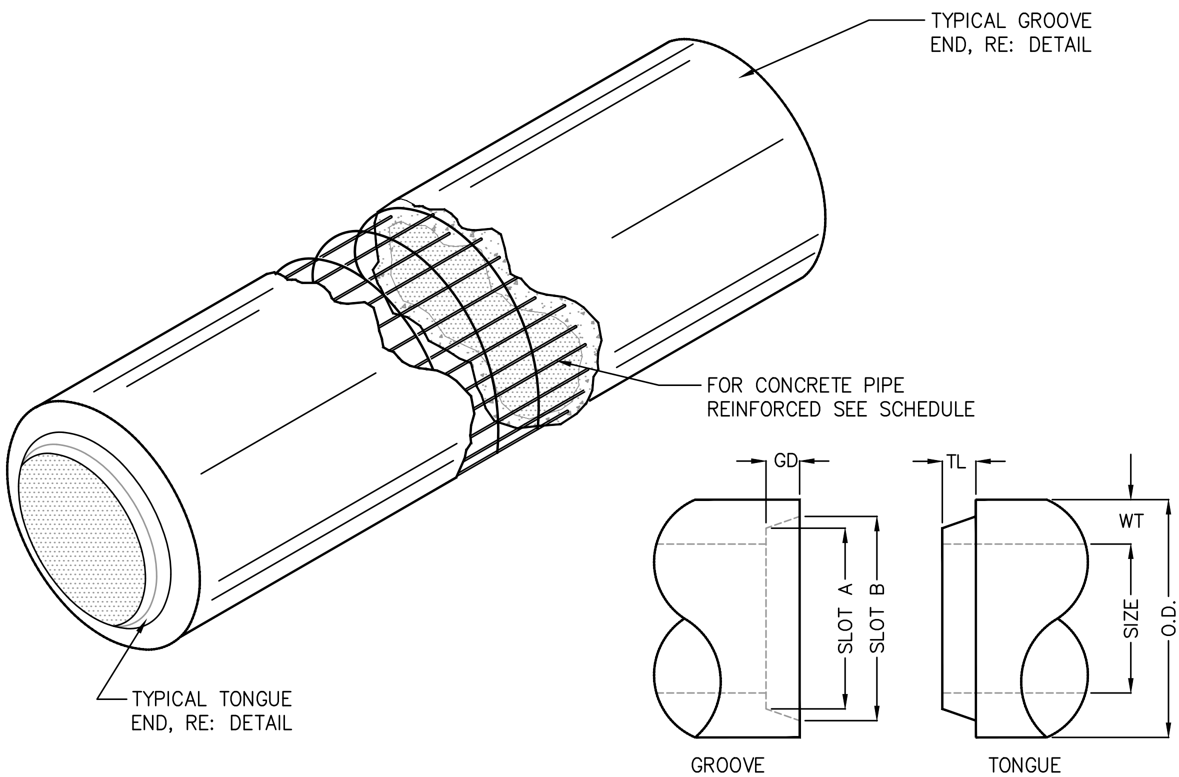
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

TRANSITIONAL MANHOLE/JUNCTION BOX
.

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	TMH-1	.
DATE 05/2019					

DIMENSION SCHEDULE OF C–76 TONGUE & GROOVE PIPE										
PIPE SIZE I.D.	O.D.	WT. / FT.	AVAILABLE LENGTHS	REINFORCEMENT	WALL THICKNESS WT	TONGUE LENGTH TL	GROOVE DEPTH GD	SLOT DIM A	SLOT DIM B	QUANTITY L.F.
12"	16"	100 LBS	4' OR 6'	W 2.0x2.5 3"x8"	2"	2"	2"	13½"	14⅛"	
15"	19½"	125 LBS	4' OR 6'	W 2.0x2.5 3"x8"	2¼"	2⅛"	2⅛"	16½"	17⅜"	
18"	23"	160 LBS	4' OR 6'	W 2.0x2.5 3"x8"	2½"	2"	2¼"	19⅝"	20½"	
24"	30"	260 LBS	4' OR 6'	W 2.0x2.5 3"x8"	3"	2⅜"	2¾"	26⅜"	27⅜"	
30"	37¼"	395 LBS	6'	W 3.0x2.0 2"x8"	3⅝"	3⅜"	3½"	31¾"	33⅜"	
36"	44"	520 LBS	6'	W 3.5x2.0 2"x8"	4"	2"	2¼"	32¾"	34⅜"	
42"	52"	743 LBS	8'	W 3.5x2.0 2"x8"	5"	4"	2¼"	52"	52¼"	
48"	58"	838 LBS	8'	W 3.5x2.0 2"x8"	5"	4½"	4¾"	52"	52¼"	



TYPICAL END DETAIL

SPECIFICATIONS

CONCRETE: CLASS 1 CONCRETE WITH DESIGN STRENGTH OF 4000 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AND IS DESIGNED CONFORMING TO ASTM C–76 CLASS III, WALL B.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A185 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

RCP–1

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

REINFORCED CONCRETE PIPE
MODEL RCP – 12" THRU 48"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RCP–1	.
DATE 05/2019					

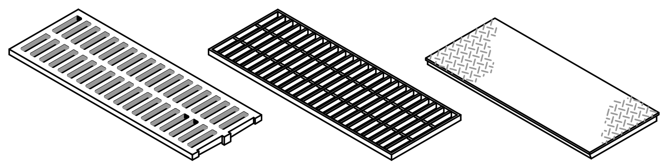
MODEL NUMBER

MODEL NUMBER: TG–X X X XX XX XX X

- COVER/GRATE STYLE
- LOAD RATING
- FRAME/BASIN STYLE
- WIDTH (TW) in
- LENGTH (L) in
- (TG) TW+2"
- OPTIONS

* * * SPECIFIED BY CUSTOMER * * *

LOAD RATING
- P – PEDESTRIAN DUTY
- H – HEAVY DUTY (H20)
- X – EXTRA HEAVY DUTY (H40)

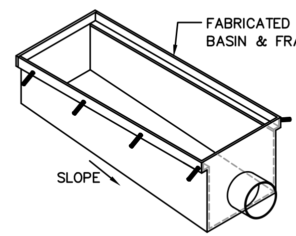


GRATING
- A – CAST IRON (PHX)
- B – DUCTILE IRON (PHX)
- J – BRONZE (P)
- Z – NONE

BAR GRATING
- C – GALVANIZED STEEL (PHX)
- D – STAINLESS STEEL (PH)
- E – FIBERGLASS (P)

SOLID COVER
- F – GALVANIZED STEEL (PHX)
- G – STAINLESS STEEL (PH)
- H – FIBERGLASS (P)

COVER/GRATE STYLE

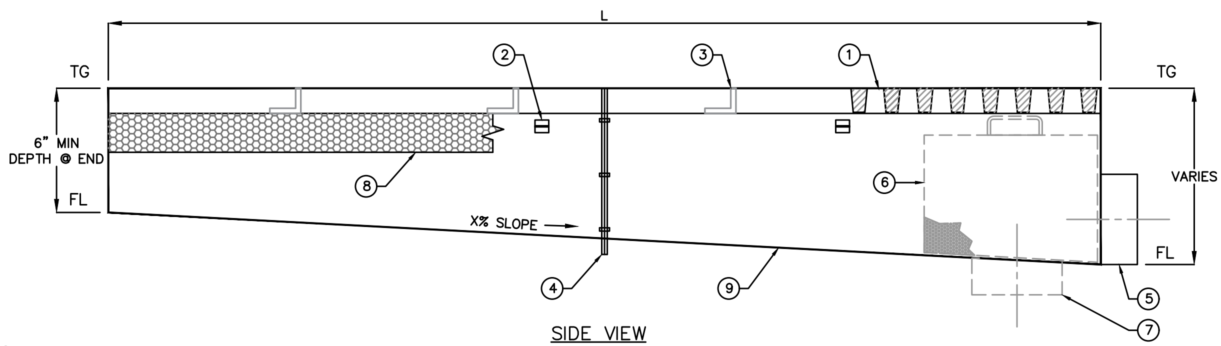


- A – GALVANIZED STEEL
- B – STAINLESS STEEL
- C – HD POLYETHYLENE
- D – POLYPROPYLENE
- E – FIBERGLASS
- Z – NONE

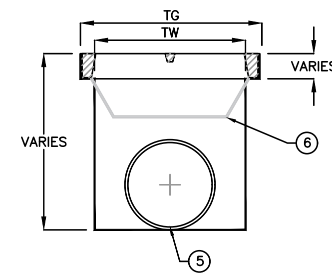
FRAME/BASIN STYLE

- SC – STAINLESS STEEL SCREEN
- BD – BOLT DOWN GRATE/COVER
- VP – VANDAL PROOF
- AD – ADA APPROVED

OPTIONS

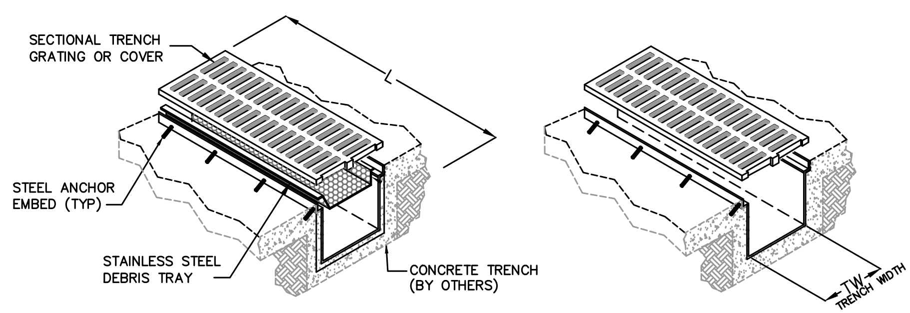


SIDE VIEW



END VIEW

C-858



ISOMETRIC VIEW: W/ SS DEBRIS TRAY

ISOMETRIC VIEW: STANDARD

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	XX"W GRATING W/ XX"W TRENCH OPENING, X" THK, X' LONG
2	–	LEVELING BRACKETS (48" NOMINAL SPACING)
3	–	REMOVEABLE WALL SUPPORTS (24" NOMINAL SPACING)
4	–	BOLTED SECTIONS (TYP)
5	1	X" OUTLET PIPE CONNECTION
6	1	OPTIONAL SS SCREEN WITH LIFT–OUT HANDLES
7	1	BOTTOM PIPE CONNECTION
8	1	OPTIONAL STAINLESS STEEL DEBRIS TRAY
9	1	PREFABRICATED TRENCH SYSTEM MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL: TG–1

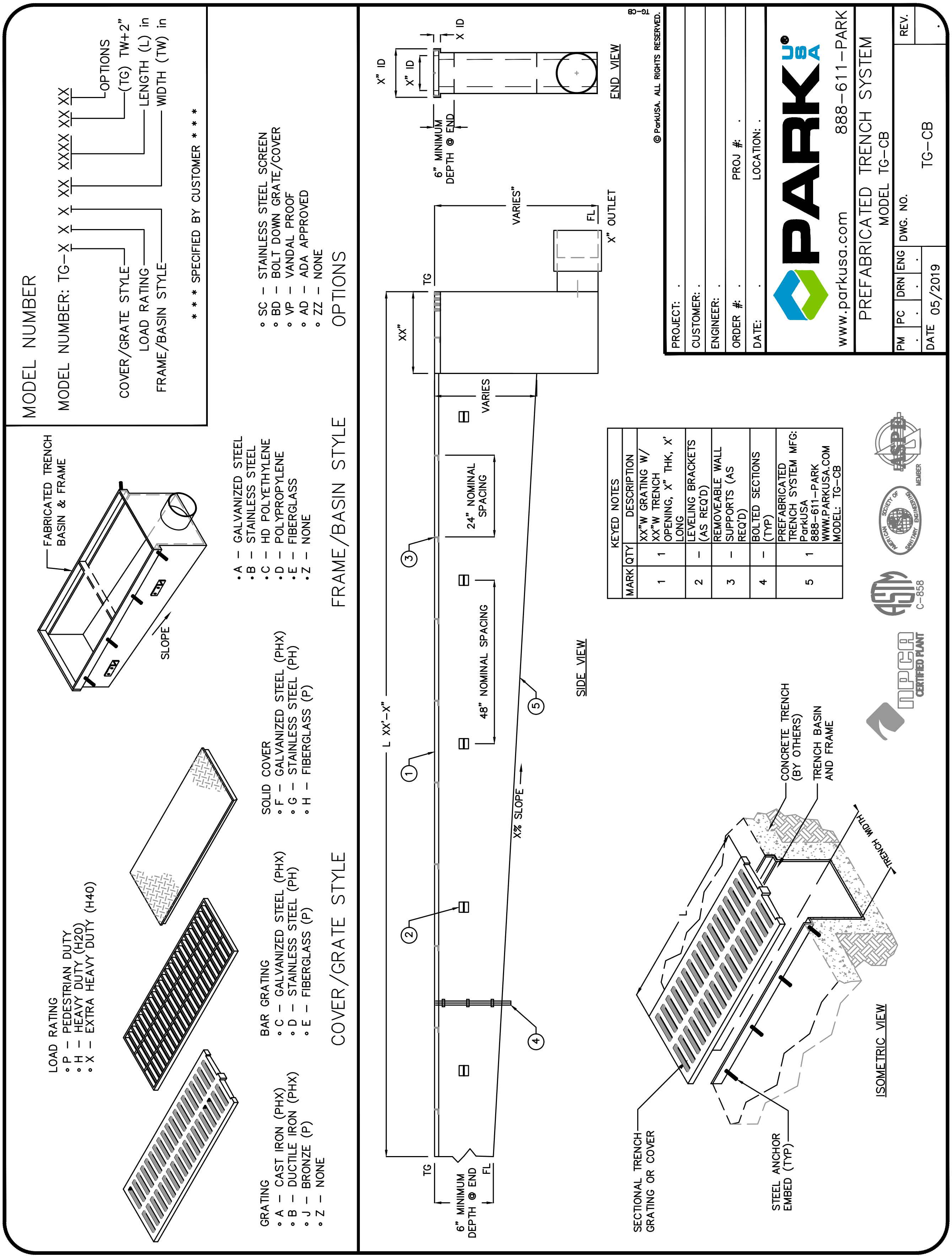
TG–1

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

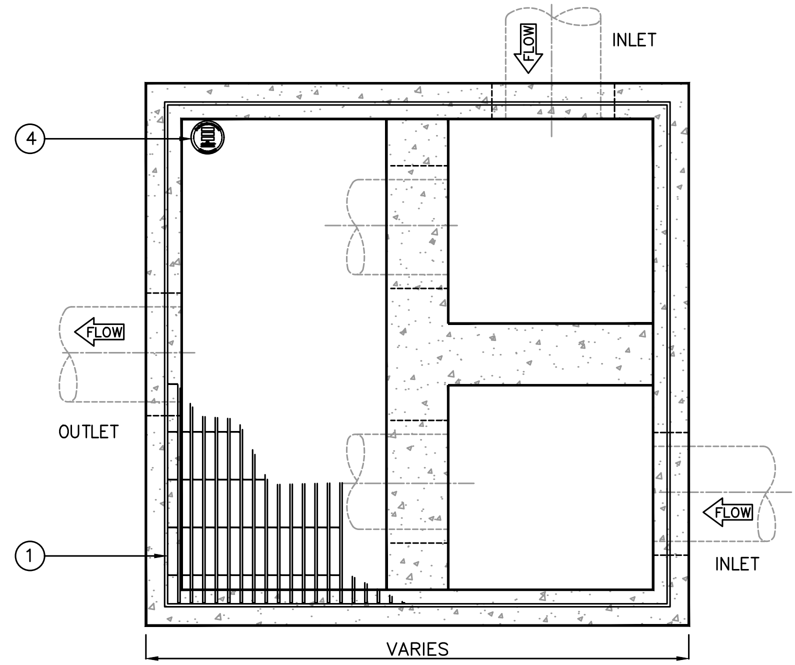
PARK USA
www.parkusa.com 888–611–PARK

PREFABRICATED TRENCH SYSTEM
MODEL TG–1

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	TG–1	.
DATE	05/2019				

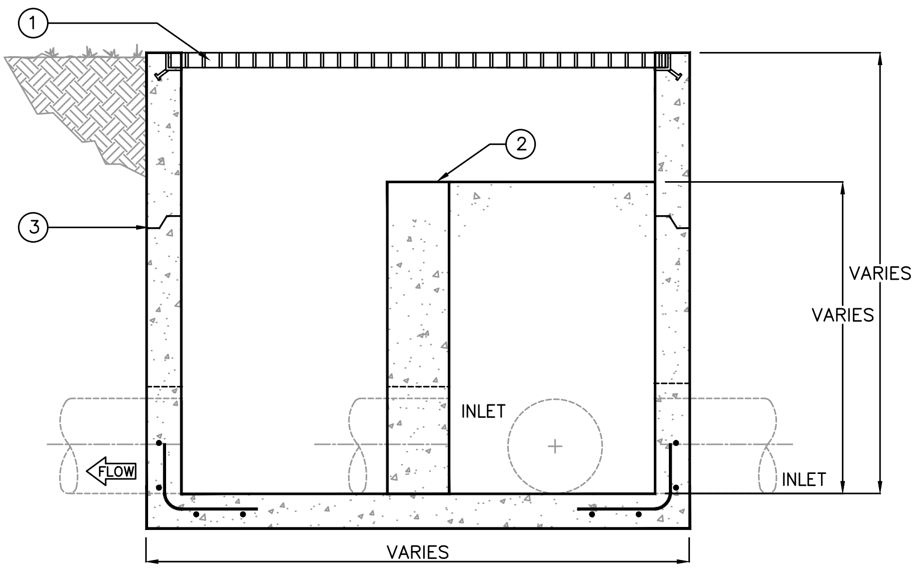

MODEL NUMBER
MODEL NUMBER: TG–X X X X XX XXXX XX XX
COVER/GRATE STYLE
LOAD RATING
FRAME/BASIN STYLE
OPTIONS
(TG) TW+2"
LENGTH (L) in
WIDTH (TW) in
* * * SPECIFIED BY CUSTOMER * * *
LOAD RATING
• P – PEDESTRIAN DUTY
• H – HEAVY DUTY (H20)
• X – EXTRA HEAVY DUTY (H40)
FABRICATED TRENCH BASIN & FRAME
SLOPE
GRATING
• A – CAST IRON (PHX)
• B – DUCTILE IRON (PHX)
• J – BRONZE (P)
• Z – NONE
BAR GRATING
• C – GALVANIZED STEEL (PHX)
• D – STAINLESS STEEL (PH)
• E – FIBERGLASS (P)
SOLID COVER
• F – GALVANIZED STEEL (PHX)
• G – STAINLESS STEEL (PH)
• H – FIBERGLASS (P)
COVER/GRATE STYLE
• A – GALVANIZED STEEL
• B – STAINLESS STEEL
• C – HD POLYETHYLENE
• D – POLYPROPYLENE
• E – FIBERGLASS
• Z – NONE
FRAME/BASIN STYLE
• SC – STAINLESS STEEL SCREEN
• BD – BOLT DOWN GRATE/COVER
• VP – VANDAL PROOF
• AD – ADA APPROVED
• ZZ – NONE
OPTIONS
6" MINIMUM DEPTH @ END
TG
FL
L XX'–X"
48" NOMINAL SPACING
24" NOMINAL SPACING
VARIES
XX"
X% SLOPE
VARIES"
X" OUTLET
SIDE VIEW
X" ID
X" ID
6" MINIMUM DEPTH @ END
X ID
END VIEW
TG–CB
KEYED NOTES
MARK | QTY | DESCRIPTION
1 | 1 | XX"W GRATING W/ XX"W TRENCH OPENING, X" THK, X' LONG
2 | – | LEVELING BRACKETS (AS REQ'D)
3 | – | REMOVEABLE WALL SUPPORTS (AS REQ'D)
4 | – | BOLTED SECTIONS (TYP)
5 | 1 | PREFABRICATED TRENCH SYSTEM MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL: TG–CB
SECTIONAL TRENCH GRATING OR COVER
STEEL ANCHOR EMBED (TYP)
CONCRETE TRENCH (BY OTHERS)
TRENCH BASIN AND FRAME
TRENCH WIDTH
L
ISOMETRIC VIEW
NPCA CERTIFIED PLANT
C-858
MEMBER
© ParkUSA. ALL RIGHTS RESERVED.
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: .
PROJ #: .
DATE: .
LOCATION: .
PARK USA
www.parkusa.com
888–611–PARK
PREFABRICATED TRENCH SYSTEM
MODEL TG–CB
PM | PC | DRN | ENG | DWG. NO. | REV.
DATE 05/2019
TG–CB

DRAINAGE



PLAN VIEW

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	GALV STEEL BAR GRATING & FRAME (PEDESTRIAN-DUTY)
2	1	BAFFLE
3	1	SECTIONAL JOINT SEALED W/ RAMNEK
4	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: OFS-1



ELEVATION

SPECIFICATIONS

CONCRETE : CLASS 1 CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123

C-913

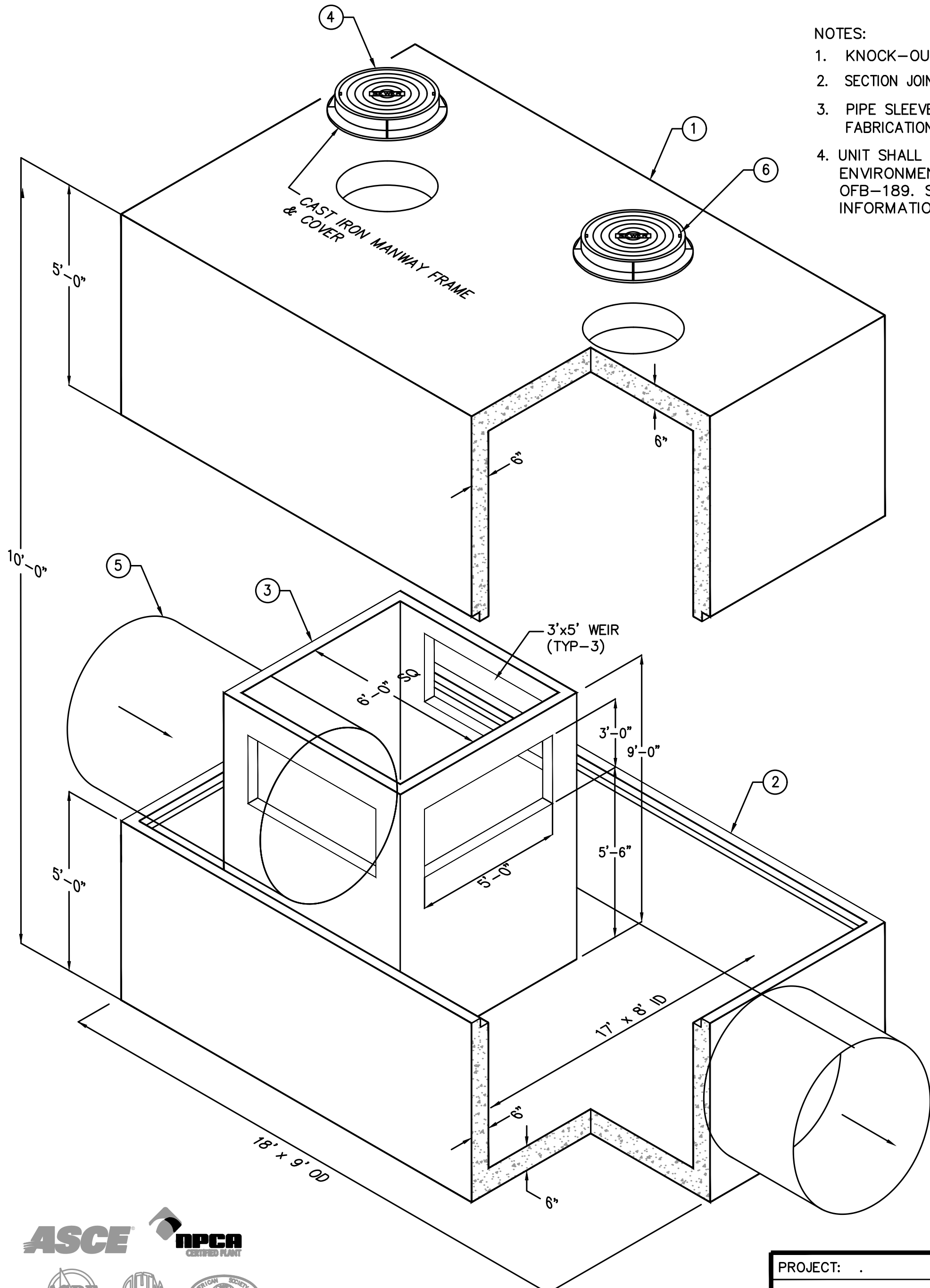
OFS-1

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

OVERFLOW STRUCTURE
MODEL OFS-1

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	OFS-1	.
DATE	05/2019				



NOTES:

1. KNOCK-OUTS PLACED WHERE REQUIRED.
2. SECTION JOINTS ARE SEALED WITH RAM-NECK.
3. PIPE SLEEVES SHALL BE VERIFIED PRIOR TO FABRICATION.
4. UNIT SHALL BE MANUFACTURED BY PARK ENVIRONMENTAL; STORMTROOPER MODEL OFB-189. SUBMIT COMPLETE SUBMITTAL INFORMATION PRIOR TO FABRICATION.

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	OVERFLOW STRUCTURE TOP
2	1	OVERFLOW STRUCTURE BOTTOM
3	1	INLET WEIR STRUCTURE
4	2	CAST IRON MANWAY FRAME & GRATE
5	1	X" RCP PIPE
6	1	OVERFLOW STRUCTURE MFG: ParkUSA 888-611-PARK WWW.PARKUSA.COM MODEL OFS189 DATE MANUFACTURED

OFS189

MEMBER C-913

SPECIFICATIONS

CONCRETE : CLASS 1 CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING & PLACEMENT SHALL COMPLY WITH THE LATEST ACI STANDARDS FOR PRECAST CONCRETE. LIFTING INSERTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

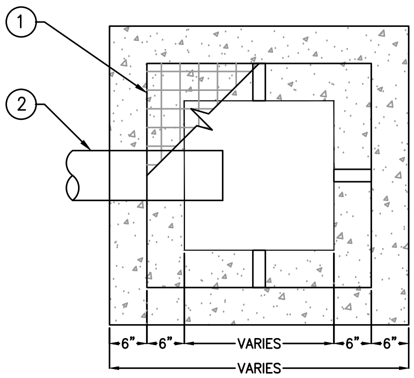
PARK USA

www.parkusa.com 888-611-PARK

STORMWATER OVERFLOW STRUCTURE
MODEL OFS189

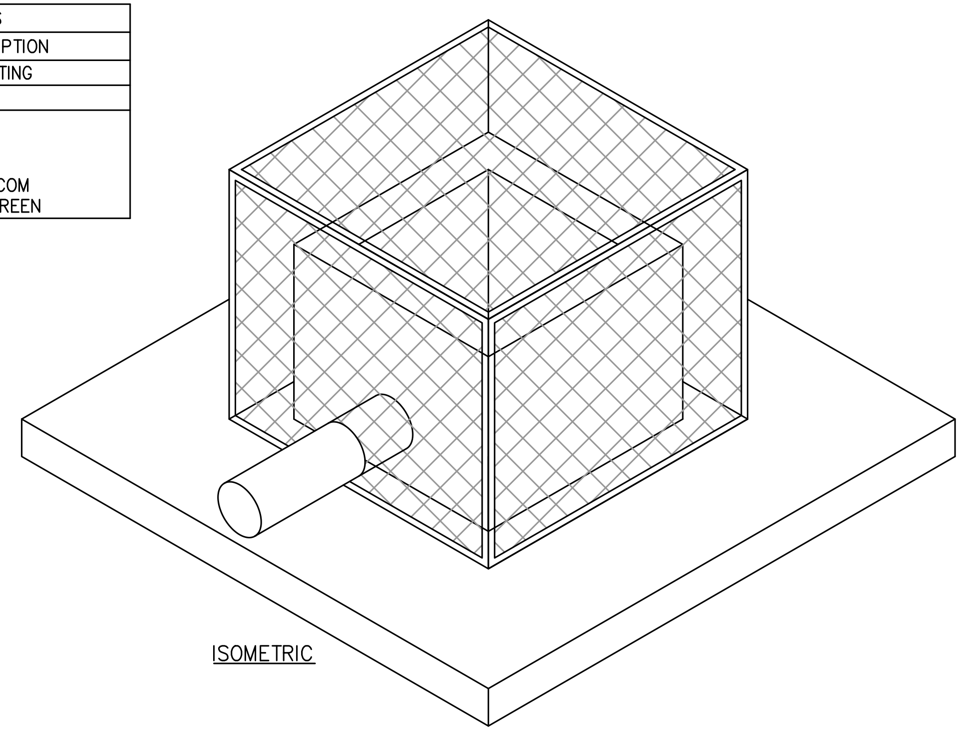
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	OFS189	.
DATE 05/2019					

DRAINAGE

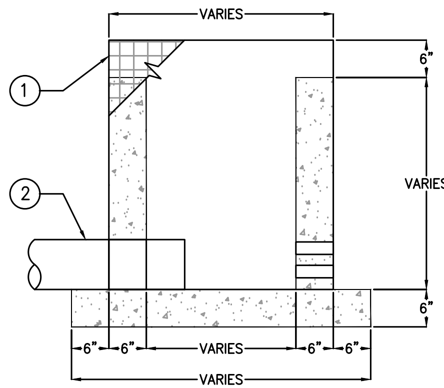


PLAN VIEW

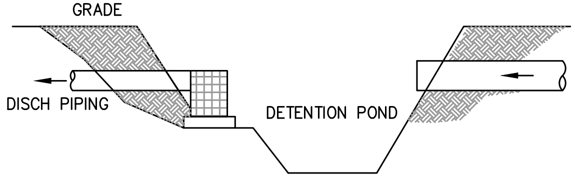
KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	GALVANIZED GRATING
2	1	PVC OUTLET
3	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL OFS-SCREEN



ISOMETRIC



ELEVATION



TYPICAL APPLICATION

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING AND PLACEMENT SHALL CONFORM THE LATEST ACI STANDARDS. UNIT SHALL CONFORM TO ASTM C915 – "PRECAST REINFORCED CONCRETE STRUCTURES".

TRASH SCREEN: ALL STEEL SHALL BE A36 STEEL WELDED IN ACCORDANCE TO AWS D1.1. ALL STEEL SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.

ENGINEERING DATA

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF STRUCTURE. USE DIMENSIONAL DATA AS SHOWN.

ASCE npca CERTIFIED PLANT AMERICAN SOCIETY OF SANITARY ENGINEERING ASPE MEMBER ASTM C-913

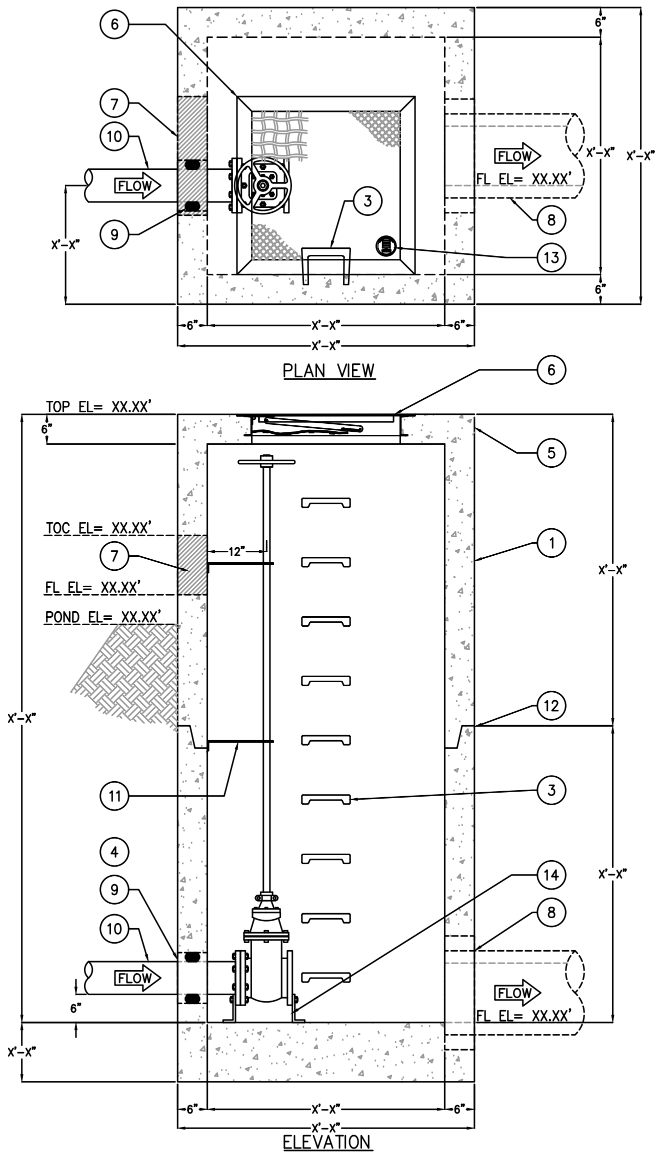
OFS-SCREEN

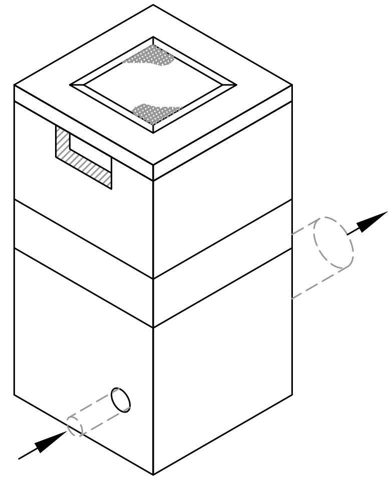
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

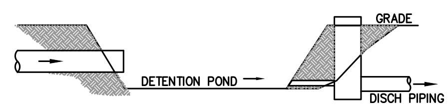
PARK USA
www.parkusa.com 888-611-PARK

STORMWATER OVERFLOW STRUCTURE
MODEL OPS-SCREEN

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	OFS-SCREEN	.
DATE	05/2019				







KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	PRECAST CONCRETE OVERFLOW BASIN X'-XX" x X'-XX" x X'-XX" DEEP
2	1	XX" RCP OUTLET PIPE
3	8	MANHOLE STEPS @ 12" OC
4	1	6" PLUG VALVE w/ GALVANIZED STEEL EXTENSION HANDLE
5	1	X' SQ X X'-XX" THK CONCRETE LID (MONOLITHIC w/ TOP RISER)
6	1	XX"xXX" ALUMINUM HATCHWAY w/ SAFETY NET
7	1	XX"xXX" OVERFLOW WINDOW
8	1	XX"ø HOLE (XX" RCP OUTLET PIPE BY OTHERS)
9	1	XX"ø HOLE w/ XX PCS. LINKSEAL MODEL #LS-XX
10	1	X" DRAIN LINE FROM POND (D.I.)
11	2	GALVANIZED STEEL HANDLE SUPPORT BRACKET
12	–	ALL JOINTS MADE WATERTIGHT w/ PLASTIC FLEXIBLE GASKET (RAMNEK)
13	1	NAMEPLATE INDICATING: MFG: ParkUSA 888-611-PARK WWW.PARKUSA.COM MODEL: OFS-VALVE DATE MANUFACTURED
14	2	GALVANIZED STEEL PIPE SUPPORTS

C-913

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING AND PLACEMENT SHALL CONFORM THE LATEST ACI STANDARDS. UNIT SHALL CONFORM TO ASTM C915 – "PRECAST REINFORCED CONCRETE STRUCTURES".

HATCHWAY: ¼" ALUMINUM DIAMOND PLATE COVER, WITH ¼" EXTRUDED ALUMINUM FRAME. HATCH TO BE FURNISHED WITH 316 STAINLESS STEEL SNAP LOCK & BRASS HINGES. (300 PSF)

ENGINEERING DATA

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF STRUCTURE. USE DIMENSIONAL DATA AS SHOWN.

OFS-VALVE

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA®
www.parkusa.com 888–611–PARK

STORMWATER OVERFLOW STRUCTURE
MODEL OFS-VALVE

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	OFS-VALVE	.
DATE 05/2019					

DRAINAGE

PARK USA
A Northwest Pipe Company

FLUMES

Applications

- Wastewater
- Industrial plant effluent
- Stormwater
- Irrigation water

Flumes

Flow measuring techniques will vary depending on the application flow type. There are two basic types of flow systems; closed channel, and open channel. A closed channel can be described as water flow through a filled pressurized pipe. Flow measurement is typically performed by inserting a mechanical meter, venture meter, magnetic meter within the pipe. A typical example of a closed channel flow is a city potable water line that is metered with a turbine meter.

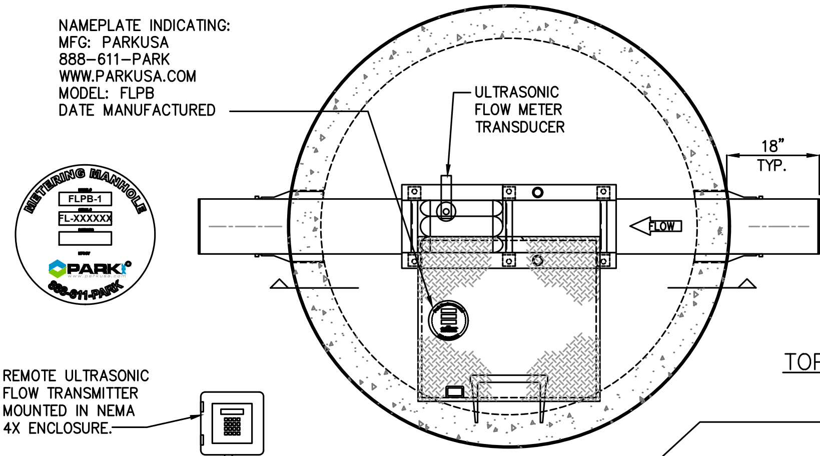
The second type of flow type, open channel, is best described as water that flows with a "free surface" typically in a non-pressurized (atmospheric) pipe or channel. Examples are rivers, irrigation/drainage ditches, canals, and sanitary sewer.

The most practical method for open channel flow measurement is accomplished using a hydraulic structure; flumes and weirs. These hydraulic structures enable flow calculation by measuring the water depth at a single point. By using the structure's associated equation or table, the flow rate can be calculated. Open channels are used to conduct liquids in most sewer systems, sewage treatment plants, industrial waste applications, and irrigation systems.

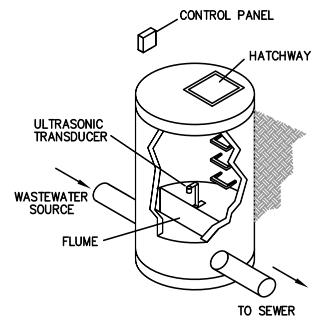
#BUILDING AMERICA!

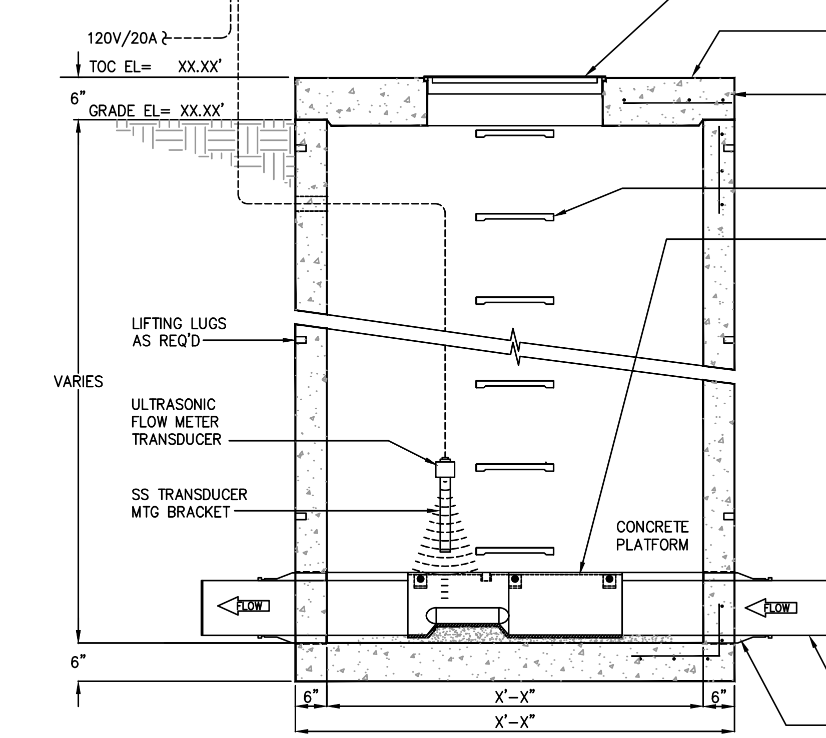
WW FLUMES Standard

LEED® COMPLIANT | NPCA | Steel Tank Institute | ASPE American Society of Plumbing Engineers | ASTM | BMP® BEST MANAGEMENT PRACTICE | IPC® INTERNATIONAL PLUMBING CODE | UPC



TOP VIEW





36"x36" ALUMINUM HATCHWAY 300 PSF w/ TORSION BAR, LOCKING POST & SLAM-LOK

PRECAST CONCRETE SLAB TOP SEALED W/ PLASTIC FLEXIBLE GASKET MATERIAL

#5 REBAR @ 10" O.C.E.W. (1) MAT FOR TOP SLAB BAR BENDING & PLACEMENT SHALL COMPLY W/ LATEST ACI STANDARDS

OSHA APPROVED STEPS AT 12" O.C.

XX" PALMER BOWLUS FLUME CONSTRUCTED OF CORROSION RESISTANT MATERIALS, WITH STAFF GAUGE

MODEL	PIPE SIZE	WET WELL SIZE	MAXIMUM FLOW RATE CFS	MGD	GPM
FLPB-4	4"	60" DIA	0.12	0.07	54
FLPB-6	6"	60" DIA	0.30	0.19	132
FLPB-8	8"	60" DIA	0.69	0.45	310
FLPB-10	10"	60" DIA	1.12	0.72	502
FLPB-12	12"	60" DIA	1.67	1.08	752
FLPB-15	15"	72" DIA	3.09	1.99	1,385
FLPB-18	18"	84" DIA	4.61	2.98	2,071
FLPB-21	21"	96" DIA	7.04	4.55	3,161
FLPB-24	24"	120" DIA	9.47	6.10	4,248
FLPB-27	27"	120" DIA	13.09	8.44	5,873

INV EL= XX.XX'

CONTRACTOR TO FIELD VERIFY ALL ELEVATIONS.

X" 40 SCH PVC INLET PIPE STUBOUT (TYP)

RESILIENT PIPE CONNECTION (PRESS-SEAL) TYP-2

ELEVATION

FLPB-1-NO PEDESTAL

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. STRUCTURAL DESIGN IS BASED ON AASHTO HS-20 LOADING.

HATCHWAY: 1/4" ALUMINUM SKID RESISTANT DIAMOND PLATE, WITH 1/4" EXTRUDED ALUMINUM FRAME. HATCH TO BE FURNISHED WITH 316 SS SNAP LOCK & HINGES. THE COVER SHALL HAVE A NAMEPLATE INDICATING "WASTEWATER FLUME ASSEMBLY".

ENGINEERING DATA

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF ASSEMBLY, USE DIMENSIONAL DATA AS SHOWN. ALL PIPE, VALVES AND FITTINGS OF THE ASSEMBLY ARE APPROVED BY ONE OF THE FOLLOWING ASSOCIATIONS.

NPCA CERTIFIED PLANT   B64.5

A	.	.	ORIGINAL DRAWING
REV	DATE	BY	DESCRIPTION

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: .   PROJ #: .
DATE: .   LOCATION: .

PARK USA
www.parkusa.com   888-611-PARK

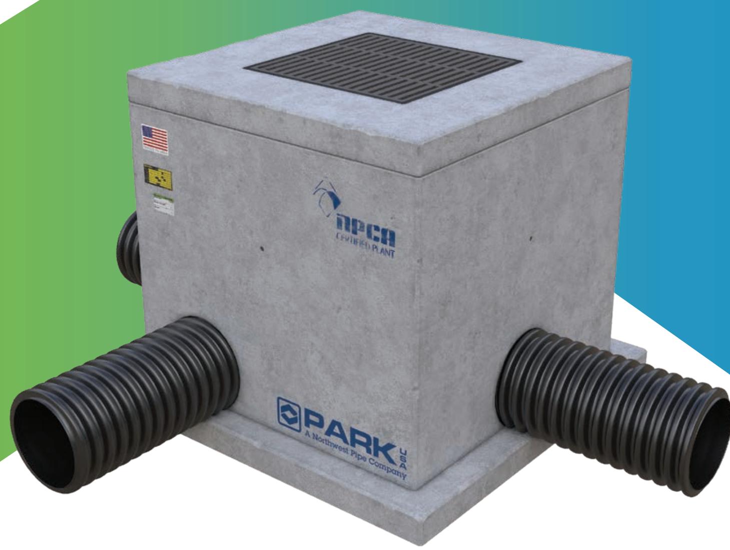
WASTEWATER MONITORING MANHOLE
MODEL FLPB-1 PALMER BOWLUS FLUME

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FLPB-1	A
DATE	01/20				

DRAINAGE

PARK USA
A Northwest Pipe Company

WEIRS



Features

- Customizable outlet orifice profile
- Monitoring devices available
- Easy-to-install pre-assembled vault

How It Works

At its simplest, a weir is no more than an obstruction placed in a channel over which water flows. The obstruction is a specially shaped notch or opening set above the floor of the channel. Weirs can be used for flow restriction and/or measuring flow. The flow rate over a weir is determined by measuring the liquid depth in the pool upstream of the weir.

Weirs

Stormwater runoff can be overwhelming to a stormwater drainage system if a large area is being drained to one discharge location. It is often beneficial to temporarily detain large amounts of runoff in a pond or other detention structure by installing a storm-water weir at the outlet. Weirs retain fluid using a baffle with area openings, which are calculated and designed to restrict outlet flow rates based on the level of the fluid, or head pressure.

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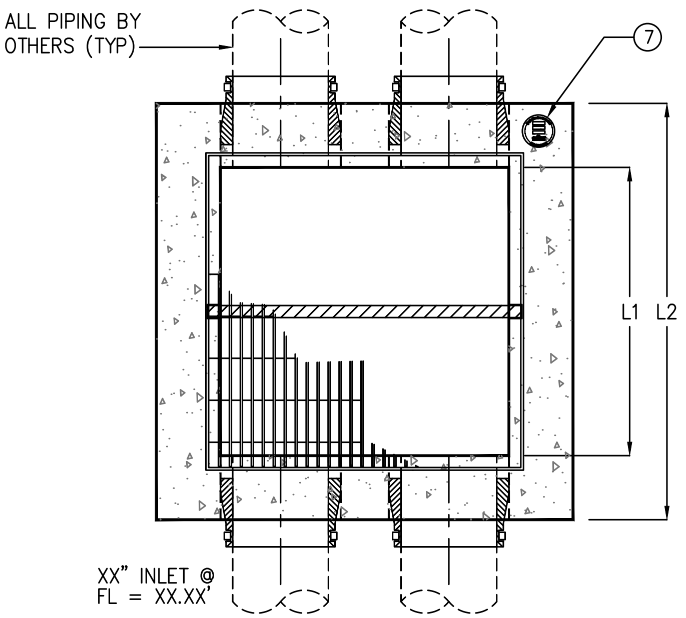
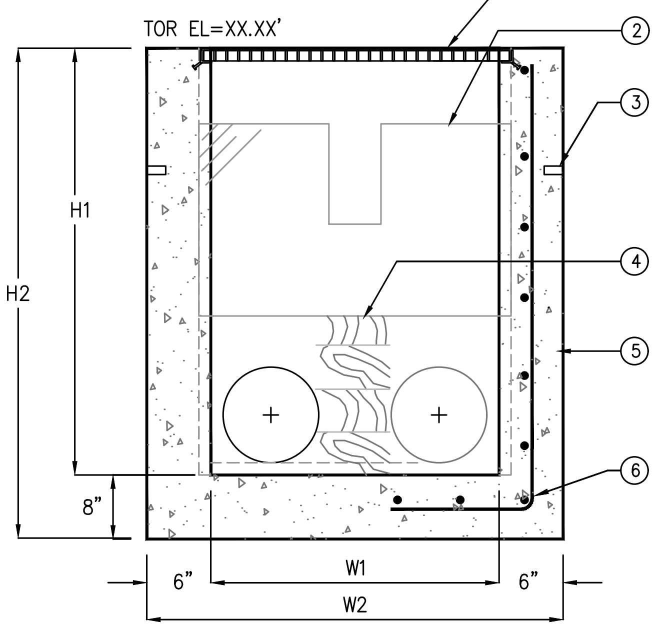
SW WEIRS Standard

APPLICATIONS

Commercial | Municipal | Industrial | Low Impact Development



PLAN VIEW



ELEVATION

SPECIFICATIONS

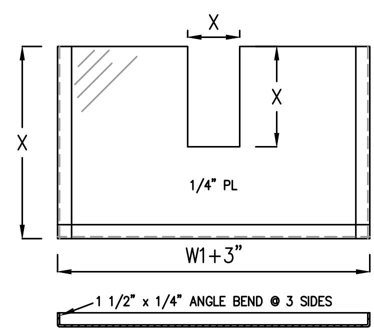
CONCRETE : CLASS 1 CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

FABR STEEL : ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	1-1/2" X 3/16" GALV STEEL BAR GRATING & FRAME (PEDESTRIAN-DUTY)
2	1	RECTANGULAR WEIR
3	1	TYPICAL LIFTING INSERT
4	1	STOP LOGS
5	1	PRECAST CONCRETE BASIN
6	1	#4 REBAR @ 8" OCEW IN BTM & WALLS
7	1	NAMEPLATE INDICATING MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WEIR-ARW DATE MANUFACTURED



DETAIL
WEIR PLATE

FLOW RATE FORMULA

$$Q = K (L - 0.2 H) H^{1.5}$$

WHERE: Q = FLOW RATE
H = HEAD ON THE WEIR
L = CREST LENGTH OF WEIR
K = CONSTANT

DRAINAGE

WEIR-ARW

REV	DATE	BY	DESCRIPTION
A	.	.	.

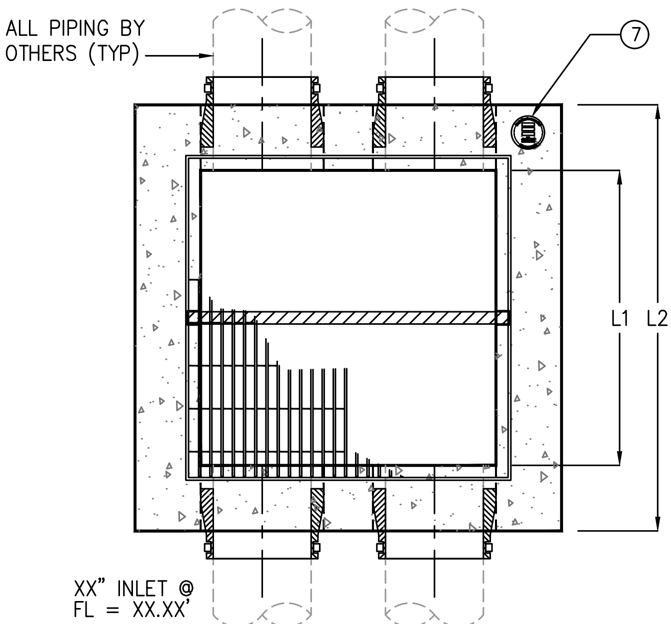
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

WEIR BOX - MODEL ARW
ADJUSTABLE RECTANGULAR WEIR

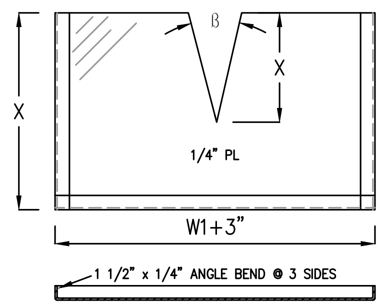
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WEIR-ARW	A
DATE 05/2019					

npca CERTIFIED PLANT — AMERICAN SOCIETY OF SANITARY ENGINEERING — ASPE MEMBER

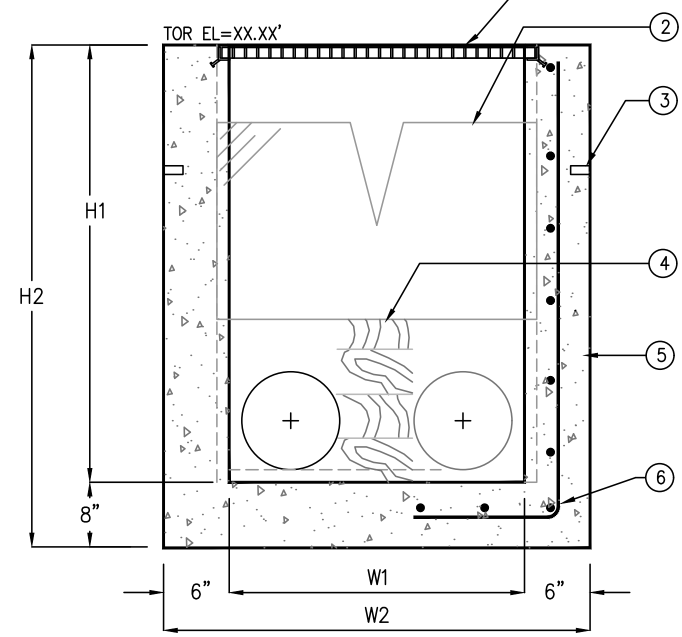


PLAN VIEW

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	1-1/2" X 3/16" GALV STEEL BAR GRATING & FRAME (PEDESTRIAN-DUTY)
2	1	V-NOTCH WEIR
3	1	TYPICAL LIFTING INSERT
4	1	STOP LOGS
5	1	PRECAST CONCRETE BASIN
6	1	#4 REBAR @ 8" OCEW IN BTM & WALLS
7	1	NAMEPLATE INDICATING MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WEIR-AVW DATE MANUFACTURED



DETAIL
WEIR PLATE



ELEVATION

FLOW RATE FORMULA

$$Q = K\ H^{2.5}$$

WHERE: Q = FLOW RATE
H = HEAD ON THE WEIR
L = CREST LENGTH OF WEIR
K = CONSTANT

WEIR-AVW

SPECIFICATIONS

CONCRETE : CLASS 1 CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

FABR STEEL : ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123

NPCA CERTIFIED PLANT — AMERICAN SOCIETY OF SANITARY ENGINEERING — ASPE MEMBER

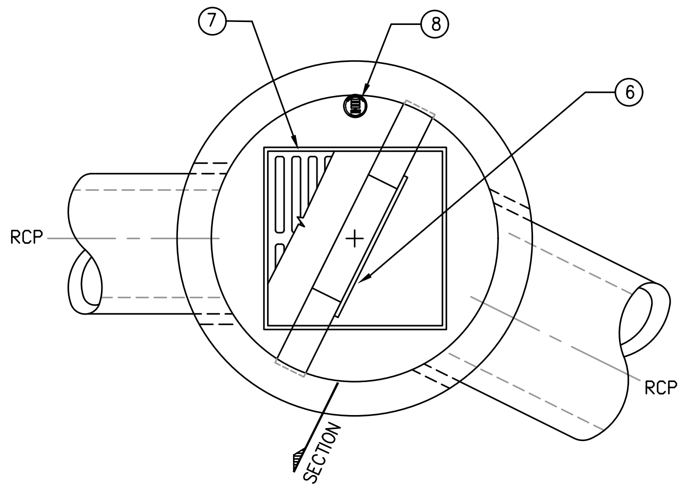
REV	DATE	BY	DESCRIPTION
A	.	.	.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA®
www.parkusa.com 888-611-PARK

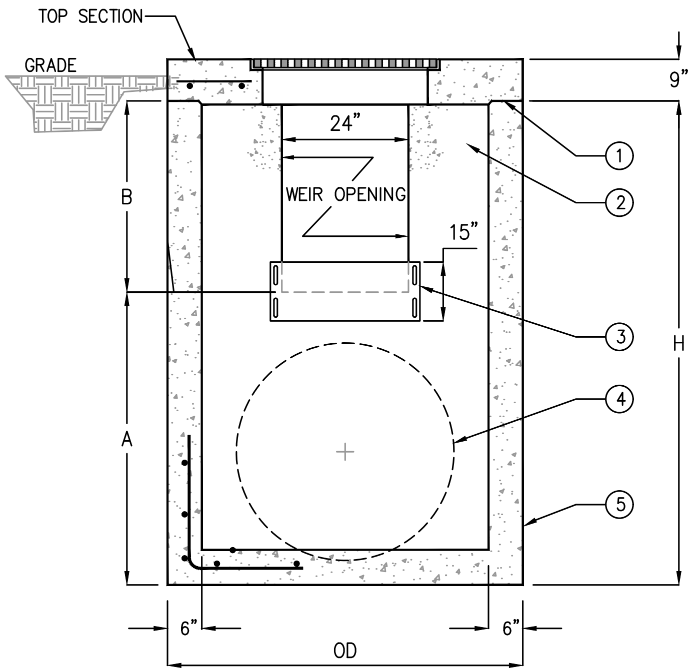
WEIR BOX – MODEL AVW
ADJUSTABLE V-NOTCH WEIR

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WEIR-AVW	A
DATE 05/2019					



PLAN

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	JOINTS SEALED W/ RAMNEK JOINT SEALANT
2	1	CONCRETE BAFFLE
3	1	GALV STEEL ADJUSTABLE WEIR PLATE W/ BOLT SLOTS. SECURE W/ (4) 3/8" X 3" ANCHOR BOLTS
4	1	TYPICAL PIPE OPENING SIZE AS REQ'D
5	1	PRECAST CONCRETE RISER SECTION
6	1	GALV STEEL ADJUSTABLE WEIR
7	1	38"X38"X2" CAST IRON GRATE W/ STEEL FRAME
8	1	NAMEPLATE INDICATING MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WEIR-WR DATE MANUFACTURED



SECTION

FLOW RATE FORMULA

$$Q = K (L - 0.2 H) H^{1.5}$$

WHERE: Q = FLOW RATE
H = HEAD ON THE WEIR
L = CREST LENGTH OF WEIR
K = CONSTANT

WEIR-WR

A	.	.	.
REV	DATE	BY	DESCRIPTION

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

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www.parkusa.com 888-611-PARK

WEIR BOX – MODEL WR
WEIR ROUND

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.		
DATE	05/2019			WEIR-WR	A

SPECIFICATIONS

CONCRETE : CLASS 1 CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

FABR STEEL : ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL, AND HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE TO ASTM A123

NPCA CERTIFIED PLANT · AMERICAN SOCIETY OF SANITARY ENGINEERING · MEMBER ASPE

DRAINAGE

NOTES

ACCESSORIES

NOTES

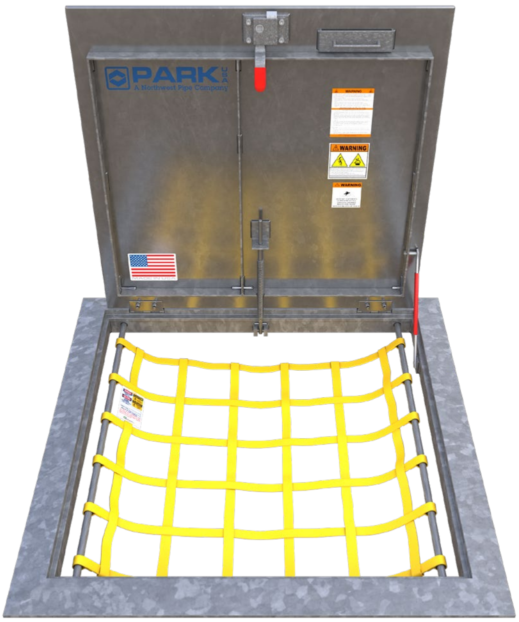
STORMWATER **ACCESSORIES**

BEST USE FOR:

STORMWATER

PARK USA
A Northwest Pipe Company

ENGINEERING **FACTS**



Model AHSS-01

Model JBC-01

COVERS, HATCHWAYS, DUCTILE IRON GRATES/COVER, AND GRATES

ParkUSA offers access covers in stainless steel and aluminum. Options include single and dual leaf hatchways, water rated, bolt down, gasketed, with horizontal springs and safety netting.

JUNCTION BOXES

The junction box is a belowground round or square structure made of precast concrete. The purpose of this structure is to interconnect storm sewer or other piping or provide for a change in direction, joining piping of different sizes, or for sewer access and inspection. Sizes can range up to 120 inches in circular or square profiles.

ELECTRICAL AND COMMUNICATIONS PULL BOXES

The electrical pull box is a belowground square structure made of precast concrete. The purpose of this structure is to interconnect underground communications or electrical cabling and provide for underground placement of electrical switchgear equipment. The design engineer customizes pull box sizes and configurations. Available accessories include ladders, hatchways, cable terminators, shelving, pulling irons, and sump pumps.

Model ELPB-1

NOTES

PARK USA
A Northwest Pipe Company

SAMPLE WELLS

Features

- Stainless steel or HDPE
- Precast concrete well basin
- Cast iron frame and cover

Sample Wells

Sample wells provide access to fluids downstream of a treatment device and allow effluent samples to be taken for quality testing. They can also house monitoring sensors, such as a pH probe, to provide real-time feedback to a remote alert station. Sample wells are often required for pretreatment devices and are recommended for most applications.

Sample wells can be used in buried or above ground applications.

#BUILDING AMERICA!

SW | SAMPLE WELLS Standard

LEED® COMPLIANT
NPCA
Steel Tank Institute
ASPE American Society of Plumbing Engineers
ASTM
BMP® BEST MANAGEMENT PRACTICE
IPC® INTERNATIONAL PLUMBING CODE
UPC®

Applications
- Industrial
- Stormwater
- Commercial
- Municipal
- Chemical handling

System Components
- Precast concrete well basin
- Sample wells come in (1) precast, (2) stainless steel and (3) HDPE (high density polyethylene)
- Cast iron frame and cover

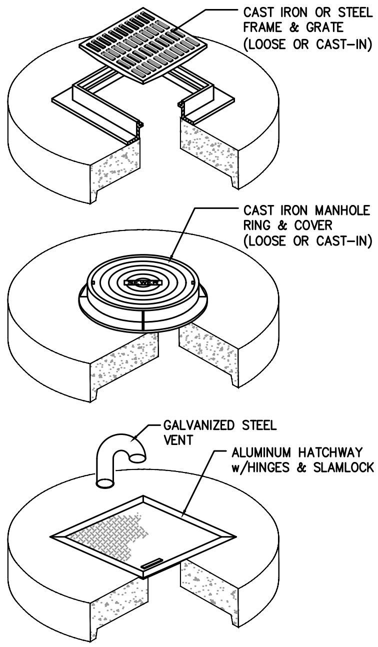
Optional Components
- pH probe
- Temperature probe
- Digital data recorder
- Ladder

How it Works
A Sample Well is placed downstream of a treatment device such as Grease/Lint interceptors, Oil/Water Separators or Acid Neutralization Tanks to monitor their performance. Opening the cover to the well allows for capturing a grab sample of the effluent or treated stormwater for sampling.

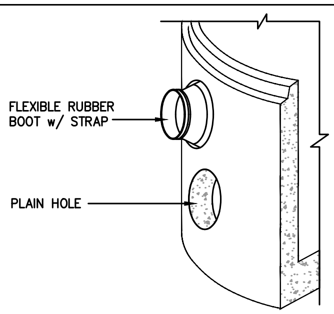
To request a quote or catalog, visit **request.parkusa.com.**

APPLICATIONS

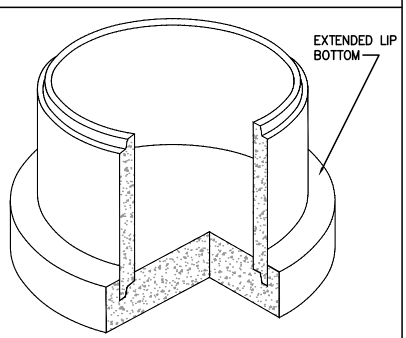
Stormwater Ponds | Agriculture & Hatcheries | Wastewater Treatment Plants | Auto Parts Salvage Yards | Irrigation Canals | Refineries & Tank Storage



TOP OPTIONS



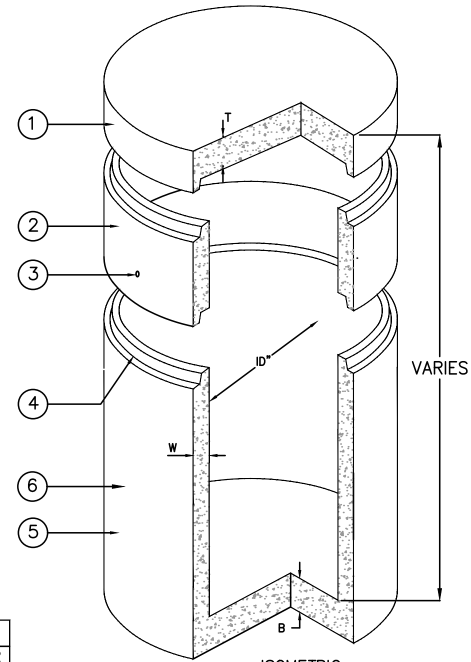
HOLE OPTIONS



BOTTOM OPTIONS

NOTES

1. MIN. CONCRETE COVER IS 2" UNLESS NOTED.
2. ALL JOINTS SHALL BE SEALED WITH RAM–NEK.
3. STRUCTURE TO BE PLACED ON MIN. 6" STABILIZED BASE.



ISOMETRIC

DIMENSIONS AND WEIGHTS					
MODEL	I.D. SIZE (in)	W (in)	B (in)	T (in)	RISER WT/LF (lb)
WW–36	36	4	6	6	663
WW–48	48	5	6	6	868
WW–60	60	6	6	8	1300
WW–72	72	6	6	8	1811
WW–84	84	6	6	8	2350
WW–96	96	6	6	8	3090
WW–120	120	8	6	10	3500
WW–144	144	8	6	10	4000

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	TOP SECTION
2	1	RISER SECTION
3	1	LIFTING INSERTS AS REQUIRED
4	1	RAMNEK SEALANT OR RUBBER O–RING GASKET
5	1	BOTTOM SECTION
6	1	PRECAST WETWELL MFG: ParkUSA 888–611–PARK WWW.PARKUSA.COM MODEL: WW

NPCA CERTIFIED PLANT ASSE ASPE MEMBER ASTM C–913

WW–1

SPECIFICATIONS

CONCRETE: CLASS II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. RATED FOR H–20 LOADING.

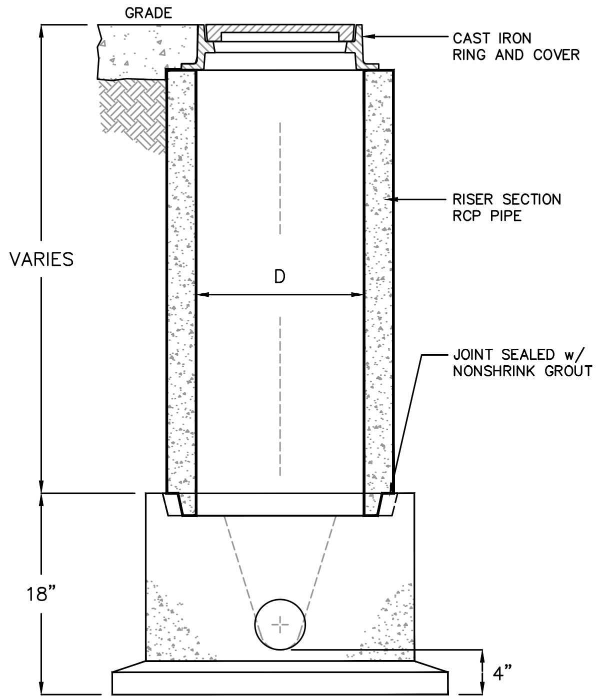
REINFORCEMENT: STRUCTURAL REINFORCEMENT CONFORMING TO ASTM–C–478.

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

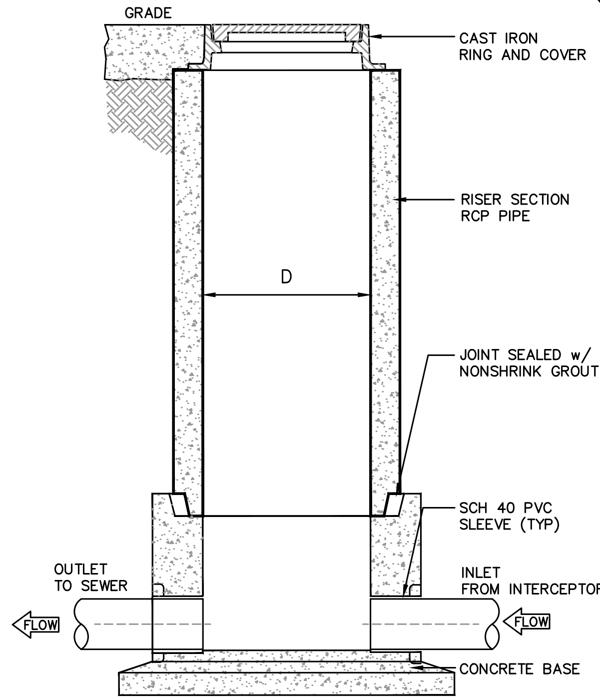
PARK USA
www.parkusa.com 888–611–PARK

PRECAST CONCRETE WETWELL
MODEL WW – 36" THRU 144"

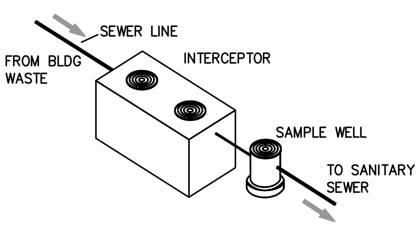
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WW–1	.
DATE 05/2019					



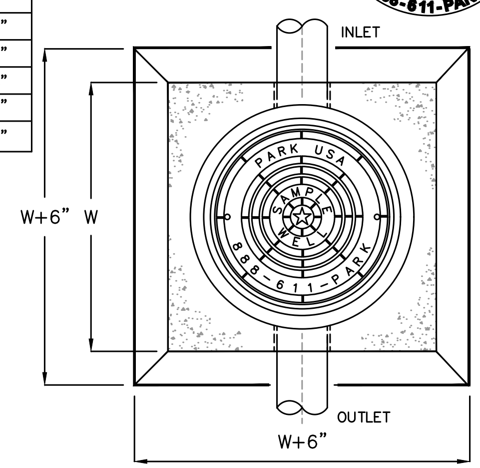
FRONT VIEW



SIDE VIEW



MODEL	DIAMETER "D"	IN & OUT PIPE SIZE	WIDTH "W"
SWB–154	15"	4"	24"
SWB–156	15"	6"	24"
SWB–158	15"	8"	24"
SWB–184	18"	4"	28"
SWB–186	18"	6"	28"
SWB–188	18"	8"	28"
SWB–244	24"	4"	34"
SWB–246	24"	6"	34"
SWB–248	24"	8"	34"



PLAN VIEW

NOTES

1. SAMPLING WELL MUST BE INSTALLED UNDER A SEPARATE PLUMBING PERMIT.
2. USE 15" FOR INSTALLATION 6'–0" DEEP AND LESS.
3. USE 24" FOR INSTALLATION GREATER THAN 6'–0" DEEP. (STD RING AND M.H. COVER REQUIRED)
4. SAMPLING WELL MUST BE SET IN A CIRCULAR OR SQUARE CONCRETE PAD (1'–0" GREATER THAN OUTSIDE DIAMETER OF PIPE.)
5. INSIDE INSTALLATION NOT PERMITTED, WHERE OUTSIDE INSTALLATION IS POSSIBLE.
6. INSTALLATION INSIDE BLDG MUST BE POURED IN PLACE (15"MIN) NO CONCRETE PIPE IS PERMITTED, (AIR–TIGHT COVER REQUIRED.)
7. LAWN INSTALLATION MUST BE 4" ABOVE FINISHED GRADE.
8. DRIVE & SIDEWALK INSTALLATION MUST BE BROUGHT TO FINISHED GRADE
9. TO BE INSTALLED ON PRIVATE PROPERTY, IN AN ACCESSIBLE LOCATION TO CITY PERSONNEL.

SPECIFICATIONS

CONCRETE: Class I/II concrete with of design strength of 4500 PSI at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth.

C.I. CASTINGS: Cast iron rings and grates are manufactured of grey cast iron conforming to ASTM A48 Class 30, Heavy–Duty AASHTO H20/HL93

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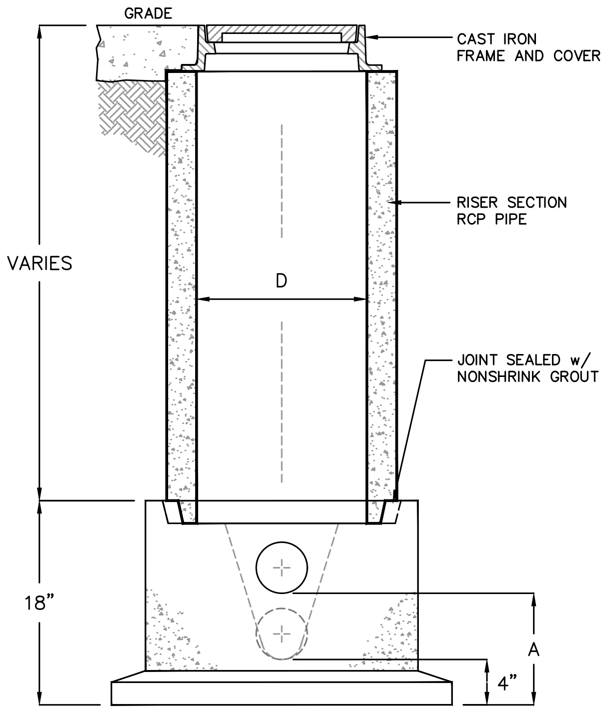
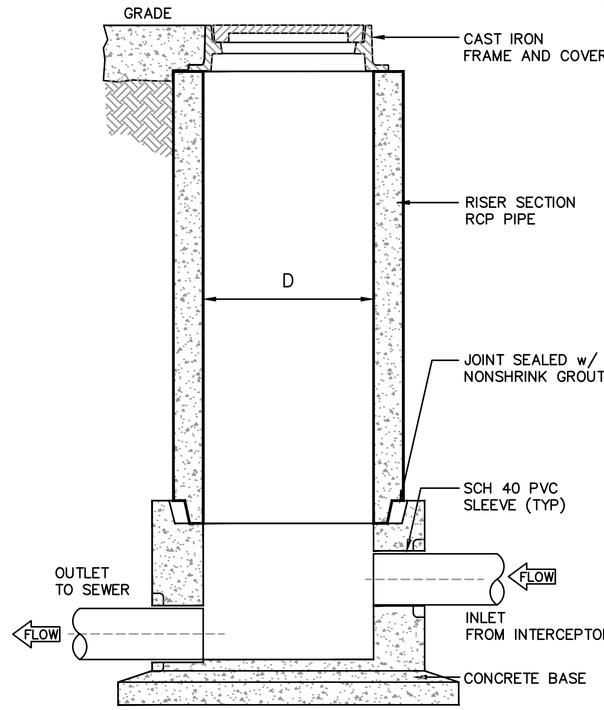
www.parkusa.com
PARK USA
DESIGN FOR WATER

SAMPLE WELL BASIN

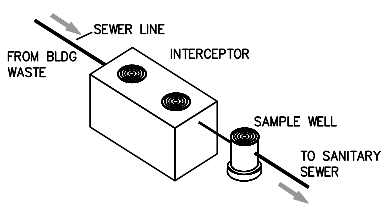
SCALE	NONE	DWG. NO.	SWB–1	REV.	A
DATE	2018				



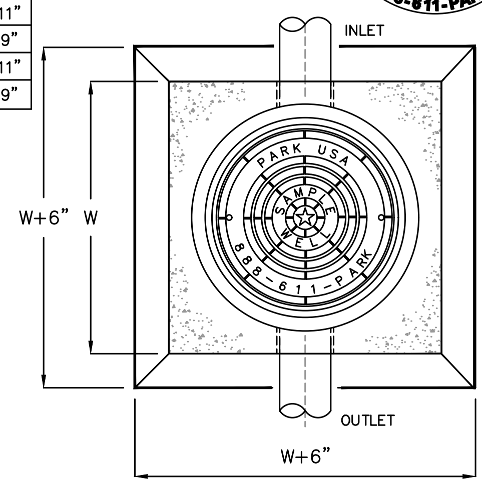
FRONT VIEW



SIDE VIEW



MODEL	DIAMETER "D"	IN & OUT PIPE SIZE	WIDTH "W"	"A"
SWB-154	15"	4"	24"	11"
SWB-156	15"	6"	24"	9"
SWB-184	18"	4"	28"	11"
SWB-186	18"	6"	28"	9"
SWB-244	24"	4"	34"	11"
SWB-246	24"	6"	34"	9"



PLAN VIEW

NOTES

1. SAMPLING WELL MUST BE INSTALLED UNDER A SEPARATE PLUMBING PERMIT.
2. USE 15" T&G R.C.P. FOR INSTALLATION 6'-0" DEEP AND LESS.
3. USE 24" T&G R.C.P. FOR INSTALLATION GREATER THAN 6'-0" DEEP. (STD RING AND M.H. COVER REQUIRED).
4. SAMPLING WELL MUST BE SET IN A CIRCULAR OR SQUARE CONCRETE PAD (1'-0" GREATER THAN OUTSIDE DIAMETER OF PIPE).
5. INSIDE INSTALLATION NOT PERMITTED, WHERE OUTSIDE INSTALLATION IS POSSIBLE.
6. INSTALLATION INSIDE BLDG MUST BE POURED IN PLACE (15"MIN) NO CONCRETE PIPE IS PERMITTED, (AIR-TIGHT COVER REQUIRED).
7. LAWN INSTALLATION MUST BE 4" ABOVE FINISHED GRADE.
8. DRIVE & SIDEWALK INSTALLATION MUST BE BROUGHT TO FINISHED GRADE.
9. TO BE INSTALLED ON PRIVATE PROPERTY, IN AN ACCESSIBLE LOCATION TO CITY PERSONNEL.

SPECIFICATIONS

CONCRETE: Class I/II concrete with of design strength of 4500 PSI at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth.

C.I. CASTINGS: Cast iron frames and grates are manufactured of grey cast iron conforming to ASTM A48-76 Class 30, Heavy-Duty AASHTO H-20

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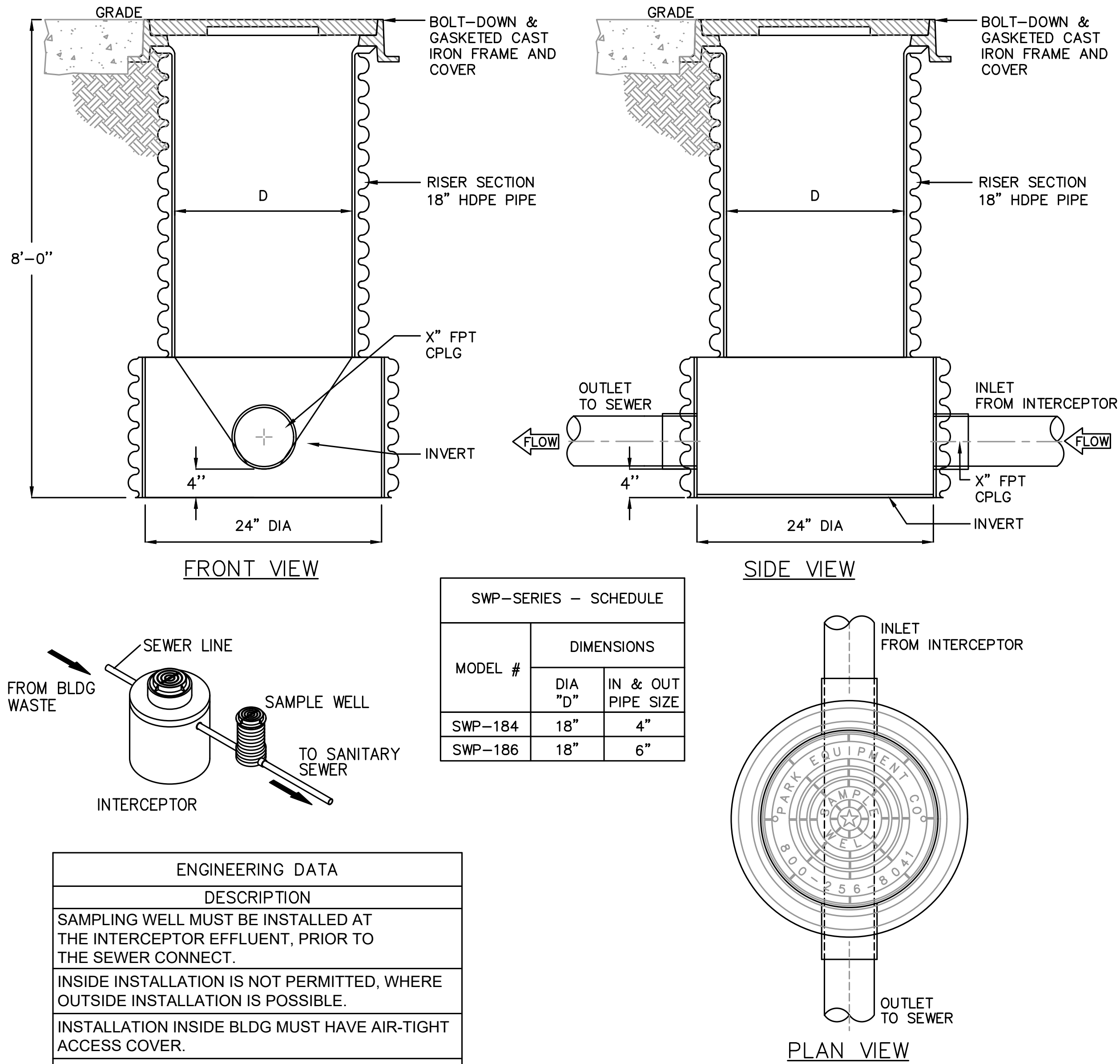
www.parkusa.com
PARK USA DESIGN FOR WATER

SAMPLE WELL BASIN

SCALE	DWG. NO.	REV.
NONE	SWB-2	A
DATE 2018		



SWP–SERIES – SCHEDULE		
MODEL #	DIMENSIONS	
	DIA "D"	IN & OUT PIPE SIZE
SWP–184	18"	4"
SWP–186	18"	6"

ENGINEERING DATA
DESCRIPTION
SAMPLING WELL MUST BE INSTALLED AT THE INTERCEPTOR EFFLUENT, PRIOR TO THE SEWER CONNECT.
INSIDE INSTALLATION IS NOT PERMITTED, WHERE OUTSIDE INSTALLATION IS POSSIBLE.
INSTALLATION INSIDE BLDG MUST HAVE AIR-TIGHT ACCESS COVER.
LAWN INSTALLATION MUST BE 4" ABOVE FINISHED GRADE
DRIVE & SIDEWALK INSTALLATION MUST BE BROUGHT TO FINISHED GRADE
TO BE INSTALLED ON PRIVATE PROPERTY, IN AN ACCESSIBLE LOCATION TO CITY PERSONNEL.

SWP–01

A	.	.	.
REV	DATE	BY	DESCRIPTION

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
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SAMPLE WELL BASIN – HDPE
MODEL SWP

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	SWP–01	A
DATE 05/2019					

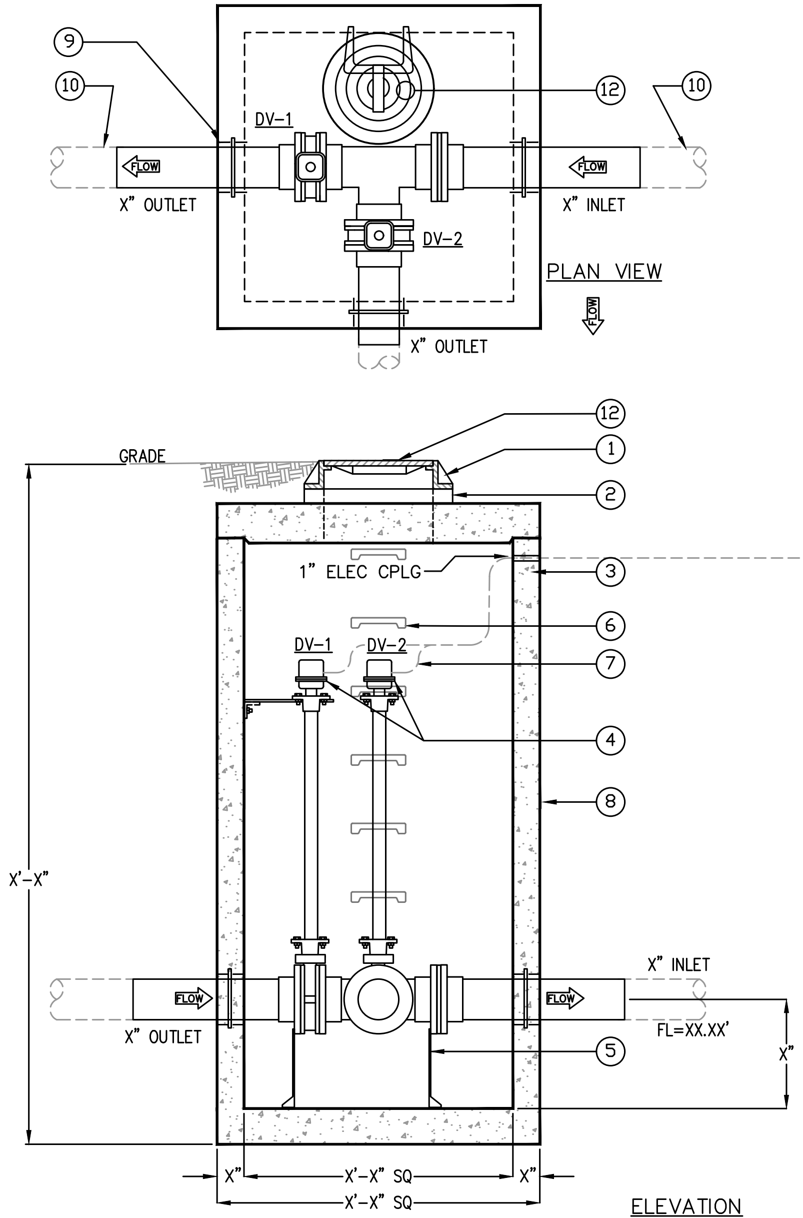
SPECIFICATIONS

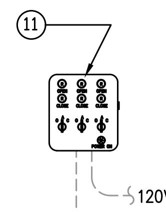
BASIN: BASIN IS CONSTRUCTED OF HIGH DENSITY POLYETHYLENE DRAINAGE PIPE CONFORMING TO ASTM F2648. ALL EXTRUDED WELDING SHALL BE PER ASTM F2880.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30, HEAVY–DUTY AASHTO H–20

NPCA CERTIFIED PLANT
AMERICAN SOCIETY OF SANITARY ENGINEERING
ASPE MEMBER

ACCESSORIES





NOTES:

1. JOINTS TO BE SEALED W/ PLASTIC RAM-NEK GASKET.
2. ALL DIMENSIONS ARE TO CENTER OF BLOCK-OUTS.
3. LIFTING INSERTS AS REQUIRED.
4. STRUCTURE TO BE PLACED ON MIN. 6" STABILIZED BASE.
5. RISER SECTIONS FURNISHED AS REQUIRED

KEYED NOTES

MARK	QTY	DESCRIPTION
1	1	XX" DIA CAST IRON FRAME & COVER (ROTATED FOR CLARITY)
2	1	3" THICK ADJUSTMENT RINGS AS REQUIRED.
3	1	PRECAST CONCRETE VAULT
4	1	ACTUATOR w/ 4' STEM EXTENSION
5	1	GALV STEEL PIPE SUPPORTS
6	1	OSHA STEPS @ 16" O.C.
7	1	POWER CABLE & CONDUIT (BY OTHERS)
8	1	RISER SECTIONS AS REQUIRED
9	1	WATERTIGHT CONNECTION (TYP)
10	1	PIPE BY OTHERS
11	1	DIVERTER VALVE CONTROL PANEL MOUNTED IN REMOTE LOCATION
12	1	NAMEPLATE MFG: PARKUSA 888-611-PARK MODEL DVA-1 DATE MANUFACTURED

SPECIFICATIONS

CONCRETE : CLASS 1 CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 AND ASTM-C478 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: MANHOLE FRAMES, COVERS OR GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30

ENGINEERING DATA

UNIT SHALL BE STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO UPC AND ACI BUILDING CODES. MANUFACTURER SHALL ENSURE VAULT ASSEMBLY DESIGN ACCOUNTS FOR PREVENTION OF BUOYANCY EFFECT.

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF INTERCEPTOR. USE DIMENSIONAL DATA AS SHOWN.

DVA-1

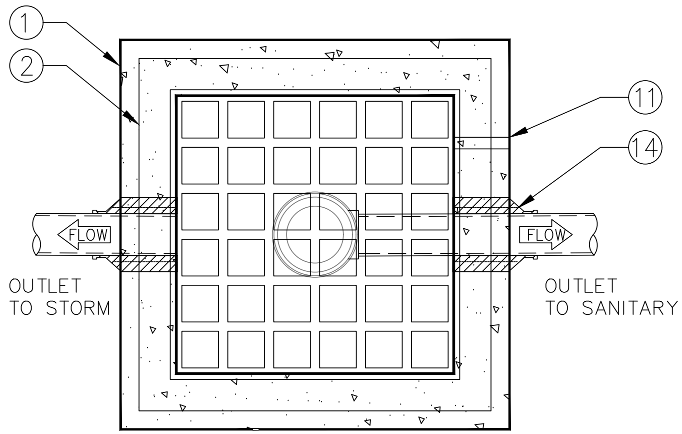
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA

www.parkusa.com 888-611-PARK

DIVERTER VALVE ASSEMBLY
MODEL DVA-1

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	DVA-1	.
DATE 05/2019					



PLAN VIEW

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

MATERIALS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 35.

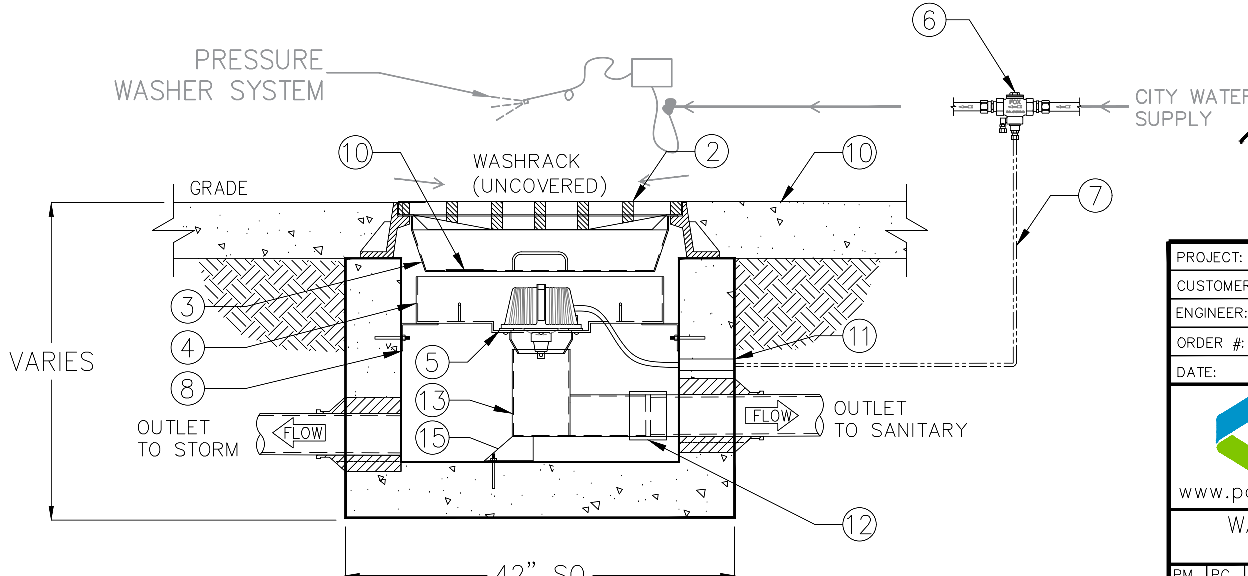
ENGINEERING DATA

UNIT SHALL BE STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO UPC AND ACI BUILDING CODES. MANUFACTURER SHALL ENSURE VAULT ASSEMBLY DESIGN ACCOUNTS FOR PREVENTION OF BUOYANCY EFFECT.

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF UNIT. USE DIMENSIONAL DATA AS SHOWN.

KEYED NOTES		
MRK	QTY	DESCRIPTION
1	1	TYPE-A 30"x30" INLET BASIN
2	1	30"x30" TYPE-A CAST IRON FRAME & GRATE
3	1	SOLIDS SCREEN BASKET
4	1	DIVERSION VALVE TRAY
5	1	HYDRAULIC DIVERSION VALVE
6	1	DEMAND VALVE
7	1	½" DRIVE LINE (BY OTHERS)
8	4	4"x4" ANGLE FRAME
9	–	NOT USED
10	1	CONCRETE APRON (BY OTHERS)
11	1	½" FULL COUPLING CONNECTION FOR DRIVE LINE
12	1	4" DIA FLEXIBLE CONNECTION
13	1	SS304 PIPE REDUCER
14	2	RESILIENT RUBBER BOOT
15	1	PIPE REDUCER SUPPORT BRACKETS
16	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: WDDV-1 MFG DATE

CONTACT PARKUSA FOR ADDITIONAL SIZES AND CONFIGURATIONS



ELEVATION VIEW

NPCA CERTIFIED PLANT · ASTM C-913 · AMERICAN SOCIETY OF SANITARY ENGINEERING · ASPE MEMBER

WDDV-1

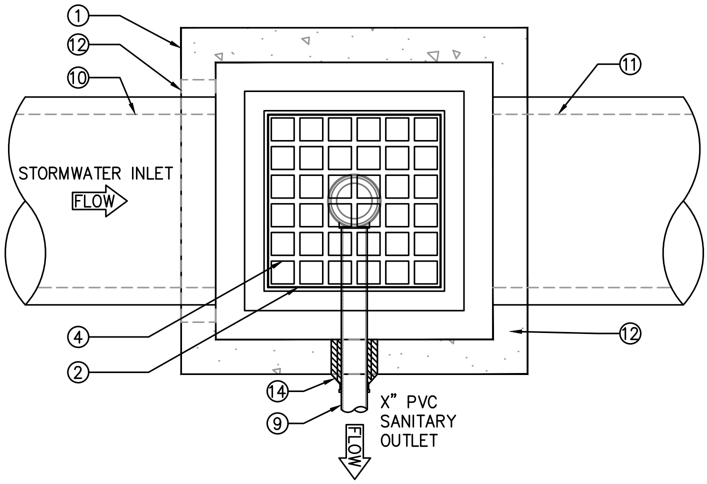
PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

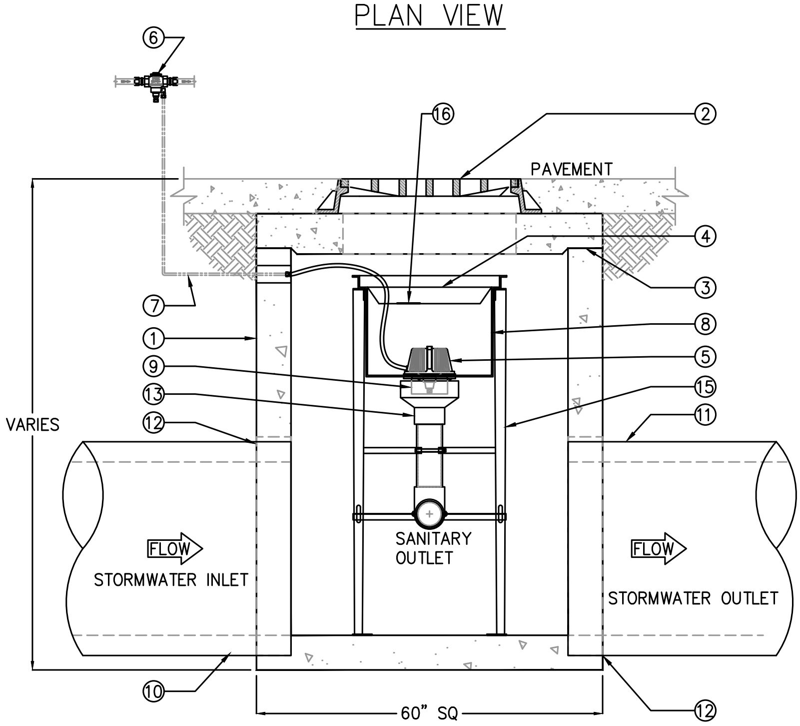
WASH DOWN DIVERTER VALVE
MODEL WDDV-1

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WDDV-1	.
DATE 05/2019					

ACCESSORIES



PLAN VIEW



ELEVATION

KEYED NOTES		
MRK	QTY	DESCRIPTION
1	1	TYPE–A 48"x48" ID INLET BASIN
2	1	30"x30" TYPE–A CAST IRON FRAME & GRATE
3	–	ALL JOINTS MADE WATER–TIGHT w/ FLEXIBLE RUBBER GASKET (RAM–NEK)
4	1	REMOVABLE SILT/DEBRIS BASKET
5	1	HYDRAULIC DIVERSION VALVE
6	1	DEMAND VALVE
7	1	½" DRIVE LINE (BY OTHERS)
8	1	BASIN INSERT w/ OVERFLOW
9	1	X" DISCHARGE TO SAND/OIL/WATER SEPARATOR
10	1	INLET FROM STORM DRAIN SYSTEM
11	1	OUTLET FROM STORM DRAIN SYSTEM
12	2	PIPE SEALED w/ NON–SHRING GROUT
13	1	4"x8" PVC BELL REDUCER
14	1	RESILIENT RUBBER BOOT
15	1	SUPPORT STAND w/ INTEGRATED PIPE SUPPORTS FOR DIVERTER ASSEMBLY
16	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL WDDV–2 SERIAL # MFG DATE

CONTACT PARKUSA FOR ADDITIONAL SIZES AND CONFIGURATIONS

NAMEPLATE

C–913

WDDV–2

SPECIFICATIONS

CONCRETE : CLASS 1 CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 AND ASTM–C478 ON REQUIRED CENTERS OR EQUAL.

ENGINEERING DATA

UNIT SHALL BE STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO UPC AND ACI BUILDING CODES. MANUFACTURER SHALL ENSURE VAULT ASSEMBLY DESIGN ACCOUNTS FOR PREVENTION OF BUOYANCY EFFECT.

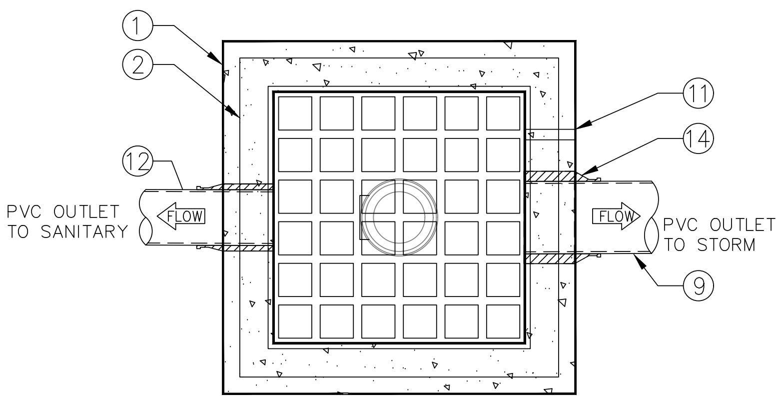
FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF UNIT. USE DIMENSIONAL DATA AS SHOWN.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

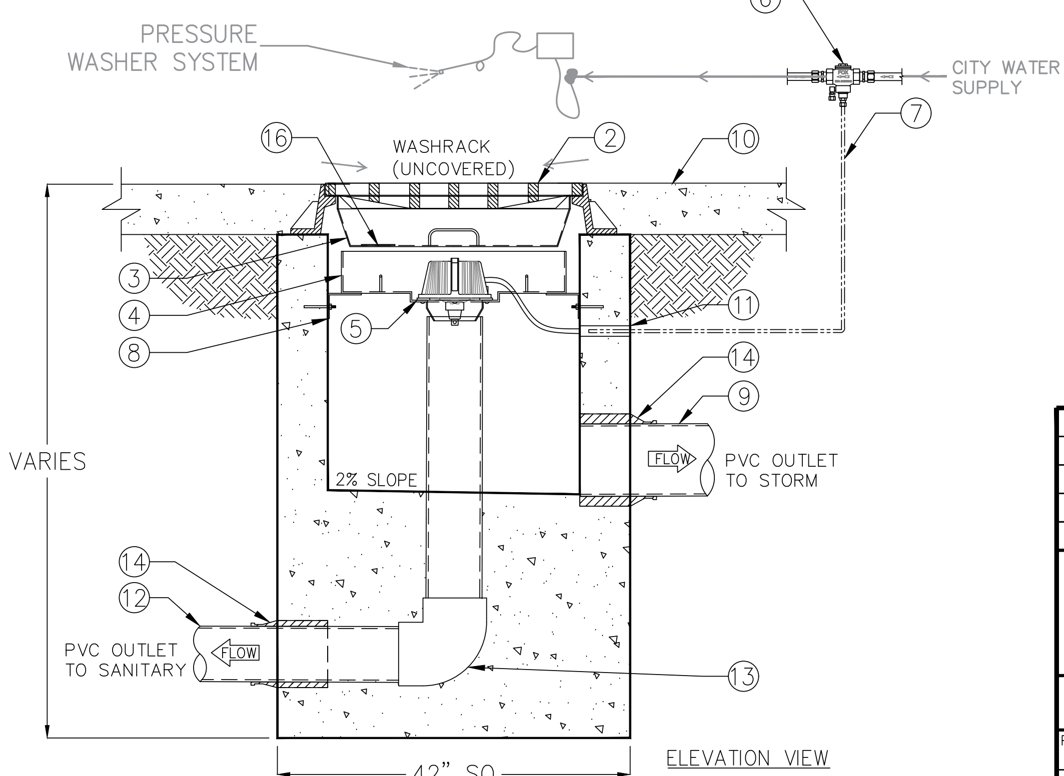
PARK USA
www.parkusa.com 888–611–PARK

WASH DOWN DIVERTER VALVE
MODEL WDDV–2

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WDDV–2	.
DATE 05/2019					



PLAN VIEW



ELEVATION VIEW

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

MATERIALS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 35.

ENGINEERING DATA

UNIT SHALL BE STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO UPC AND ACI BUILDING CODES. MANUFACTURER SHALL ENSURE VAULT ASSEMBLY DESIGN ACCOUNTS FOR PREVENTION OF BUOYANCY EFFECT.

FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF UNIT. USE DIMENSIONAL DATA AS SHOWN.

KEYED NOTES

MRK	QTY	DESCRIPTION
1	1	30"x30" INLET BASIN
2	1	30"x30" CAST IRON FRAME & GRATE
3	1	SOLIDS SCREEN BASKET
4	1	DIVERSION VALVE TRAY
5	1	HYDRAULIC DIVERSION VALVE
6	1	DEMAND VALVE
7	1	DRIVE LINE (BY OTHERS)
8	4	4"x4" ANGLE FRAME W/ PERFORATIONS
9	–	SCH 80 PVC
10	1	CONCRETE APRON (BY OTHERS)
11	1	FULL COUPLING CONNECTION FOR DRIVE LINE
12	1	SCH 80 PVC
13	1	SCH 80 PVC 90-DEGREE ELBOW, CAST-IN
14	2	RESILIENT RUBBER BOOT
15	1	NOT USED
16	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM DATE MANUFACTURED MODEL WDDV-3 SERIAL # MFG DATE

CONTACT PARKUSA FOR ADDITIONAL SIZES AND CONFIGURATIONS

NPCA CERTIFIED PLANT ASTM C-913 AMERICAN SOCIETY OF SANITARY ENGINEERING ASPE MEMBER

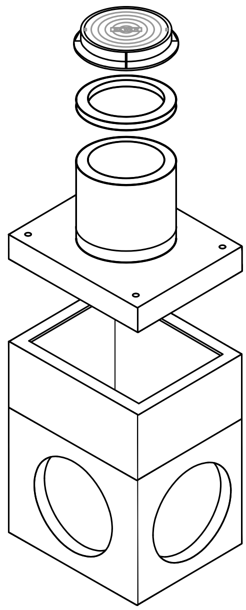
WDDV-3

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

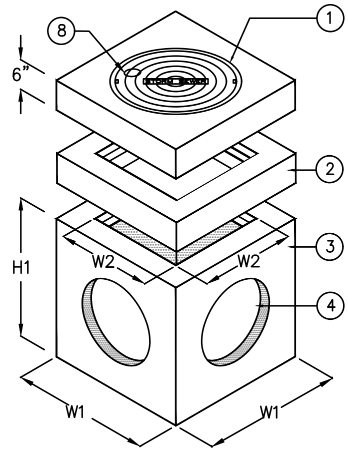
PARK USA®
www.parkusa.com 888-611-PARK

WASH DOWN DIVERTER VALVE
MODEL WDDV-3

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	WDDV-3	.
DATE 05/2019					

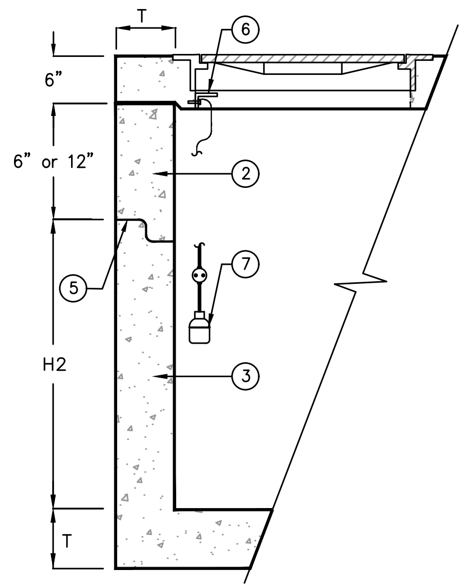


ISOMETRIC w/ OPTIONAL EXTENSIONS



ISOMETRIC

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IRON FRAME & COVER, FURNISHED LOOSE OR CAST-IN. SQUARE PLATE OPTIONAL.
2	1	OPTIONAL EXTENSION 6" OR 12"
3	1	PRECAST CONCRETE BASIN SECTION
4	4	THIN WALL KNOCKOUT ON ALL 4 SIDES, SEE KO DIMENSION FOR MAXIMUM PIPE O.D.
5	1	RAM-NEK GASKET
6	1	(OPTIONAL) CABLE BRACKET FOR FLOAT SWITCH
7	1	(OPTIONAL) LEVEL FLOAT SWITCH FOR PUMP SHUT-DOWN @ DITCH HIGH LEVEL
8	1	NAMEPLATE INDICATING: MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: JBC-1 DATE MANUFACTURED



PARTIAL SECTION

MODEL	W1	W2	H1	H2	T	KO	GRATE SIZE	OPEN AREA	WEIGHT LBS
JBC-12	15"	10"	21"	18"	3"	10"	12"x12"x1"	90	180
JBC-14	20"	12"	28"	24"	4"	12"	14"x14"x1½"	120	600
JBC-18	24"	16"	34"	30"	4"	15"	18"x18"x1½"	168	1,000
JBC-20	26"	18"	34"	30"	4"	17"	20"x20"x1½"	170	1,335
JBC-24	32"	22"	41"	36"	5"	22"	24"x24"x2"	268	2,245
JBC-27	37"	25"	42"	36"	6"	24"	27"x27"x2"	350	2,875
JBC-30	42"	30"	42"	36"	6"	30"	32"x32"x2"	490	3,675
JBC-36	48"	36"	42"	36"	6"	32"	38"x38"x2"	693	4,585
JBC-48	60"	48"	54"	48"	6"	48"	38"x38"x2"	693	7,250
JBC-60	72"	60"	66"	60"	6"	60"	38"x38"x2"	693	10,500
*JBC-72	84"	72"	78"	72"	6"	72"	38"x38"x2"	693	15,350
*JBC-84	96"	84"	78"	72"	6"	72"	38"x38"x2"	693	19,500

*THIN WALL KNOCKOUTS NOT AVAILABLE

SPECIFICATIONS

CONCRETE : CLASS II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

NPCA CERTIFIED PLANT   ASTM C-913   AMERICAN SOCIETY OF SANITARY ENGINEERING   ASPE MEMBER

JBC-1

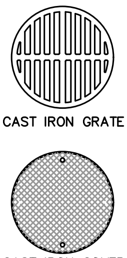
REV	DATE	BY	DESCRIPTION
A	.	.	.

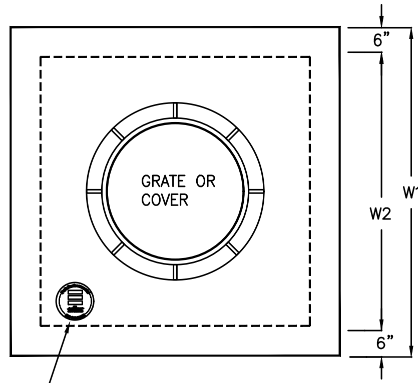
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA®
www.parkusa.com 888-611-PARK

JUNCTION BOX – W/FLOAT SWITCH
MODEL JBC – 12" THRU 84"

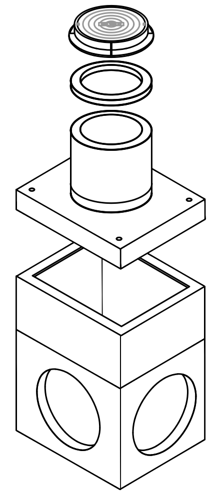
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	JBC-1	A
DATE 05/2019					



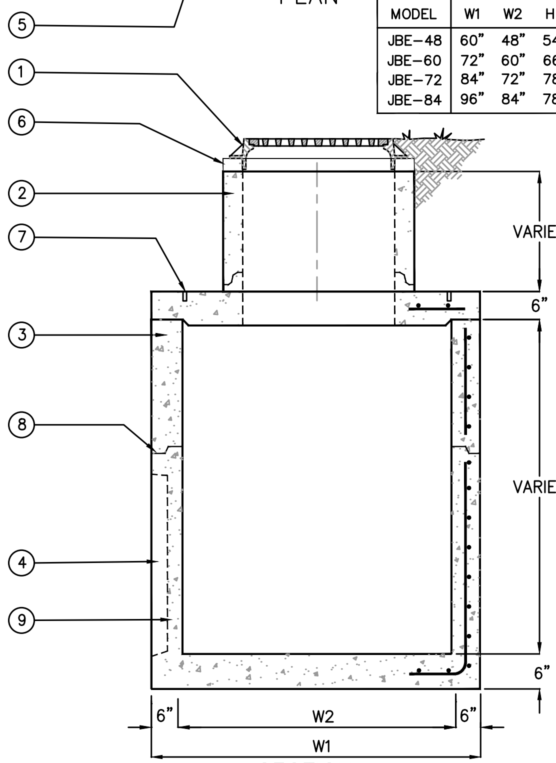


PLAN

MODEL	W1	W2	H1	H2	KO	WEIGHT LBS
JBE-48	60"	48"	54"	48"	48"	8,900
JBE-60	72"	60"	66"	60"	60"	13,650
JBE-72	84"	72"	78"	72"	72"	19,000
JBE-84	96"	84"	78"	72"	84"	23,000



ISOMETRIC



SECTION

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IRON FRAME & COVER/GRATE, FURNISHED LOOSE OR CAST–IN
2	1	PRECAST CONCRETE EXTENSION, AS REQUIRED
3	1	PRECAST CONCRETE RISER SECTION
4	4	THIN WALL KNOCKOUT ON ALL 4 SIDES, SEE KO DIMENSION FOR MAXIMUM PIPE O.D.
5	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL: JBE–1 DATE MANUFACTURED
6	–	GRADE RINGS AS REQUIRED
7	–	LIFTING LUGS AS REQUIRED
8	–	ALL JOINTS SEALED WATER–TIGHT WITH RAM–NEK
9	1	PRECAST CONCRETE BOTTOM SECTION

JBE–1

NPCA CERTIFIED PLANT · ASTM C–913 · AMERICAN SOCIETY OF SANITARY ENGINEERING · ASPE MEMBER

SPECIFICATIONS

CONCRETE :	CLASS II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.
REINFORCEMENT:	GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.
C.I. CASTINGS:	CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

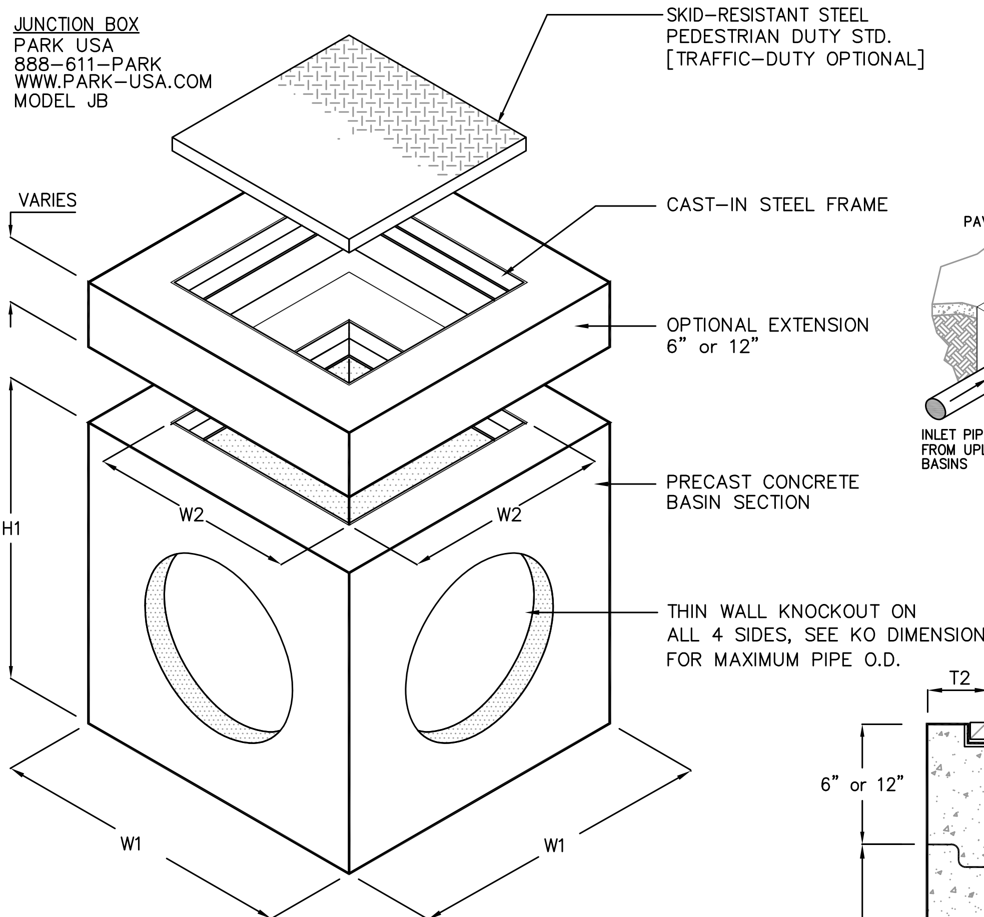
PARK USA®
www.parkusa.com 888–611–PARK

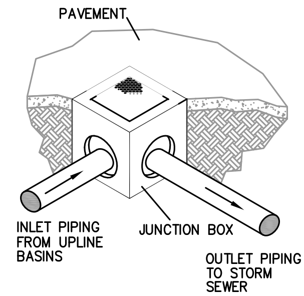
JUNCTION BOX
MODEL JBE– 48" THRU 84"

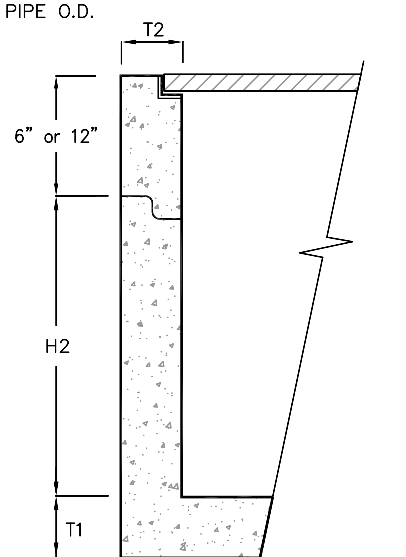
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.		
DATE	01/2019			JBE–1	.

ACCESSORIES

JUNCTION BOX
PARK USA
888–611–PARK
WWW.PARK–USA.COM
MODEL JB







PARTIAL SECTION

MODEL #	DIMENSIONS								
JUNCTION BOX [1]	W1	W2	H1	H2	T1	T2	KO	GRATE SIZE	WEIGHT LBS
JB–12	15"	10"	21"	18"	3"	2i"	10"	12"x12"x1"	180
JB–14	20"	14"	28"	24"	4"	3"	12"	14"x14"x1i"	600
JB–18	24"	16"	34"	30"	4"	4"	15"	18"x18"x1i"	1,000
JB–20	26"	18"	34"	30"	4"	4"	17"	20"x20"x1i"	1,335
JB–24	32"	22"	41"	36"	5"	5"	22"	24"x24"x2"	2,245
JB–27	37"	25"	42"	36"	6"	6"	24"	27"x27"x2"	2,875
JB–30	42"	30"	42"	36"	6"	6"	30"	32"x32"x2"	3,675
JB–36	48"	36"	42"	36"	6"	6"	32"	38"x38"x2"	4,585
JB–48	60"	48"	54"	48"	6"	6"	44"	38"x38"x2"	7,395

1. ALL JUNCTION BOXES ARE STANDARD PEDESTRIAN DUTY OR OPTIONAL TRAFFIC DUTY.

NPCA CERTIFIED PLANT   ASTM C–913   ASSE   ASPE MEMBER

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	
PROJ #:	
DATE:	

SPECIFICATIONS

CONCRETE: Class I/II concrete with of design strength of 4500 PSI at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth.

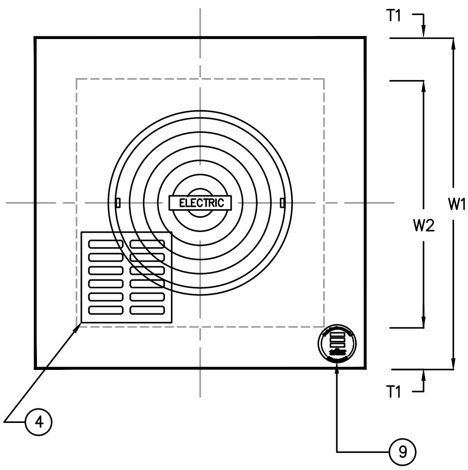
REINFORCEMENT: Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.

COVER & FRAME: All steel fabrication shall be in accordance to AWA D1.1. Steel shall be ASTM A36 carbon steel, and hot–dipped galvanized after fabrication in accordance to ASTM A123

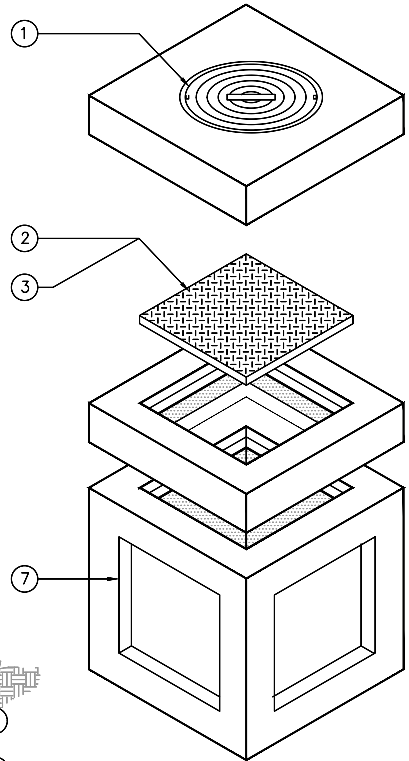
888.611.PARK
www.park-usa.com
PARK USA
DESIGN FOR WATER

JUNCTION BOX
MODEL JB – 12" THRU 48"

PM	DRN	ENG	DWG. NO.	REV.
.	.	.	JB–01	A
DATE	06/16			

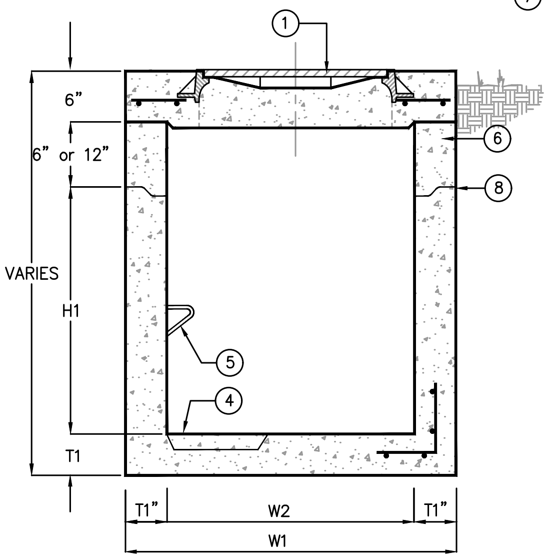


PLAN



ISOMETRIC

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	WATERTIGHT CAST IRON RING AND COVER. (OPTIONAL)
2	1	SKID–RESISTANT STEEL COVER & FRAME, GALV PEDESTRIAN DUTY STD. (OPTIONAL)
3	1	PEDESTRIAN OR H–20 RATED HINGED OPENING W/ SAFETY NET. (OPTIONAL)
4	1	RECESSED SUMP w/ CAST IRON GRATE
5	1	PULLING IRONS
6	1	EXTENSION AS REQ'D IN 6" & 12" INCREMENTS
7	1	THINWALL KNOCKOUTS OR TERMINATORS AS REQUIRED
8	1	JOINTS SEALED WATERTIGHT
9	1	NAMEPLATE MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL ELPB



SECTION

MODEL	W1	W2	H1	T1	STD COVER SIZE	WATERTIGHT COVER SIZE	WEIGHT LBS
ELPB12	15"	10"	21"	2"	12"x12"x1"	N/A	180
ELPB18	24"	16"	30"	4"	18"x18"x1½"	N/A	1,000
ELPB20	26"	18"	36"	4"	20"x20"x1½"	N/A	1,335
ELPB24	32"	22"	48"	5"	24"x24"x2"	N/A	2,245
ELPB27	37"	25"	48"	6"	27"x27"x2"	N/A	2,875
ELPB30	42"	30"	48"	6"	32"x32"x2"	24" DIA	4,100
ELPB36	48"	36"	48"	6"	38"x38"x2"	24" DIA	6,600
ELPB48	60"	48"	48"	6"	38"x38"x2"	24" DIA	9,150
ELPB60	72"	60"	60"	6"	38"x38"x2"	30" DIA	13,650
ELPB72	84"	72"	72"	6"	38"x38"x2"	30" DIA	19,000
ELPB84	96"	84"	72"	6"	38"x38"x2"	30" DIA	23,100
ELPB96	108"	96"	72"	6"	38"x38"x2"	30" DIA	27,500

1. CB12 PULLBOX IS RATED FOR PEDESTRIAN LOADING ONLY
2. SUMP & GRATE AVAILABLE FOR PB30 THRU PB60 ONLY

OPTIONS:
- LADDER
- SUMP PUMP

npca CERTIFIED PLANT — MEMBER — C-913

ELPB-1

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

www.parkusa.com 888–611–PARK

PRECAST ELECTRIC PULL BOX
MODEL ELPB

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	ELPB–1	.
DATE 05/2019					

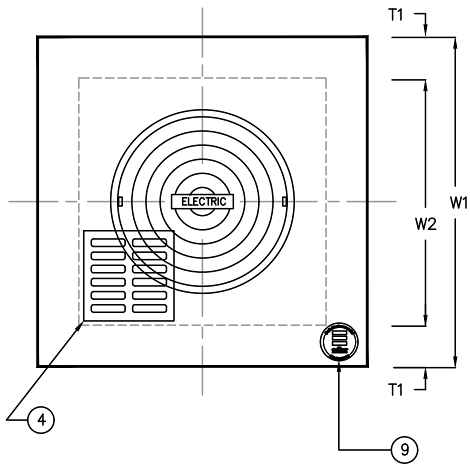
SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H–20 LOADING.

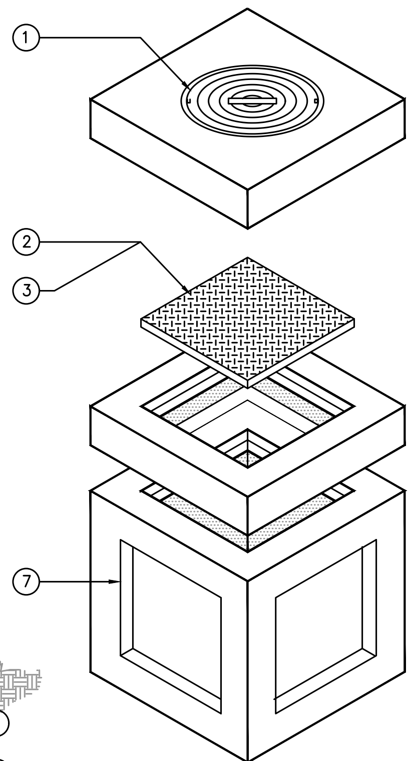
REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

ACCESSORIES

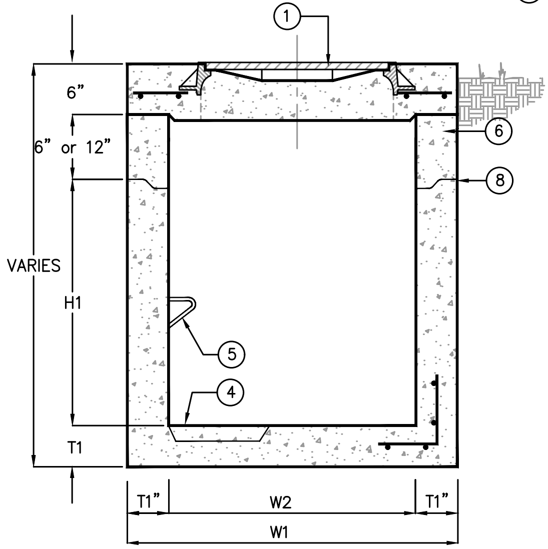


PLAN



ISOMETRIC

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	WATERTIGHT CAST IRON RING AND COVER. (OPTIONAL)
2	1	SKID-RESISTANT STEEL COVER & FRAME, GALV PEDESTRIAN DUTY STD. (OPTIONAL)
3	1	PEDESTRIAN OR H-20 RATED HINGED OPENING W/ SAFETY NET. (OPTIONAL)
4	1	RECESSED SUMP w/ CAST IRON GRATE
5	1	PULLING IRONS
6	1	EXTENSION AS REQ'D IN 6" & 12" INCREMENTS
7	1	THINWALL KNOCKOUTS OR TERMINATORS AS REQUIRED
8	1	JOINTS SEALED WATERTIGHT
9	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL ELPB



SECTION

MODEL	W1	W2	H1	T1	STD COVER SIZE	WATERTIGHT COVER SIZE	WEIGHT LBS
ELPB12	15"	10"	21"	2"	12"x12"x1"	N/A	180
ELPB18	24"	16"	30"	4"	18"x18"x1½"	N/A	1,000
ELPB20	26"	18"	36"	4"	20"x20"x1½"	N/A	1,335
ELPB24	32"	22"	48"	5"	24"x24"x2"	N/A	2,245
ELPB27	37"	25"	48"	6"	27"x27"x2"	N/A	2,875
ELPB30	42"	30"	48"	6"	32"x32"x2"	24" DIA	4,100
ELPB36	48"	36"	48"	6"	38"x38"x2"	24" DIA	6,600
ELPB48	60"	48"	48"	6"	38"x38"x2"	24" DIA	9,150
ELPB60	72"	60"	60"	6"	38"x38"x2"	30" DIA	13,650
ELPB72	84"	72"	72"	6"	38"x38"x2"	30" DIA	19,000
ELPB84	96"	84"	72"	6"	38"x38"x2"	30" DIA	23,100
ELPB96	108"	96"	72"	6"	38"x38"x2"	30" DIA	27,500

1. CB12 PULLBOX IS RATED FOR PEDESTRIAN LOADING ONLY
2. SUMP & GRATE AVAILABLE FOR PB30 THRU PB60 ONLY

OPTIONS:
- LADDER
- SUMP PUMP

NPCA CERTIFIED PLAN · AMERICAN SOCIETY OF SANITARY ENGINEERING · ASPE MEMBER · ASTM C-913

ELPB-1

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. RATED FOR H-20 LOADING.

REINFORCEMENT: GRADE 60 REINFORCED. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

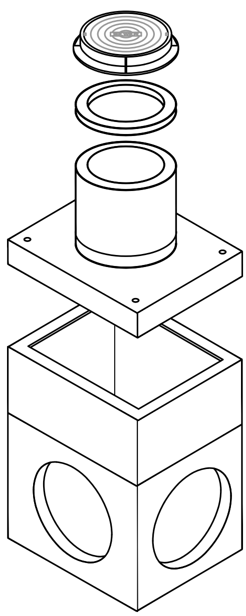
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

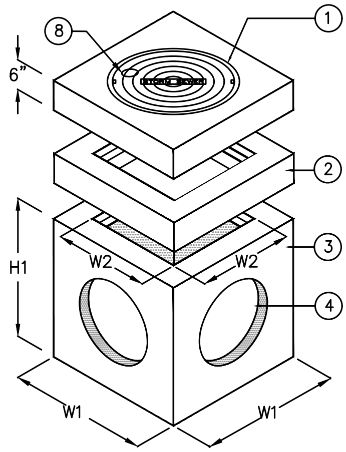
PARK USA
www.parkusa.com 888-611-PARK

PRECAST ELECTRIC PULL BOX
MODEL ELPB

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	ELPB-1	.
DATE 05/2019					

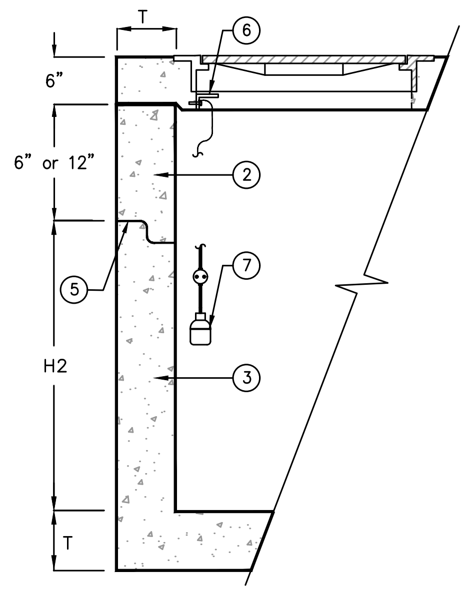


ISOMETRIC w/ OPTIONAL EXTENSIONS



ISOMETRIC

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	CAST IRON FRAME & COVER, FURNISHED LOOSE OR CAST–IN. SQUARE PLATE OPTIONAL.
2	1	OPTIONAL EXTENSION 6" OR 12"
3	1	PRECAST CONCRETE BASIN SECTION
4	4	THIN WALL KNOCKOUT ON ALL 4 SIDES, SEE KO DIMENSION FOR MAXIMUM PIPE O.D.
5	1	RAM–NEK GASKET
6	1	(OPTIONAL) CABLE BRACKET FOR FLOAT SWITCH
7	1	(OPTIONAL) LEVEL FLOAT SWITCH FOR PUMP SHUT–DOWN @ DITCH HIGH LEVEL
8	1	NAMEPLATE INDICATING: MFG: PARKUSA 888–611–PARK WWW.PARKUSA.COM MODEL: JBC–1 DATE MANUFACTURED



PARTIAL SECTION

MODEL	W1	W2	H1	H2	T	KO	GRATE SIZE	OPEN AREA	WEIGHT LBS
JBC–12	15"	10"	21"	18"	3"	10"	12"x12"x1"	90	180
JBC–14	20"	12"	28"	24"	4"	12"	14"x14"x1½"	120	600
JBC–18	24"	16"	34"	30"	4"	15"	18"x18"x1½"	168	1,000
JBC–20	26"	18"	34"	30"	4"	17"	20"x20"x1½"	170	1,335
JBC–24	32"	22"	41"	36"	5"	22"	24"x24"x2"	268	2,245
JBC–27	37"	25"	42"	36"	6"	24"	27"x27"x2"	350	2,875
JBC–30	42"	30"	42"	36"	6"	30"	32"x32"x2"	490	3,675
JBC–36	48"	36"	42"	36"	6"	32"	38"x38"x2"	693	4,585
JBC–48	60"	48"	54"	48"	6"	48"	38"x38"x2"	693	7,250
JBC–60	72"	60"	66"	60"	6"	60"	38"x38"x2"	693	10,500
*JBC–72	84"	72"	78"	72"	6"	72"	38"x38"x2"	693	15,350
*JBC–84	96"	84"	78"	72"	6"	72"	38"x38"x2"	693	19,500

*THIN WALL KNOCKOUTS NOT AVAILABLE

SPECIFICATIONS

CONCRETE : CLASS II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48–76 CLASS 30.

NPCA CERTIFIED PLANT   ASTM C–913   AMERICAN SOCIETY OF SANITARY ENGINEERING   ASPE MEMBER

JBC–1

A	.	.	.
REV	DATE	BY	DESCRIPTION

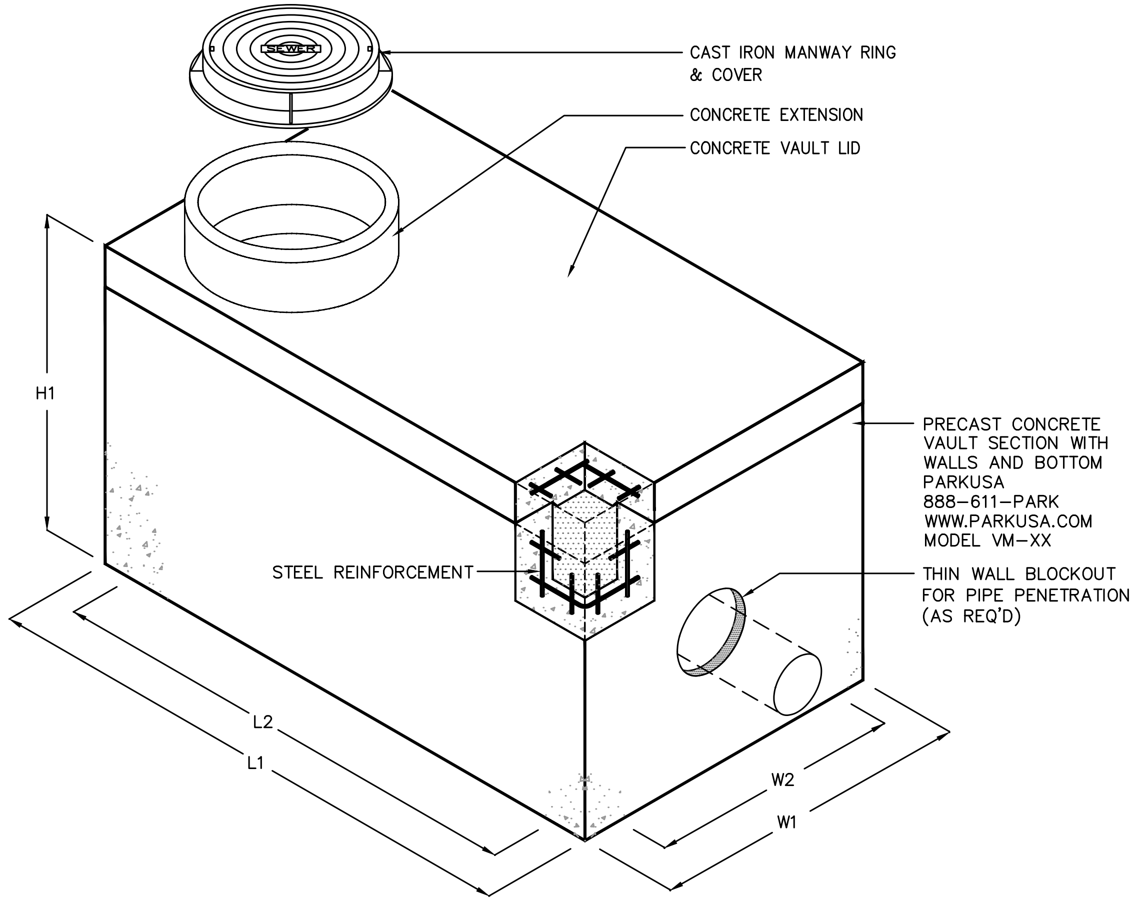
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

JUNCTION BOX – W/FLOAT SWITCH
MODEL JBC – 12" THRU 84"

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	JBC–1	A
DATE 05/2019					

ACCESSORIES



[1] MODEL NO.		DIMENSIONS					
STANDARD DUTY	HEAVY DUTY	L1	L2	W1	W2	H1	WEIGHT LBS
VM-343	VM343-H	4'-0"	3'-6"	3'-0"	2'-6"	3'-9"	2,800
VM-364	VM364-H	6'-0"	5'-6"	3'-0"	2'-6"	3'-9"	4,600
VM-475	VM475-H	7'-10"	7'-2"	4'-4"	3'-8"	6'-0"	10,200
VM-483	VM483-H	8'-8"	8'-0"	5'-0"	4'-4"	3'-9"	9,400
VM-485	VM485-H	8'-8"	8'-0"	5'-0"	4'-4"	6'-0"	12,000
VM-585	VM585-H	9'-2"	8'-2"	5'-8"	4'-8"	6'-0"	18,200
VM-685	VM685-H	9'-0"	8'-0"	6'-0"	5'-0"	6'-0"	18,600
VM-3105	VM3105-H	11'-0"	10'-0"	4'-0"	3'-0"	6'-0"	19,000
VM-5104	VM5104-H	11'-0"	10'-0"	6'-0"	5'-0"	5'-0"	19,600
VM-5106	VM5106-H	11'-0"	10'-0"	6'-0"	5'-0"	7'-0"	24,400
VM-6124	VM6124-H	13'-0"	12'-0"	7'-0"	6'-0"	5'-0"	25,000
VM-6126	VM6126-H	13'-0"	12'-0"	7'-0"	6'-0"	7'-0"	30,800
VM-6154	VM6154-H	16'-0"	15'-0"	7'-0"	6'-0"	5'-0"	31,800
VM-6156	VM6156-H	16'-0"	15'-0"	7'-0"	6'-0"	7'-0"	38,700

1. STANDARD DUTY INDICATES PEDESTRIAN LOAD RATED, HEAVY DUTY IS TRAFFIC LOAD RATED.

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING & PLACEMENT SHALL CONFORM TO LATEST ACI STANDARDS FOR PRECAST CONCRETE.

MANWAY : MANHOLE FRAME AND COVER ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

npca CERTIFIED PLANT
ASTM C-858
MEMBER
VM-1

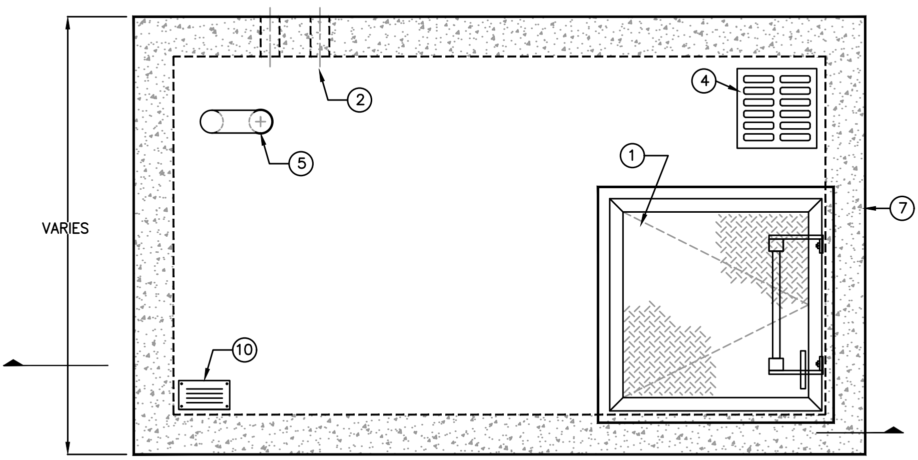
PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

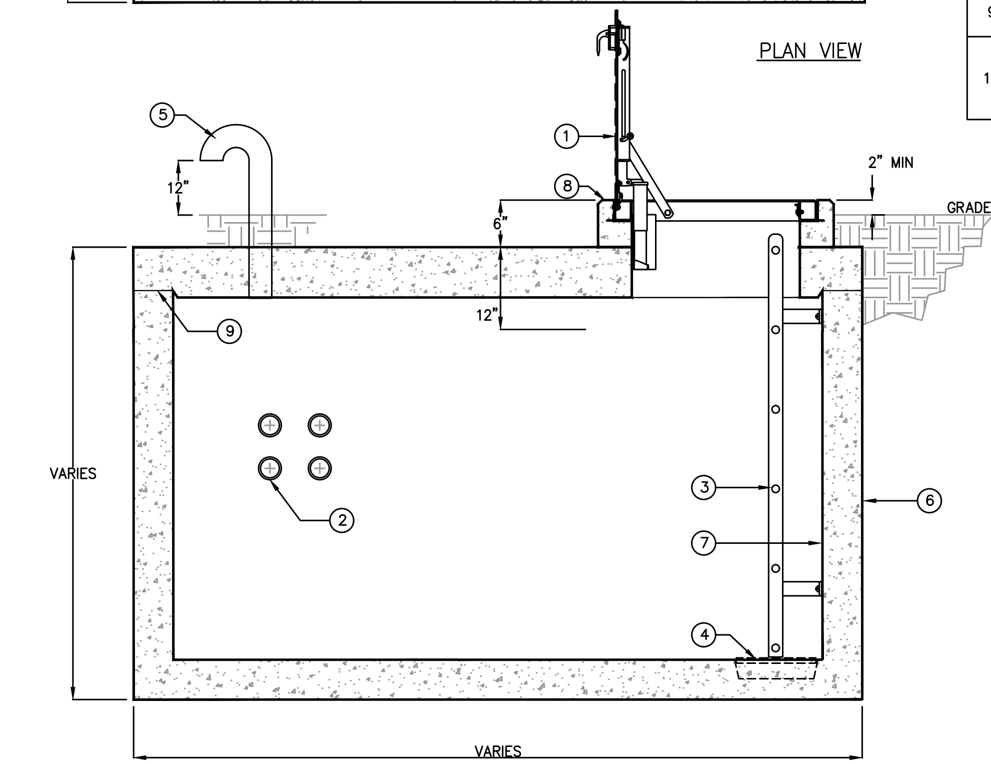
UTILITY VAULTS w/ MANWAY
MODEL VM

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.		
DATE	05/2019			VM-1	.

KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	ALUMINUM HATCHWAY WATER-TIGHT W/ LOCKING HASP, SPRINGS, & LOCKING ARM. PARK MODEL [PEDESTRIAN OR TRAFFIC DUTY]
2	4	ELECTRICAL TERMINATOR SLEEVES IN SIDE WALL QUANTITY & LOCATIONS AS REQUIRED.
3	1	OSHA APPR. ALUMINUM LADDER
4	1	12"x12"x3" DEEP SUMP
5	1	4" GALV. STEEL VENT w/ SCREEN
6	1	VAULT EXTERIOR TO BE COATED W/ 2 COATS OF BITUMASTIC VAPOR BARRIER
7	1	PRECAST CONCRETE ELECTRICAL VAULT
8	1	CONCRETE EXTENSION AS REQUIRED
9	1	ALL JOINTS TO MADE WATERPROOF WITH PLASTIC FLEXIBLE GASKET
10	1	NAMEPLATE MFG: PARKUSA 888-611-PARK WWW.PARKUSA.COM MODEL: VLT-EL



PLAN VIEW



ELEVATION

SPECIFICATIONS

CONCRETE : CLASS 1 CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH. GROSS EMPTY WEIGHT OF APPROXIMATELY 20,000 POUNDS.

REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ENGINEERING DATA

MANUFACTURER TO PROVIDE STRUCTURAL & BUOYANCY CERTIFICATION BY A LICENSED ENGINEER. FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF VAULT. (COORDINATE WITH PARK EQUIPMENT COMPANY)

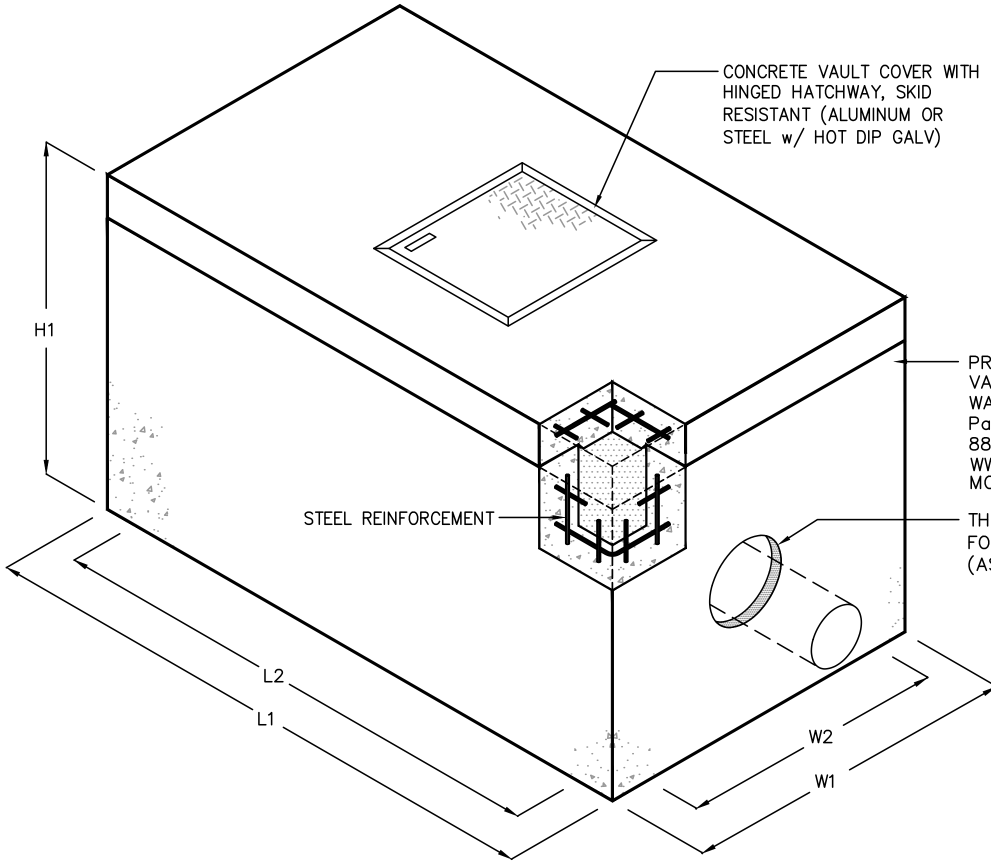
VLT-EL

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888-611-PARK

PRECAST CONCRETE ELECTRICAL VAULT
MODEL VLT-EL

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	VLT-EL	.
DATE 05/2019					



[1]MODEL NO.		DIMENSIONS					
STANDARD DUTY	HEAVY DUTY	L1	L2	W1	W2	H1	WEIGHT LBS
VH–343	VH343–H	4'–0"	3'–6"	3'–0"	2'–6"	3'–9"	2,800
VH–364	VH364–H	6'–0"	5'–6"	3'–0"	2'–6"	3'–9"	4,600
VH–475	VH475–H	7'–10"	7'–2"	4'–4"	3'–8"	6'–0"	10,200
VH–483	VH483–H	8'–8"	8'–0"	5'–0"	4'–4"	3'–9"	9,400
VH–485	VH485–H	8'–8"	8'–0"	5'–0"	4'–4"	6'–0"	12,000
VH–585	VH585–H	9'–2"	8'–2"	5'–8"	4'–8"	6'–0"	18,200
VH–685	VH685–H	9'–0"	8'–0"	6'–0"	5'–0"	6'–0"	18,600
VH–5104	VH5104–H	11'–0"	10'–0"	6'–0"	5'–0"	4'–9"	19,600
VH–5106	VH5106–H	11'–0"	10'–0"	6'–0"	5'–0"	7'–0"	24,400
VH–6124	VH6124–H	13'–0"	12'–0"	7'–0"	6'–0"	5'–0"	25,000
VH–6126	VH6126–H	13'–0"	12'–0"	7'–0"	6'–0"	7'–0"	30,800
VH–6154	VH6154–H	16'–0"	15'–0"	7'–0"	6'–0"	5'–0"	31,800
VH–6156	VH6156–H	16'–0"	15'–0"	7'–0"	6'–0"	7'–0"	38,700

1. STANDARD DUTY INDICATES PEDESTRIAN LOAD RATED, HEAVY DUTY IS TRAFFIC LOAD RATED.

SPECIFICATIONS

CONCRETE: CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING & PLACEMENT SHALL CONFORM TO LATEST ACI STANDARDS FOR PRECAST CONCRETE.

HATCHWAY: 1/4" ALUMINUM SKID RESISTANT DIAMOND PLATE, WITH 1/4" EXTRUDED ALUMINUM FRAME. HATCH TO BE FURNISHED WITH DROP HANDLE, SS HINGES, & LOCKING ARM.

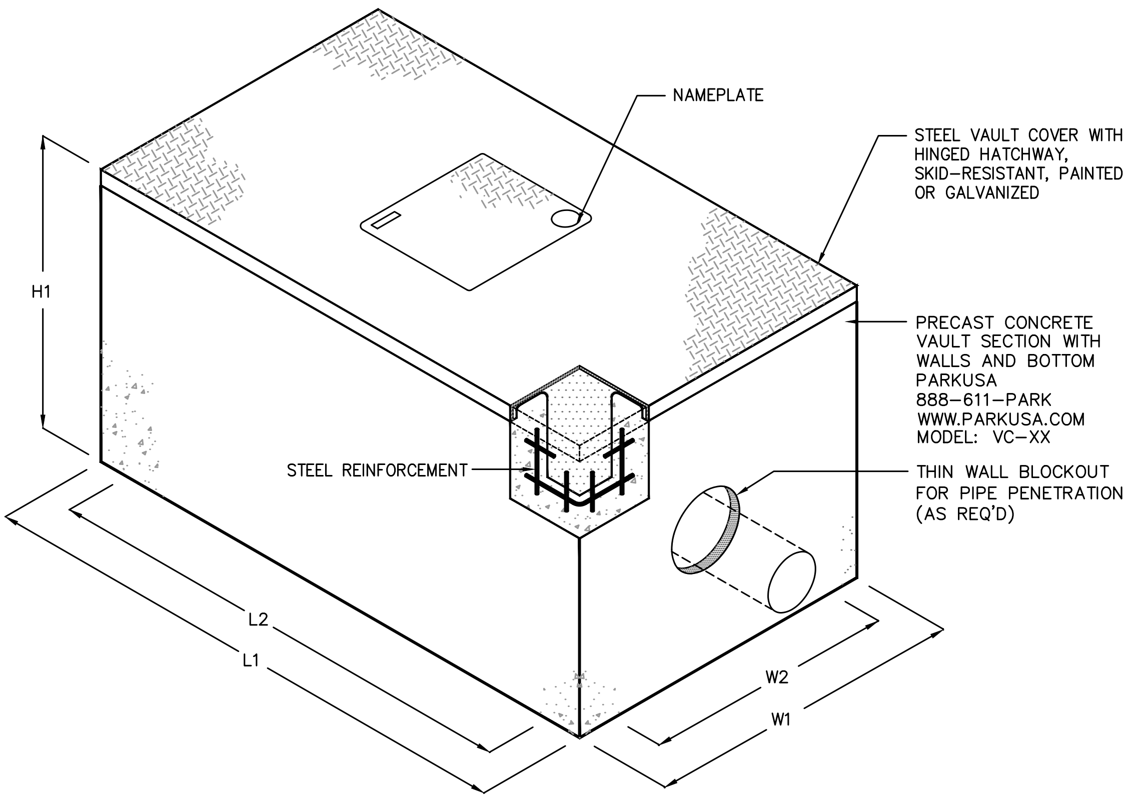
NPCA CERTIFIED PLANT
ASTM C–858
AMERICAN SOCIETY OF SANITARY ENGINEERING
ASPE MEMBER
VH–1

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

UTILITY VAULTS w/ HATCH
MODEL VH

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	VH–1	.
DATE	05/2019				



[1] MODEL #		DIMENSIONS					
STANDARD DUTY	HEAVY DUTY	L1	L2	W1	W2	H1	WEIGHT LBS
VC–343	VC343–H	4'–0"	3'–6"	3'–0"	2'–6"	4'–0"	1,900
VC–364	VC364–H	6'–0"	5'–6"	3'–6"	3'–0"	4'–0"	3,300
VC–475	VC475–H	7'–10"	7'–2"	4'–4"	3'–8"	5'–6"	7,600
VC–483	VC483–H	8'–8"	8'–0"	5'–0"	4'–4"	3'–6"	6,100
VC–485	VC485–H	8'–8"	8'–0"	5'–0"	4'–4"	5'–6"	8,700
VC–585	VC585–H	9'–2"	8'–2"	5'–8"	4'–8"	5'–6"	14,300
VC–685	VC685–H	9'–0"	8'–0"	6'–0"	5'–0"	6'–0"	18,600
VC–5104	VC5104–H	11'–0"	10'–0"	6'–0"	5'–0"	4'–6"	14,600
VC–5106	VC5106–H	11'–0"	10'–0"	6'–0"	5'–0"	6'–6"	19,400
VC–6124	VC6124–H	13'–0"	12'–0"	7'–0"	6'–0"	4'–6"	18,200
VC–6126	VC6126–H	13'–0"	12'–0"	7'–0"	6'–0"	6'–6"	24,000
VC–6154	VC6154–H	16'–0"	15'–0"	7'–0"	6'–0"	4'–6"	23,400
VC–6156	VC6156–H	16'–0"	15'–0"	7'–0"	6'–0"	6'–6"	30,300

1. STANDARD DUTY INDICATES PEDESTRIAN LOAD RATED, HEAVY DUTY IS TRAFFIC LOAD RATED.

SPECIFICATIONS

CONCRETE : CLASS I/II CONCRETE WITH OF DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL #4 REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING & PLACEMENT SHALL CONFORM TO LATEST ACI STANDARDS FOR PRECAST CONCRETE.

STEEL COVER: ALL STEEL FABRICATION SHALL BE IN ACCORDANCE TO AWA D1.1. STEEL SHALL BE ASTM A36 CARBON STEEL. FINISH IS PRIMER & PAINTED WITH INDUSTRIAL ENAMEL.

NPCA CERTIFIED PLANT
ASTM C–858
MEMBER

VC–1

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

PARK USA
www.parkusa.com 888–611–PARK

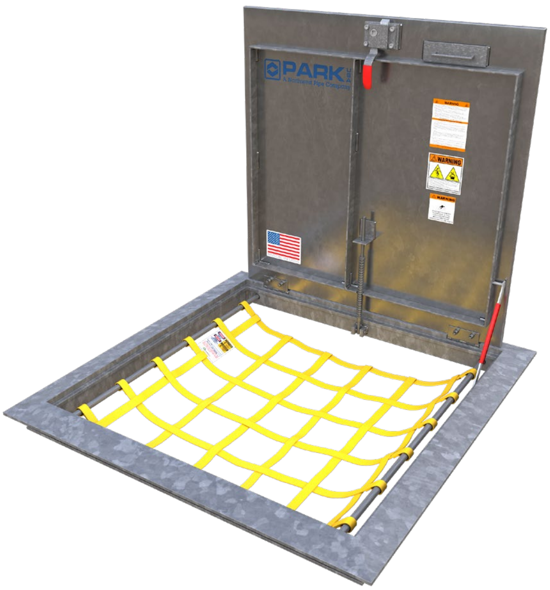
UTILITY VAULTS w/ STEEL COVER
MODEL VC 343 THRU 6156

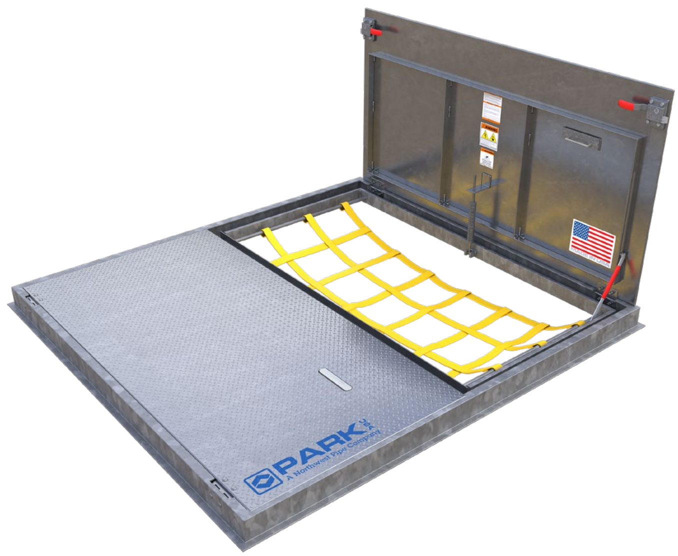
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	VC–1	.
DATE 05/2019					

ACCESSORIES

Hatch Safe™

FALL PROTECTION





GENERAL INFORMATION

The HatchSafe™ fall protection system is a lightweight net system that will greatly reduce the risk of a fall through. The system is designed to be installed in any type of floor or roof access hatch, for both new and existing applications. The system is compatible with all hatchway manufacturers.

The ParkUSA HatchSafe net system meets or exceeds all current OSHA standards and will greatly reduce the risk of injury or death from fall through accidents in hatchway installations. This protects you from costly law suits, time lost through accidents, and OSHA fines and citations. It can also lower workers compensation and liability costs.

The Occupational Safety and Hazard Association (OSHA) sets standards for workplace safety. One of the OSHA standards states that workers who are exposed to possible vertical drops over six feet must have fall protection. One of the options for fall protection is a safety net system. OSHA has outlined specific guidelines for workplace safety net systems. The OSHA standard classification that covers safety nets is in section 1926.502(c) of the OSHA standards.

The ParkUSA HatchSafe net system meets or exceeds all current OSHA standards and will greatly reduce the risk of injury or death from fall through accidents in hatchway installations. This protects you from costly law suits, time lost through accidents, and OSHA fines and citations. It can also lower workers compensation and liability costs. The HatchSafe net system is a lightweight net system that will greatly reduce the risk of fall through. The system is designed to be installed in any type of floor or roof access hatch, or both new and existing units. The net does not restrict light or visibility needed for inspections, and the net easily slides open to facilitate access. Because 85 percent of normal procedures can be accomplished with the Hatch Net in place, one person can safely perform most inspections without the need for an additional worker or cumbersome fall protection equipment.

FEATURES

- OSHA Compliant
- Chemical & UV Resistant
- Complete Systems
- Easily Installed in Minutes
- Retracts Easily for Access
- Custom Sizes
- Manufactured of aluminum and stainless steel with a highly visible synthetic netting.
- Custom sizes are manufactured in days at no additional cost.
- Full Five Year Warranty

INSPECTION

Safety nets should be inspected on a frequent basis. The inspection must cover damage, wear and deterioration. The safety net systems must also be inspected after any incident occurs that could affect the integrity of the net. If any net is found to be defective, it must not be used and must be removed from the safety net system.

SPECIFICATIONS

HatchSafe fall protection systems adhere to OSHA Drop Test Standards. The drop test involves a sandbag that weighs 400 pounds and is between 28 and 32 inches in diameter. The sandbag is dropped from the highest point from where a person could fall. The mesh size of the net cannot be larger than six by six inches and cannot widen more than six inches measured from center to center. Each net, or section of net, in a system has to have a perimeter border with a minimum breaking strength of 5,000 pounds. Between safety net panels, connections have to be just as strong as the net components themselves. Connections cannot be spaced more than six inches apart from each other.

INSTALLATION

HatchSafe fall protection systems can be installed on any standard aluminum or steel floor access, roof hatch or custom sized framed opening. The units are factory assembled and ready for installation.

LIMITATIONS

The HatchSafe net system, after installation, should be maintained in the closed position after each use. The HatchSafe is a fall protection system. At no time is the net to be used as a work platform, lifting mechanism, tool holder, tie off point or to attach any other equipment to it.

PRODUCT DESCRIPTION

The HatchSafe fall protection system is a rail mounted safety net system designed to be installed in all floor access and roof hatches to reduce risks associated with fall-throughs. The fall protection safety net system provides protection during the initial opening of this hatch and maintains protection after access has been gained.

The safety net easily slides on guide rails to facilitate entry and then repositioned to prevent fall through accidents. This system also provides excellent fall through protection while a hatch or other opening is left uncovered and/or while a worker is below. The HatchSafe can be manufactured to fit 150#, 300#, H-20 live load, roof hatches and all other floor openings.

AVAILABILITY

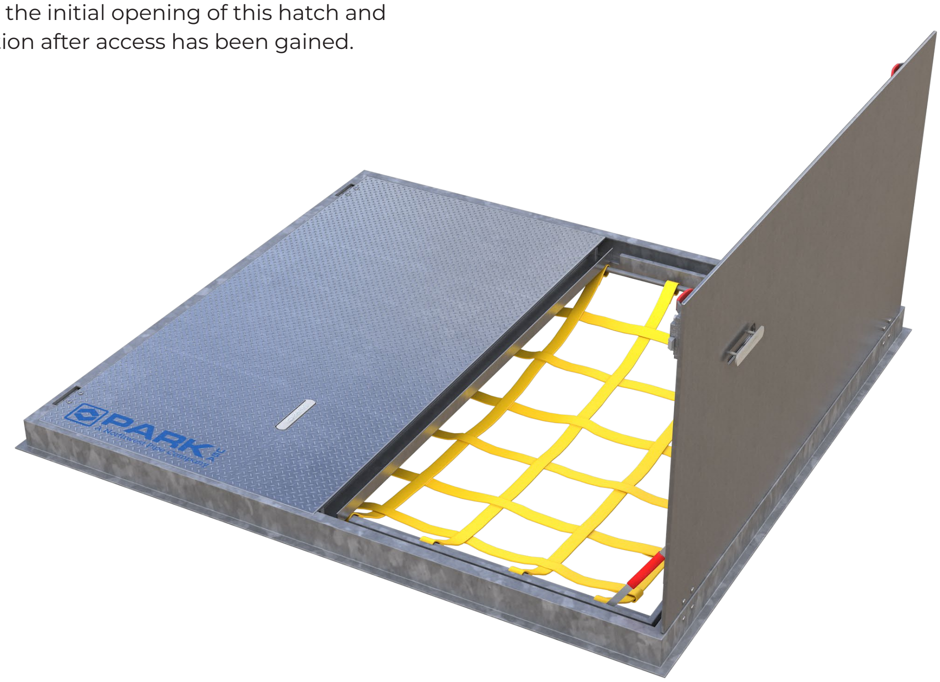
Standard HatchSafe fall protection systems are readily available in a few days. Custom systems are manufactured to customer's order and shipped within two to four weeks. Larger orders may take longer.

MAINTENANCE

HatchSafe fall protection systems should be inspected semi-annually by Owner. The netting should be inspected for visible decay, fraying, tears or ripped stitches. The hardware should be inspected for damage, broken or bent pieces, corrosion or missing pieces.

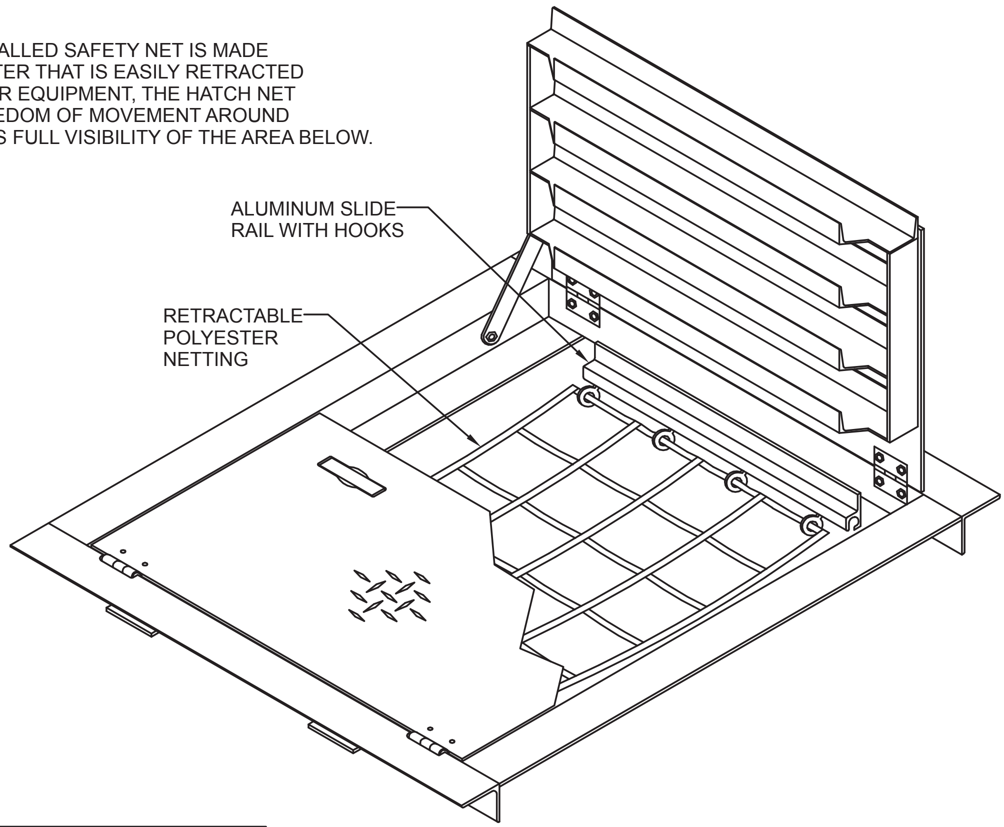
WARRANTY

The HatchSafe fall protection system is warranted for a period of five (5) years against defects in material and workmanship. Any modification to the system voids the manufacturer's warranty.

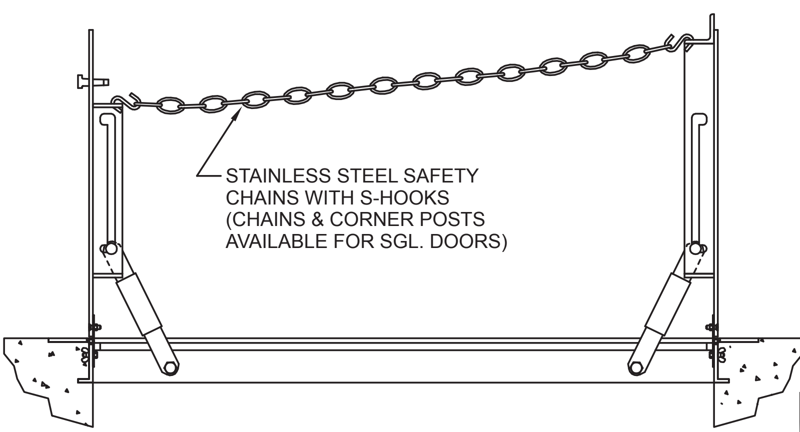


HATCHWAY SAFETY NET

THIS PERMANENTLY INSTALLED SAFETY NET IS MADE OF HEAVY DUTY POLYESTER THAT IS EASILY RETRACTED TO FACILITATE ACCESS OR EQUIPMENT, THE HATCH NET ALLOWS COMPLETE FREEDOM OF MOVEMENT AROUND THE OPENING AS WELL AS FULL VISIBILITY OF THE AREA BELOW.



SAFETY CHAINS



PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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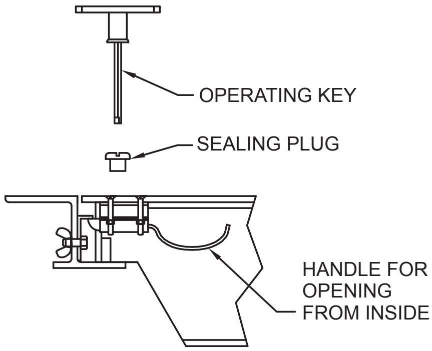
HATCHWAY SAFETY NET
FALL THROUGH PREVENTION SYSTEM

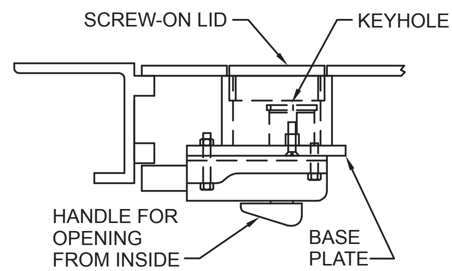
PM	PC	DRN	ENG	DWG. NO.	REV.
DATE	01/2018			HSN-1	A

HSN-1

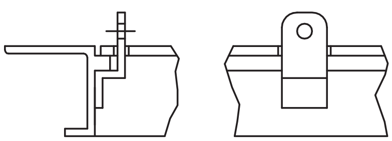
HATCHWAY LOCKING DEVICES



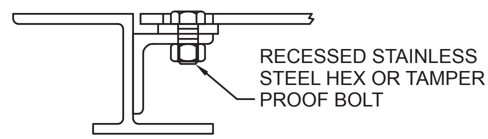
STAINLESS STEEL SLAM LOCK



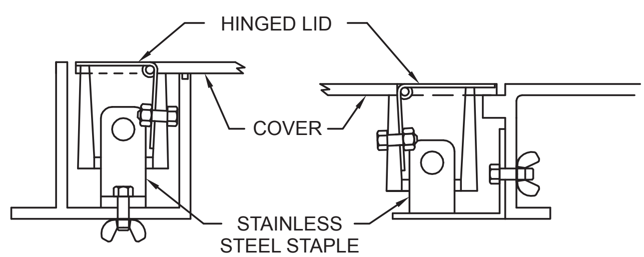
RECESSED CYLINDER LOCK



STAPLE FOR PADLOCK

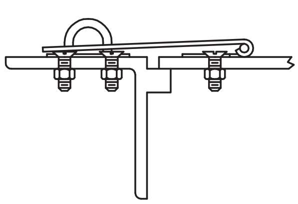


BOLT LOCK



TROUGH FRAME **ANGLE FRAME**

RECESSED STAPLE FOR PADLOCK



STAINLESS STEEL HASP & STAPLE

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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HATCHWAY LOCKING DEVICES

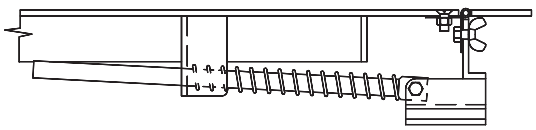
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	HLD-1	A
DATE	01/2018				

HLD-1

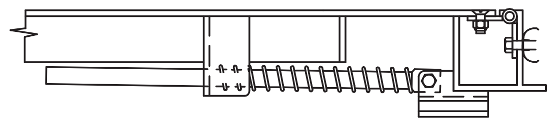
19-18

ACCESSORIES

HATCHWAY SPRING MECHANISMS



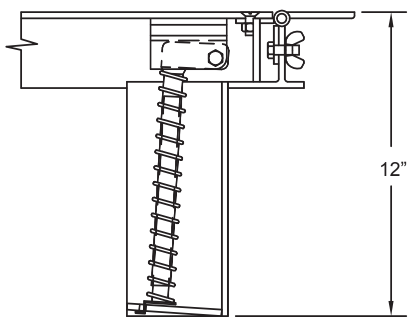
ANGLE FRAME



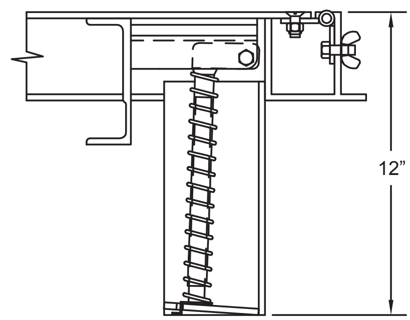
TROUGH FRAME

HORIZONTAL SPRINGS

THE HORIZONTAL ARRANGEMENT IS THE STANDARD DESIGN FOR PEDESTRIAN HATCHES AND HEAVY DUTY SINGLE DOOR HATCHES. THEY ELIMINATE THE CASTING PROBLEMS CAUSED BY THE SPRING ASSEMBLY BELOW THE SLAB.



ANGLE FRAME



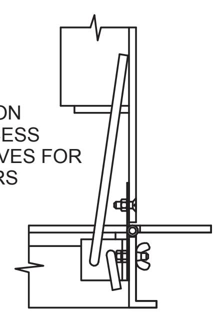
TROUGH FRAME

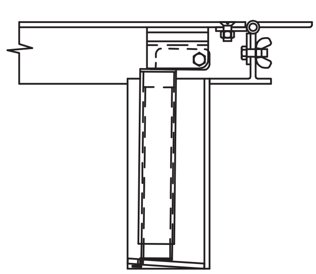
VERTICAL SPRINGS

THE VERTICAL ARRANGEMENT IS THE STANDARD DESIGN FOR HEAVY DUTY DOUBLE DOOR HATCHES. THEY ARE ALSO AVAILABLE ON ANY OF OUR OTHER HATCH DESIGNS.

TORSION BARS

TORSION BAR SPRINGS CAN BE USED ON BOTH TROUGH AND ANGLE FRAME ACCESS DOORS. CONSULT OUR REPRESENTATIVES FOR USE ON HEAVY STEEL OR OTHER DOORS WITH HEAVY COVERS.





ENCLOSED COMPRESSION SPRINGS

WE CAN SUPPLY STAINLESS STEEL ENCLOSURES ON HORIZONTAL AND VERTICAL SPRINGS IF YOU WISH TO ENCLOSE THE SPRINGS.

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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HATCHWAY SPRING MECHANISMS

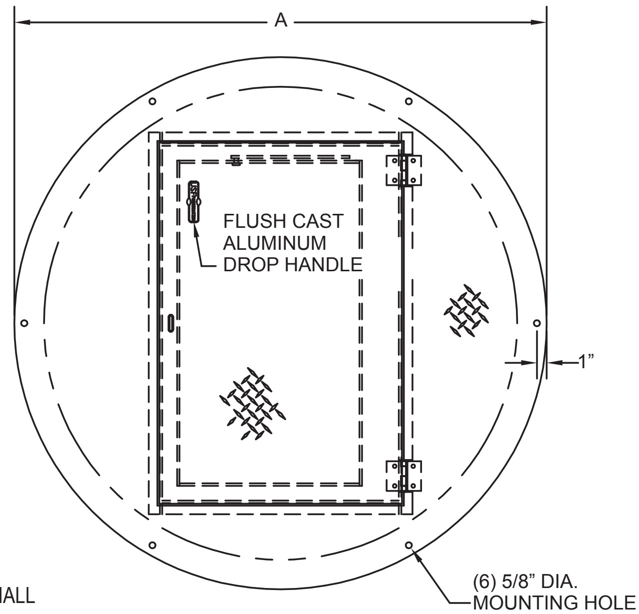
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	HSM-1	A
DATE	01/2018				

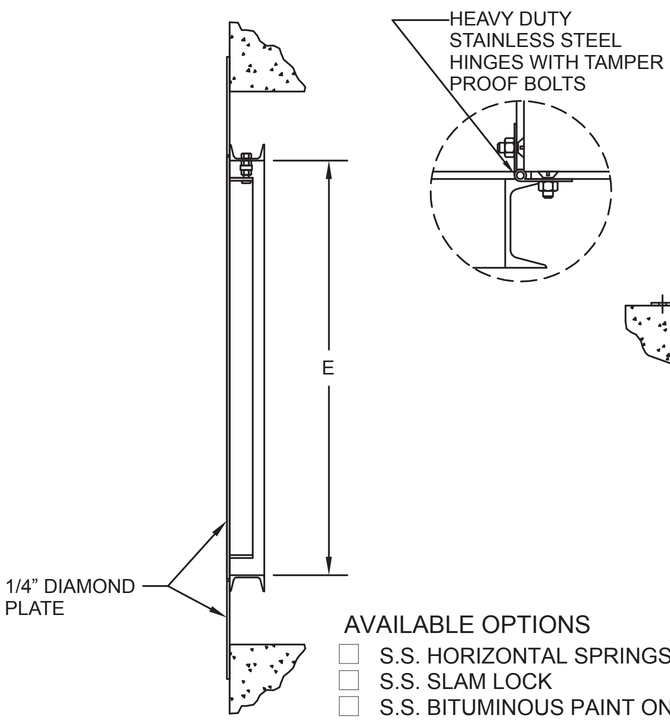
HSM-1

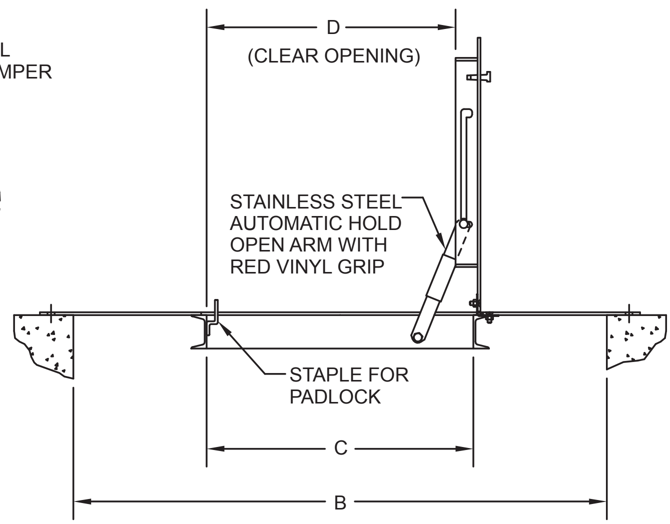
BASIN COVER PEDESTRIAN LOADING SINGLE LEAF

GENERAL INFORMATION:
THE BASIN COVER IS DESIGNED FOR INTERIOR AND EXTERIOR APPLICATIONS WHERE WATERTIGHTNESS IS NOT REQUIRED AND THE COVER IS TO BE BOLTED DOWN TO THE BASIN.

SPECIFICATIONS:
THE BASIN COVER SHALL BE MODEL BPS BY PARK ENVIRONMENTAL EQUIPMENT (800-256-8041), WITH THE SIZE BEING SPECIFIED ON THE PLANS. COVER PLATE AND DOOR LEAF SHALL BE1/4 INCH THICK ALUMINUM DIAMOND PLATE REINFORCED TO A 300 P.S.F. LIVE LOAD. THE COVER SHALL HAVE (6) 5/8" HOLES EQUALLY SPACED AROUND THE PERIMETER TO BOLT IT DOWN TO THE STRUCTURE. THE ACCESS DOOR SHALL BE EQUIPPED WITH A FLUSH ALUMINUM DROP HANDLE THAT DOES NOT PROTRUDE ABOVE THE COVER, AND A STAINLESS STEEL AUTOMATIC HOLD OPEN ARM WITH A RED VINYL GRIP TO LOCK THE COVER IN THE OPEN POSITION.THE DOOR SHALL HAVE STAINLESS STEEL HINGES WITH STAINLESS STEEL TAMPER PROOF BOLTS AND NUTS. A STAPLE FOR A PADLOCK SHALL BE SUPPLIED FOR SECURITY ALL PARTS OF THE FRAME AND COVER SHALL BE ALUMINUM OR STAINLESS STEEL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S ATTACHED INSTRUCTIONS. MANUFACTURER SHALL GUARANTEE AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF TEN (10) YEARS.







AVAILABLE OPTIONS
- ☐ S.S. HORIZONTAL SPRINGS
- ☐ S.S. SLAM LOCK
- ☐ S.S. BITUMINOUS PAINT ON AREA IN CONTACT WITH CONCRETE
- ☐ OTHER ____________

MODEL	DIMENSIONS (in) Thk in.	A	B	C	D	E	WEIGHT Lbs.
BPS-40X36	1/4	40	36	19	17	27	50
BPS-46X42	1/4	46	42	22	20	32	65
BPS-54X48	1/4	54	48	24	22	36	80
BPS-66X60	1/4	66	60	24	22	36	110
BPS-78X72	1/4	78	72	24	22	36	155

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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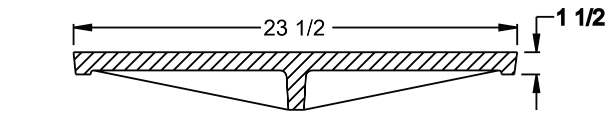
BASIN COVER SINGLE LEAF

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	MODEL BPS	A
DATE 01/2018					

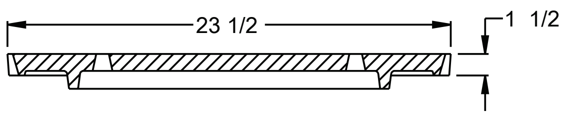
MODEL BPS

Manhole Ring & Cover

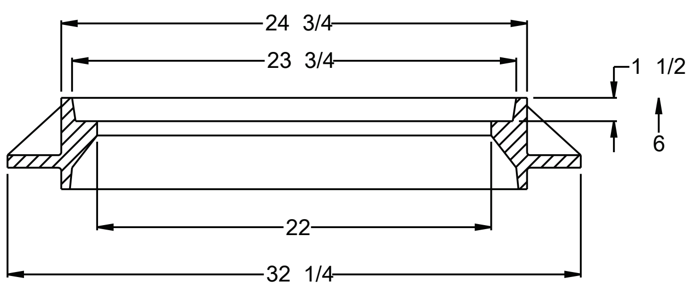
ITEM # 2104/2130-2136



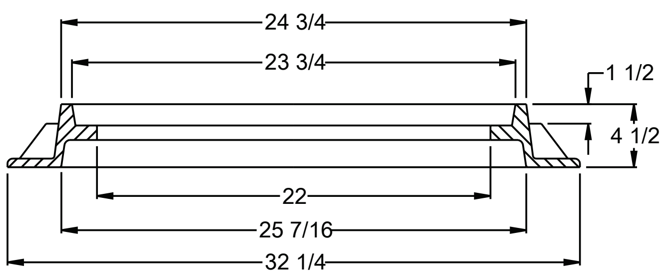
RIBBED COVER



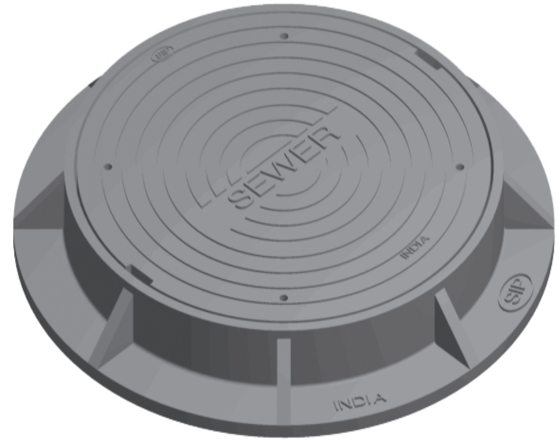
PLATEN COVER



MUDRING



STACKABLE RING



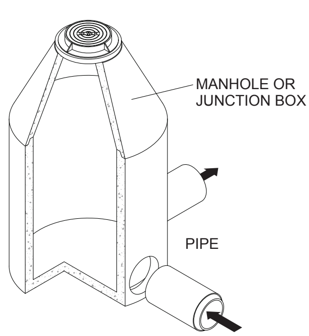
2134

2130

2132

2104

DESCRIPTION : 23½ STD. RING & COVER.
MATERIAL : CAST IRON, ASTM A48, CLASS 30B/35B.



TYPICAL APPLICATION

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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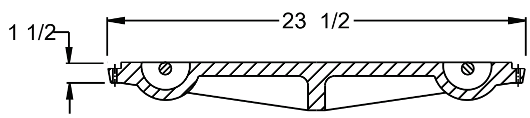
24" MANHOLE RING & COVER

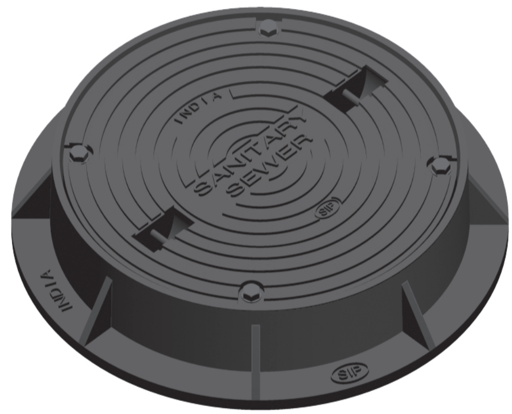
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RC2134	A
DATE 01/2018					

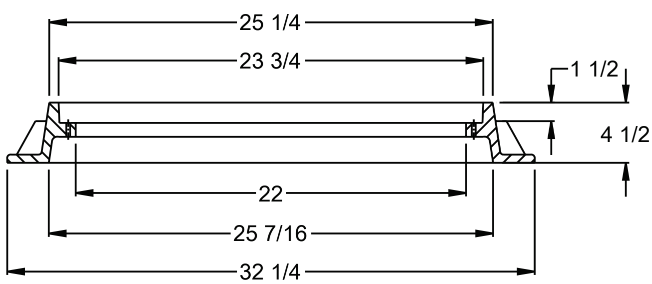
RC2134

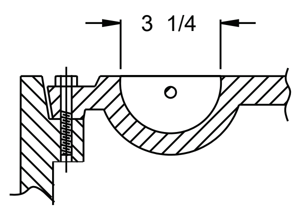
Manhole Ring & Cover

ITEM # 2105

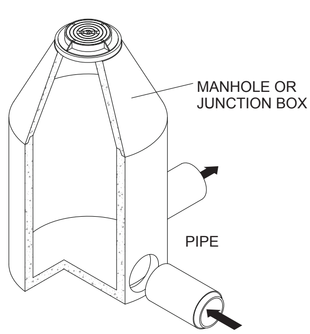








DESCRIPTION : 23½ STD. RING & COVER.
MATERIAL : CAST IRON, ASTM A48, CLASS 35B.
WEIGHT : 240lbs



TYPICAL APPLICATION

PROJECT:
CUSTOMER:
ENGINEER:
ORDER #: PROJ #:
DATE: LOCATION:

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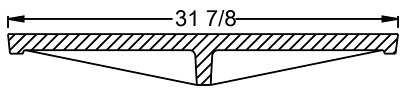
BOLT DOWN 24" MANHOLE RING & COVER

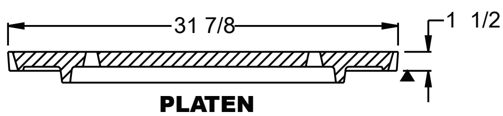
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RC2105	A
DATE 01/2018					

RC2105

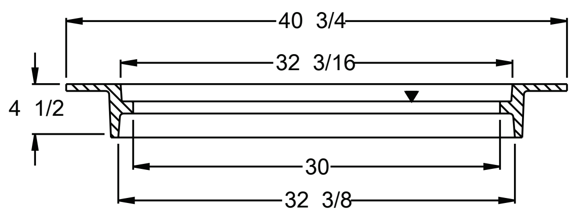
Manhole Ring & Cover ITEM # 2207/2208



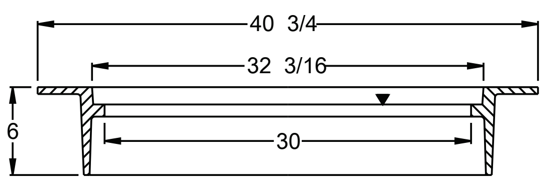
RIBBED



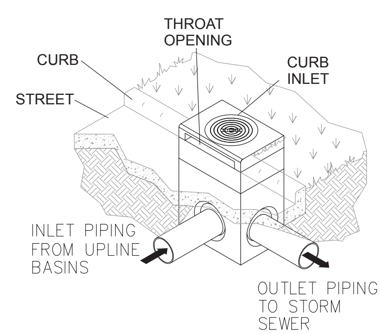
PLATEN



4.5" TOP FLANGE / REVERSIBLE / INVERTED



6" TOP FLANGE / INVERTED



TYPICAL APPLICATION

DESCRIPTION : 23” TOP FLANGE RING & COVER
MATERIAL : CAST IRON, ASTM A48, CLASS 30B/ Class 35B.

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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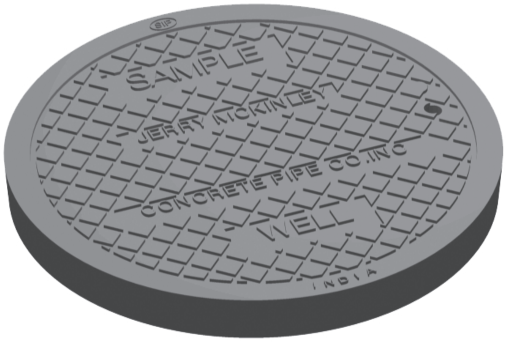
32” CAST IN RING & COVER

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RC2207	A
DATE	01/2018				

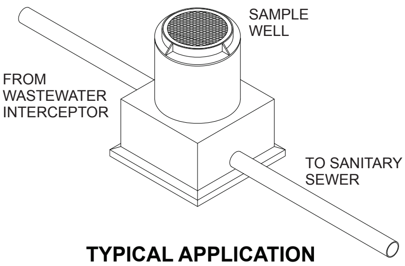
RC2207

Manhole Ring & Cover

ITEM # 2300/2301

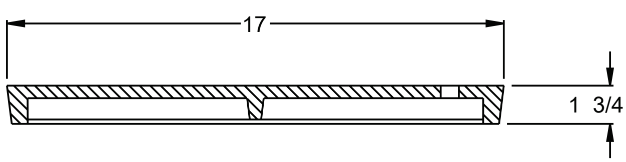


2300



TYPICAL APPLICATION

2301



DESCRIPTION : 17" SAMPLE WELL LOGO COVER.
MATERIAL : CAST IRON, ASTM A48, CLASS 30B.
WEIGHT : 35 lbs

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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17" SAMPLE WELL RING & COVER

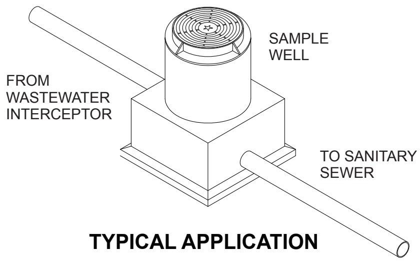
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RC2300	A
DATE 01/2018					

RC2300

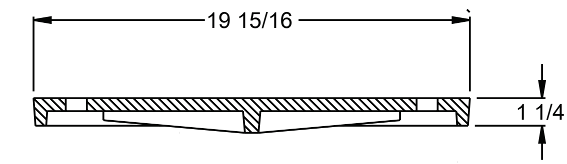
ACCESSORIES

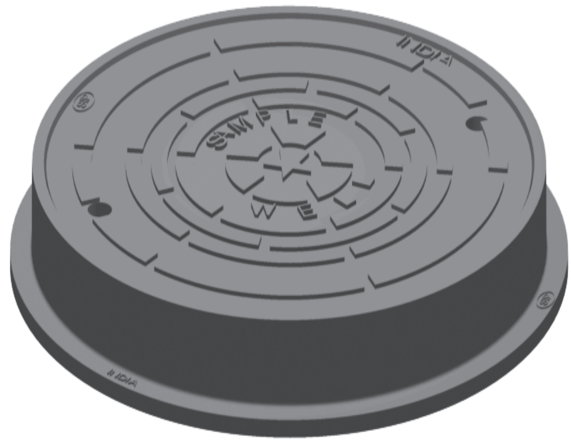
Manhole Ring & Cover

ITEM # 2310-2321

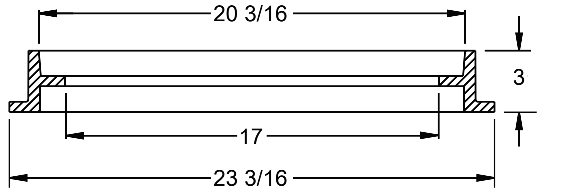


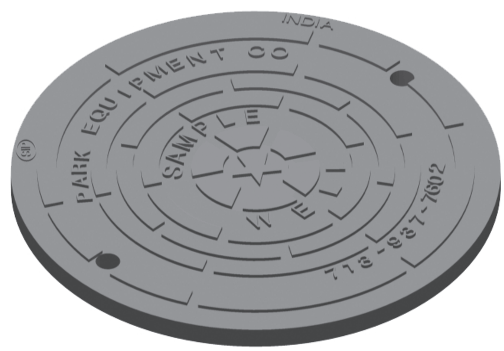
TYPICAL APPLICATION





2310





2320

DESCRIPTION : EQ. V-1815 SAMPLE WELL REV. R&C.
MATERIAL : CAST IRON, ASTM A48, CLASS 30B

PROJECT:
CUSTOMER:
ENGINEER:
ORDER #: PROJ #:
DATE: LOCATION:

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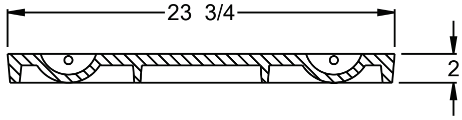
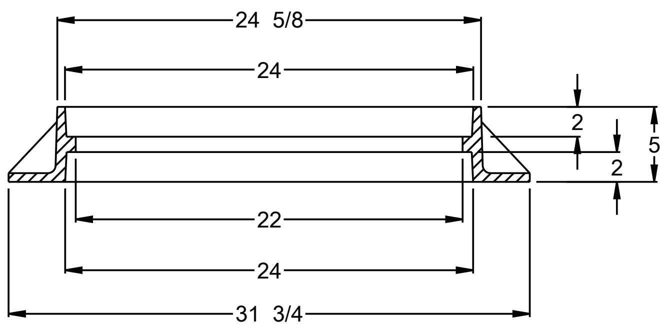
18" SAMPLE WELL RING & COVER

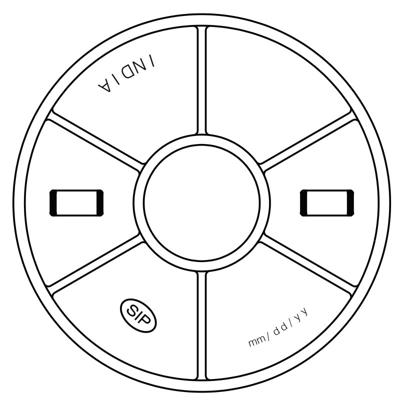
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RC2310	A
DATE	01/2018				

RC2310

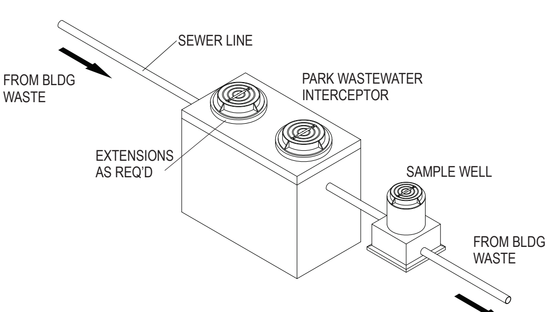
Manhole Ring & Cover — ITEM # 2330-2332







DESCRIPTION : PARK INTERCEPTOR REV. R&C.
MATERIAL : CAST IRON, ASTM A48, CLASS 30B.



TYPICAL APPLICATION

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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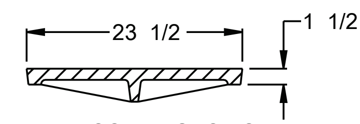
24" INTERCEPTOR RING & COVER

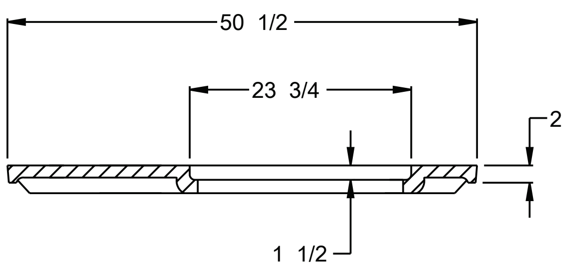
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RC2330	A
DATE 01/2018					

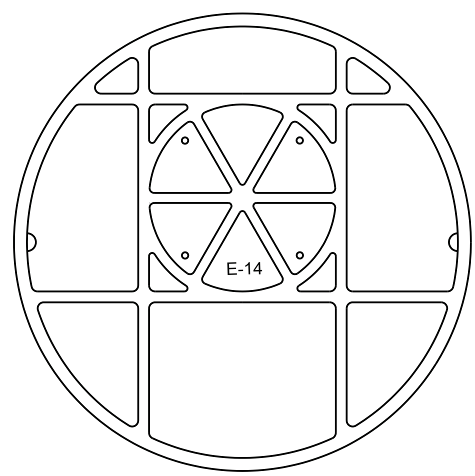
RC2330

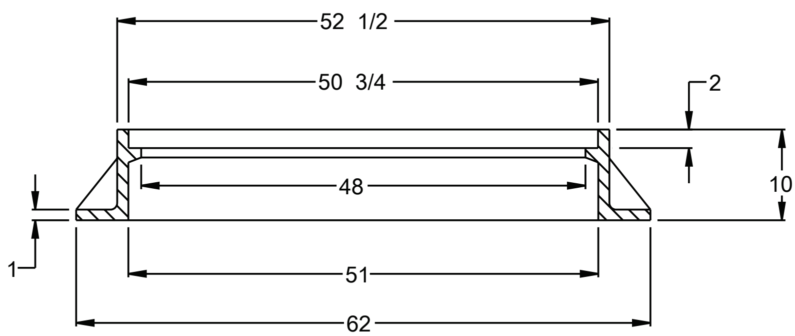
Manhole Ring & Cover ITEM # 2348-2350



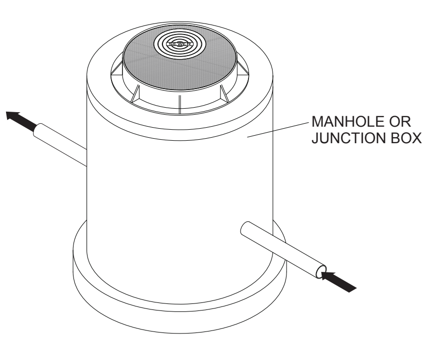
INNER COVER SECTION







DESCRIPTION : EQ. V-7048 UTILITY MANHOLE
MATERIAL : CAST IRON, ASTM A48, CLASS 30B.
WEIGHT : 1580 lbs.



TYPICAL APPLICATION

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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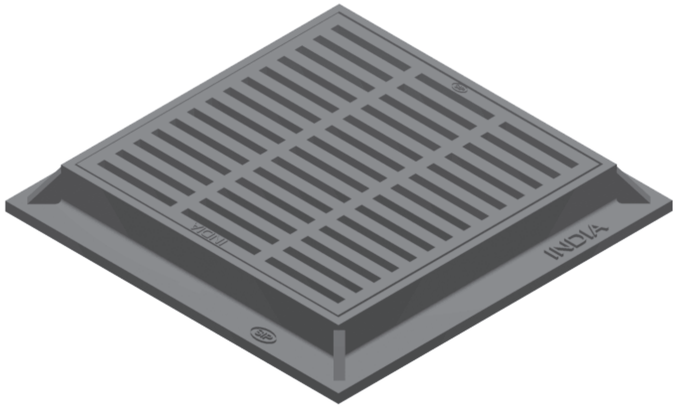
50" UTILITY MANHOLE W/ 24" ACCESS COVER

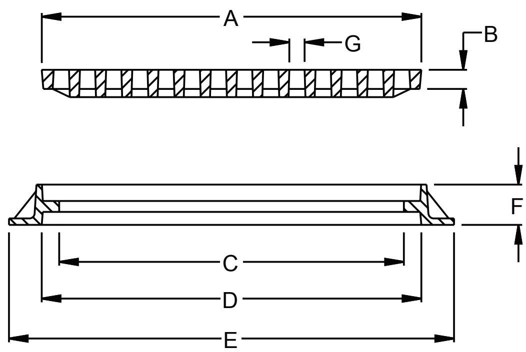
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	RC2348	A
DATE 01/2018					

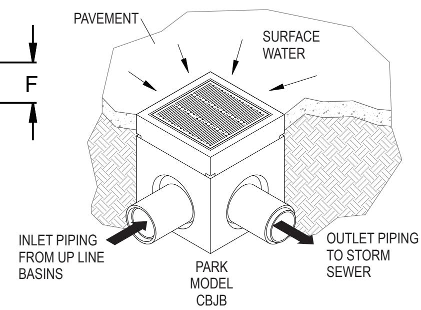
RC2348

Frame and Grate

ITEM # 2700-2730







TYPICAL APPLICATION

ITEM NO.	EQ. NO.	A (IN)	B (IN)	C (IN)	D (IN)	E (IN)	F (IN)	G (IN)	OPEN AREA	WEIGHT (LBS)
2700	V5613	13 3/8 x 13 3/8	1 1/2	11 5/8 x 11 5/8	13 5/8 x 13 5/8	19 1/8 x 19 1/8	4	1 3/8 x 4 5/8	63	125
2705	V5620	19 3/4 x 19 3/4	1 1/2	18 x 18	20 x 20	25 1/2 x 25 1/2	4	1 1/4 x 8 3/8	171	196
2710	V5622	23 3/4 x 23 3/4	1 1/2	22 x 22	24 x 24	29 1/4 x 29 1/4	4	1 1/4 x 6 5/8	275	228
2715	V5624	25 3/4 x 25 3/4	1 1/2	24 x 24	26 x 26	31 1/2 x 31 1/2	4	1 1/ 4 x 7 1/4	300	283
2725	V5630	31 3/4 x 31 3/4	1 1/2	30 x 30	32 x 32	37 1/2 x 37 1/2	4	1 3/16 x 6 5/8	480	402
2728	V5636	37 3/4 x 37 3/4	1 1/2	36 x 36	38 x 38	43 1/2 x 43 1/2	4	1 3/8 x 8 1/2	720	555

PROJECT:
CUSTOMER:
ENGINEER:
ORDER #: PROJ #:
DATE: LOCATION:

DESCRIPTION : REVERSIBLE FRAME & GRATE EQ. V5600 SERIES.
MATERIAL : CAST IRON, ASTM A48, CLASS 30B.

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CAST IRON FRAME & GRATE

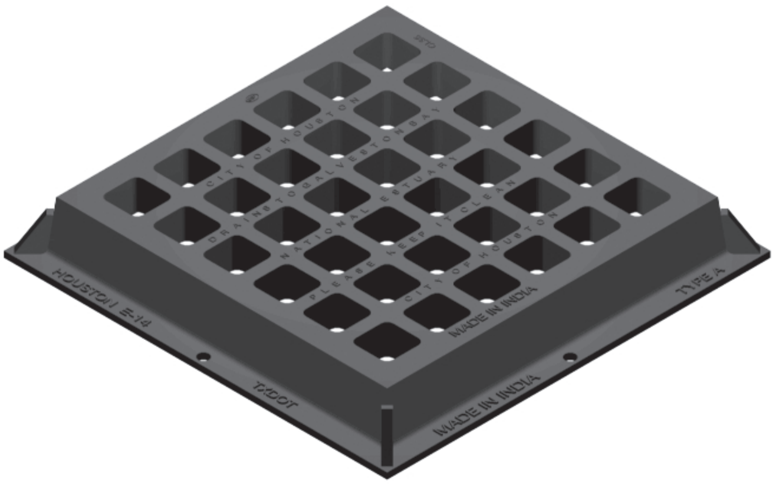
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FG2700	A
DATE 01/2018					

FG2700

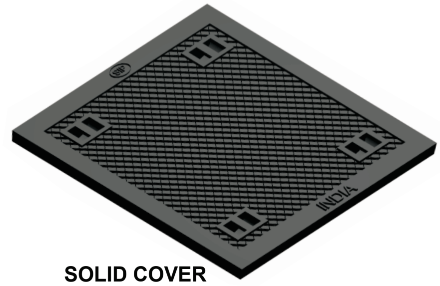
ACCESSORIES

Frame and Grate

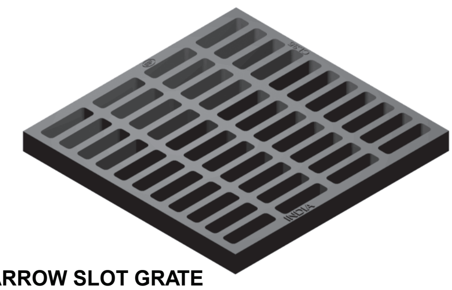
ITEM # 2401-2448



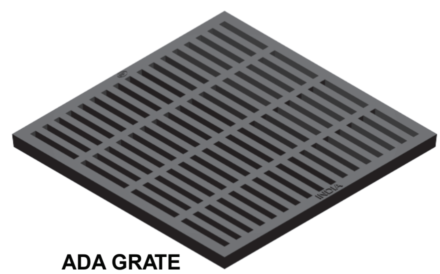
FRAME & GRATE



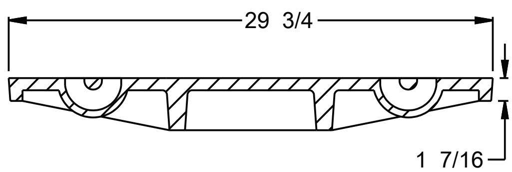
SOLID COVER

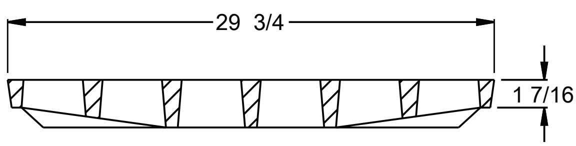


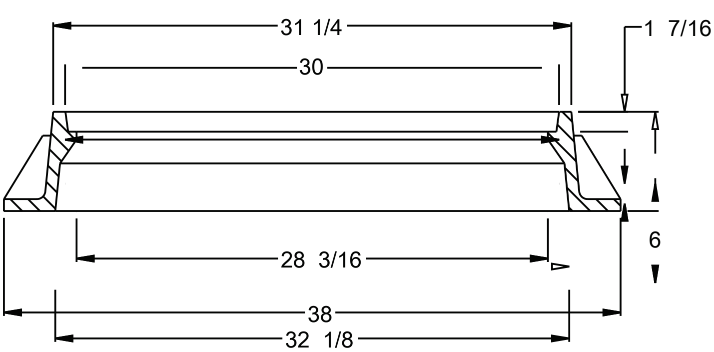
NARROW SLOT GRATE

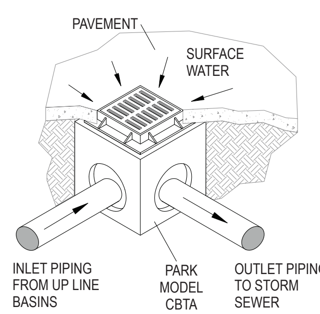


ADA GRATE









TYPICAL APPLICATION

DESCRIPTION : TYPE A 30"x30" FRAME & GRATE
MATERIAL : CAST IRON, ASTM A48, CLASS 30B /CLASS 35B.

ITEM NO	DESCRIPTION	WEIGHT (LBS.)
2425	FRAME & SOLID COVER	440
2440	FRAME & GRATE	425
2443	FRAME & NARROW SLOT GRATE	440
2449	FRAME & ADA GRATE	465

FG2401

PROJECT:
CUSTOMER:
ENGINEER:
ORDER #: PROJ #:
DATE: LOCATION:

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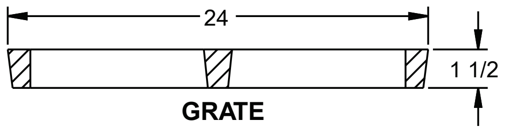
TYPE A FRAME & GRATE

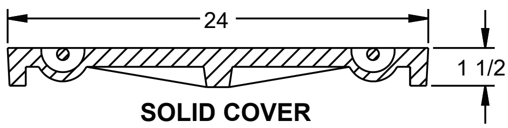
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FG2401	A
DATE 01/2018					

Frame and Grate

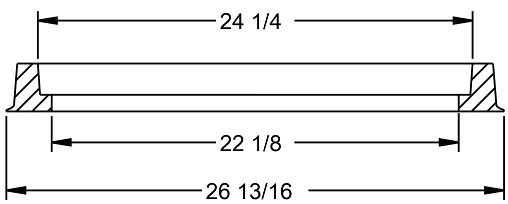
ITEM # 2639-2644



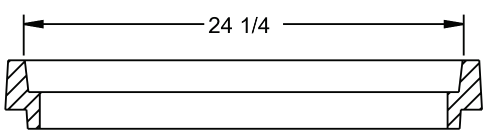
GRATE



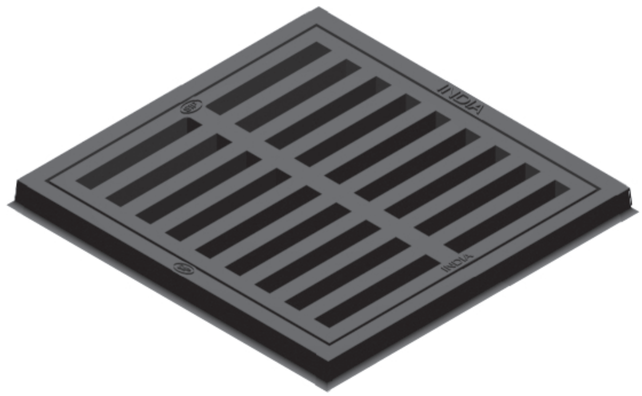
SOLID COVER



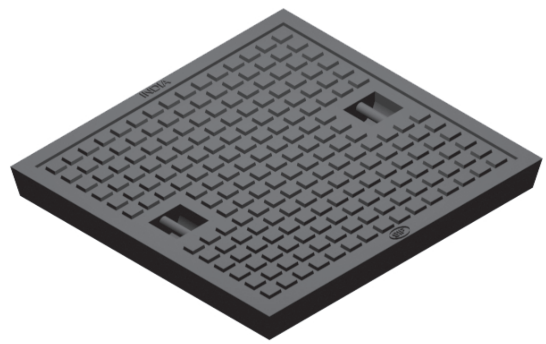
FRAME



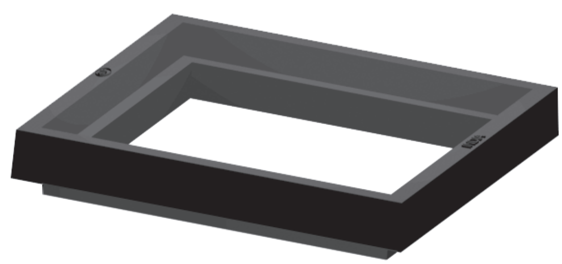
EXTENSION



FRAME & GRATE



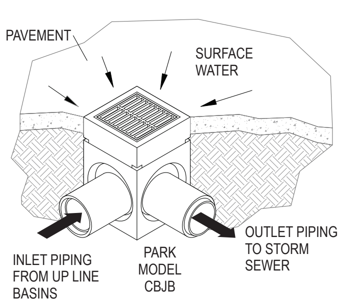
SOLID COVER



EXTENSION

ITEM NO	DESCRIPTION	WEIGHT (LBS.)
2639	FRAME & GRATE	175
2642	FRAME ONLY	67
2643	SOLID COVER	101
2644	EXTENSION	80

DESCRIPTION : 24" X 24" FRAME, GRATE, COVER & EXTENSION.
MATERIAL : CAST IRON, ASTM A48, CLASS 30B.



TYPICAL APPLICATION

FG2639

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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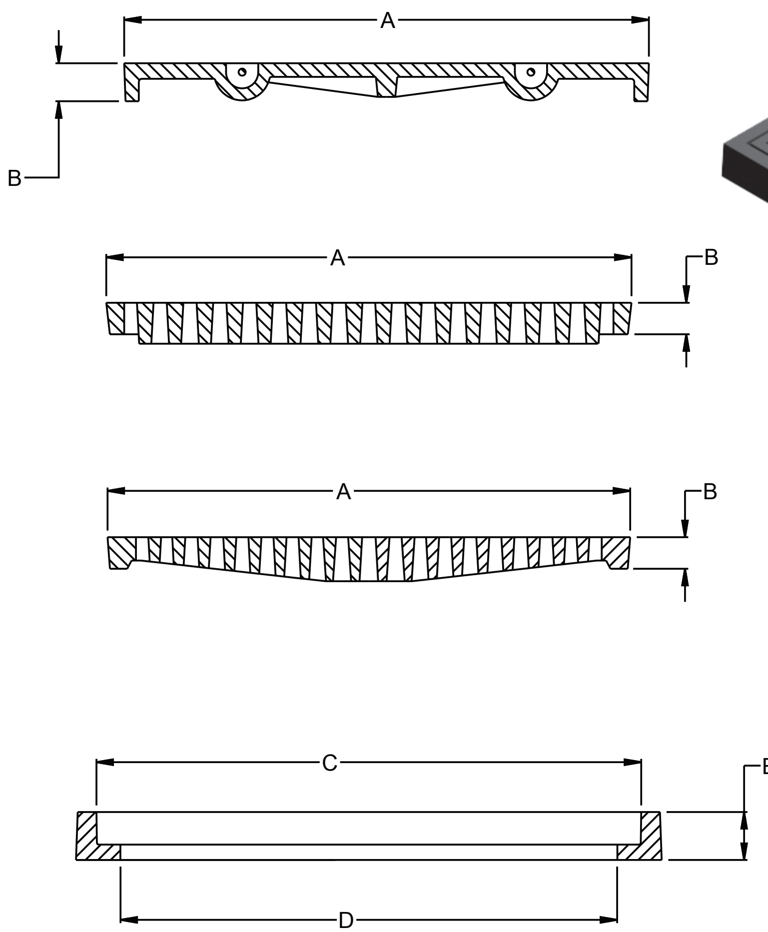
24" X 24" FRAME & GRATE

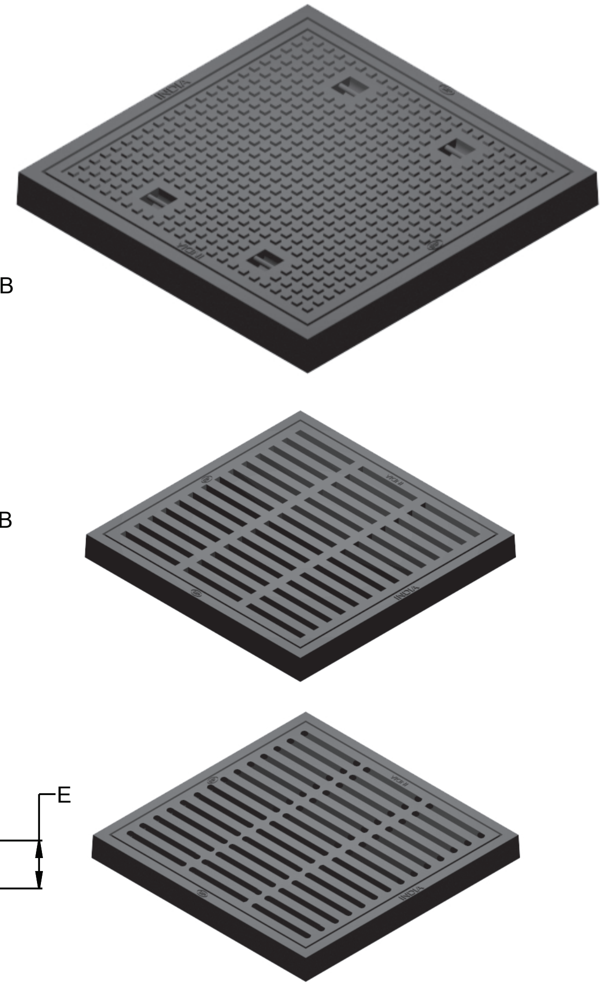
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.		
DATE	01/2018			FG2639	A

ACCESSORIES

Frame and Grate

ITEM # 2660 - 2682

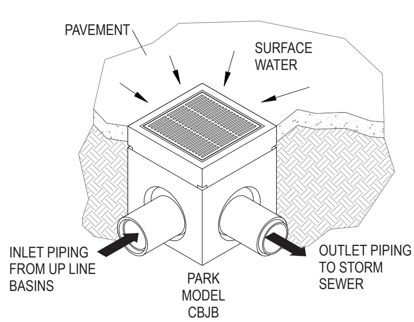




ITEM NO	SIZE (IN.)	A (IN.)	B (IN.)	C (IN.)	D (IN.)	E (IN.)
2660/61/62	32 X 32	32	2	32 ¼	30 ½	2 ¾
2670/71/72	34 X 34	34	2	34 ¼	32 ¼	2 ¾
2680/81/82	38 X 38	38	2	38 ¼	36 ¼	2 ¾

DESCRIPTION : FRAME, GRATE & COVER.

MATERIAL : CAST IRON, ASTM A48, CLASS 30B.



TYPICAL APPLICATION

FG2660

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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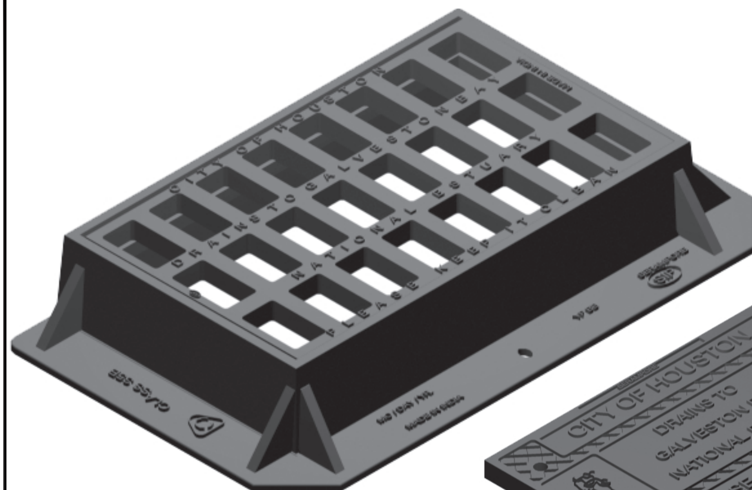
30" X 30" FRAME & GRATE

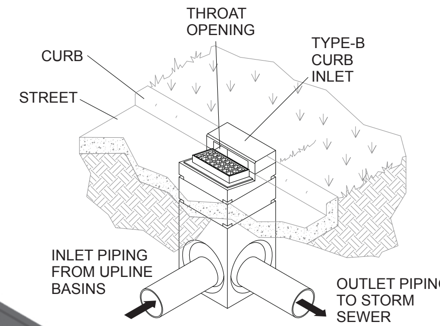
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FG2660	A
DATE	01/2018				

Frame and Grate

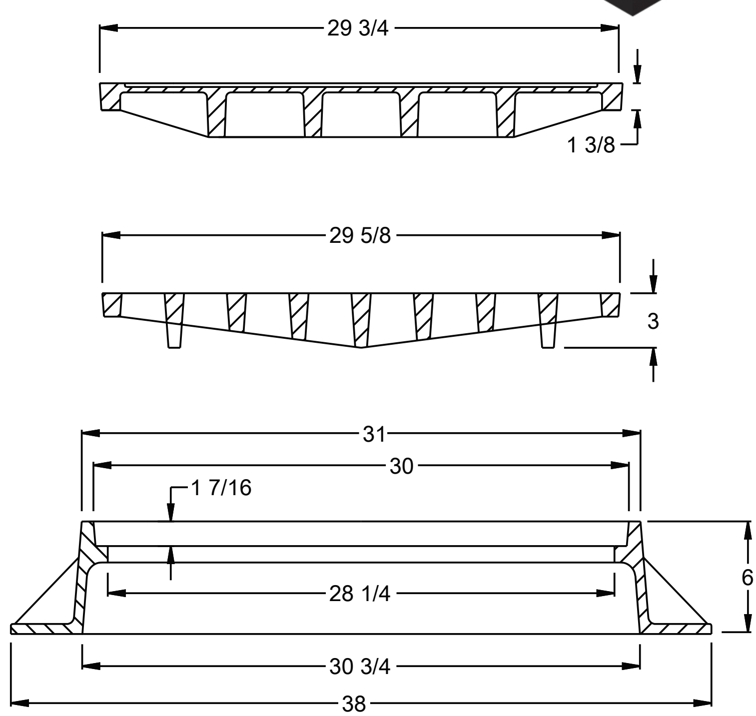
ITEM # 2457 -2460



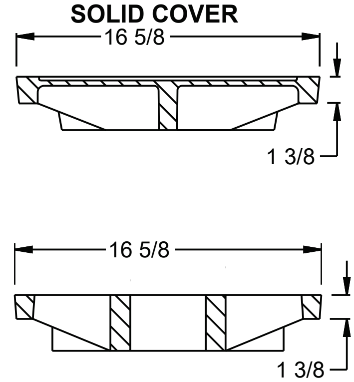
FRAME & GRATE

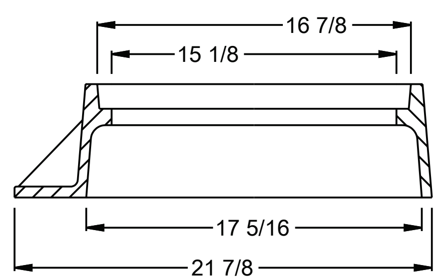


TYPICAL APPLICATION



SOLID COVER





DESCRIPTION : TYPE B FRAME, COVER & GRATE.
MATERIAL : CAST IRON,ASTM A48,CLASS 35B.

ITEM NO	DESCRIPTION	WEIGHT (LBS.)
2457	FRAME & COH COVER	255
2460	FRAME & COH GRATE	245

FG2457

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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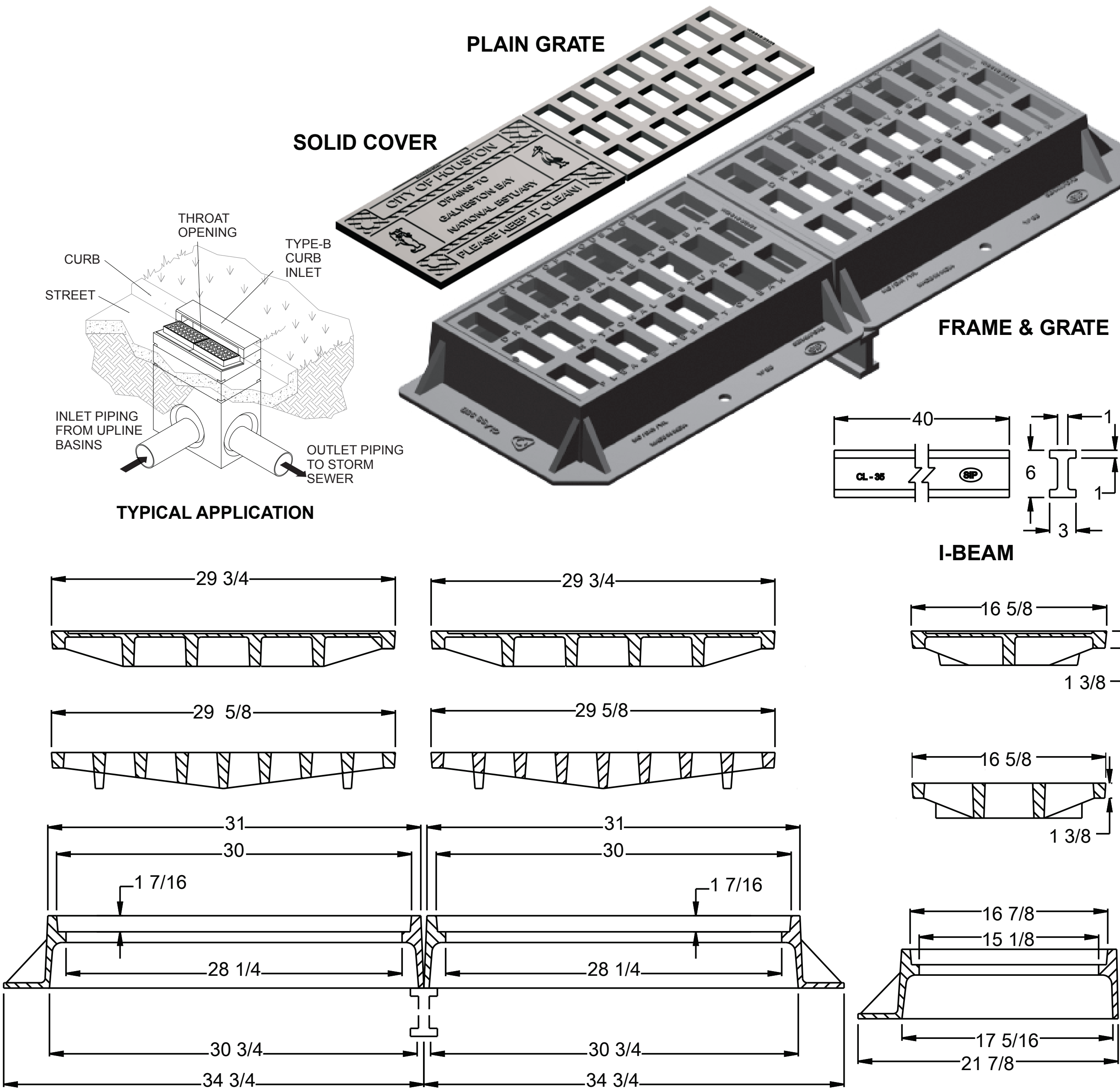
TYPE B CURB INLET FRAME & GRATE

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FG2457	A
DATE 01/2018					

Frame and Grate

ITEM # 2560 - 2567



DESCRIPTION : TYPE BB FRAME, COVER & GRATE.
MATERIAL : CAST IRON, ASTM A48, CLASS 35B.

ITEM NO	DESCRIPTION	WEIGHT (LBS.)
2560	FRAME & COH COVER	597
2562	FRAME & COH GRATE	577
2564	FRAME & PLAIN GRATE	557
2565	I-BEAM ONLY	107

PROJECT:
CUSTOMER:
ENGINEER:
ORDER #: PROJ #:
DATE: LOCATION:

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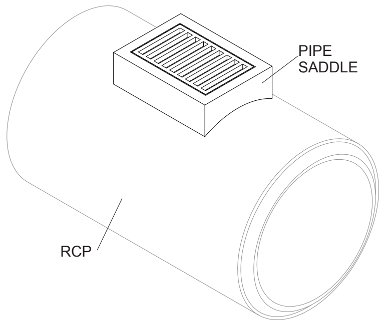
TYPE BB CURB INLET FRAME & GRATE

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FG2560	A
DATE 01/2018					

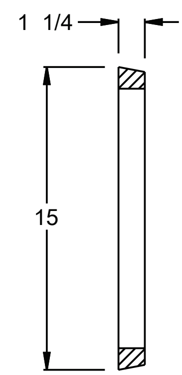
FG2560

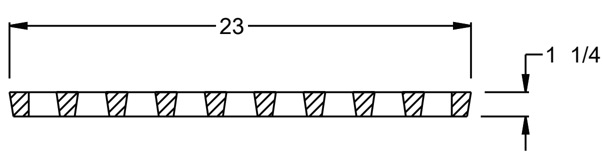
Frame and Grate

ITEM # 2615



TYPICAL APPLICATION





DESCRIPTION : 23” X 15” GRATE ONLY EQ. V6072.
MATERIAL : CAST IRON, ASTM A48, CLASS 30B.
WEIGHT : 55 lbs.

PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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23” X 15” GRATE

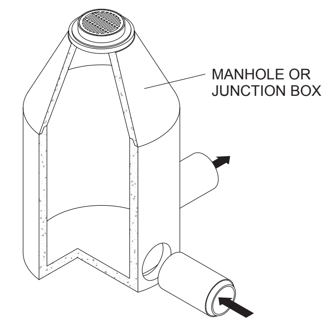
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FG2615	A
DATE	01/2018				

FG2615

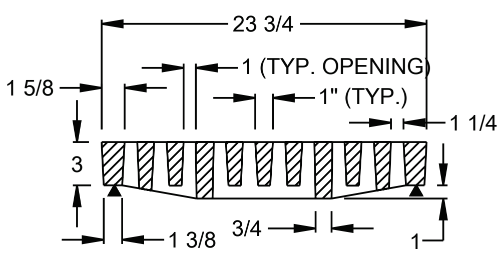
ACCESSORIES

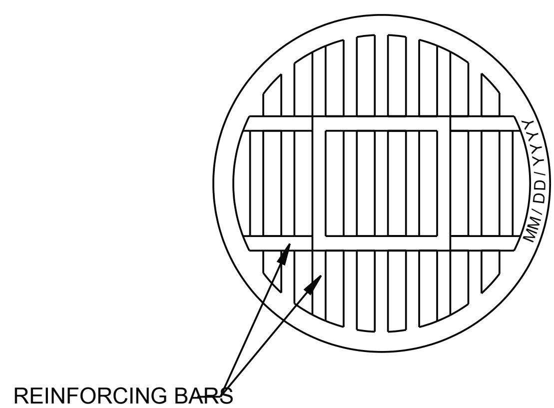
Frame and Grate

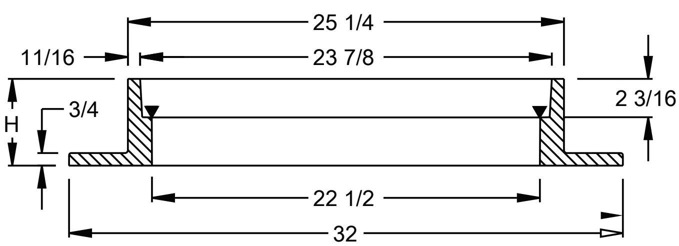
ITEM # 4450-4460



TYPICAL APPLICATION







ITEM	DESCRIPTION	H
4450	GRATE w/5 1/4" HIGH RING.	5 1/4
4460	GRATE w/6 1/4" HIGH RING	6 1/4

DESCRIPTION : CITY OF EL PASO STORM RING & GRATE
MATERIAL : CAST IRON, ASTM A48, CLASS 35B.

PROJECT:
CUSTOMER:
ENGINEER:
ORDER #: PROJ #:
DATE: LOCATION:

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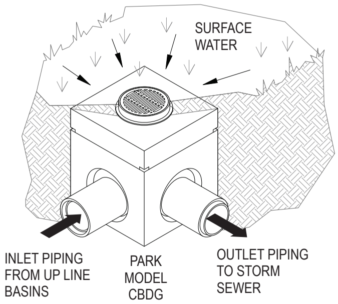
24" RING & GRATE

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FG4450	A
DATE	01/2018				

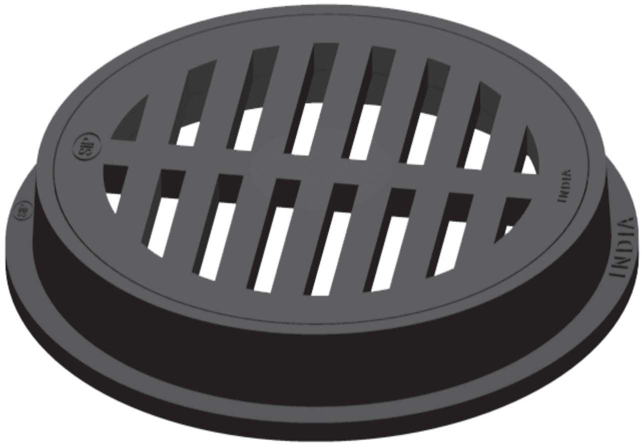
FG4450

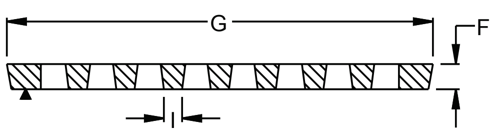
Frame and Grate

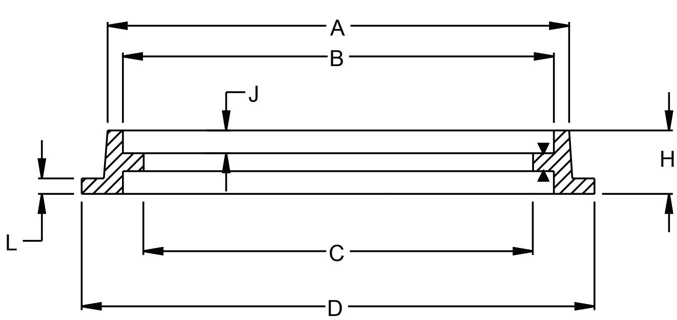
ITEM # 2690 - 2693

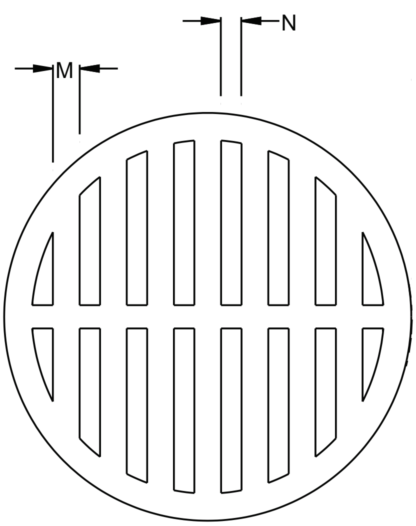


TYPICAL APPLICATION









ITEM	EQ.NO.	A	B	C	D	F	G	H	I	J	L	M	N	WEIGHT (lbs.)
2690	V3810-1	11 5/8	10 1/2	8 1/2	14 1/2	1 1/2	10 1/4	4	5/8	1 1/2	1/2	3/4	1 3/8	55
2691	V3810-2	14 5/8	13 1/2	11 1/2	17 5/8	1 1/2	13 1/4	4	7/8	1 1/2	1/2	1	1 1/8	81
2692	V3810-3	17 5/8	16 1/2	14 1/2	20 1/2	1 1/2	16 1/4	4	7/8	1 1/2	1/2	1	1 1/8	106
2693	V3810-4	23 5/8	22 1/8	20 1/4	26 5/8	1 1/2	21 7/8	4	7/8	1 1/2	1/2	1	1 1/4	170

PROJECT:
CUSTOMER:
ENGINEER:
ORDER #: PROJ #:
DATE: LOCATION:

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DITCH INLET RING & GRATE

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FG2690	A
DATE 01/2018					

FG2690

DESCRIPTION : REV. RING & GRATEEQ. V-3810..
MATERIAL : CAST IRON,ASTM A48, CLASS 30B.

NOTES


PARK USA
A Northwest Pipe Company
Normal
100% Full
50% Full
Leak Detection
TEST
SILENCE

CONTROLS

NOTES

SENSORS & CONTROL PANELS

BEST USE FOR:

STORMWATER

PARK USA
A Northwest Pipe Company

ENGINEERING FACTS

ParkUSA offers a wide variety of sensors and customizable control panels for our products. These vary in size and function to effectively address the needs of your project.

SENSORS

High Oil Level

Oil interface float switches indicate high oil levels following excessive oil accumulation in the designated holding area of a product. Each switch is actuated using stainless steel floats with specific gravity of 0.92, allowing each float to rise to the open position in the presence of water while sinking to the closed position in the presence of oil. The conduit head may be mounted with the structure or on the outside of the unit.

Grease Interface

Grease interface float switches are used to indicate high oil levels following excessive oil accumulation in the designated holding area of a product. Grease interface float switches have a protective membrane (grease shield) to avoid fouling of the float switch actuators. Each switch is actuated using stainless steel floats with specific gravity of 0.92, allowing each float to rise to the open position in the presence of water while sinking to the closed position in the presence of oil. The conduit head may be mounted with the structure or on the outside of the unit.

Fluid Level

Level indicator float switches are typically used to indicate that the fluid levels are above a set elevation. The sensor's actuation level is set during installation and remains in the open position while fluids are below this established limit.

Single Float Switch

For a steel holding tank, the conduit head is mounted on the outside of the unit. Performance is dependent on tank design and mounting location.

For concrete holding tanks and those with debris screens the conduit head is mounted at a high elevation inside the structure with a lead running to the float switch apparatus and is typically used to detect flow obstruction and fluid buildup.

Dual Float Switch

For a steel holding tank, the conduit head is mounted on the outside of the unit. Performance is dependent on tank design and mounting location.

For concrete holding tanks and those with debris screens the conduit head is mounted at a high elevation inside the structure with a lead running to the float switch apparatus. Performance is dependent on tank design and mounting location.

Triple Float Switch

For a steel holding tank, the conduit head is mounted on the outside of the unit. Performance is dependent on tank design and mounting location. Typical applications include "fluid level rising" and "fluid level falling" detection.

Analog
Single float device for most holding tank applications which includes a continuous sensor for level monitoring with a range of fluid elevations. The sensor provides analog feedback to the control panel and allows real time level indication.

Float
Single float device for most concrete and steel holding tanks. A junction box is mounted at a high elevation inside concrete structures and outside steel structures with a lead running to the float switch apparatus.

Leak Detection
Leak detection sensors are typically used to detect when fluid is present in an area of a product that is not supposed to contain any fluid. These sensors are designed to close only upon submersion in a fluid and can be installed inside the hollow walls of many products upon request.

Conductivity sensing device is installed in an area meant to be void of fluid. Upon submergence, the fluid provides an electrical pathway between two electric probes on the sensor, thereby indicating submergence.

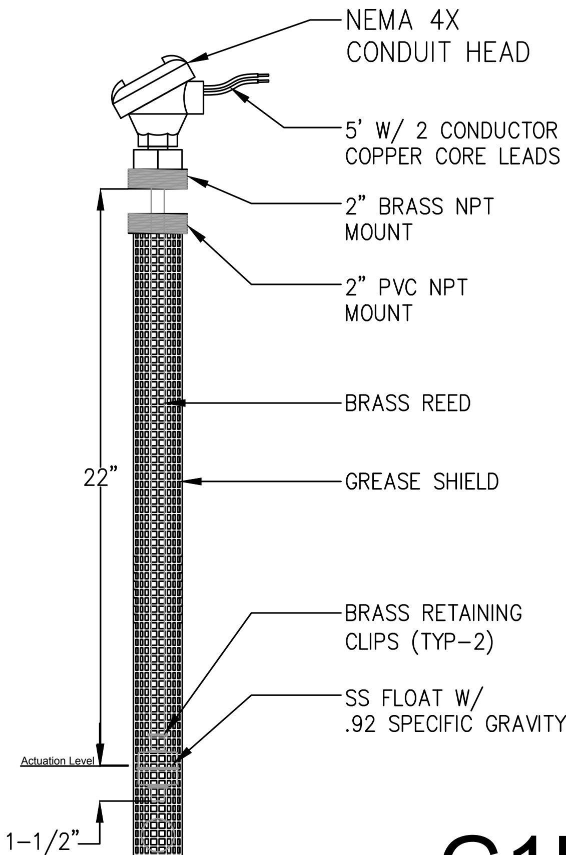
Lay-flat float device is installed on the floor or horizontal surface of a product. Upon submergence, an attached float raises an existing lever away from the horizontal plane and closes the switch, thereby indicating submergence.

Buoyancy float device is installed in an area meant to be void of fluid. Upon submergence, an enclosed float raises with the fluid and close upon a set elevation.

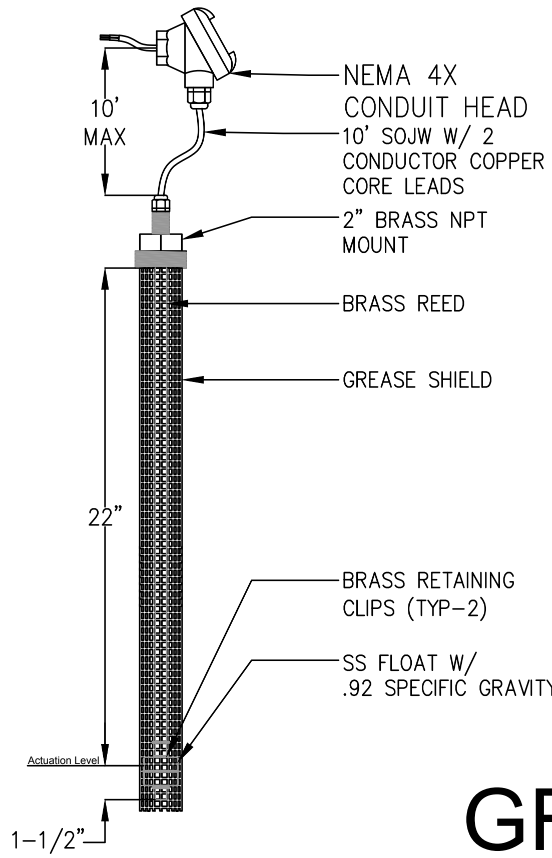
pH Sensors
Applications include acid neutralization tanks and other situations where pH monitoring is required. The pH sensor is designed to be mounted in a manner that allows for the pH probe to be submerged in the flowing fluid. The sensor is manufactured and installed with a protective PVC housing to protect the cable connecting the sensor to the conduit head within the enclosed environment.

Ultra-Sonic Sensors
These sensors are typically used to detect fluid levels when contact with the fluid is undesirable, such as an acidic environment or laminar flow. This sensor type produces analog feedback meaning the return signal will vary in magnitude.

CONTROL PANELS
Control panels are offered in a variety of user interface features including, but not limited to, audible alarms; light indicators; control switches; sensor status display screens; and data logging.



G1F



GF

G1F SENSOR:

SINGLE FLOAT SWITCH DEVICE FOR MOST STEEL HOLDING TANKS. CONDUIT HEAD IS MOUNTED ON THE OUTSIDE OF THE UNIT. PROTECTIVE MEMBRANE IS PRESENT AROUND FLOAT SWITCH APPARATUS TO AVOID FOULING OF THE FLOAT SWITCH ACTUATORS.

GF SENSOR:

SINGLE FLOAT SWITCH DEVICE FOR MOST CONCRETE HOLDING TANKS. CONDUIT HEAD IS MOUNTED AT A HIGH ELEVATION INSIDE THE STRUCTURE WITH A LEAD RUNNING TO THE FLOAT SWITCH APPARATUS. PROTECTIVE MEMBRANE IS PRESENT AROUND FLOAT SWITCH APPARATUS TO AVOID FOULING OF THE FLOAT SWITCH ACTUATORS.

GREASE INTERFACE SENSORS

GREASE INTERFACE FLOAT SWITCHES HAVE A PROTECTIVE MEMBRANE (GREASE SHIELD) TO AVOID FOULING OF THE FLOAT SWITCH ACTUATORS.

GREASE INTERFACE FLOAT SWITCHES ARE USED TO INDICATE HIGH OIL LEVELS FOLLOWING EXCESSIVE OIL ACCUMULATION IN THE DESIGNATED HOLDING AREA OF A PRODUCT. EACH SWITCH IS ACTUATED USING STAINLESS STEEL FLOATS WITH A SPECIFIC GRAVITY OF 0.92, ALLOWING EACH FLOAT TO RISE TO THE OPEN POSITION IN THE PRESENCE OF WATER WHILE SINKING TO THE CLOSED POSITION IN THE PRESENCE OF OIL.

GREASE LEVEL SENSORS

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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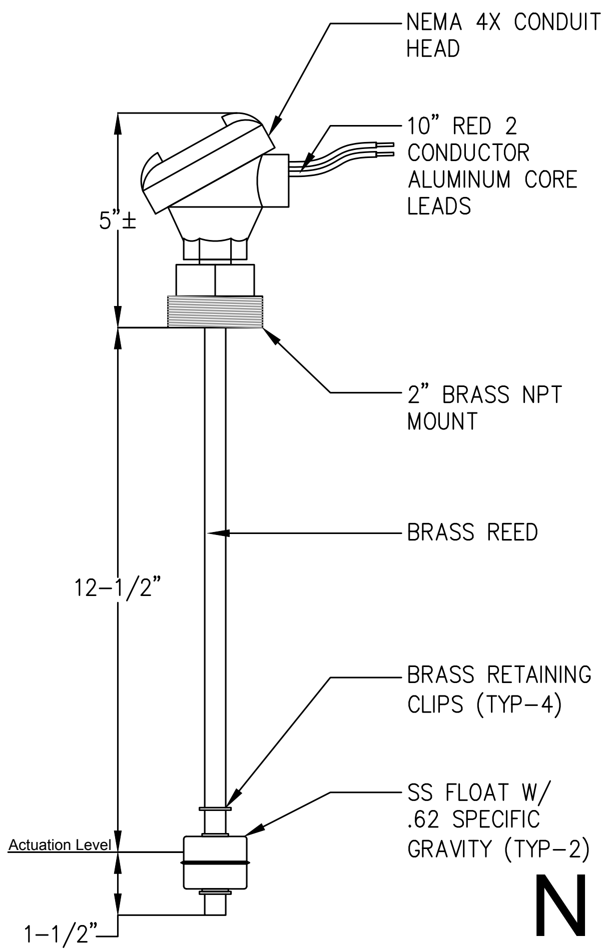
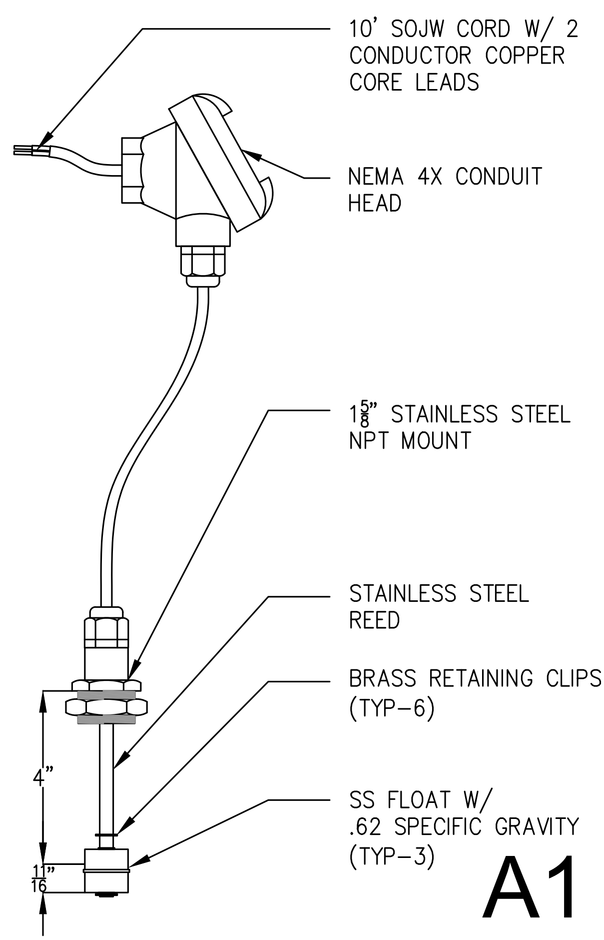
HIGH GREASE LEVEL SENSORS

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	GREASE LEVEL SENSORS	A
DATE	07/2018				





N SENSOR:

SINGLE FLOAT SWITCH DEVICE FOR MOST STEEL HOLDING TANKS. CONDUIT HEAD IS MOUNTED ON THE OUTSIDE OF THE UNIT. PERFORMANCE IS DEPENDANT ON TANK DESIGN AND MOUNTING LOCATION.

A1 SENSOR:

SINGLE FLOAT SWITCH DEVICE FOR MOST CONCRETE HOLDING TANKS AND TANKS WITH DEBRIS BASKETS. CONDUIT HEAD IS MOUNTED AT A HIGH ELEVATION INSIDE THE STRUCTURE WITH A LEAD RUNNING TO THE FLOAT SWITCH APPARATUS. DEVICE TYPICALLY USED TO DETECT FLOW OBSTRUCTION AND FLUID BUILDUP.

LEVEL INDICATOR SENSORS:

LEVEL INDICATOR FLOAT SWITCHES ARE TYPICALLY USED TO INDICATE THAT FLUID LEVELS ARE ABOVE A SET ELEVATION. THE SENSOR'S ACTUATION LEVEL IS SET DURING INSTALLATION, AND REMAINS IN THE OPEN POSITION WHILE FLUIDS ARE BELOW THIS ESTABLISHED LIMIT.

FLUID LEVEL SENSORS – SINGLE FLOAT

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

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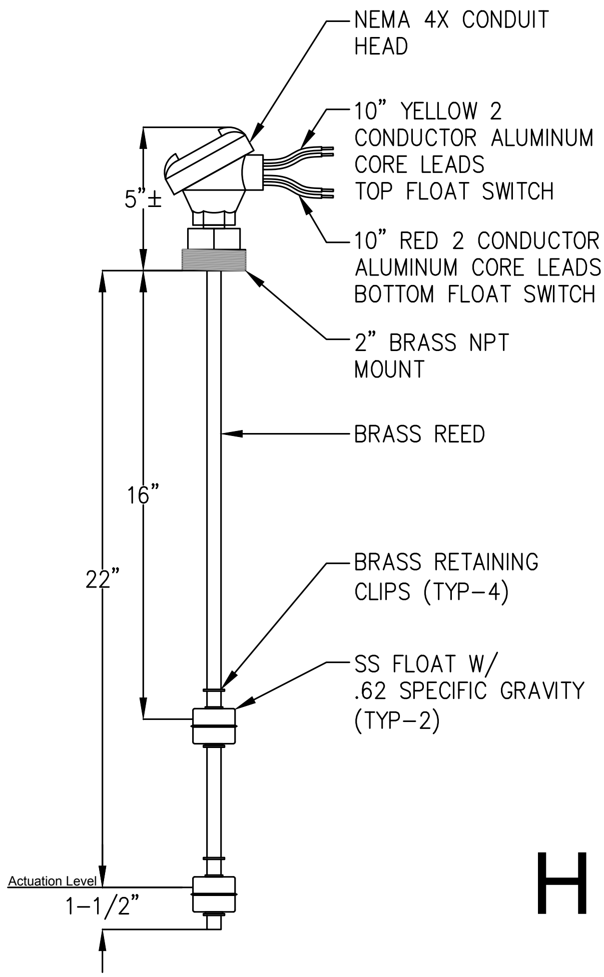
SINGLE FLOAT FLUID LEVEL SENSORS

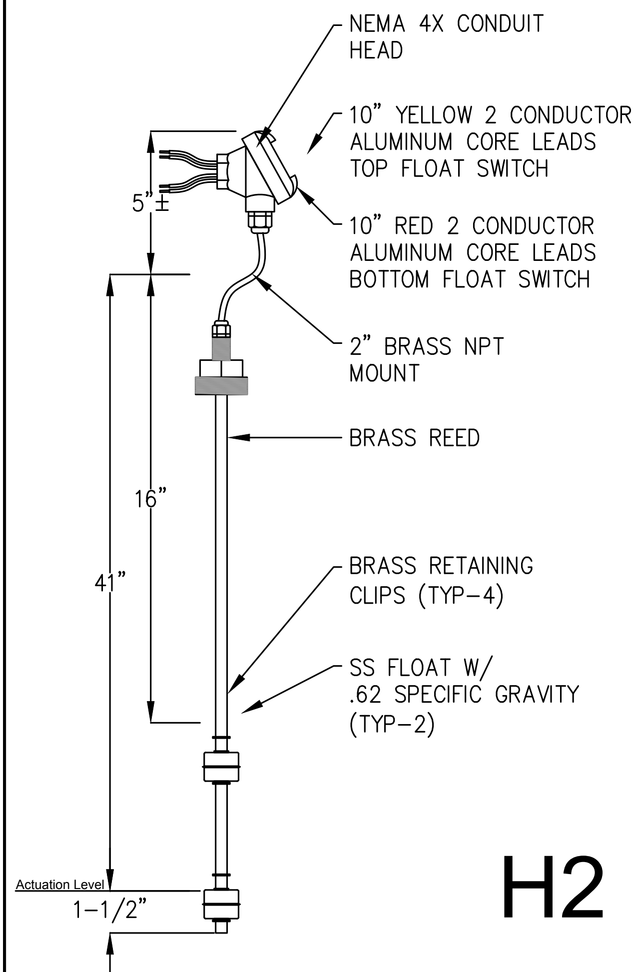
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FLUID LEVEL SENSORS – SINGLE FLOAT	A
DATE 07/2018					

CONTROLS



H SENSOR:

DUAL FLOAT SWITCH DEVICE FOR MOST STEEL HOLDING TANKS. CONDUIT HEAD IS MOUNTED ON THE OUTSIDE OF THE UNIT. PERFORMANCE IS DEPENDANT ON TANK DESIGN AND MOUNTING LOCATION.



H2 SENSOR:

DUAL FLOAT SWITCH DEVICE FOR MOST STEEL HOLDING TANKS. CONDUIT HEAD IS MOUNTED AT A HIGH ELEVATION INSIDE THE STRUCTURE WITH A LEAD RUNNING TO THE FLOAT SWITCH APPARATUS. PERFORMANCE IS DEPENDANT ON TANK DESIGN AND MOUNTING LOCATION.

LEVEL INDICATOR SENSORS:

LEVEL INDICATOR FLOAT SWITCHES ARE TYPICALLY USED TO INDICATE THAT FLUID LEVELS ARE ABOVE A SET ELEVATION. THE SENSOR'S ACTUATION LEVEL IS SET DURING INSTALLATION, AND REMAINS IN THE OPEN POSITION WHILE FLUIDS ARE BELOW THIS ESTABLISHED LIMIT.

FLUID LEVEL SENSORS – DUAL FLOAT

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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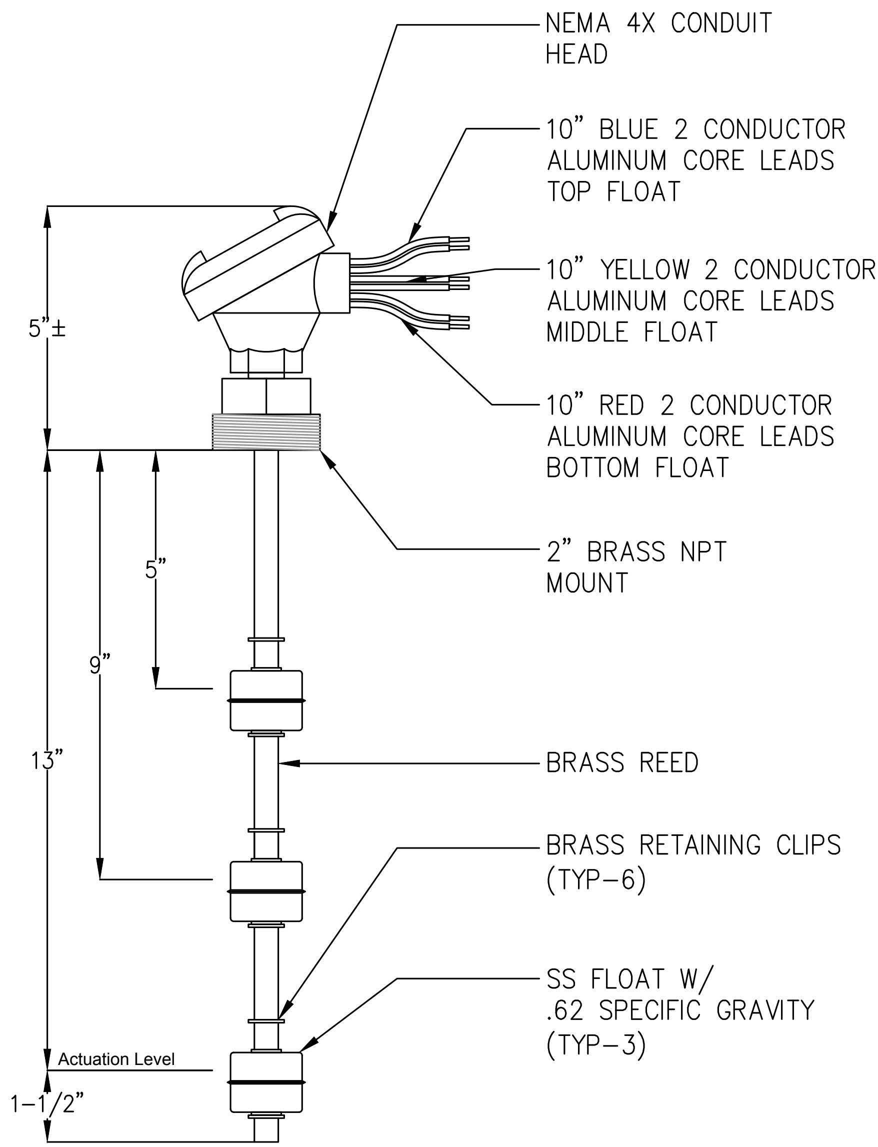
DUAL FLOAT FLUID LEVEL SENSORS

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FLUID LEVEL SENSORS – DUAL FLOAT	A
DATE	07/2018				

L



L SENSOR:

TRIPLE FLOAT SWITCH DEVICE FOR MOST STEEL HOLDING TANKS. CONDUIT HEAD IS MOUNTED ON THE OUTSIDE OF THE UNIT. PERFORMANCE IS DEPENDANT ON TANK DESIGN AND MOUNTING LOCATION. TYPICAL APPLICATIONS INCLUDE PARKUSA ELEVADER PRODUCT FOR "FLUID LEVEL RISING" AND "FLUID LEVEL FALLING" DETECTION.

LEVEL INDICATOR SENSORS:

LEVEL INDICATOR FLOAT SWITCHES ARE TYPICALLY USED TO INDICATE THAT FLUID LEVELS ARE ABOVE A SET ELEVATION. THE SENSOR'S ACTUATION LEVEL IS SET DURING INSTALLATION, AND REMAINS IN THE OPEN POSITION WHILE FLUIDS ARE BELOW THIS ESTABLISHED LIMIT.

FLUID LEVEL SENSORS – TRIPLE FLOAT

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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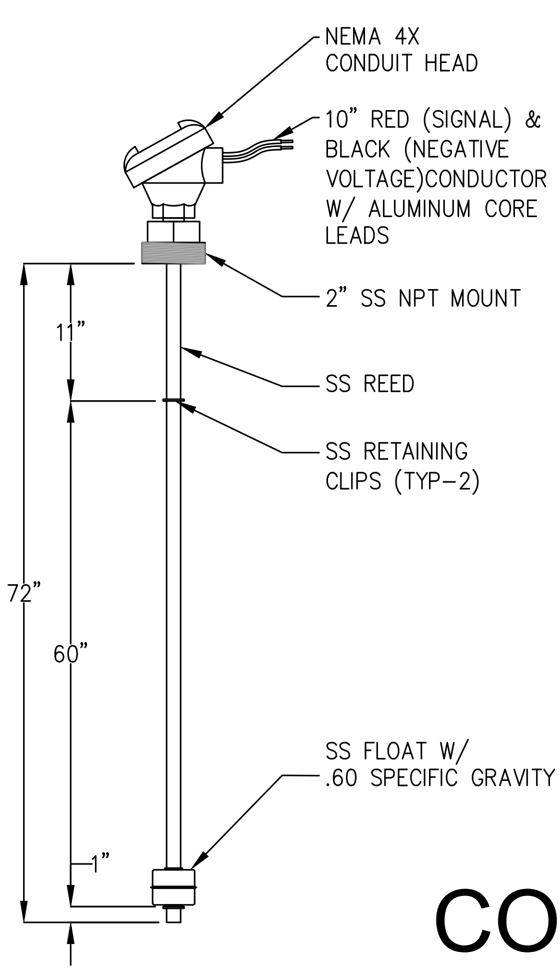
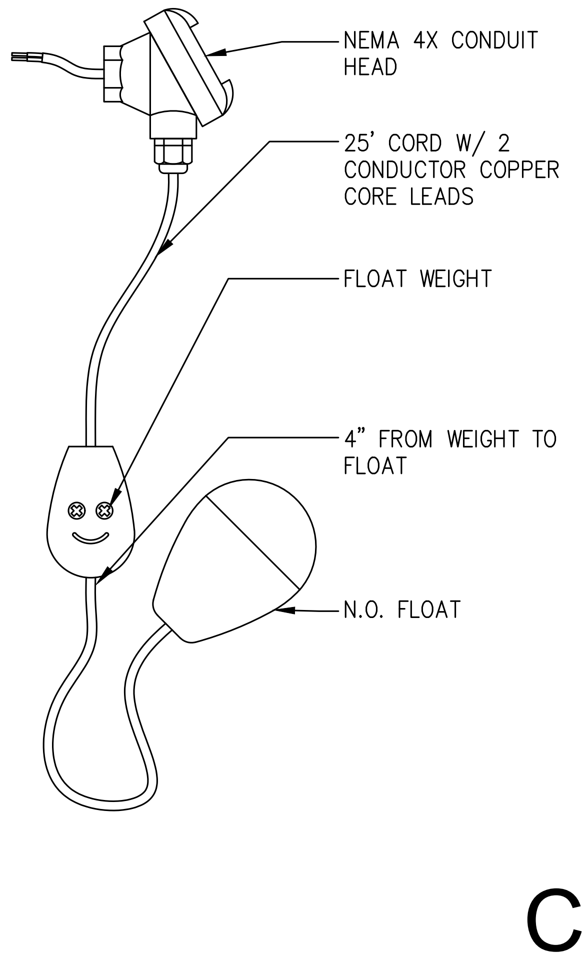
TRIPLE FLOAT FLUID LEVEL SENSOR

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FLUID LEVEL SENSORS – TRIPLE FLOAT	A
DATE	07/2018				

CONTROLS





CO SENSOR:

SINGLE FLOAT DEVICE FOR MOST HOLDING TANK APPLICATIONS. THE CONTINUOUS SENSOR PROVIDES LEVEL MONITORING FOR A RANGE OF FLUID ELEVATION. THIS SENSOR PROVIDES ANALOG FEEDBACK TO THE CONTROL PANEL AND ALLOWS REALTIME LEVEL INDICATION.

C SENSOR:

SINGLE FLOAT SWITCH DEVICE FOR MOST CONCRETE AND STEEL HOLDING TANKS. JUNCTION BOX IS MOUNTED AT A HIGH ELEVATION INSIDE CONCRETE STRUCTURES AND OUTSIDE STEEL STRUCTURES WITH A LEAD RUNNING TO THE FLOAT SWITCH APPARATUS.

LEVEL INDICATOR SENSORS:

LEVEL INDICATOR FLOAT SWITCHES ARE TYPICALLY USED TO INDICATE THAT FLUID LEVELS ARE ABOVE A SET ELEVATION. THE SENSOR'S ACTUATION LEVEL IS SET DURING INSTALLATION, AND REMAINS IN THE OPEN POSITION WHILE FLUIDS ARE BELOW THIS ESTABLISHED LIMIT.

FLUID LEVEL SENSORS – ANALOG & FLOAT

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

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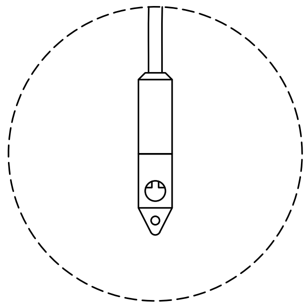
FLUID LEVEL SENSORS

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	FLUID LEVEL SENSORS – ANALOG & FLOAT	A
DATE	07/2018				

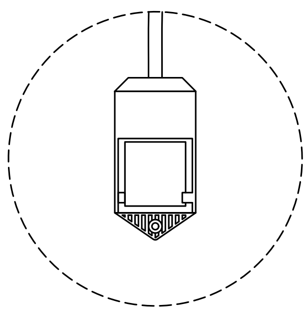
E1



E1 SENSOR:

CONDUCTIVITY SENSING DEVICE THAT IS TO BE INSTALLED IN AN AREA MEANT TO BE VOID OF FLUID. UPON SUBMERGENCE, THE FLUID PROVIDES AN ELECTRICAL PATHWAY BETWEEN TWO ELECTRIC PROBES ON THE SENSOR, THEREBY INDICATING SUBMERGENCE.

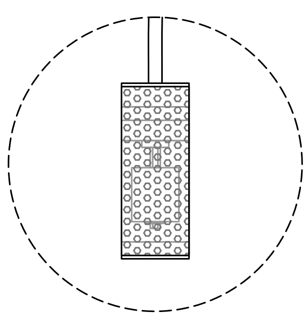
E2



E2 SENSOR:

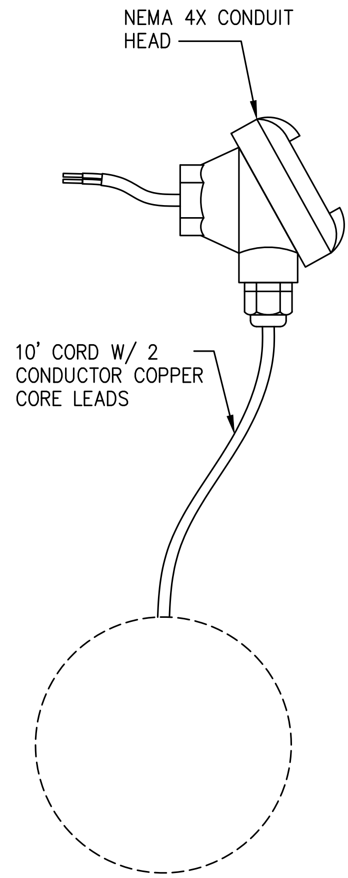
LAY–FLAT FLOAT DEVICE THAT IS TO BE INSTALLED ON THE FLOOR OR HORIZONTAL SURFACE OF A PRODUCT. UPON SUBMERGENCE, AN ATTACHED FLOAT RAISES AN EXSISTING LEVER AWAY FROM THE HORIZONTAL PLANE AND CLOSES THE SWITCH, THEREBY INDICATING SUBMERGENCE.

E3



E3 SENSOR:

BOUANCY FLOAT DEVICE THAT IS TO BE INSTALLED IN AN AREA MEANT TO BE VOID OF FLUID. UPON SUBMERGENCE, AN ENCLOSED FLOAT WILL RAISE WITH THE FLUID LEVEL AND CLOSE UPON ADEQUATE ELEVATION.



LEAK DETECTION SENSORS:

LEAK DETECTION SENSORS ARE TYPICALLY USED TO DETECT WHEN FLUID IS PRESENT IN AN AREA OF A PRODUCT THAT IS NOT SUPPOSED TO CONTAIN ANY FLUID. THESE SENSORS ARE DESIGNED TO CLOSE ONLY UPON SUBMERSION IN A FLUID AND CAN BE INSTALLED INSIDE THE HOLLOW WALLS OF MANY PRODUCTS UPON REQUEST.

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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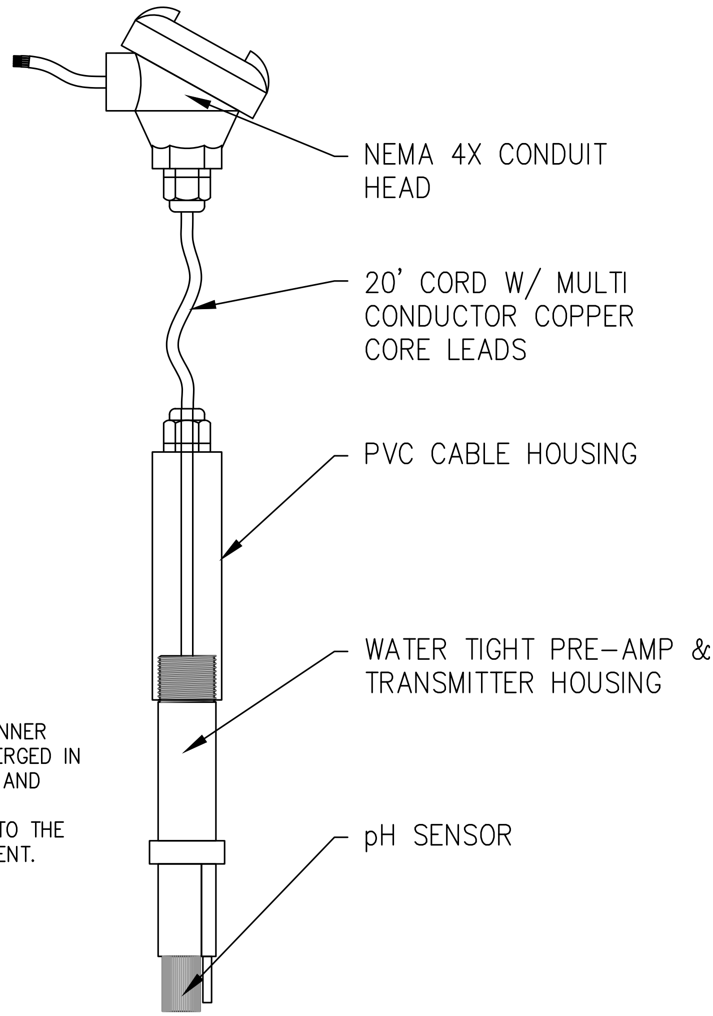
LEAK DETECTION SENSORS

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	LEAK DETECTION SENSORS	A
DATE 07/2018					

LEAK DETECTION SENSORS

CONTROLS

pH



pH SENSORS:

PH SENSOR DESIGNED TO BE MOUNTED IN A MANNER THAT ALLOWS FOR THE PH PROBE TO BE SUBMERGED IN THE FLOWING FLUID. SENSOR IS MANUFACTURED AND INSTALLED WITH A PROTECTIVE PVC HOUSING TO PROTECT THE CABLE CONNECTING THE SENSOR TO THE CONDUIT HEAD WITHIN THE ENCLOSED ENVIRONMENT.

pH SENSORS:

PH SENSORS ARE TYPICALLY USED TO DETECT THE PH OF A FLUID. TYPICAL APPLICATIONS INCLUDE PARKUSA'S ACID NEUTRALIZATION TANKS, AS THE FLUID FLOWING OUT OF THE SYSTEM MUST BE WITHING A STANDARDIZED RANGE FOR THE SAFETY OF CONNECTED LOCAL WATER INFASTRUCTURES AND AFFECTED ENVIRONMENTS. BECAUSE THIS SENSOR TYPE PRODUCES ANALOG FEEDBACK, MEANING THE RETURN SIGNAL VARIES IN MAGNITUDE, THESE SENSORS ARE ONLY AVAILABLE UPON SPECIAL ORDER AND CANNOT BE ADDED TO THE STANDARD PANELS LISTED.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

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pH SENSORS

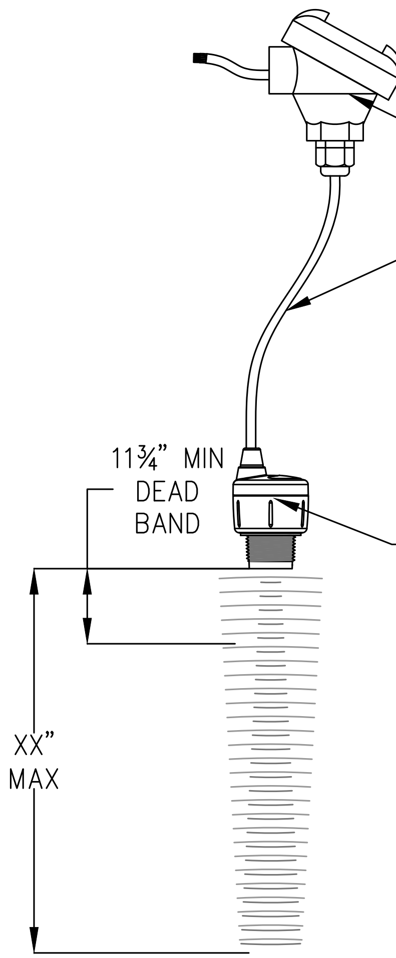
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	PH SENSOR	A
DATE 07/2018					

pH SENSOR

U

U SENSOR:

ULTRA–SONIC SENSORS THAT CAN BE INSTALLED IN MOST HOLDING TANKS. THE ULTRA–SONIC TRANSDUCER IS TYPICALLY FIXED AT A LOCATION INSIDE THE TANK WITH A LEAD RUNNING TO THE CONDUIT HEAD EITHER INSIDE OR OUTSIDE OF THE TANK. SENSOR MODEL DESIGNATION DEPENDS ON DISTANCE OF FLUID FROM DESIGNED TRANSDUCER MOUNT LOCATION.



ULTRA–SONIC SENSOR SCHEDULE		
MODEL	L (in)	DEAD BAND (DB) (in)
U1	49	2
U2	49	2
U3	117	4
U4	228	8
U5	384	4

ULTRA–SONIC SENSORS:

ULTRA–SONIC SENSORS ARE TYPICALLY USED TO DETECT FLUID LEVELS WHEN SENSOR CONTACT WITH FLUID IS UNDESIREABLE, SUCH AS IN AN ACIDIC ENVIRONMENT OR LAMINAR FLOW. BECAUSE THIS SENSOR TYPE PRODUCES ANALOG FEEDBACK, MEANING THE RETURN SIGNAL VARIES IN MAGNITUDE, THESE SENSORS ARE ONLY AVAILABLE UPON SPECIAL ORDER AND CANNOT BE ADDED TO THE STANDARD PANELS LISTED.

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

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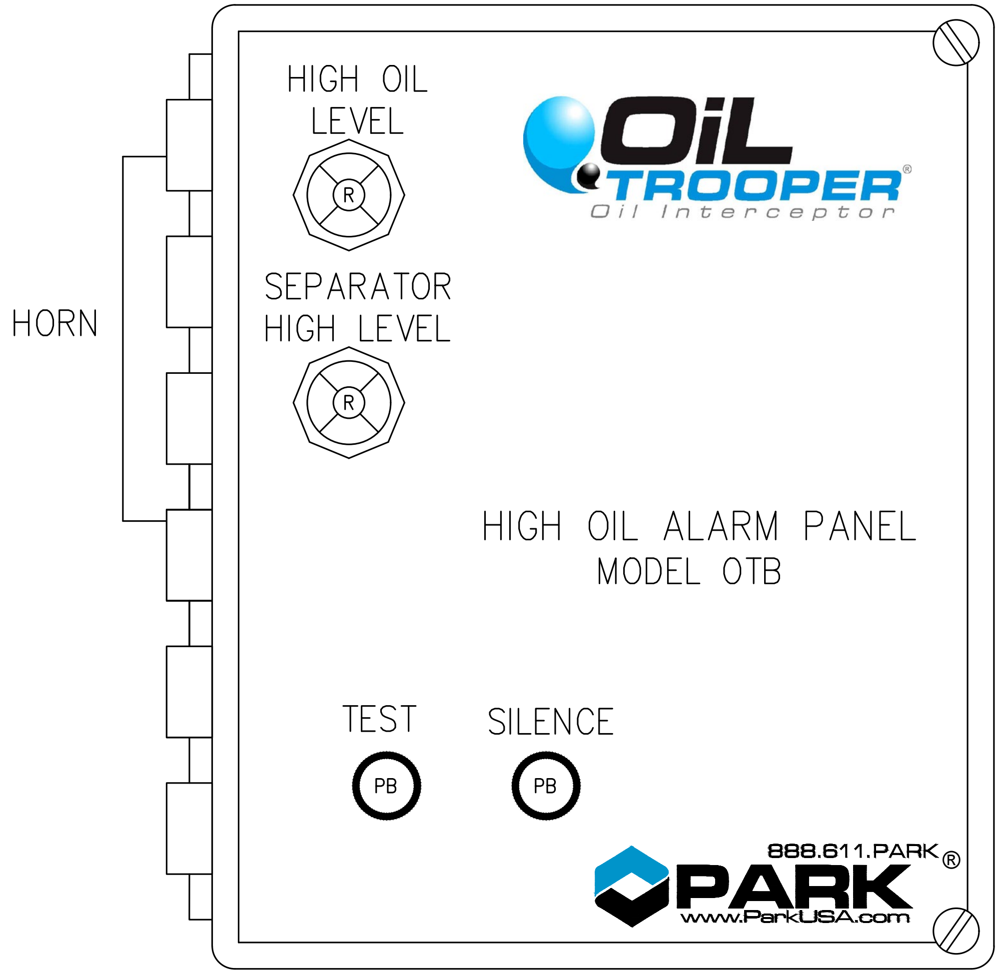
ULTRA–SONIC FLUID LEVEL SENSORS

ULTRA–SONIC SENSORS

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	ULTRA–SONIC SENSORS	A
DATE 07/2018					



6" DEEP

NEMA 4X FIBERGLASS ENCLOSURE

10"H X 8"W X 6"D
PAINT : IN/OUT: LT. GRAY

WARNING
SUBSTITUTION OF COMPONENTS
MAY IMPAIR INTRINSIC SAFETY

1.5" X 4" NAMETAG
W/ RED LETTERS
LOCATED ON INSIDE DOOR

OiL TROOPER®
Oil Interceptor

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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PARK
www.ParkUSA.com

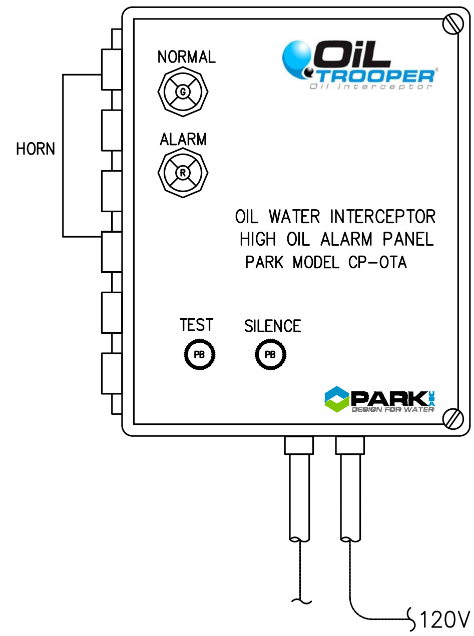
OIL HIGH LEVEL CONTROL PANEL
MODEL CP-OTB

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CP-__B-DETAIL	A
DATE	07/2018				

CP-__B-DETAIL

CONTROL PANEL SPECIFICATIONS	
SUPPLY VOLTAGE	120 VAC
SENSOR VOLTAGE	120 VAC
ENCLOSURE	NEMA 4X 10"H x 8"W x 6"D
TEMPERATURE	-40 TO 150 °F
APPROVAL	UL 913
CONDUIT CONNECTION	1" METALLIC HUB AC SUPPLY – TOP ENTRANCE SENSOR – BTM ENTRANCE

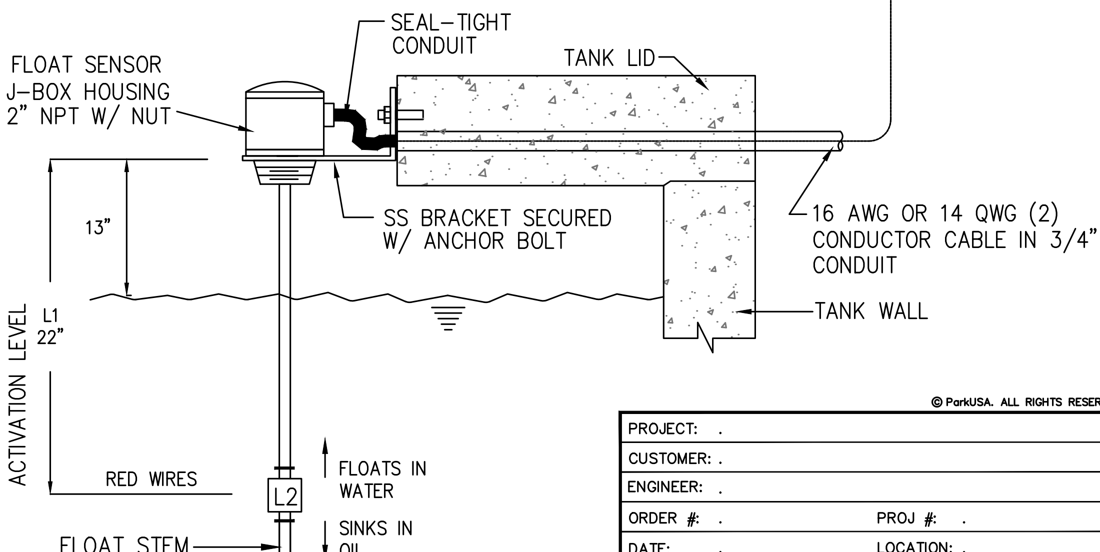
FLOAT SPECIFICATIONS	FLOAT G
CABLE	AWG 14-16
FLOAT	STAINLESS .93 sg
PRESSURE	100 PSI @ 25° C
TEMPERATURE	-40 to 200 °F
APPROVAL	NEMA-6
SWITCH RATING	120/240VAC @ 50W
CONFIGURATION	NORMALLY OPEN
QTY REQUIRED	1



SEQUENCE OF OPERATION

NORMAL CONDITION
WHEN THE WATER LEVEL IS BELOW THE HIGH LEVEL MARK, THE FLOAT SWITCH RESIDES IN A NORMALLY OPEN CONFIGURATION. THE TEST BUTTON IS USED TO TEST THE HIGH LEVEL INDICATORS.

HIGH WATER CONDITION
WHEN THE WATER LEVEL RISES TO THE HIGH LEVEL MARK, THE FLOAT SWITCH FLOATS TO A CLOSED CONFIGURATION. THE HIGH LEVEL AUDIBLE & VISUAL ALARMS ARE ACTIVATED. A SILENCE BUTTON CAN SILENCE THE AUDIBLE ALARM.



NOTE:
ALL MOUNTING OF PANEL, AND ALL ELECTRICAL PARTS AND LABOR IS TO BE PROVIDED BY A ELECTRICIAN

OiL TROOPER®
Oil Interceptor

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

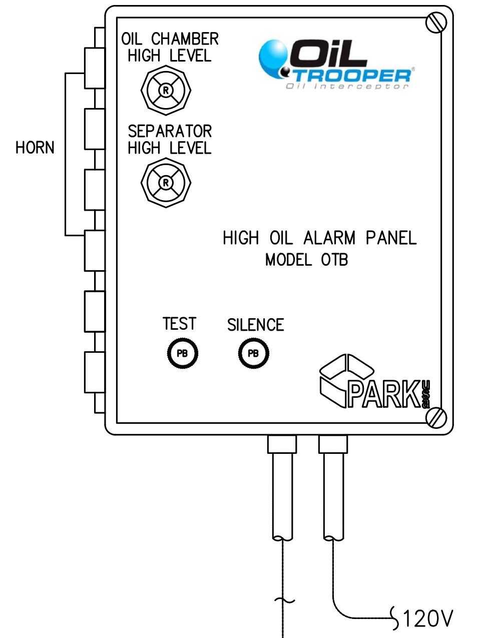
888.611.PARK®
PARK USA
www.ParkUSA.com

OIL HIGH LEVEL ALARM PANEL
MODEL CP-OTA

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.		
DATE 07/2018				CP-__A	A

CP-__A

CONTROL PANEL SPECIFICATIONS	
SUPPLY VOLTAGE	120 VAC
SENSOR VOLTAGE	120 VAC
ENCLOSURE	NEMA 4X
TEMPERATURE	−40 TO 150 °F
APPROVAL	UL 913
CONDUIT CONNECTION	1" METALLIC HUB AC SUPPLY – TOP ENTRANCE SENSOR – BTM ENTRANCE



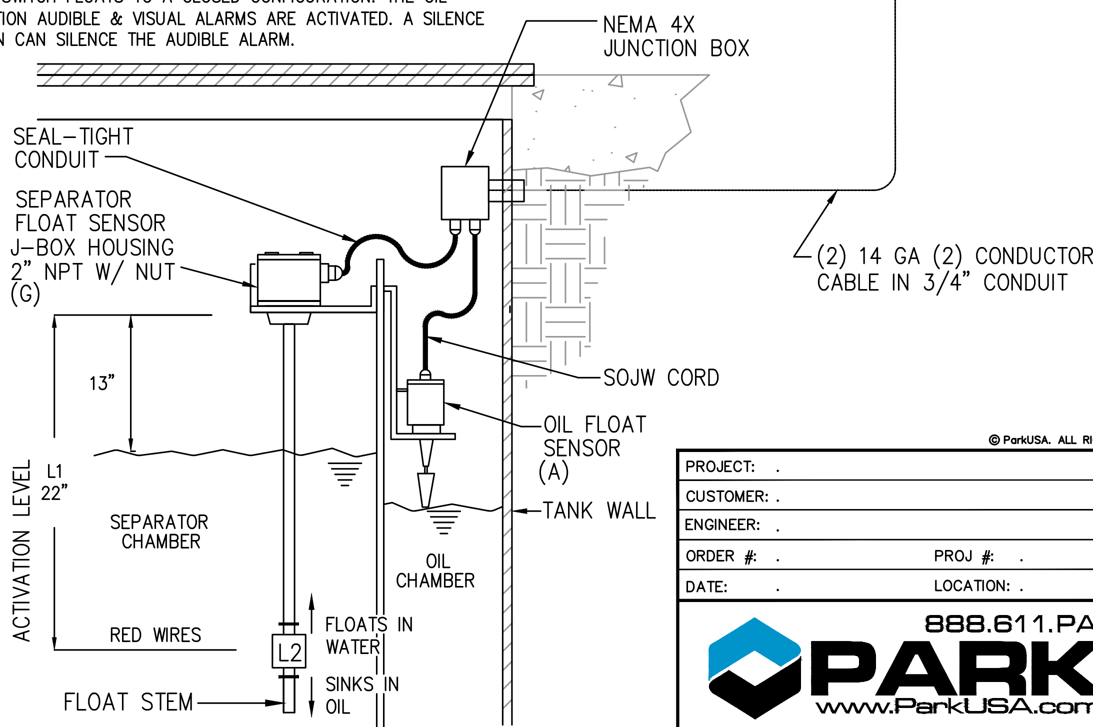
FLOAT SPECIFICATIONS	FLOAT G	FLOAT A
CABLE	AWG 14–16	18–Z SJOW
FLOAT	STAINLESS .93 sg	POLYPROPYLENE
PRESSURE	100 PSI @ 25° C	25 PSI @ 25° C
TEMPERATURE	−40 to 200 °F	−40 to 90 °F
APPROVAL	NEMA–6	NEMA–6
SWITCH RATING	120/240VAC @ 50w	120VAC @ 15VA
CONFIGURATION	NORMALLY OPEN	NORMALLY OPEN
QTY CONTACTS	1	1

SEQUENCE OF OPERATION

NORMAL CONDITION
WHEN THE WATER LEVEL IS BELOW THE HIGH LEVEL MARK, THE FLOAT SWITCH RESIDES IN A NORMALLY OPEN CONFIGURATION. THE TEST BUTTON IS USED TO TEST THE HIGH LEVEL INDICATORS.

HIGH OIL IN SEPARATOR CHAMBER
WHEN THE OIL LEVEL RISES TO THE HIGH LEVEL MARK, THE FLOAT SWITCH FLOATS TO A CLOSED CONFIGURATION. THE HIGH OIL LEVEL AUDIBLE & VISUAL ALARMS ARE ACTIVATED. A SILENCE BUTTON CAN SILENCE THE AUDIBLE ALARM.

HIGH LEVEL IN OIL CHAMBER
IF OIL LEVEL RISES TO THE OIL SENSOR PROBE, THE FLOAT SWITCH FLOATS TO A CLOSED CONFIGURATION. THE OIL DETECTION AUDIBLE & VISUAL ALARMS ARE ACTIVATED. A SILENCE BUTTON CAN SILENCE THE AUDIBLE ALARM.



NOTE:
ALL MOUNTING OF PANEL, AND ALL ELECTRICAL PARTS AND LABOR IS TO BE PROVIDED BY A ELECTRICIAN

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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OIL HIGH LEVEL CONTROL PANEL
MODEL CP–OTB

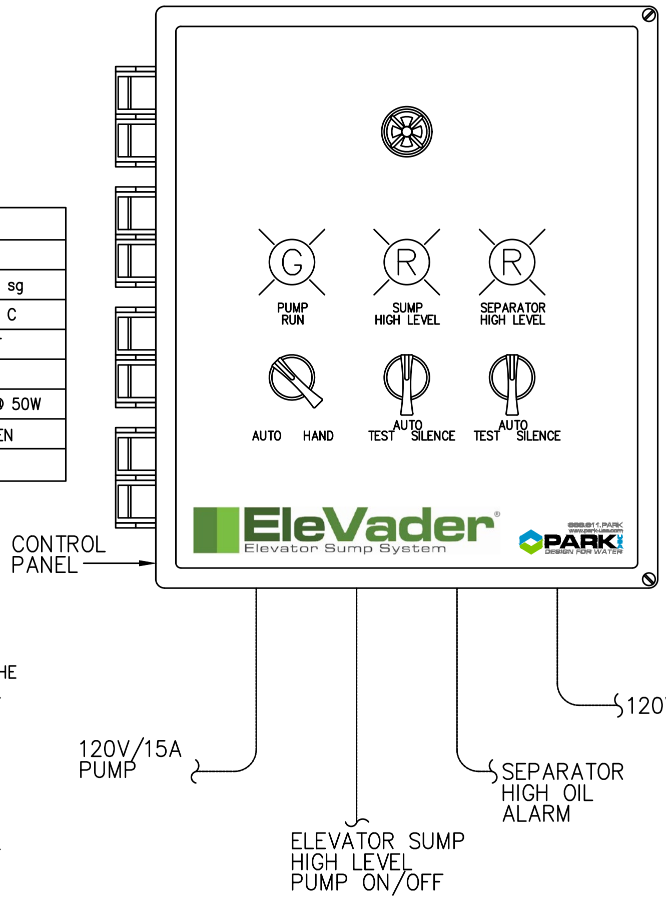
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CP–__B	A
DATE 07/2018					

CP–__B

CONTROL PANEL SPECIFICATIONS	
SUPPLY VOLTAGE	120 VAC / 20 AMP
SENSOR VOLTAGE	120 VAC
ENCLOSURE	NEMA / 6" X 4" X 2.25"
TEMPERATURE	–40 TO 150 °F
APPROVAL	UL
CONDUIT CONNECTION	1" METALLIC HUB AC SUPPLY – BTM ENTRANCE SENSOR – BTM ENTRANCE

FLOAT SPECIFICATIONS	FLOAT G	FLOAT L
CABLE	AWG 14–16	AWG 14–16
FLOAT	STAINLESS .93 sg	STAINLESS .60 sg
PRESSURE	100 PSI @ 25° C	100 PSI @ 25° C
TEMPERATURE	–40 to 200 °F	–40 to 200 °F
APPROVAL	NEMA–6	NEMA–6
SWITCH RATING	120/240VAC @ 50W	120/240VAC @ 50W
CONFIGURATION	NORMALLY OPEN	NORMALLY OPEN
QTY SENSORS	1	3

NOTE:
ALL MOUNTING OF PANEL, AND ALL ELECTRICAL PARTS AND LABOR IS TO BE PROVIDED BY A ELECTRICIAN



SEQUENCE OF OPERATION

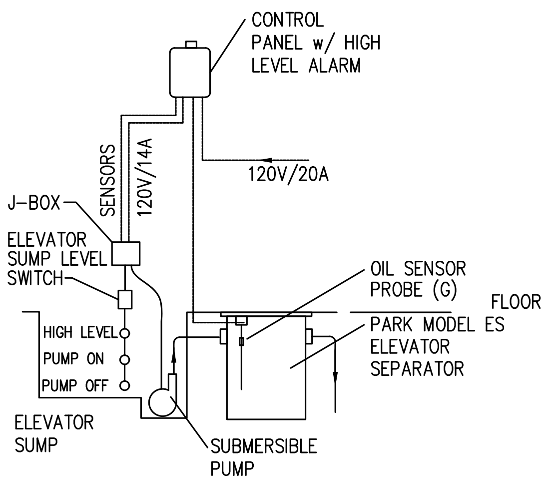
NORMAL CONDITION
WHEN THE WATER LEVEL IS BELOW THE HIGH LEVEL MARK, THE FLOAT SWITCH RESIDES IN A NORMALLY OPEN CONFIGURATION. THE TEST BUTTON IS USED TO TEST THE HIGH OIL LEVEL INDICATORS.

WATER CONDITION WITH ELEVATOR SUMP WHEN THE WATER LEVEL RISES TO THE OPERATION LEVEL MARK, THE PUMP FLOAT SWITCH FLOATS TO A CLOSED CONFIGURATION. THE SUMP PUMP IS ENERGIZED UNTIL LEVEL RECEEDS.

HIGH WATER CONDITION IN HOISTWAY SUMP
IF WATER LEVEL REACHES TO THE WATER SENSOR PROBE (N), IT SWITCHES TO A CLOSED CONFIGURATION. THE HIGH WATER AUDIBLE & VISUAL ALARMS ARE ACTIVATED. A SILENCE BUTTON CAN SILENCE THE AUDIBLE ALARM.

HIGH OIL CONDITION IN SEPARATOR
IF OIL LEVEL REACHES TO THE OIL SENSOR PROBE, IT SWITCHES TO A CLOSED CONFIGURATION. THE HIGH OIL AUDIBLE & VISUAL ALARMS ARE ACTIVATED. A SILENCE BUTTON CAN SILENCE THE AUDIBLE ALARM.

EleVader®
Elevator Sump System



INSTALLATION SCHEMATIC

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

888.611.PARK®
PARK
www.ParkUSA.com

ELEVATOR SUMP SYSTEM
MODEL CP–ES3

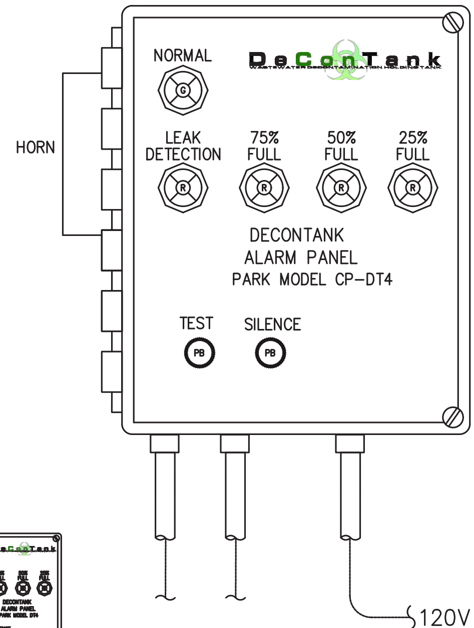
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CP–__3	A
DATE 07/2018					

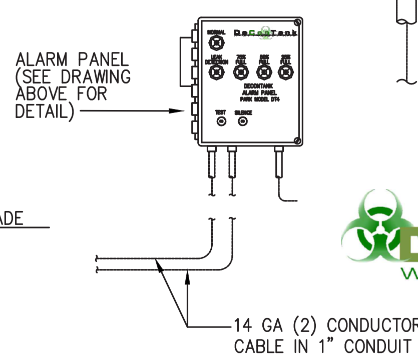
CP–_3

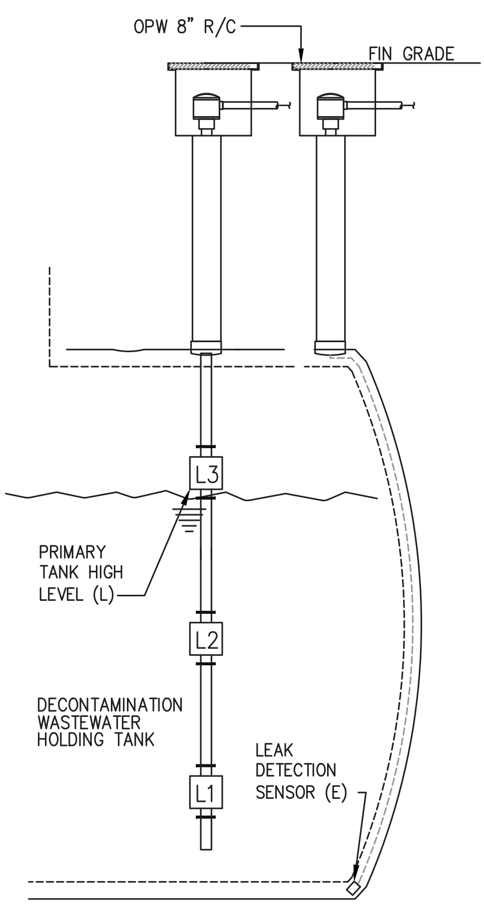
CONTROL PANEL SPECIFICATIONS	
SUPPLY VOLTAGE	120 VAC
SENSOR VOLTAGE	120 VAC
ENCLOSURE	NEMA 4X – 10"H x 8"W x 6"D
TEMPERATURE	–40 TO 150 °F
APPROVAL	UL 913 – INTRINSIC SAFE
CONDUIT CONNECTION	1" METALLIC HUB AC SUPPLY – TOP ENTRANCE SENSOR – BTM ENTRANCE

FLOAT SPECIFICATIONS	FLOAT Q
CABLE	22–3 w/SHIELD & PP
FLOAT	POLYPROPYLENE
PRESSURE	25 PSI @ 25° C
TEMPERATURE	–40 to 194 °F
APPROVAL	NEMA–6
SWITCH RATING	120VAC @ 15VA
CONFIGURATION	NORMALLY OPEN
QTY REQUIRED	1

NOTE:
ALL MOUNTING OF PANEL, AND ALL ELECTRICAL PARTS AND LABOR IS TO BE PROVIDED BY A ELECTRICIAN







DeConTank®
Water Decontamination Holding Tank

SEQUENCE OF OPERATION

NORMAL CONDITION WHEN THE WATER LEVEL IS BELOW THE HIGH LEVEL MARK, THE FLOAT SWITCH RESIDES IN A NORMALLY OPEN CONFIGURATION. THE TEST BUTTON IS USED TO TEST THE HIGH LEVEL INDICATORS.

WATER LEVEL CONDITION
WHEN THE WATER LEVEL RISES, THE FLOAT SWITCH FLOATS TO A CLOSED CONFIGURATION. THE VISUAL ALARMS ARE ACTIVATED AT 25%, 50%, AND 75% TANK LEVELS. THE HIGH LEVEL AUDIBLE ALARM IS ACTIVATED AT 75% FULL. A SILENCE BUTTON CAN SILENCE THE AUDIBLE ALARM.

LEAK DETECTION CONDITION
IF WATER LEVEL RISES TO THE LEAK SENSOR PROBE, THE FLOAT SWITCH FLOATS TO A CLOSED CONFIGURATION. THE LEAK DETECTION AUDIBLE & VISUAL ALARMS ARE ACTIVATED. A SILENCE BUTTON CAN SILENCE THE AUDIBLE ALARM.

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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DECONTANK HIGH LEVEL ALARM PANEL
MODEL CP–DT4

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CP–__4	A
DATE	07/2018				

CP–_4

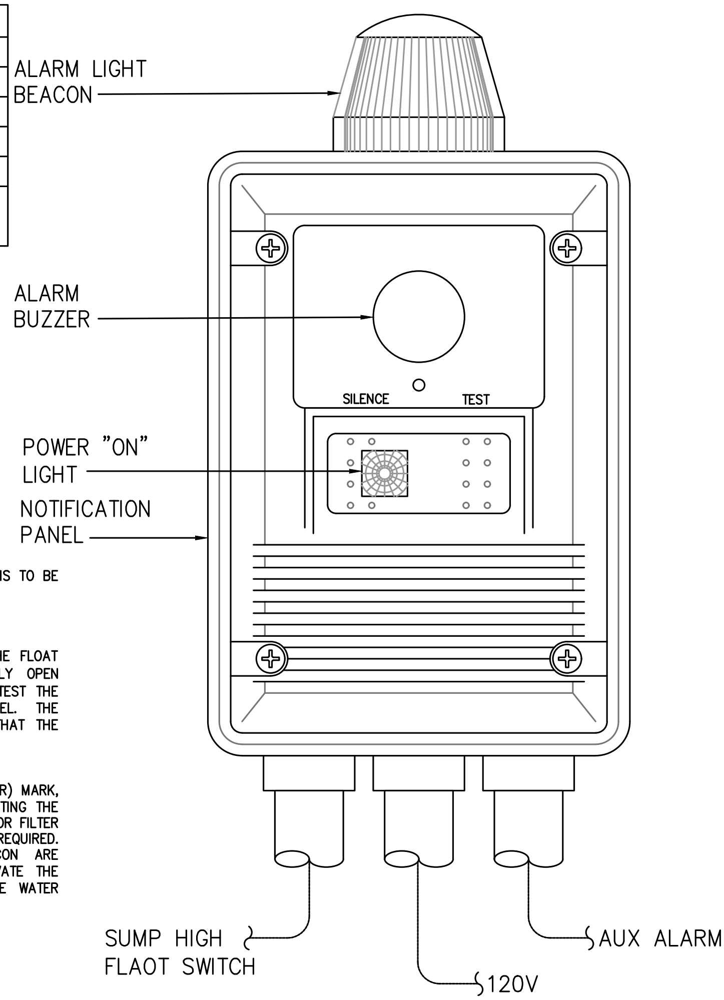
CONTROL PANEL SPECIFICATIONS	
SUPPLY VOLTAGE	120 VAC
SENSOR VOLTAGE	120 VAC
ENCLOSURE	NEMA 4X
TEMPERATURE	–40 TO 150 °F
APPROVAL	UL 913
CONDUIT CONNECTION	1" METALLIC HUB AC SUPPLY – TOP ENTRANCE SENSOR – BTM ENTRANCE

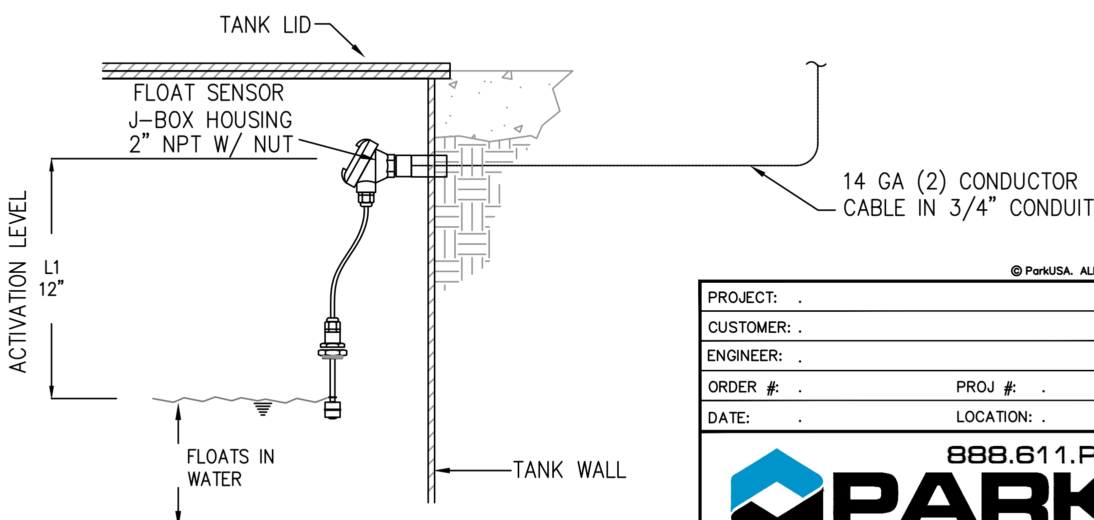
FLOAT SPECIFICATIONS	FLOAT A
CABLE	16 AWG 2 SJOW
FLOAT	STAINLESS STEEL
PRESSURE	25 PSI @ 25° C
TEMPERATURE	32° F to 190° F
APPROVAL	NEMA–6
SWITCH RATING	120/240VAC @ 5/10A
CONFIGURATION	N.O. NARROW ANGLE
QTY REQUIRED	1

NOTE:
ALL MOUNTING OF PANEL, AND ALL ELECTRICAL PARTS AND LABOR IS TO BE PROVIDED BY AN ELECTRICIAN

SEQUENCE OF OPERATION
NORMAL CONDITION
WHEN THE WATER LEVEL IS BELOW THE 'SERVICE LEVEL' MARK, THE FLOAT SWITCH (LOCATED WITHIN THE INTERCEPTOR) IS IN A NORMALLY OPEN CONTACT CONFIGURATION. THE PANEL 'TEST BUTTON' IS USED TO TEST THE SERVICE NOTIFICATION FUNCTIONS OF THE NOTIFICATION PANEL. THE NOTIFICATION PANEL HAS A 'POWER ON' LIGHT THAT INDICATES THAT THE PANEL IS POWERED AND FUNCTIONING.

MAINTENANCE CONDITION
WHEN THE WATER LEVEL RISES TO THE 'SERVICE LEVEL' (HIGH WATER) MARK, THE FLOAT SWITCH CHANGES TO A CLOSED CONFIGURATION, ACTIVATING THE NOTIFICATION PANEL. THIS CONDITION INDICATES THAT THE INTERCEPTOR FILTER BASKET IS EXCESSIVELY FULL, AND THAT FILTER MAINTENANCE IS REQUIRED. THE PANEL AUDIBLE BUZZER AND VISUAL NOTIFICATION BEACON ARE ACTIVATED. THE 'SILENCE' BUTTON, WHEN PRESSES, WILL DEACTIVATE THE BUZZER. THE VISUAL BEACON WILL REMAIN ENERGIZED UNTIL THE WATER RECEDES BACK TO THE 'NORMAL LEVEL'.





NOTE:
ALL MOUNTING OF PANEL, AND ALL
ELECTRICAL PARTS AND LABOR IS
TO BE PROVIDED BY A ELECTRICIAN

Lint TROOPER®
Lint Removal System

PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

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www.ParkUSA.com

LINT INTERCEPTOR CONTROL PANEL
MODEL CP–LTR

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CP–__R	A
DATE 07/2018					

CP–_R

CONTROLS

SEQUENCE OF OPERATION
- 100 Gal. Acid Tank

Normal Condition

When the system is operating within normal conditions, the pH levels are within 5-9 pH and the leak detection sensor in in the open condition. All indicators are de-energized. Depressing any of the push to test LED switches (b,c,e) will momentarily test the alarm relay, indicator lights and the audible alarm. The touch screen readout (p) indicated all items are operating within normal parameters.

High pH Level Alarm Condition

When the pH of the wastewater rises above the set limit (9 pH), the "HIGH pH" indication light (b) and the audible alarm (h) are energized. Depressing the "SILENCE" switch (f) de-energizes the audible alarm (h). The touch screen readout (p) will indicate pH reading on line. After alarm condition is cleared (pH level returns to normal operating conditions), the monitoring panel will automatically reset to normal condition.

Low pH Level Alarm Condition

When the pH of the wastewater drops below the set limit (5 pH), the "LOW pH" indication light (c) and the audible alarm (h) are energized. Depressing the "SILENCE" switch (f) de-energizes the audible alarm (h). The touch screen readout (p) will indicate pH reading on line After alarm condition is cleared (pH level returns to normal operating conditions), the monitoring panel will automatically reset to normal condition.

Leak Detection Condition

When the leak detection sensor detected a water level in the containment vault. As the water level reaches a depth about 1-2", the leak detection sensor (k) float rises. The red "LEAK DETECTION" indication light (e) and the audible alarm (h) are energized. Depressing the "SILENCE" switch (f) de-energizes the audible alarm (h). The touch screen readout (p) will indicate to "INSPECT VAULT" on line (t). After alarm condition is cleared (liquid evacuated from the containment vault), the monitoring panel will automatically reset to normal condition.

LABTANK®

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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SEQUENCE OF OPERATION: pH-100

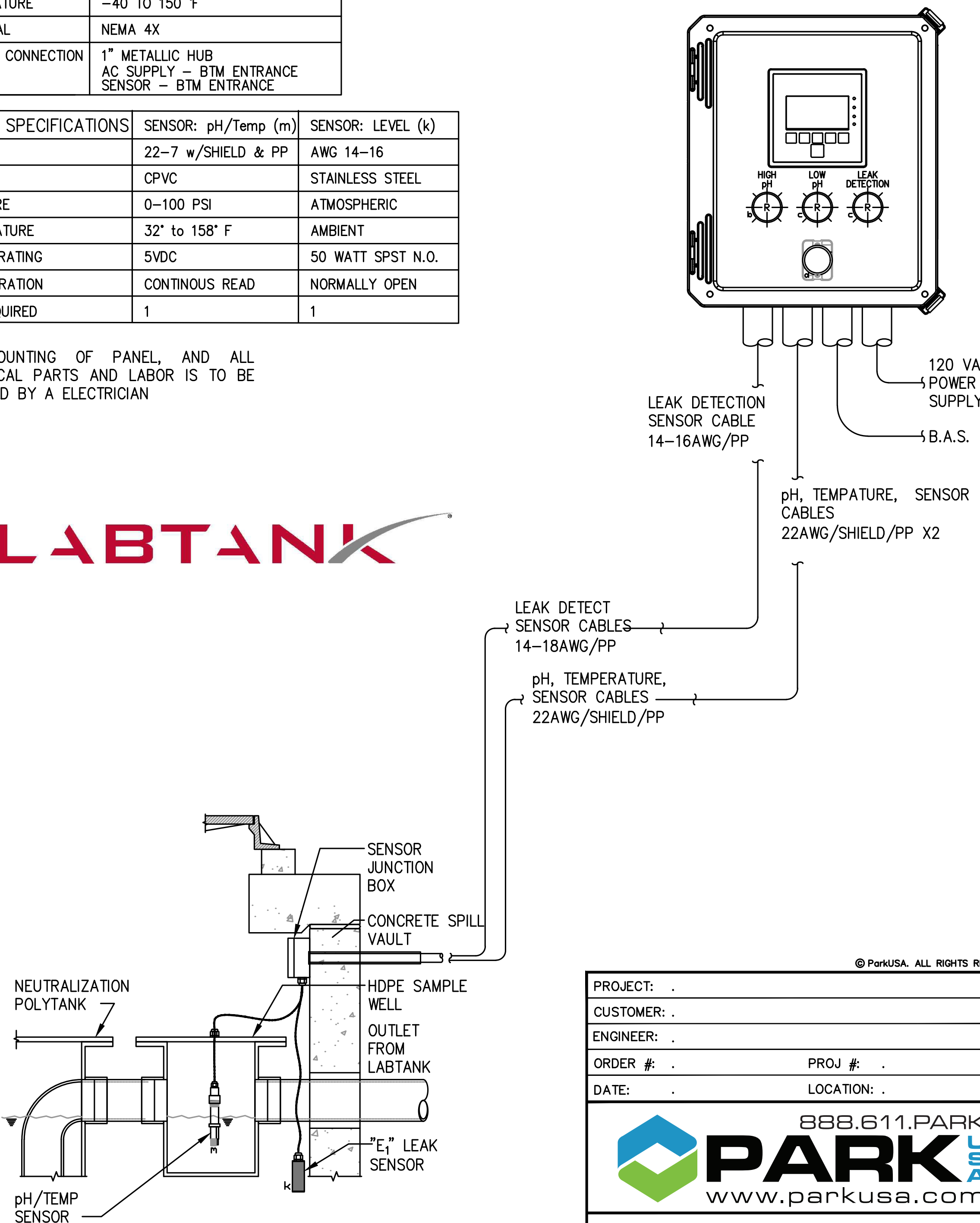
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CP-PH-100-INFO	A
DATE 07/2018					

CP-pH-100-INFO

CONTROL PANEL SPECIFICATIONS	
SUPPLY VOLTAGE	120 VAC
SENSOR VOLTAGE	120 VAC
ENCLOSURE	16"H x 14"W x 8"D
TEMPERATURE	–40 TO 150 °F
APPROVAL	NEMA 4X
CONDUIT CONNECTION	1" METALLIC HUB AC SUPPLY – BTM ENTRANCE SENSOR – BTM ENTRANCE

FLOAT SPECIFICATIONS	SENSOR: pH/Temp (m)	SENSOR: LEVEL (k)
CABLE	22-7 w/SHIELD & PP	AWG 14-16
SENSOR	CPVC	STAINLESS STEEL
PRESSURE	0-100 PSI	ATMOSPHERIC
TEMPERATURE	32° to 158° F	AMBIENT
SWITCH RATING	5VDC	50 WATT SPST N.O.
CONFIGURATION	CONTINOUS READ	NORMALLY OPEN
QTY REQUIRED	1	1

NOTE:
ALL MOUNTING OF PANEL, AND ALL ELECTRICAL PARTS AND LABOR IS TO BE PROVIDED BY A ELECTRICIAN



PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

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OVERVIEW: pH–100

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CP–PH–100	A
DATE 07/2018					

CP–pH–100

CONTROLS

SEQUENCE OF OPERATION
-600 Gal. Acid Tank

Normal Condition

When the system is operating within normal conditions, the pH levels are within 5-9 pH and the leak detection sensor in in the open condition. All indicators are de-energized. Rotating the "TEST" switch (g) to the left (counter-clockwise) will momentarily test all alarm relays, indicator lights and the audible alarm. The touch screen readout (p) indicated all items are operating within normal parameters.

High pH Level Alarm Condition

When the pH of the wastewater rises above the set limit (9 pH), the "HIGH pH" indication light (b) and the audible alarm (h) are energized. Rotating the "SILENCE" switch (f) to the right (clockwise) de-energizes the audible alarm (h). The touch screen readout (p) will indicate pH reading on line (r). After alarm condition is cleared (pH level returns to normal operating conditions), the monitoring panel will automatically reset to normal condition.

Low pH Level Alarm Condition

When the pH of the wastewater drops below the set limit (5 pH), the "LOW pH" indication light (b) and the audible alarm (h) are energized. Rotating the "SILENCE" switch (f) to the right (clockwise) de-energizes the audible alarm (h). The touch screen readout (p) will indicate pH reading on line (r). After alarm condition is cleared (pH level returns to normal operating conditions), the monitoring panel will automatically reset to normal condition.

Data Logging

Trending data is retrieved by 4 methods.

The first method is by visually inspecting the touch screen (p). This method gives the user access to the most current trending data samples. History can be viewed as a line graph or raw data.

The second method is to download the logged data to a USB thumb drive through the front USB port (x) on the controller (w). Logged data is available in *.csv (comma delimited) format for use in a spreadsheet.

The third method is remote network access. If network access has been set up the user can access current trending data across a local network (internet access to be granted through a VPN on the user's local network). Logged data can be retrieved via a downloadable *.csv file.

The fourth method of data retrieval is via emailed reports. Reports of logged data can be setup to be email on programed regular intervals. Logged data is emailed in *.csv format.

LABTANK

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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SEQUENCE OF OPERATION: pH-600

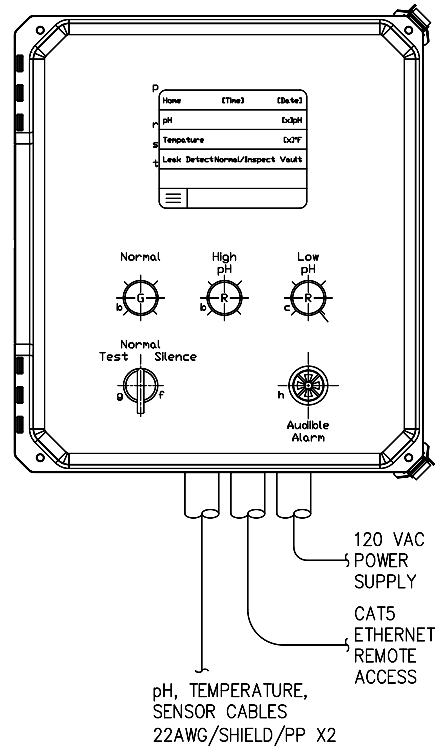
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CP-__-600-INFO	A
DATE 07/2018					

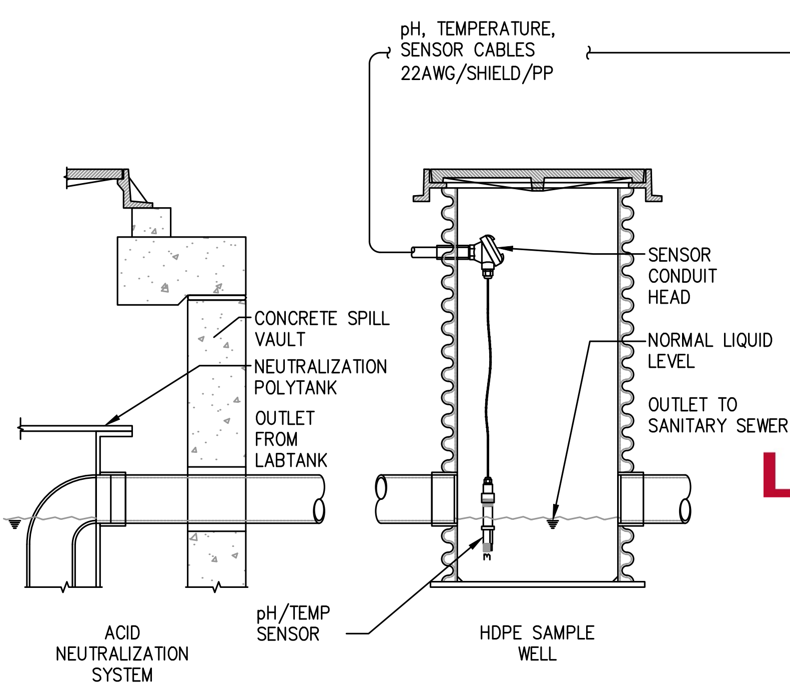
CP-__-600-INFO

CONTROL PANEL SPECIFICATIONS	
SUPPLY VOLTAGE	120 VAC
SENSOR VOLTAGE	120 VAC
ENCLOSURE	16"H x 14"W x 8"D
TEMPERATURE	−40 TO 150 °F
APPROVAL	NEMA 4X
CONDUIT CONNECTION	1" METALLIC HUB AC SUPPLY – BTM ENTRANCE SENSOR – BTM ENTRANCE

FLOAT SPECIFICATIONS	SENSOR: pH/Temp (m)
CABLE	22–7 w/SHIELD & PP
SENSOR	CPVC
PRESSURE	0–100 PSI
TEMPERATURE	32° to 158° F
SWITCH RATING	5VDC
CONFIGURATION	CONTINOUS READ
QTY REQUIRED	1

NOTE:
ALL MOUNTING OF PANEL, AND ALL ELECTRICAL PARTS AND LABOR IS TO BE PROVIDED BY A ELECTRICIAN





LABTANK

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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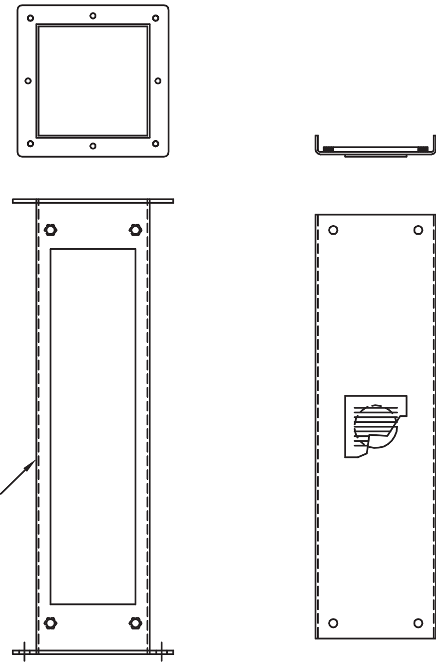
OVERVIEW: pH–600

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	CP–__–600	A
DATE	07/2018				

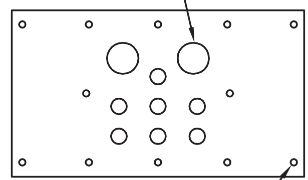
CP–__–600

CONTROLS

CONTROL PANEL PEDESTALS



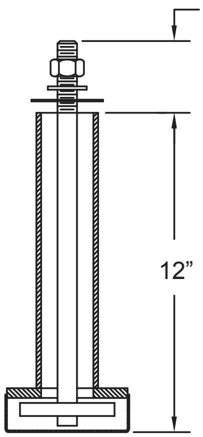
ALUMINUM PEDESTAL
(CUSTOM SIZES AVAILABLE)



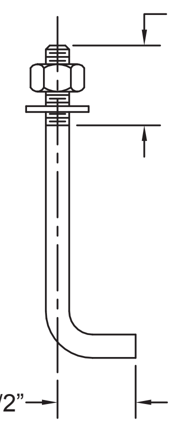
MOUNTING PLATE
(CUSTOM SIZES AVAILABLE)

ANCHOR BOLTS

PARK EQUIPMENT USES STAINLESS STEEL 316 ALLOY AS STANDARD MATERIAL FOR ANCHORING HARDWARE.



ADJUSTABLE ANCHOR BOLT



J-BOLT

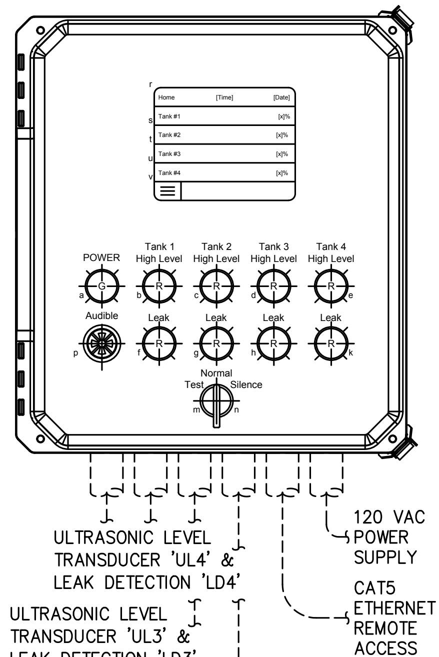
PROJECT:					
CUSTOMER:					
ENGINEER:					
ORDER #:			PROJ #:		
DATE:			LOCATION:		
PARK USA www.ParkUSA.com • 888.611.PARK					
CONTROL PANEL PEDESTALS					
PM .	PC .	DRN .	ENG .	DWG. NO. CPP-1	REV. A
DATE 01/2018					

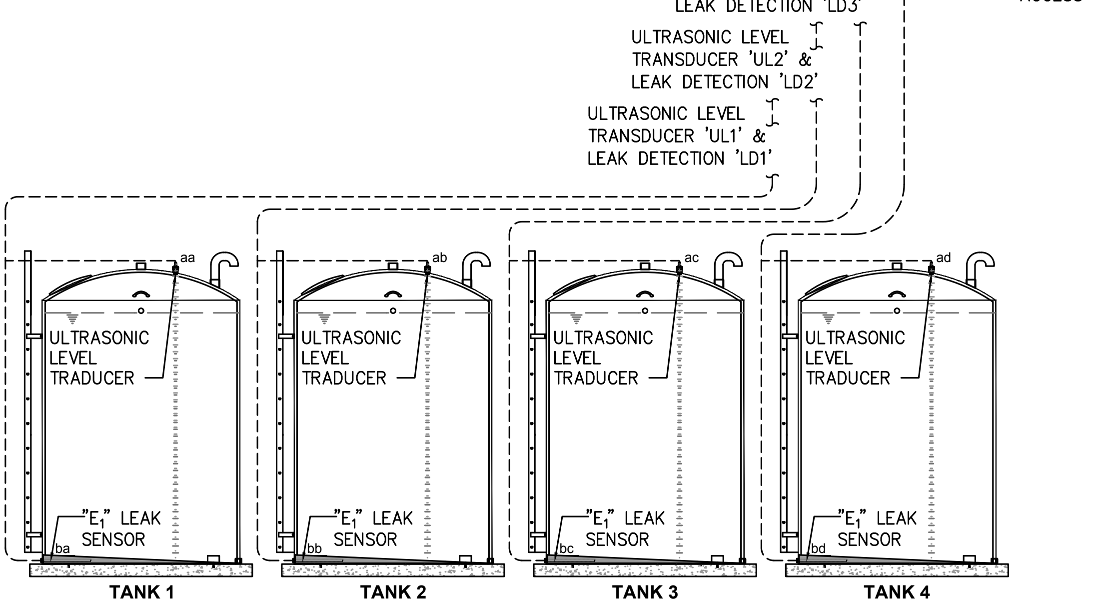
CPP-1

CONTROL PANEL SPECIFICATIONS	
SUPPLY VOLTAGE	120 VAC
SENSOR VOLTAGE	120 VAC
ENCLOSURE	16"H x 14"W x 8"D
TEMPERATURE	−40 TO 150 °F
APPROVAL	NEMA 4X
CONDUIT CONNECTION	1" METALLIC HUB AC SUPPLY – BTM ENTRANCE SENSOR – BTM ENTRANCE

FLOAT SPECIFICATIONS	SENSOR: pH/Temp (m)	SENSOR: LEVEL (k)
CABLE	22-7 w/SHIELD & PP	AWG 14-16
SENSOR	CPVC	STAINLESS STEEL
PRESSURE	0-100 PSI	ATMOSPHERIC
TEMPERATURE	32° to 158° F	AMBIENT
SWITCH RATING	5VDC	50 WATT SPST N.O.
CONFIGURATION	CONTINUOUS READ	NORMALLY OPEN
QTY REQUIRED	1	1

NOTE:
ALL MOUNTING OF PANEL, AND ALL ELECTRICAL PARTS AND LABOR IS TO BE PROVIDED BY A ELECTRICIAN





PROJECT: .
CUSTOMER: .
ENGINEER: .
ORDER #: . PROJ #: .
DATE: . LOCATION: .

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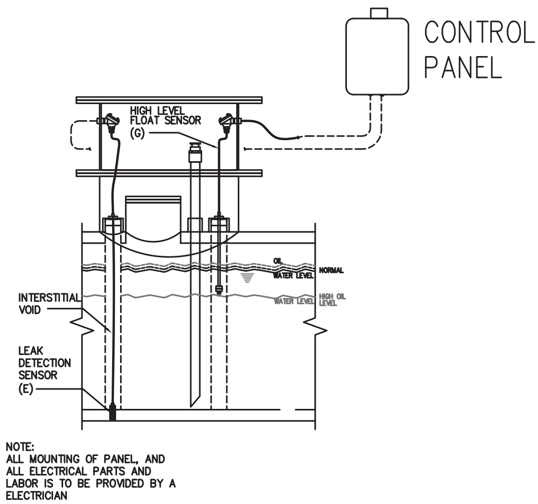
WASTEWATER HOLDING TANK
LEVEL MONITORING PANEL

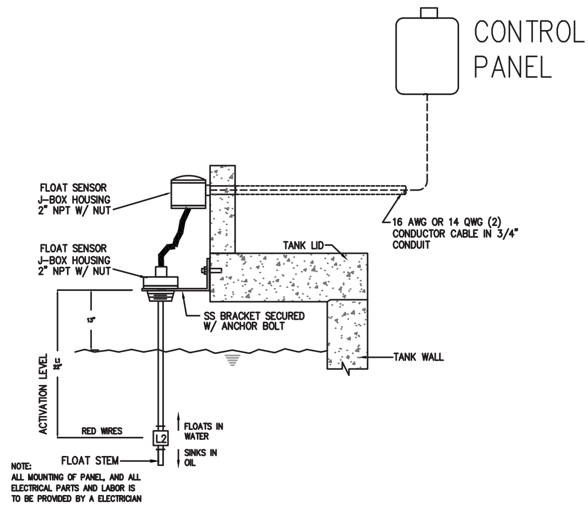
PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	MULI-CHANNEL ANALOG SENSOR INSTALLATION EXAMPLES	A
DATE 07/2018					

MULI-CHANNEL ANALOG SENSOR INSTALLATION EXAMPLES

CONTROLS

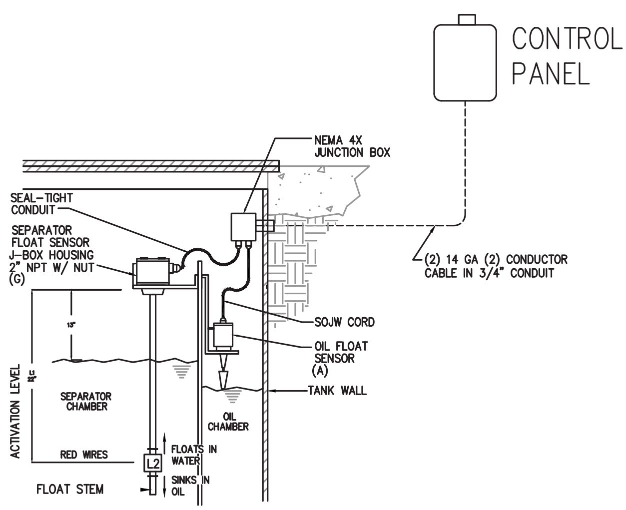


STEEL OILTROOPER
w/ ONE SENSOR



CONCRETE OILTROOPER
w/ ONE SENSOR

OiL TROOPER®
Oil Interceptor



STEEL OILTROOPER BELOW GRADE
w/ MULTIPLE SENSORS

PROJECT: .	
CUSTOMER: .	
ENGINEER: .	
ORDER #: .	PROJ #: .
DATE: .	LOCATION: .

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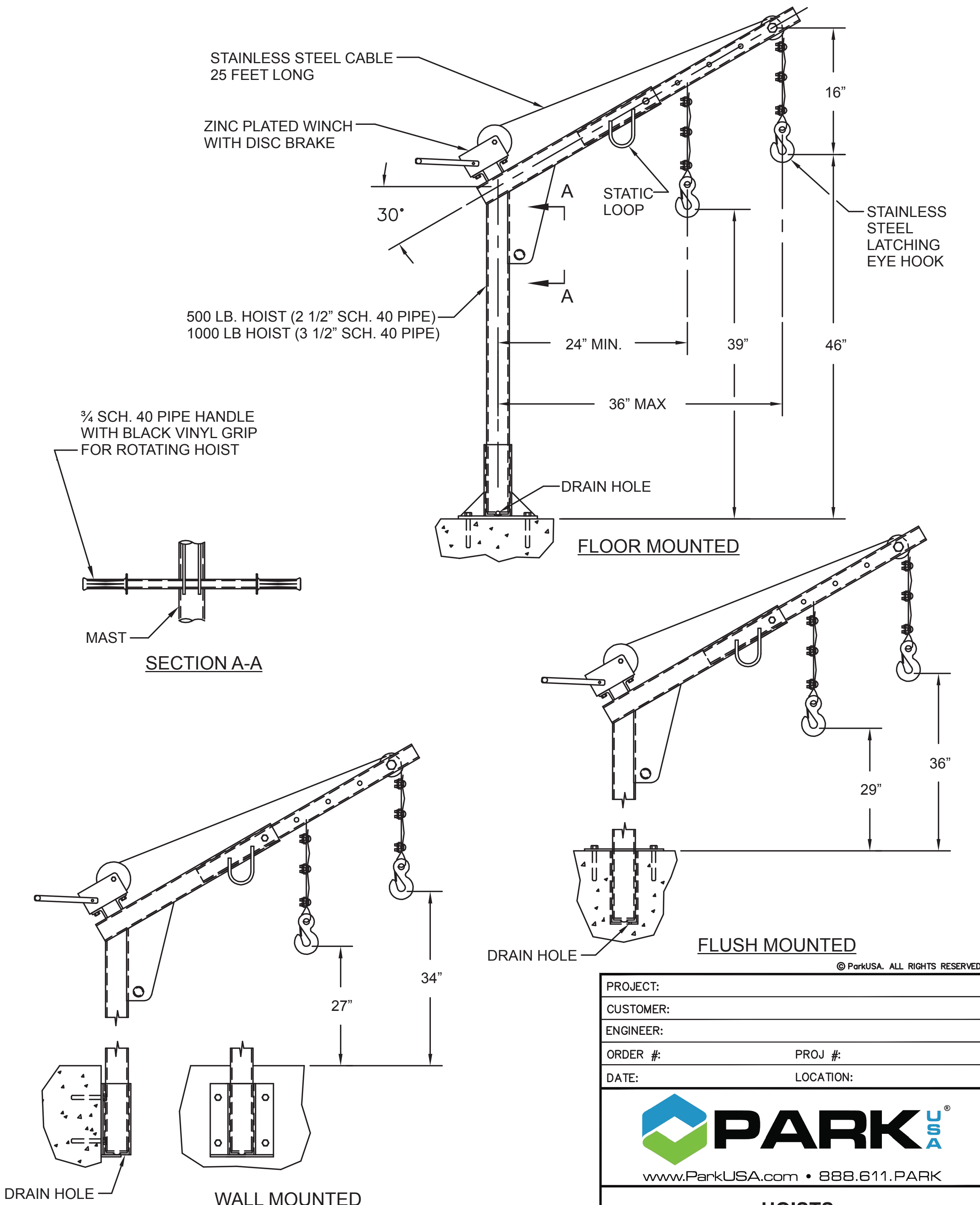
SENSOR CONFIGURATION EXAMPLE
OILTROOPER PRODUCT

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	OILTROOPER INSTALLATION EXAMPLES	A
DATE	07/2018				

OILTROOPER INSTALLATION EXAMPLES

HOISTS



PROJECT:	
CUSTOMER:	
ENGINEER:	
ORDER #:	PROJ #:
DATE:	LOCATION:

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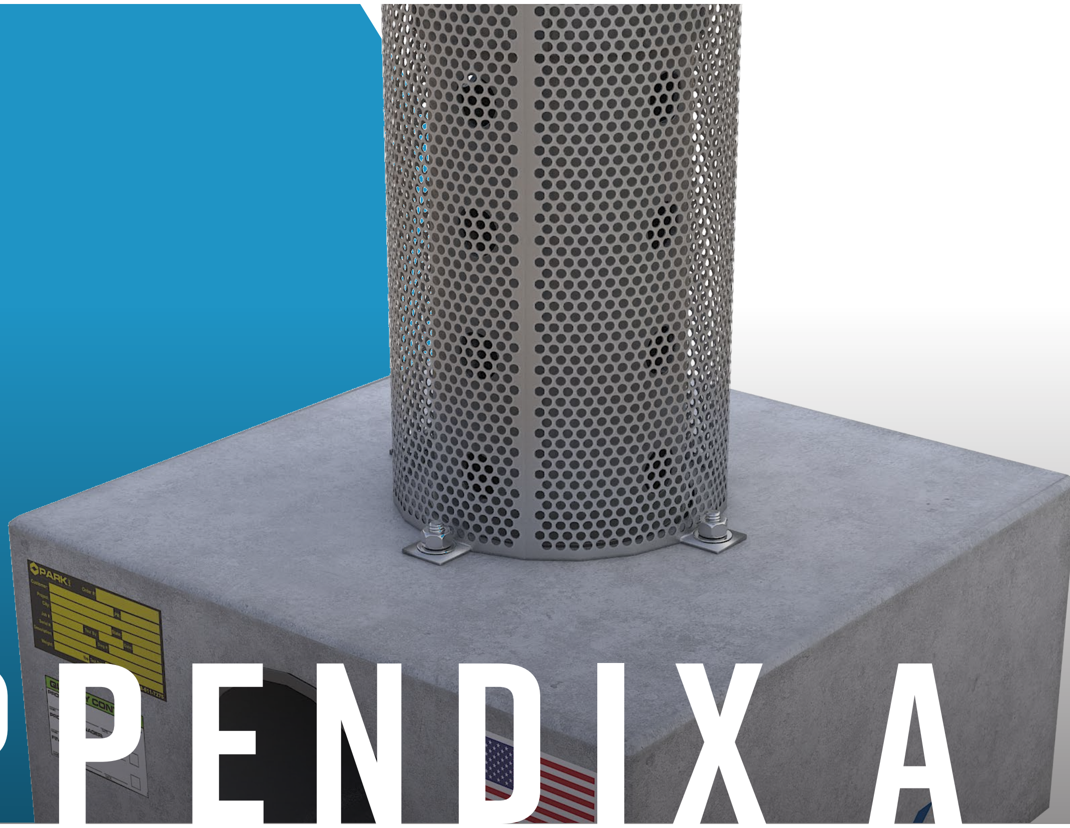
HOISTS

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	HWH-1	A
DATE	01/2018				

NOTES



APPENDIX A

NOTES

FORWARD

This example storm water quality management plan provides general guidance for developing a storm water quality management plan for non-structural and structural controls to reduce pollutants in storm water runoff from post development activities in residential, commeercial, and light industrial areas, and at public facilities. This sample document provides information to assist owners, engineers, architects, and other citizens to prepare a storm water quality management plan. The document is intended only as an example to assist in the development of a storm water quality management plan. Storm water quality management plans that do not follow this example may be accepted; conversely, use of this example does not gurantee that a proposed plan will be accepted.

TPDES STORM WATER WEBSITE

The Storm Water Management Joint Task Force (JTF) maintains an NPDES Storm Water website at the following address:

http://www.cleanwaterways.org/

Information on updates to the *Example Storm Water Quality Management Plan* will be posted at the above site.

Visit swqmp.parkusa.com for your swqmp template.

STORM WATER QUALITY MANAGEMENT PLAN

FOR

(Site Name)
***(City)*, Texas**

Storm Water Quality Management Plan
Prepared for:

(Name)
(Address)

Storm Water Quality Management Plan
Prepared by:

(Printed Name)
(License Number)
(Address)
(Phone Number)

____
Engineer's Seal and Signature

<u>(NOTE: Plans submitted to the City of Houston as part of a storm water quality permit application must be sealed by a Professional Engineer, licensed to practice engineering in Texas, in accordance with Section 47-651 of City of Houston Ordinance No. 2001-800.)</u>

(Date)

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STORM WATER QUALITY MANAGEMENT PLAN

Site Name
(***City or County***), Texas

TABLE OF CONTENTS

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EXHIBITS

Exhibit 1 Vicinity Map
Exhibit 2 Site Drainage Map
Exhibit 3 Potential Pollutant Activities and Minimum Control Measures Map

APPENDIX A – DOCUMENTATION

(*NPDES or TPDES Permit or NOI*)
Maintenance Schedule

APPENDIX B – FORMS

Permittee Certification of Storm Water Quality Management Requirements
Storm Water Quality Management Plan Engineer's Certification
Storm Water Quality Permit As-Built Certificate
Annual Permittee Certification of Proper Maintenance for Permit Renewal
Annual Professional Engineer Inspection Certification
Monthly Inspection Form

APPENDIX C – SAMPLE CALCULATIONS

Visit swqmp.parkusa.com for your swqmp template.

STORM WATER QUALITY MANAGEMENT PLAN

Site Name
(***City or County***), Texas

<u>Project Information:</u>
Site Name
Location

<u>Permittee Information:</u>
Name
Contact
Address
Phone number

<u>Prepared by:</u>
Name
Address
Phone number

1. Site Description

A. <u>Site Location</u>

Provide a description of the site location. (Jurisdiction (e.g., in the City of Houston, in unincorporated Harris County), name of the MUD if applicable, street address, latitude/longitude, subdivision name if applicable, direction from intersections or landmarks, etc.)

B. <u>Owner Information</u>

The owner of the property is:

Company Name
Person to Contact
Address
Phone Number

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The property is leased to: *(if applicable)*

Company Name
Person to Contact
Address
Phone Number

C. New Development or Redevelopment Description

Describe the intent and scope of the project. Include as many details as needed to completely describe the development. This may include type of structures that will be built, types of infrastructure, types of existing development, acreage of the new development and existing development, ... etc.

Example:

> This project consists of the construction of a 20-acre new development of single-family residential homes. This will include the construction of underground utilities, streets, paving, 36 one or two story houses, landscaping, and a dry detention basin.

D. Activities

Describe all of the activities at the developed site. The description should delineate the use of the land, buildings and/or structures and the general tasks or services performed by the occupants. If applicable, include the Standard Industrial Classification Codes. Possible activities may include but are not limited to the following.

- *Bulk liquid storage*
- *Bulk materials storage*
- *Landscaping activities*
- *Fertilizer storage and/or use*
- *Chemical storage and/or use*
  (Herbicides, Pesticides, Cleaners, Solvents, ... etc.)
- *Loading and unloading of liquids and materials*
- *Vehicle / equipment / machinery repair and/or maintenance*
- *Metal work*
- *Chemical production*
- *Water and/or wastewater treatment*
- *Wood / lumber storage and/or product fabrication*
- *Building and structural maintenance*
- *Parking lots*
- *Vehicle / equipment / machinery storage*
- *Vehicle / equipment washing*

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Example:

The development is a 20-acre single-family residential development consisting of 36 houses. All activities associated with this development are typical to residential households. These activities generally include landscaping maintenance, house maintenance, and residential waste disposal. Sanitary waste is transferred via sanitary sewer lines to an offsite wastewater treatment plant, which is operated by (***Name***). There is a master drainage plan for the development that includes a dry detention basin. The dry detention basin will be regularly maintained. The maintenance activities for the dry detention basin generally include vegetative management and sediment removal. There is no Standard Industrial Classification Code for single-family residential homes.

E. <u>NPDES or TPDES Permit for Storm Water Discharges from Construction Activities</u>

Describe how the site will have a permit for water discharges from construction activities.

Example:

A Notice of Intent (NOI) to obtain coverage under an (***NPDES or TPDES***) storm water general permit for construction activities has been submitted and a permit number received. The NOI has been included into this document in *Appendix A*.

F. <u>Total Site Area and Affected Area</u>

Provide the acreage of the property and the acreage that will be affected by the project.

Example:

The total site area of the proposed development is 20 acres. The entire 20 acres will be affected by the development.

or

The acreage of the property is 20 acres, of which 10 will be affected by the development.

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G. Site and Vicinity Maps and Associated Information

1) Vicinity Map

Reference an exhibit for general location of the project site. Include a description of the location based on the map.

Example:

The site location is in the northwestern part of Harris County. Specifically, the site is at the corner of W. Main Road and Addicks Drive on the northern side of W. IH 10 and Addicks Reservoir (***Provide street address if applicable.***). The site location is identified in *Exhibit 1, Vicinity Map*.

2) Areas of Development

Reference an exhibit identifying areas of development. Include a description of the areas to be developed.

Example:

The current project will develop a 20-acre single-family residential area with a dry detention basin as a storm water quality and flood control feature. The 20-acre tract is located in the western section of the (***subdivision name***) subdivision. The areas of development are identified in *Exhibit 2, Site Drainage Map*.

3) Areas Not to be Developed

Reference an exhibit identifying any areas that are not to be developed. Describe any pertinent structures or land that are not to be developed. Note structures that are to remain as they exist at the present time.

Example:

The current project will preserve a portion of the site on the southeastern boundary as undeveloped. The area not to be developed is identified as Reserve "A" in *Exhibit 2, Site Drainage Map*.

4) Drainage Areas

Reference an exhibit identifying drainage areas for the project site. Identify the acreage, patterns, and approximate slopes anticipated after development.

Example:

> The residential lots are graded to drain into the street gutters, which discharge into various storm sewer inlets. The storm sewer discharges into the proposed dry detention basin, which drains east through a 60-inch CSP to West Creek (HCFCD Channel K100-00). West Creek is a tributary of Spring Creek (HCFCD Channel J100-00), which is a tributary of the West Fork San Jacinto River (HCFCD Channel G103-00). A site drainage map is depicted in *Exhibit 2*.

5) Wetlands and Surface Waters

Reference an exhibit identifying the location of any known jurisdictional areas, such as waters of the United States, including wetlands. Include a description of the jurisdictional area, including wetlands and surface waters on site.

Example:

> West Creek (HCFCD Channel K100-00) is located along the eastern boundary of the property. No jurisdictional areas, including wetlands have been identified on this project site. These water features are identified in *Exhibit 2, Site Drainage Map*.

6) Potential Pollutant Activities

Reference an exhibit identifying the location of any activities that may generate pollutants via potential discharges to the storm drainage system. These locations may include but are not limited to hazardous materials treatment, storage, or disposal facilities, parking areas, and loading and unloading areas. The activities identified on the exhibit should identify any polluting activities that may be related to those activities described in Section 1-D. Include a list of activities and a description of the location of the activities based on the map.

Example:

> All activities associated with this development are typical to residential living. These activities include landscaping maintenance, house maintenance, and residential waste disposal. These activities will be located in the vicinity of each house. Other activities will be located in and around the dry detention basin, which include vegetative maintenance and occasionally, sediment removal. Potential pollutant activities are identified in *Exhibit 3, Potential Pollutant Activities and Minimum Control Measures Map*.

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7) Non-Structural Controls and Structural Controls

Reference an exhibit identifying the location of any structural controls that are identified in the plan (Section 2). If applicable, identify any specific areas where non-structural controls will be implemented. Include a description of the control and its location based on the map.

Example:

> Non-structural controls for storm water quality in this development will include proper waste disposal and proper landscaping practices by the homeowners and inlet stenciling (inlet marker).
>
> The storm water quality structural control for this development is comprised of the dry detention basin, which is separated into two sections by a concrete wall. The basin is designed to store the first 0.5 inch of storm water runoff in the 0.83 ac. ft detention/sedimentation basin constructed in the northern half of the dry detention basin. Additional storm water runoff that flows into the basin will bypass the detention/sedimentation basin through a weir that discharges into the detention basin in the northern half of the dry detention basin.
>
> Non-structural controls and structural controls are depicted in *Exhibit 3, Potential Pollutant Activities and Minimum Control Measures Map*.

8) Storm Water Discharge Locations

Reference an exhibit identifying the storm water discharge locations to the MS4 and the name of the MS4 operator. Include a description of the locations based on the map and the MS4 operator information.

Example:

> Storm water discharges into various storm sewer inlets in the residential area of the development. The storm sewer outfalls through a 72-inch pipe into the dry detention basin. The basin discharges through a 60-inch CSP to West Creek (HCFCD Channel K100-00) on the southeastern corner of the 20-acre tract. The MS4 operator is (***the City of Houston, Harris County, etc.***). All storm sewer inlets and outfalls are identified in *Exhibit 2, Site Drainage Map.*

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2. Controls

A. Non-Structural Controls

In this section, identify and describe every non-structural control that is to be implemented at the site and how it will be used. These controls may be subcategorized into controls for waste materials, hazardous waste, sanitary waste, landscaping practices / fertilizer and pesticide practices, and others. Refer to the Storm Water Quality Management Guidance Manual and Storm Water Management Handbook for Construction Activities for additional information on non-structural controls. Possible non-structural controls may include but are not limited to the following:

- *Public Education*
- *Reporting Hotline*
- *Household Hazardous Materials Storage/Disposal*
- *Pet Waste Management*
- *Litter Control*
- *Landscaping Practices*
- *Fertilizer and Pesticide Use*
- *Fueling Station Practices*
- *Vehicle/Equipment Washing and Steam Cleaning Practices*
- *Liquid Materials Loading and Unloading Practices*
- *Liquid Storage in Aboveground Tanks Practices*
- *Container Storage of Liquids, Food Wastes, Hazardous Wastes*
- *Spill Prevention and Response Plan*
- *Outdoor Storage Practices*
- *Recycling*
- *Inlet Stenciling (Inlet Marker)*
- *Routine Maintenance of Septic or Sanitary System*
- *Buffer Zone*
- *Urban Forestry*
- *Narrower Residential Streets*
- *Eliminating Curbs and Gutters*
- *Green Parking*
- *Alternative Turnarounds*
- *Alternative Pavers*
- *Plug Floor Drains*
- *Use Dry Cleanup Methods*
- *Stockpile Protection*
- *Spill Kits*
- *Secondary Containment*
- *Dispose/Remove Exposed Materials That Are Not Intended For Use*
- *Volunteer Programs (Stream Cleanup and Monitoring)*

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1) Waste Materials

Address any non-structural controls for waste materials that are being implemented as a BMP for the project. These may include but are not limited to litter control and proper solid waste disposal practices.

Example:

Homeowners will be given information on proper handling of household solid waste. Solid waste materials should be stored in a trashcan with a functional lid or kept under cover. The trashcans are placed on the curbside twice a week (***or insert applicable pickup frequency***) for pickup by a licensed waste management provider where it will be taken to an approved landfill for disposal.

2) Hazardous Waste

Address any non-structural controls for hazardous waste that are being implemented as a BMP for the project. These controls may include but are not limited to household hazardous materials storage/disposal, fueling station practices, and materials loading, unloading, and storage practices.

Example:

Homeowners will be given information on proper storage and disposal of household hazardous materials.

3) Sanitary Waste

Address any non-structural controls for sanitary materials that are being implemented as a BMP for the project. These controls may include but are not limited to connection to sanitary sewer or septic system.

Example:

All residential homes in the subdivision are connected to a sanitary sewer that drains to (***name of MUD***) treatment facilities. The (***name of facility***) is located offsite at (***address***).

4) Landscaping Practices / Fertilizer and Pesticide Practices

Address any non-structural controls for landscaping practices. These controls may include but are not limited to use of native or low maintenance vegetation, mowing practices, and proper application of fertilizers and pesticides.

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Example:

Homeowners will be responsible for maintaining their private property; however, good management practices for lawn and garden will be provided to educate residence on pollutant reducing practices and alternatives.

The dry detention basin is vegetated with native species of plants. Fertilizers and herbicides will be applied only when necessary and in accordance with manufactures specifications. The basin is mowed once every six months (***or insert applicable frequency***) or as needed.

5) Other

Address any non-structural controls not elsewhere classified that are being implemented as a BMP for the project. These controls may include but are not limited to vehicle/equipment cleaning practices, spill prevention and response plan, and inlet stenciling (inlet marker).

Example:

Inlets in the residential area are stenciled to identify the inlet as a storm drain that drains to West Creek (HCFCD Channel K100-00) and to discourage dumping of waste into the inlet.

B. Structural Controls

In this section, identify and describe every structural control that is to be constructed at the site and how it will be used. These controls may be subcategorized into storm water quality basins, infiltration/filtration facility, catchment facility, vegetative practices, low impact development, and others. Refer to the Storm Water Quality Management Guidance Manual, Storm Water Management Handbook for Construction Activities, and Minimum Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options for additional information on structural controls. Possible structural controls may include but are not limited to the following:

- *Dry Basins*
- *Wet Ponds*
- *Dual Use Flood Control/Water Quality Basin*
- *Constructed Wetlands*
- *Infiltration / Filtration Facilities*
- *Oil / Grit Separators*
- *Grass Swales*
- *Vegetated Filter Strips*
- *Low Impact Development*
- *Porous Pavement*
- *Bioretention*

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1) Storm Water Quality Basin

Address any dry basins, wet ponds, dual use flood control/water quality basins, or constructed wetlands used for storm water quality treatment.

Example:

Dry Detention Basin

This project incorporates a dual use flood control/water quality basin to treat the storm water runoff from the 20-acre residential area. The dry detention basin for water quality enhancements is designed to divert the first 0.5 inches of storm water runoff. The storm water quality basin discharges into the detention basin via a 2-inch PVC pipe in the concrete wall that separates the two. A trash rack is used to prevent the PVC pipe from being clogged with trash and debris. During high frequency events, storm water runoff flows over a weir into the detention basin, which discharges into West Creek (HCFCD Channel K100-00). The bottom and side slopes of the basin will be vegetated to prevent or reduce resuspension of sediment. A pilot channel is included to reduce erosion of the basin.

2) Infiltration/Filtration Facility

Address any infiltration or filtration facilities used for storm water quality treatment.

Example:

Not applicable to this project.

3) Vegetative Practices

Address any grass swales or vegetated filter strips used for storm water quality treatment.

Example:

Not applicable to this project.

4) Low Impact Development

Address any low impact development used for storm water quality treatment.

Example:

Not applicable to this project.

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5) Other

Address structural controls not elsewhere classified that are being implemented as a BMP for the project.

Example:

Litter Control

A litter control net will be placed on the inlet pipe of the detention basin to collect trash and debris. The net detaches from the pipe once it is filled and is anchored to the ground until the litter can be removed. Additional trash pickup will be performed as needed. These control measures will help to prevent litter from becoming a source of floatables. The litter control net will be inspected once a month (or insert applicable frequency) for litter removal. Any litter collected is brought to an approved landfill for disposal.

3. Maintenance Plan

Describe procedures and qualified personnel to assure the timely maintenance of the control measures identified in Section 2. Maintenance requirements must be discussed for each control individually. Reference a table that schedules all maintenance activities for all BMPs.

Example:

The following maintenance and inspection requirements will be performed for the identified BMPs used on the property. Table A-1 in Appendix A schedules all maintenance activities on the site and will be used to insure regular and timely maintenance for structural measures.

A. <u>Non-Structural Controls</u>

Example:

Litter Control

1. Homeowners will be responsible for maintaining any trash receptacles or other materials that are needed for proper management of household waste materials. The trash will be picked up twice a week by a licensed waste management provider. Packets of information on proper storage and handling of waste materials will be provided by (***Name***) to homeowners. The packets of information will include:

    - Control litter from becoming floatables

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- Secure lids on trash receptacles or place them undercover
- Only dispose of permitted materials in trash receptacles
- Recycling

Household Hazardous Materials Storage/Disposal

1. Homeowners will be given information on proper storage and disposal of household hazardous materials. These packets of information will be provided by (***Name***). The packets of information will include:

    - Keep products in their original containers with original labels
    - Store in a cool, dry place
    - Keep products out of reach of children and pets
    - Regularly check containers; place a leaky container inside another container and label accordingly
    - Store incompatible chemical products separately
    - Secure lids tightly

Routine Maintenance of Septic or Sanitary System

1. All residential homes in the subdivision are connected to a sanitary sewer that drains to (***name of MUD***) treatment facilities. The (***name of facility***) is located offsite at (***address***) and is operated and maintained by (***name***). They will maintain and inspect the wastewater treatment plant regularly to insure that it is functioning properly. The sanitary sewer system is owned and maintained by (***name of MUD***). The sanitary sewer system will be regularly inspected and maintained by (***name***) to insure that it is functioning properly.

Landscaping Practices / Fertilizer and Pesticide Practices

1. Homeowners will be responsible for maintaining their private property; however, literature on good management practices for lawn and garden will be provided to inform residents on pollutant reducing practices and alternatives. The packets of information on proper landscaping and fertilizer and pesticide practices will be provided by (***Name***).

    The dry detention basin is vegetated with native species of plants in order to reduce maintenance. Fertilizers and herbicides will be applied by a contract service provider only when necessary and in accordance with manufactures specifications. The basin is mowed by a contract service provider once every 6 months or as needed.

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The contract service provider will not cut the grass any lower than 6 inches when mowing the dry detention basin.

Consult the *Storm Water Quality Management Guidance Manual* for addition guidance for landscaping and fertilizer practices.

Inlet Stenciling (Inlet Marker)

1. All inlets in the residential area will be stenciled or marked to identify the inlet as a storm drain that drains to West Creek (HCFCD Channel K100-00) and to discourage dumping of waste into the inlet. The stenciling will be performed and maintained by a contract service provider. Inspection of the stenciled inlets will be performed once a year by (***Name***) to access if restenciling will be necessary. Consult the *Storm Water Quality Management Guidance Manual* for addition guidance on inlet stenciling.

B. <u>Structural Controls</u>

Example:

Dry Detention Basin

1. This project incorporates a dual use flood control/water quality basin to treat the storm water runoff from the 20-acre residential area. The basin will be visually inspected by (***Name***) once a month to assess any additional maintenance or repairs that may be required. Additional planning considerations and guidance are listed below:

    - The trash and debris will be removed from the trash rack to prevent clogging. This will be incorporated into the regular litter pickup performed by the licensed service provider.
    - Sediment will be removed from the basin when accumulations exceed one-third the design depth of the basin.

    Consult the *Storm Water Quality Management Guidance Manual* for addition guidance for dry basin maintenance.

2. Trash pickup will be performed as needed. This control measure will help to prevent litter from becoming a source of floatables. The litter pickup will be performed as needed but at least once a month (***or insert applicable frequency***). Any litter collected will be brought to an approved landfill for disposal. Additional planning considerations and guidance are listed below:

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- Additional visits for litter removal may be needed if trash accumulation becomes excessive.
- Litter will be removed from the dry detention basin and the litter control nets will be inspected before rain events to prevent floatables from continuing downstream of the basin.

Consult the *Storm Water Quality Management Guidance Manual* for addition guidance for litter control.

4. Inspection Plan

Describe procedures and qualified personnel to assure the timely inspection of the control measures identified in Section 2. Inspection requirements must be discussed for each control individually.

Example:

The following inspection requirements will be performed for the identified control measures used on the property.

A. Non-Structural Controls

Example:

Visual inspection of the residential area will be performed by (***Name***) every (***frequency***). An inspection form will be filled out by the person(s) performing the inspection and filed at (***Location***). The form will include the inspector's name, address, and qualifications. The residential area will be inspected for the following:

- Proper litter control (e.g., trash receptacles have secure lids or under cover)
- Proper landscaping, fertilizer, and pesticide practices
- Inlet stenciling (inlet marker) repair

The inspector will note the date that any maintenance or repairs have been performed since the last inspection. Blank inspection checklists can be found in *Appendix B*. (***Name***) will also be responsible for following up on residents' complaints, which are pertinent to the SWQMP. Public education will continue to be provided to residents on proper waste and household hazardous materials storage and disposal, landscaping practices, and fertilizer and pesticide practices. Public outreach performed specifically for the (***subdivision name***) subdivision will be properly documented by (***Name***) and filed at (***Location***).

B. Structural Controls

Example:

Monthly Inspections

Visual inspections of the dry detention basin and litter control net will be performed by (***Name***) once a month and after rainfall events of 1 inch or more in a 24-hour period. An inspection form will be filled out by the person(s) performing the inspection and filed at (***Location***). The form will include the following information:

- Inspector's name, address, and qualifications.
- Description of any litter and/or debris present in the basin.
- Description of any vegetative and/or erosion maintenance needed in the basin.
- Description of any structural failures and/or m intenance needed
- The date, any maintenance or repairs that have been performed since the last inspection, whether there is any standing water in the basin, the amount of rain produced in the last rainfall event, and the period of time since that event.

C. Annual Inspection Report

Example:

1. Annual inspections of the residential area and dry detention basin will be performed by (***Name***). An inspection report will be written and filed at (***Location***). The report will be written to assess the effectiveness of all current control measures, non-structural and structural, and identify any changes that need to be made to the SWQMP to better control pollutants. The report will include the following information:

- Inspector's name, address, and qualifications.
- Status of proper litter control (trash receptacles have secure lids or under cover)
- Status of proper landscaping, fertilizer, and pesticide practices
- Status of inlet stenciling (inlet marker) repair
- Status of public education practices based on documentation and attached materials (e.g., brochures, flyers, etc.)

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- Status of the basin for litter, debris, vegetation needs, integrity of any structural components, erosion problems, and sediment accumulation.
- Whether the current BMPs, non-structural and structural, are effectively controlling floatables, suspended solids, and other pollutants.
- The date that any maintenance or repairs were performed since the last annual inspection, whether there is any standing water in the basin, the amount of rain produced in the last rainfall event, and the period of time since that event.

2. As a pre-requisite for the permittee's annual renewal of the Storm Water Quality Permit, the structural storm water quality control(s)/feature(s) will be inspected by a Professional Engineer, licensed in the state of Texas, who will certify that the controls conform to the plans and technical specifications contained in the approved civil engineering drawings and the Storm Water Quality Management Plan on file with the (***Harris County Public Infrastructure Department, Engineering Division***). The Annual Professional Engineer Inspection Certification form can be found in Appendix B.

3. As a pre-requisite for the permittee's annual renewal of the Storm Water Quality Permit, the permitted operator will complete the Annual Permittee Certification of Proper Maintenance for Permit Renewal form. The Annual Permittee Certification of Proper Maintenance for Permit Renewal form can be found in Appendix B.

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EXHIBITS

Exhibit 1 – Vicinity Map

(*Insert an exhibit showing the general location of the project site.*)

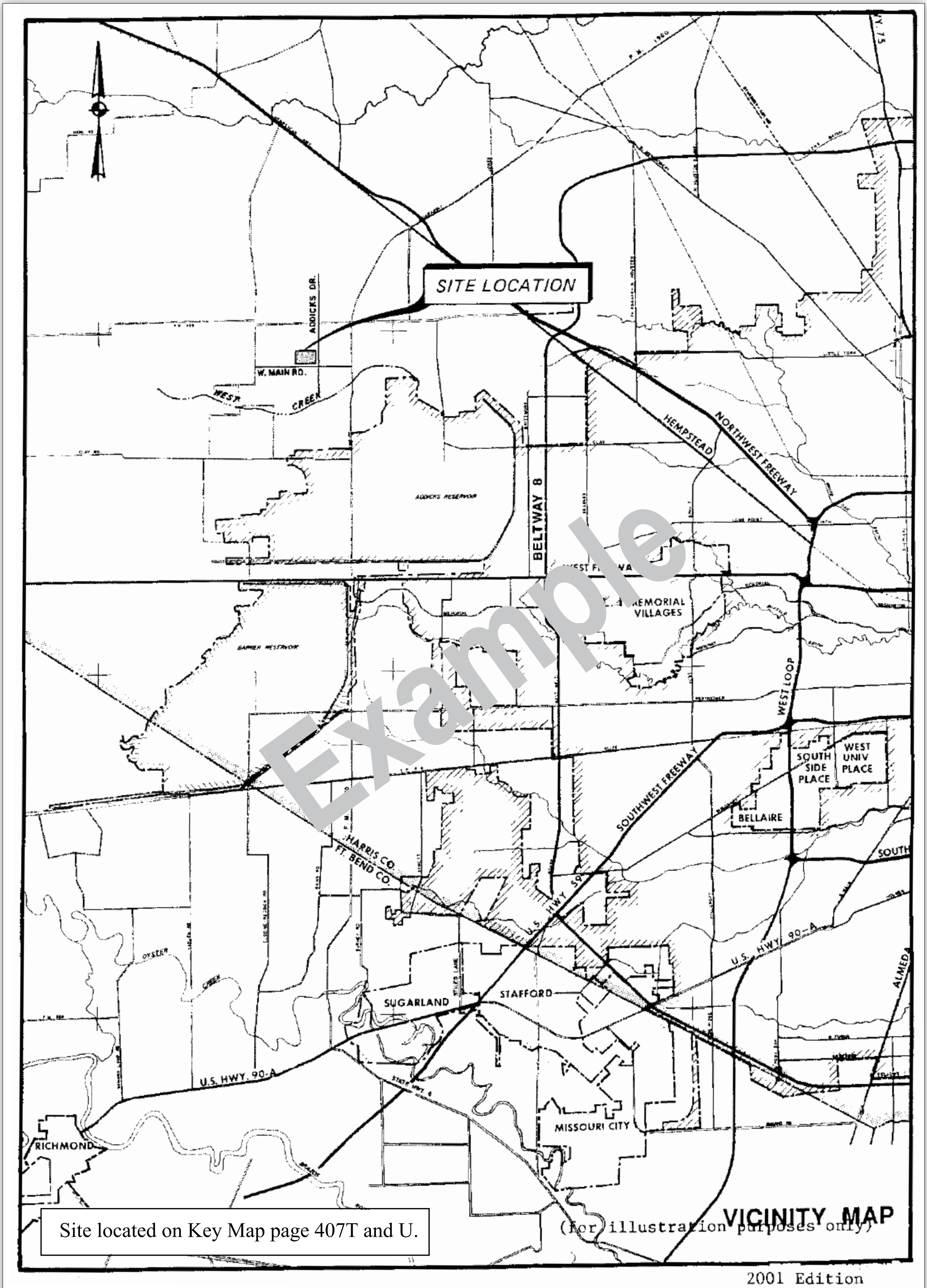

SITE LOCATION
ADDICKS DR.
W. MAIN RD.
WEST CREEK
ADDICKS RESERVOIR
BELTWAY 8
WEST FWY
MEMORIAL VILLAGES
HEMPSTEAD
NORTHWEST FREEWAY
BARKER RESERVOIR
WEST LOOP
SOUTH SIDE PLACE
WEST UNIV PLACE
BELLAIRE
SOUTHWEST FREEWAY
HARRIS CO.
FT. BEND CO.
U.S. HWY. 59
U.S. HWY. 90-A
SOUTH
ALMEDA
OYSTER CREEK
SUGARLAND
STAFFORD
MISSOURI CITY
RICHMOND
Example
Site located on Key Map page 407T and U.
VICINITY MAP
(For illustration purposes only)
2001 Edition

Exhibit 2 – Site Drainage Map

(*Insert an exhibit identifying areas of development and areas that are not to be developed.*)

(*Insert an exhibit identifying drainage basins, the location of any wetlands or surface waters, and the storm water discharge locations to the MS4 and the name of the MS4 operator.*)

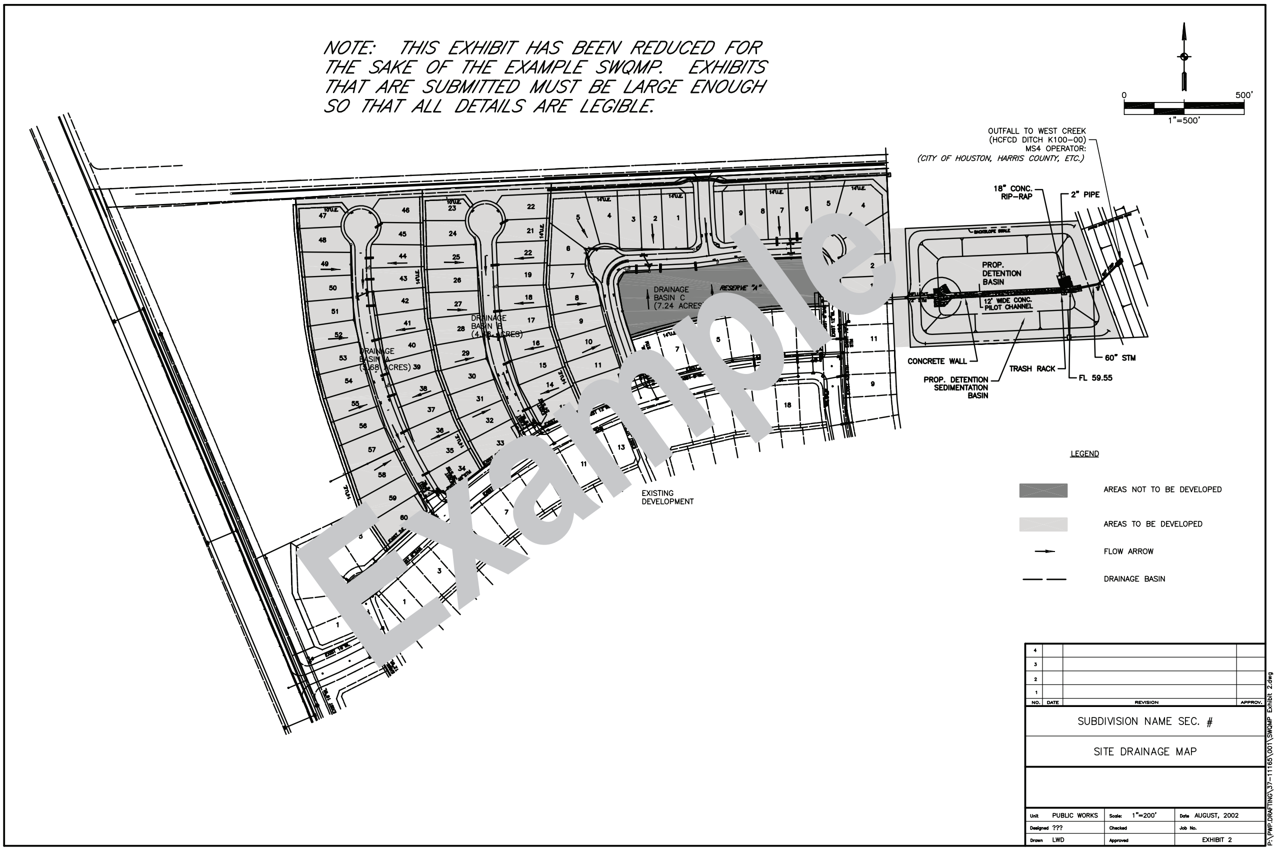
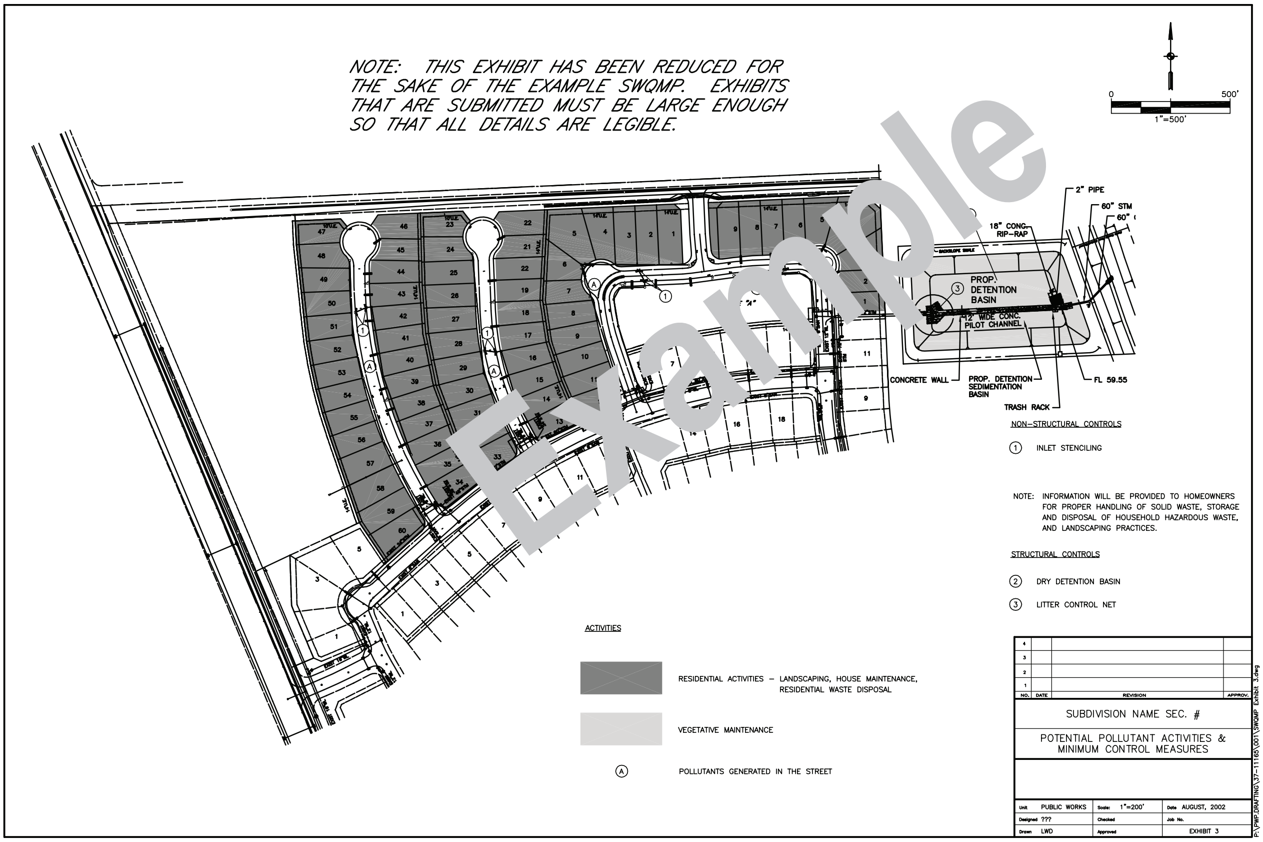

NOTE: THIS EXHIBIT HAS BEEN REDUCED FOR THE SAKE OF THE EXAMPLE SWQMP. EXHIBITS THAT ARE SUBMITTED MUST BE LARGE ENOUGH SO THAT ALL DETAILS ARE LEGIBLE.
OUTFALL TO WEST CREEK (HCFCD DITCH K100-00) MS4 OPERATOR: (CITY OF HOUSTON, HARRIS COUNTY, ETC.)
18" CONC. RIP-RAP
2" PIPE
PROP. DETENTION BASIN
12' WIDE CONC. PILOT CHANNEL
CONCRETE WALL
PROP. DETENTION SEDIMENTATION BASIN
TRASH RACK
60" STM
FL 59.55
DRAINAGE BASIN C (7.24 ACRES)
RESERVE "A"
DRAINAGE BASIN B
DRAINAGE BASIN A
EXISTING DEVELOPMENT
Example
LEGEND
AREAS NOT TO BE DEVELOPED
AREAS TO BE DEVELOPED
FLOW ARROW
DRAINAGE BASIN
SUBDIVISION NAME SEC. #
SITE DRAINAGE MAP
PUBLIC WORKS
1"=200'
AUGUST, 2002
LWD
EXHIBIT 2

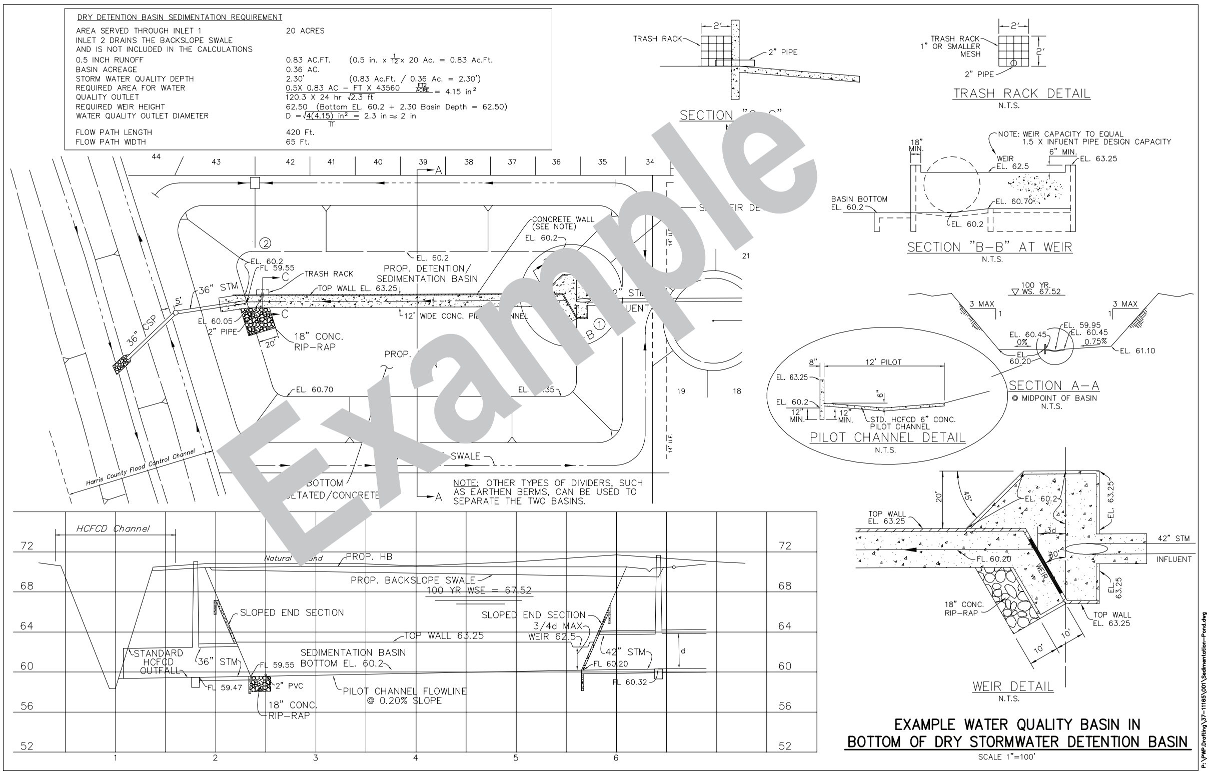
Exhibit 3 – Potential Pollutant Activities & Minimum Control Measures Map

(*Insert an exhibit identifying the location of any activities that may generate pollutants and potential discharges.*)

(*Insert an exhibit identifying the location of any non-structural and structural controls that are identified in the plan.*)


NOTE: THIS EXHIBIT HAS BEEN REDUCED FOR THE SAKE OF THE EXAMPLE SWQMP. EXHIBITS THAT ARE SUBMITTED MUST BE LARGE ENOUGH SO THAT ALL DETAILS ARE LEGIBLE.
Example
1"=500'
2" PIPE
18" CONC. RIP-RAP
PROP. DETENTION BASIN
12' WIDE CONC. PILOT CHANNEL
CONCRETE WALL
PROP. DETENTION SEDIMENTATION BASIN
FL 59.55
TRASH RACK
NON-STRUCTURAL CONTROLS
1 INLET STENCILING
NOTE: INFORMATION WILL BE PROVIDED TO HOMEOWNERS FOR PROPER HANDLING OF SOLID WASTE, STORAGE AND DISPOSAL OF HOUSEHOLD HAZARDOUS WASTE, AND LANDSCAPING PRACTICES.
STRUCTURAL CONTROLS
2 DRY DETENTION BASIN
3 LITTER CONTROL NET
ACTIVITIES
RESIDENTIAL ACTIVITIES – LANDSCAPING, HOUSE MAINTENANCE, RESIDENTIAL WASTE DISPOSAL
VEGETATIVE MAINTENANCE
A POLLUTANTS GENERATED IN THE STREET
SUBDIVISION NAME SEC. #
POTENTIAL POLLUTANT ACTIVITIES & MINIMUM CONTROL MEASURES
PUBLIC WORKS
1"=200'
AUGUST, 2002
LWD
EXHIBIT 3

NOTE: THIS EXHIBIT HAS BEEN REDUCED FOR THE SAKE OF THE EXAMPLE SWQMP. EXHIBITS THAT ARE SUBMITTED MUST BE LARGE ENOUGH SO THAT ALL DETAILS ARE LEGIBLE.



Appendix A

Documentation

NPDES** or **TPDES Permit** or **NOI
Maintenance and Inspection Schedule

NPDES or TPDES Permit or NOI

(*Insert a NPDES or TPDES permit or NOI.*)

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity under the TPDES Construction General Permit (TXR150000)

TCEQ

For help completing this application, read the TXR150000 NOI Instructions (TCEQ-20022-Instructions).

TCEQ Office Use Only
TPDES Permit Number: TXR15__________ NO
GIN Number: ________________

A. Construction Site Operator [x] New [ ] No Change Customer Reference Number: CN________

Name: **Center City Construction, Inc.**

Mailing Address: **222 Austin, Suite 810** City: **Houston** State: **TX** Zip Code: **77008-0022**

Country Mailing Information (*if outside USA*) Territory: ______ Country Code: ______ Postal Code: ______

Phone Number: **(713) 323-7655** Extension: ______ Fax Number: **(713) 323-7650**

E-mail Address: **ccc@centercityconst.com**

Type of Operator: [ ] Individual [ ] Sole Proprietorship - D.B.A. [ ] Partnership [x] Corporation [ ] Federal Government [ ] State Government [ ] County Government [ ] City Government [ ] Other: ______

Independent Operator? [x] Yes [ ] No Number of Employees: [ ] 0-20 [ ] 21-100 [ ] 101-250 [x] 251-500 [ ] 501 or higher

Federal Tax ID: **If Applicable** State Franchise Tax ID Number: **If Applicable** DUNS Number: **If Applicable**

B. Billing Address

Name: **Center City Construction, Inc.; Attn: Accounting**

Mailing Address: **222 Austin, Suite 810** City: **Houst** State: **TX** Zip Code: **77008-0022**

Country Mailing Information (*if outside USA*) Territory: ______ Country C : ______ Postal Code: ______

C. Project / Site Information [x] New [ ] No Change Regulated Ent Refe ce r: RN______

Name: **Addick Estates**

Mailing Address: **2536 Addick Dr.** City: **H ston** State: **TX** Zip Code: **77081-0000**

Physical Address: **3500 Addick Estates Pkwy.** City: **H ust** ounty: **HARRIS** Zip Code: **77082-0000**

Location Access Description: **Turn left off of the 3500 block of ic stat Pkw**

Latitude: **29** ° **51** ' **0** " N Longitude: **95** ° ' " W Degrees (°), Minutes ('), and Seconds (")

Latitude: **29.85** Longitude: – **66** Decimal Form

Standard Industrial Classification (SIC) code: **1521** Also, d scri the construction activity at this site *(do not repeat the SIC code)*:
Single family residential constructi

Has a storm water pollution preven plan been pre s specified in the general permit (TXR150000)? [x] Yes [ ] No

Estimated area of land disturbed (to est acre **13** Is the project / site located on Indian Country Lands? [ ] Yes [x] No

Does this project / site discharge storm er into unicipal separate storm sewer system (MS4)? [x] Yes [ ] No

If yes, provide the name of the MS4 opera **ris County**

Provide the name or segment number of the water body that receives storm water from this project / site: **West Creek**

Example

D. Contact - If the TCEQ needs additional information regarding this application, who should be contacted?

Name: **Joseph Contractor** Title: **Vice President**

Phone Number: **(713) 323-7655** Extension: ______ Fax Number: **(713) 323-7650**

E-mail Address: **joseph.contractor@centercityconst.com**

E. Payment Information - Check / Money Order Number: **552** Name on Check / Money Order: **Center City Construction, Inc.**

F. Certification

I certify under penalty of law that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Construction Site Operator:

Prefix: **Mr.** First: **Joseph** Middle: **E.**

Last: **Contractor** Suffix: ______ Title: **Vice President**

Signature: Joseph E Contractor Date: 9/5/03

If you have questions on how to fill out this form or about the storm water program, please contact us at (512) 239-4671.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at (512) 239-3282.

The completed NOI must be mailed to the following address. Use the attached document to submit the $100 application fee. Please note that the NOI and application fee are submitted separately to different addresses.

Texas Commission on Environmental Quality
Storm Water & General Permits Team; MC - 228
P.O. Box 13087
Austin, Texas 78711-3087

TCEQ-20022 (05/03) **Page 1 of 2**

APPENDIX A

Texas Commission on Environmental Quality
Payment Submittal Form

The storm water application fee shall be sent under separate cover to the Texas Commission on Environmental Quality.

This form must be used to submit your Storm Water Application Fee. Please complete the following information, staple your check in the space provided at the bottom of this document, and mail it to:

BY REGULAR U.S. MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
P.O. Box 13088
Austin, TX 78711-3088

BY OVERNIGHT/EXPRESS MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
12100 Park 35 Circle
Austin, TX 78753

Fee Code: GPA

Storm Water General Permit: TXR150000

Check / Money Order No:

Amount of Check/Money Order:

Date of Check or Money Order:

Name on Check or Money Order:

Facility / Site Name:

Facility / Site Physical Address:

City:

Zip Code:

Staple Check In This Space

TCEQ-20022 (05/03)

Page 2 of 2

Table A-1: Maintenance and Inspection Schedule for (*Location*)

Maintenance Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Non-Structural Controls												
Information packets*												
Litter Pickup in the Basin	X	X	X	X	X	X	X	X	X	X	X	X
Mowing of the Basin			X						X			
Structural Controls												
Cleaning of the Trash Rack	X	X	X	X	X	X	X	X	X	X	X	X
Sediment Removal**												
Inspections												
Monthly	X	X	X	X	X	X	X	X	X	X	X	X
Annual												X
"X" identifies the months in which the activity will be performed (at a minimum).												
*Provided to residents at move-in and available at community locations.												
**Sediment removed from the basin when accumulations exceed one-third the design depth of the basin.												

Appendix B

Forms

Permittee Certification of Storm Water Quality Management Requirements
Storm Water Quality Management Plan Engineer's Certification
Storm Water Quality Permit As-Built Certificate
Annual Permittee Certification of Proper Maintenance for Permit Renewal
Annual Professional Engineer Inspection Certification
Monthly Inspection Form

PERMITTEE CERTIFICATION OF STORM WATER QUALITY MANAGEMENT REQUIREMENTS

I, (***Name***), acting as (***Position***) for (***Permittee's Name***), Permittee, certify under penalty of law that the proposed development is subject to storm water quality requirements. It is my duty to see that all storm water quality features be placed in accordance with construction drawings approved by (***the City of Houston, Harris County, ... etc.***). Once storm water quality features are in place, it is my responsibility that all features be inspected either yearly or at the frequency outlined in the Storm Water Quality Management Plan For (***Site Name***). Also, all storm water quality features will be maintained in accordance with the above-mentioned report for the property known as (***Site Name***) at (***Address or Location***).

Signature:________________________________ Date:______________

(***Printed Name***)
(***Permittee's Name***)
(***Address***)
(***Phone Number***)

State of Texas
County of __________

Before me, a notary public, on this day personally appeared ___________________ known to me (or proved to me on the oath of ________________) to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he/she executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this _______ day of _____________, ________.

____
Notary Public's Signature

STORM WATER QUALITY MANAGEMENT PLAN
ENGINEER'S CERTIFICATION

(NOTE: Engineer's Certification is required for SWQMPs submitted to Harris County for a Harris County Storm Water Quality Permit.)

I, ______________________________(***Name***), a registered __________ (***Engineer***) duly licensed to practice in the State of Texas do hereby certify that the information presented in this document was prepared under my direction and supervision and complies with the *Regulations of Harris County, Texas for Storm Water Quality Management* and the *Storm Water Quality Management Guidance Manual*. Any parts of the design/sizing of the permanent storm water quality feature(s) that do not meet current minimum design criteria contained within the Regulations and Manual are noted below.

(Describe any exceptions to the criteria here.)

Signature:_________________________________ Date:______________

(***Printed Name***)
(***License Number***)
(***Address***)
(***Phone Number***)

____
Engineer's Seal and Signature

Project Name: ____

Project Description: ____

Project Location: ____

STORM WATER QUALITY PERMIT AS-BUILT CERTIFICATE

I, _____________________________(*Name*), a registered _______________(***Engineer***) duly licensed to practice in the State of Texas do hereby certify that the _______________________________(***Storm water quality features***) constructed at _______________________________ under Permit Number _________________ were completed in accordance with the drawings and specifications on file with the Harris County Public Infrastructure Department Engineering Division.

Signature:________________________________ Date:______________

(***Printed Name***)
(***License Number***)
(***Address***)
(***Phone Number***)

____
Engineer's Seal and Signature

APPENDIX A

ANNUAL PERMITTEE CERTIFICATION OF PROPER MAINTENANCE FOR PERMIT RENEWAL

I, (***Name***), acting as (***Position***) for (***Permittee's Name***), Permittee, certify under penalty of law that the Storm Water Quality Management Plan in effect for __________________ (***Development***) under Harris County/City of Houston Storm Water Quality Permit number ___________, has been maintained according to the provisions contained therein.

Signature:_________________________________ Date:______________

(***Printed Name***)
(***Permittee's Name***)
(***Address***)
(***Phone Number***)

State of Texas
County of __________

Before me, a notary public, on this day personally appeared ___________________ known to me (or proved to me on the oath of ________________) to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he/she executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this _______ day of _____________, ________.

____
Notary Public's Signature

ANNUAL PROFESSIONAL ENGINEER INSPECTION CERTIFICATION

I, ______________________________(***Name***), a professional engineer licensed in the State of Texas, certify that on ________________________(***inspection date***) the ________________________________(***structural control(s)***) designed and constructed as part of Storm Water Quality Permit number ______________ conformed to the plans and technical specifications contained in the approved civil engineering drawings and Storm Water Quality Management Plan for that permit on file with the (***Harris County Public Infrastructure Department, Engineering Division/City of Houston***).

Signature:_________________________________ Date:______________

(***Printed Name***)
(***License Number***)
(***Address***)
(***Phone Number***)

____
Engineer's Seal and Signature

STORM DRAIN INLET STENCILING MONTHLY INSPECTION

Inspection Date______________ **By:** ____________________________

Time ______________ **Location:** ____________________________

ITEM	DESCRIPTION	Yes/No/NA	Correction Action/By	Corrected Date	Notes
1	**PRACTICES**				
1.1	Signs painted on or adjacent to all storm drain inlets noting receiving waters and warning against dumping.				
1.2	Stenciled message on concrete or metal plates on or adjacent to storm drain inlets noting receiving waters and warning against dumping				
1.3	Other:				
2	**REQUIRED MAINTENANCE AND/OR REPAIRS:**				

DRY DETENTION BASIN MONTHLY INSPECTION

Inspection Date______________ **By:** ____________________________

Time ______________ **Location:** ____________________________

ITEM	DESCRIPTION	Yes/No/NA	Correction Action/By	Corrected Date	Notes
1	**SEDIMENT REMOVAL**				
1.1	Design depth (feet): ____________				
1.2	Sediment thickness:____________ (Measure sediment thickness directly, or measure current depth and subtract from design depth to arrive at sediment thickness. Remove sediment if thickness exceeds 1/3 of design depth.)				
2	**EMBANKMENT**				
2.1	Evidence of subsidence.				
2.2	Presence of erosion.				
2.3	Presence of crack.				
2.4	Presence of tree growth.				
2.5	Presence burrowing animals.				
2.6	Other. Describe below.				
2.7	Explanation:				
3	**OUTFALL**				
3.1	Emergency spillway.				
3.2	Outlet.				
3.3	Discharge control such as valve, riser/barrel, weir, check dam, and other.				
3.4	Other. Describe below.				
3.5	Explanation:				
4	**DRAW DOWN TIME**				
	Design volume drains less than 24 hours or remains 72 hours or more after a storm. If answer is yes, outfall or outlet control should be checked, cleaned or adjusted as needed.				
5	**CONTRIBUTORY DRAINAGE**				
5.1	Inlet condition is satisfactory.				
5.2	Upstream channel conditions are satisfactory.				
5.3	Upstream erosion controls are satisfactory.				
5.4	Upstream sediment controls are satisfactory.				
5.5	Other. Describe below.				
5.6	Explanation:				

DRY DETENTION BASIN MONTHLY INSPECTION (Continued)

Inspection Date______________ **By:** ________________________

Time ______________ **Location:** ________________________

ITEM	DESCRIPTION	Yes/No/NA	Correction Action/By	Corrected Date	Notes
6	**DEBRIS / LITTER REMOVAL**				
6.1	Date of last litter removal:____________________				
6.2	Removal of litter is required. (Required if last litter removal was more than 6 months ago.)				
7	**MOWING**				
7.1	Date of last mowing performed:_______________				
7.2	Mowing required. (Required if last mowing was more than 6 months ago or if trees or woody shrubs are present on embankment.)				
8	**NUISANCE CONTROL**				
8.1	Presence of insects.				
8.2	Presence of weeds				
8.3	Presence of odors.				
8.4	Other. Describe below.				
8.5	Explanation:				
9	**STRUCTURAL REPAIRS/REPLACEMENT**				
	Describe any item needing structural repair and replacement below.				
10	**OTHER ITEM.**				
	Describe item and condition. Explain any problem below.				
	REQUIRED MAINTENANCE AND /OR REPAIRS:				

Appendix C

Calculations

STORM WATER QUALITY MANAGEMENT PLAN CALCULATIONS

Provide detailed design calculations for all structural controls used on the site.

Example:

Dry Detention Basin

1. *Determine the drainage area that contributes storm water runoff to the basin.* The drainage area served only accounts for the storm water runoff from inlet 1. Inlet 2 drains the backslope swale and is not included in the calculations. The inlets are identified in *Exhibits 5.*

   $$A = 20 acres$$

2. *Compute the water quality treatment volume.* The water quality treatment volume is 0.5 inches of runoff from the drainage area.

   $$V_{wq} = 0.5in \times \frac{1ft}{12in} \times 20acres = 0.83acre - feet$$

3. *Design the basin layout with approximate length to width ratio of at least 3:1.* The basin width is 140 ft wide. The length of the basin is 440 ft and the side slopes are 3:1. The storm water quality depth was calculated based on an average storm water quality basin acreage of 0.36 acres.

   $$A_b = 0.36acre$$

   $$d_{wq} = V_{wq} / A_b = 0.83acre - feet / 0.36acre = 2.30 feet$$

4. *Calculate the orifice area require to drain 50 percent of the water quality volume within 24-hours.* Using *Eq. 2* from the *Storm Water Quality Management Guidance Manual*, page 4-38, the orifice area required would be:

   $$A_p = \frac{V}{120.3 \Delta t \sqrt{\Delta H}}$$

   Where: A_p = perforation area, square inches

   V = the design volume, cubic feet

   $V = 50\% V_{wq}$

   Δt = the draw down time, hours

$\Delta t = 24$ hours

$\Delta H =$ the maximum storage depth of the basin, feet

$\Delta H = d_{wq}$

$$A_p = \frac{0.5 \times 0.83ac - ft \times 43560 \frac{ft^2}{acre}}{120.3 \times 24hr\sqrt{2.30\,ft}} = 4.15in^2$$

5. *Calculate the maximum diameter of the pipe to be used to have the needed perforated area.*

$$D = \sqrt{\frac{4 \times A_p}{\pi}} = \sqrt{\frac{4 \times 4.15in^2}{\pi}} = 2.3in$$

Use a 2-inch PVC pipe to retain the storm water quality volume for the required length of time.

6. *Calculate the number of holes required in the riser.*

0.5 in. diameter = 0.19635 sq. in. area

1.0 in. diameter = 0.7854 sq. in. area

$A_h =$ Area of the desired hole size

Choose the desired hole size.

$N_{0.5} =$ Number of 0.5 in. holes required $= \frac{A_p}{A_h}$

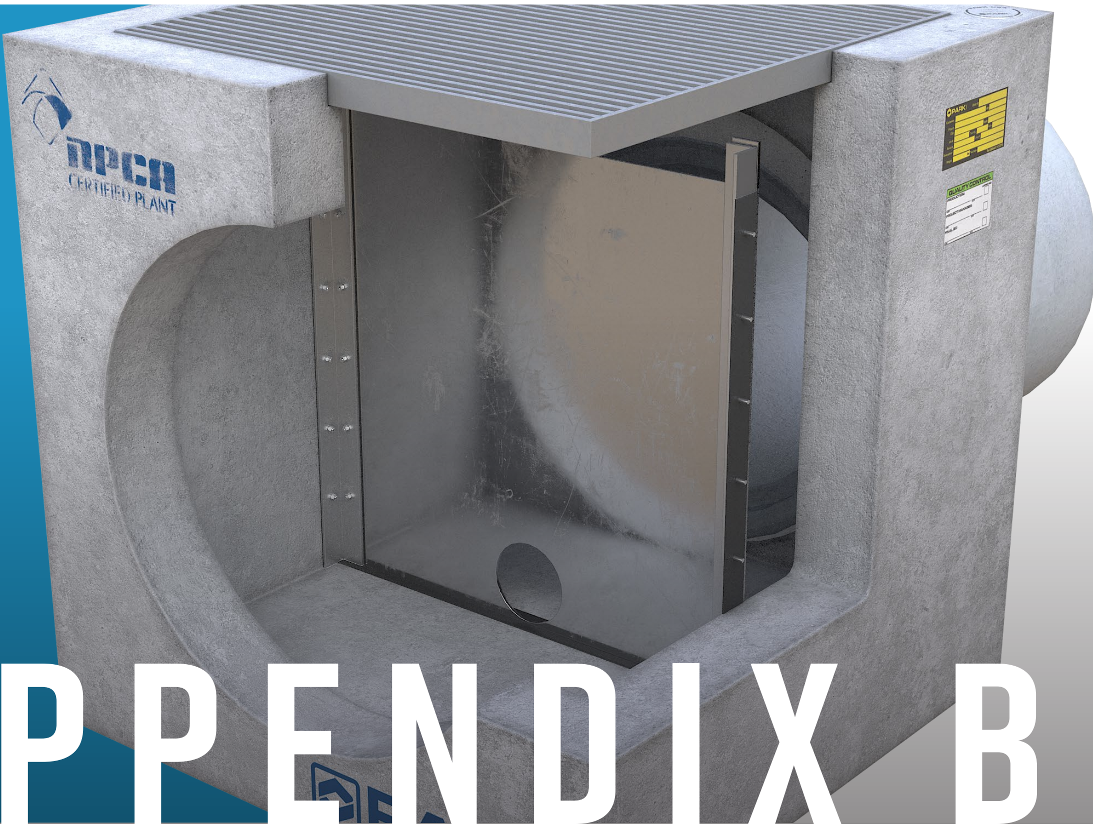
$$N_{0.5} = \frac{A_p}{A_h} = \frac{4.15in^2}{0.19635in^2} = 21.11holes$$

$$N_{1.0} = \frac{A_p}{A_h} = \frac{4.15in^2}{0.7854in^2} = 5.28holes$$

Place 21 – 0.5 inch holes or 5 – 1.0 inch holes in the riser.

APPENDIX A

NOTES



APPENDIX B

NOTES

US007470361B2

(12) **United States Patent**
Eberly

(10) **Patent No.: US 7,470,361 B2**
(45) **Date of Patent: Dec. 30, 2008**

(54) **SYSTEM FOR STORMWATER ENVIRONMENTAL CONTROL**

(76) Inventor: **Christopher N. Eberly**, 10104 Eberly Ranch Rd., Chappel Hill, TX (US) 77426

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 322 days.

(21) Appl. No.: **10/987,126**

(22) Filed: **Nov. 12, 2004**

(65) **Prior Publication Data**

US 2005/0103698 A1 May 19, 2005

Related U.S. Application Data

(60) Provisional application No. 60/520,001, filed on Nov. 14, 2003.

(51) **Int. Cl.**
C02F 1/40 (2006.01)

(52) **U.S. Cl.** **210/99**; 210/162; 210/164; 210/254; 210/259; 210/305; 210/307; 210/311; 210/418; 210/522; 210/538

(58) **Field of Classification Search** 210/99, 210/153, 154, 162, 163, 164, 170.3, 254, 210/259, 305, 307, 311, 318, 418, 522, 538, 210/DIG. 5; 137/574
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

236,740	A	1/1881	Waring, Jr.	
325,231	A	9/1885	Badgley	
942,907	A	12/1909	Huff	
1,035,926	A	8/1912	Wagner	
1,237,068	A	8/1917	Loeb	
1,349,734	A	8/1920	Riley	
1,778,326	A	10/1930	Kutzer	
1,844,443	A	2/1932	Schmidt	
1,903,774	A *	4/1933	Burrell	210/130
2,136,945	A	11/1938	Klein	
2,164,011	A	6/1939	Hilborn	
2,393,498	A	1/1946	Miller	
2,764,545	A	9/1956	Primich	
2,796,988	A	6/1957	Loffler	
2,820,550	A	1/1958	Sorg	
3,175,578	A	3/1965	Patterson et al.	
3,221,881	A	12/1965	Weiler et al.	
3,258,123	A	6/1966	Fontaine	
3,282,436	A	11/1966	Malm	

(Continued)

FOREIGN PATENT DOCUMENTS

EP 011799 A1 6/1984

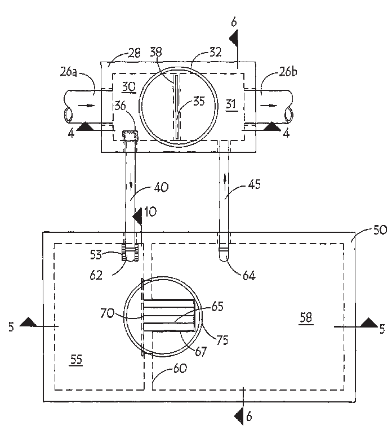
(Continued)

Primary Examiner—Matthew O Savage
(74) *Attorney, Agent, or Firm*—Charles S. Knobloch; Arnold & Knobloch, L.L.P.

(57) **ABSTRACT**

The present invention provides a method of installing an environmental control system so as to allow for separate sizing of treatment and bypass capacity while also offering the ability to make or change either treatment or bypass capacities at different times. This is accomplished by containing the treatment and bypass functions in separate chambers, using screen, baffle, or coalescing media pack to further refine effectiveness and capacity of each structure independently. The control structure and interceptor structure may be pre-engineered to a variety of sizes, capacities, or other specifications. This allows simple selection of a specific control structure and a specific interceptor structure from a variety of combinations, eliminating the need for custom engineering for each installation.

19 Claims, 9 Drawing Sheets



APPENDIX B

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Page 2

U.S. PATENT DOCUMENTS

3,346,122 A		10/1967	Cornelissen	
3,362,542 A		1/1968	Stevens	
3,363,876 A		1/1968	Moore	
3,374,894 A		3/1968	Webster	
3,567,024 A		3/1971	McCormick	
3,567,032 A		3/1971	Kemper	
3,568,842 A		3/1971	Bozek	
3,725,271 A		4/1973	Giannotti	
3,837,501 A		9/1974	Pielkenrood	
3,862,040 A		1/1975	Preus et al.	
3,884,815 A		5/1975	Comelissen	
4,031,009 A		6/1977	Hicks	
4,073,734 A		2/1978	Lowrie	
4,103,862 A		8/1978	Moore	
4,127,488 A		11/1978	Bell et al.	
4,136,010 A		1/1979	Pilie et al.	
4,261,823 A		4/1981	Gallagher et al.	
4,297,219 A		10/1981	Kirk et al.	
4,328,101 A		5/1982	Broden	
4,363,731 A		12/1982	Filippi	
4,405,458 A		9/1983	McHugh, Jr.	
4,455,231 A		6/1984	Filippi	
4,526,691 A		7/1985	Melis et al.	
4,578,188 A		3/1986	Cousino	
4,684,467 A		8/1987	Cloud	
4,722,800 A	*	2/1988	Aymong	210/802
4,778,494 A		10/1988	Patterson	
4,897,206 A	*	1/1990	Castelli	210/791
4,898,678 A		2/1990	Johnson et al.	
4,985,148 A		1/1991	Monteith	
5,052,442 A		10/1991	Johannessen	
5,122,280 A		6/1992	Russell et al.	
5,156,745 A		10/1992	Cairo, Jr. et al.	
5,173,195 A		12/1992	Wright et al.	
5,196,123 A		3/1993	Guthy	
5,246,592 A		9/1993	Schweizer et al.	
5,266,191 A	*	11/1993	Greene et al.	210/195.1
5,303,782 A		4/1994	Johannessen	
5,310,481 A	*	5/1994	Rondano	210/86
5,401,404 A		3/1995	Strauss	
5,419,838 A		5/1995	DiTullio	
5,433,845 A	*	7/1995	Greene et al.	210/170.03
5,498,331 A		3/1996	Monteith	
5,500,132 A		3/1996	Elmi	
5,505,860 A		4/1996	Sager	
5,531,888 A		7/1996	Geiger et al.	
5,549,817 A		8/1996	Horsley et al.	
5,560,826 A		10/1996	Szereday et al.	
5,565,101 A		10/1996	Kuntz	
5,725,760 A		3/1998	Monteith	
5,746,911 A		5/1998	Pank	
5,746,912 A		5/1998	Monteith	
5,753,115 A		5/1998	Monteith	
5,759,415 A		6/1998	Adams	
5,779,888 A		7/1998	Bennett	
5,788,848 A		8/1998	Blanche et al.	
5,849,181 A		12/1998	Monteith	
5,902,477 A		5/1999	Vena	
5,946,967 A		9/1999	Russell	
5,993,646 A		11/1999	Powers	
6,053,206 A		4/2000	Johannesen	
6,062,767 A		5/2000	Kizhnerman et al.	
6,077,448 A		6/2000	Tran-Quoc-Nam et al.	
6,080,305 A		6/2000	Sandahl	
6,080,307 A		6/2000	Morris et al.	
6,086,756 A		7/2000	Roy	
6,126,817 A		10/2000	Duran et al.	
6,190,545 B1		2/2001	Williamson	
6,241,881 B1		6/2001	Pezzaniti	
6,241,882 B1		6/2001	Allard	
6,264,835 B1		7/2001	Pank	
6,428,692 B2		8/2002	Happell	
6,475,381 B1		11/2002	Gustafsson	
6,524,473 B2		2/2003	Williamson	
6,783,683 B2	*	8/2004	Collings	210/669
2003/0000895 A1		1/2003	Hensley et al.	

FOREIGN PATENT DOCUMENTS

EP	0 561 170 A1	9/1993
EP	0 739 858 A2	10/1996
FR	2 626 782 A1	8/1989
FR	2 682 945 A1	4/1993
JP	63-12396 A	1/1988
JP	2-95492 A	4/1990
JP	4-83033 A	3/1992
JP	10-34188 A	2/1998
JP	11-57693 A	3/1999
JP	11-165183 A	6/1999
JP	2000-354712 A	12/2000
WO	WO 92/03208 A1	3/1992
WO	WO 94/05601 A1	3/1994
WO	WO 96/06667 A2	3/1996
WO	WO 97/44219 A1	11/1997
WO	WO 97/46300 A1	12/1997
WO	WO 98/01395 A1	1/1998
WO	WO 99/58455 A1	11/1999

* cited by examiner

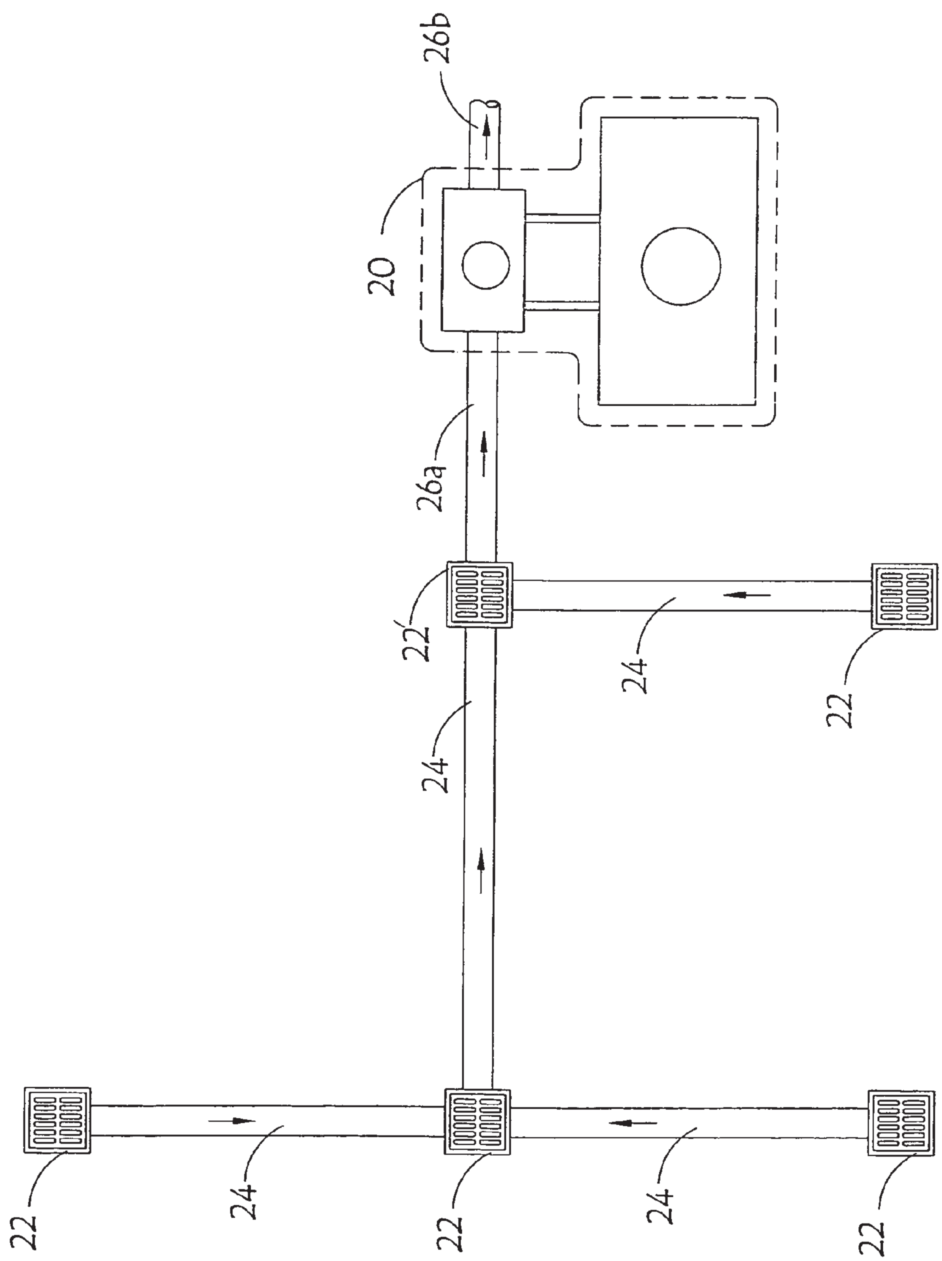

FIG. 1

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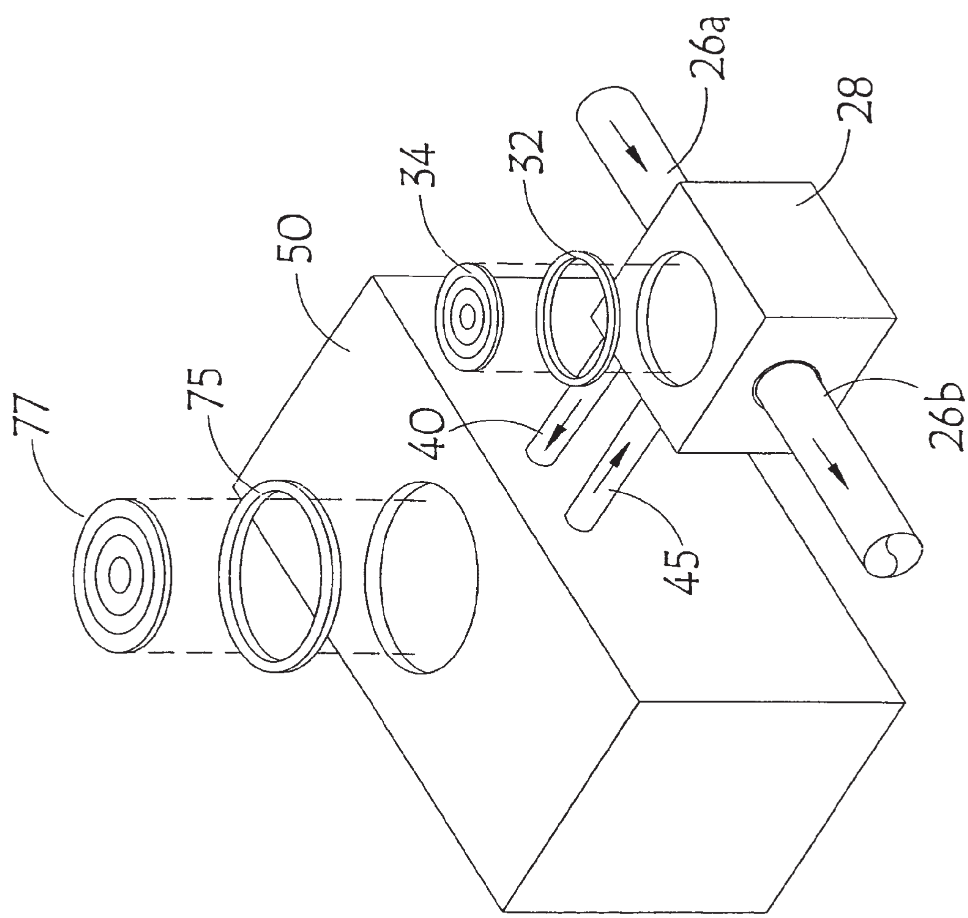

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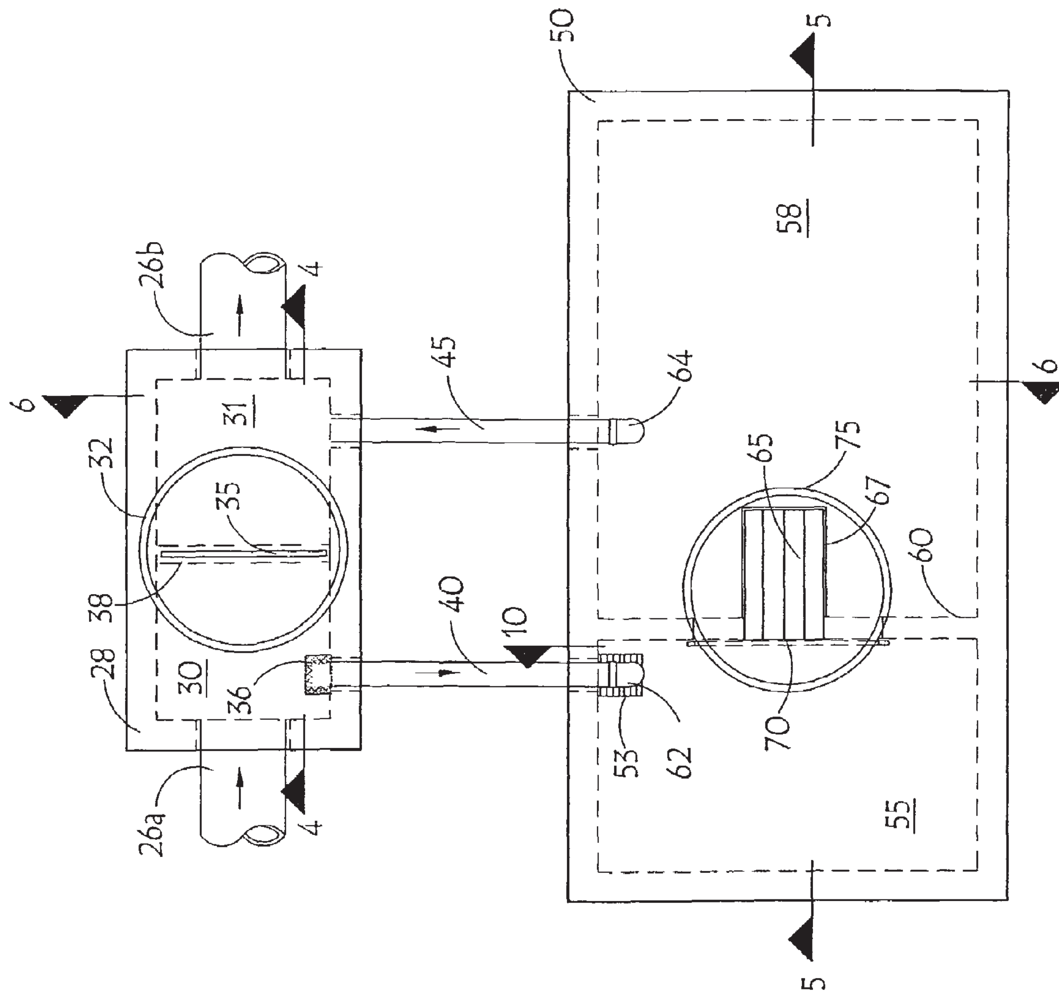
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FIG. 3

U.S. Patent Dec. 30, 2008 Sheet 4 of 9 US 7,470,361 B2

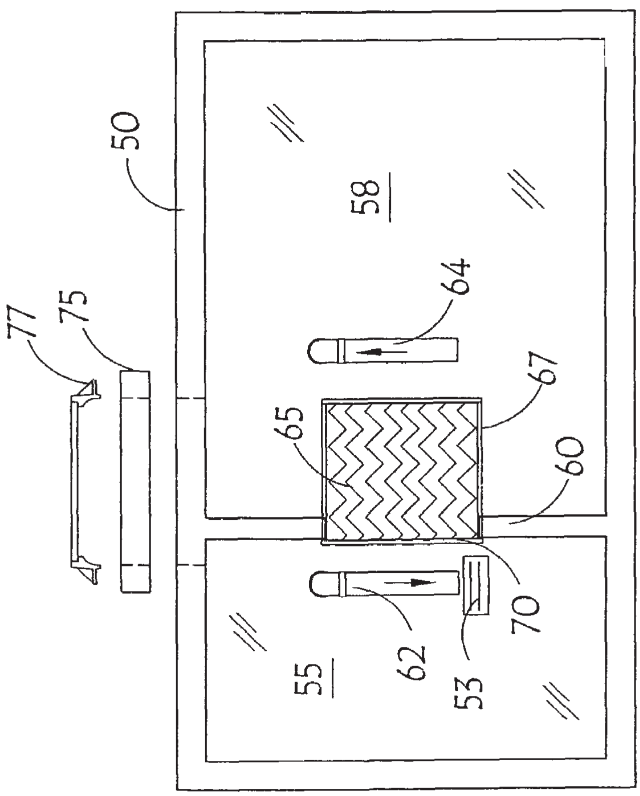

FIG. 5

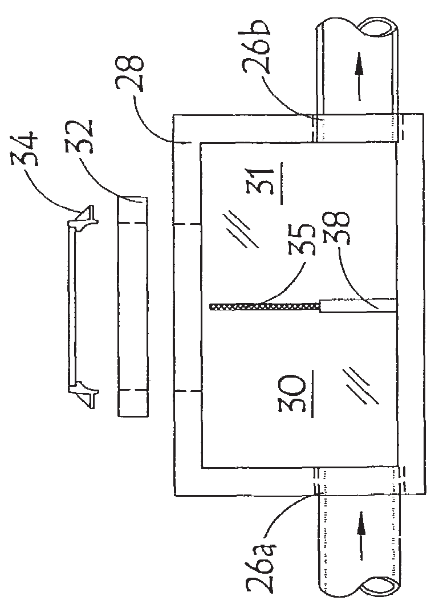

FIG. 4

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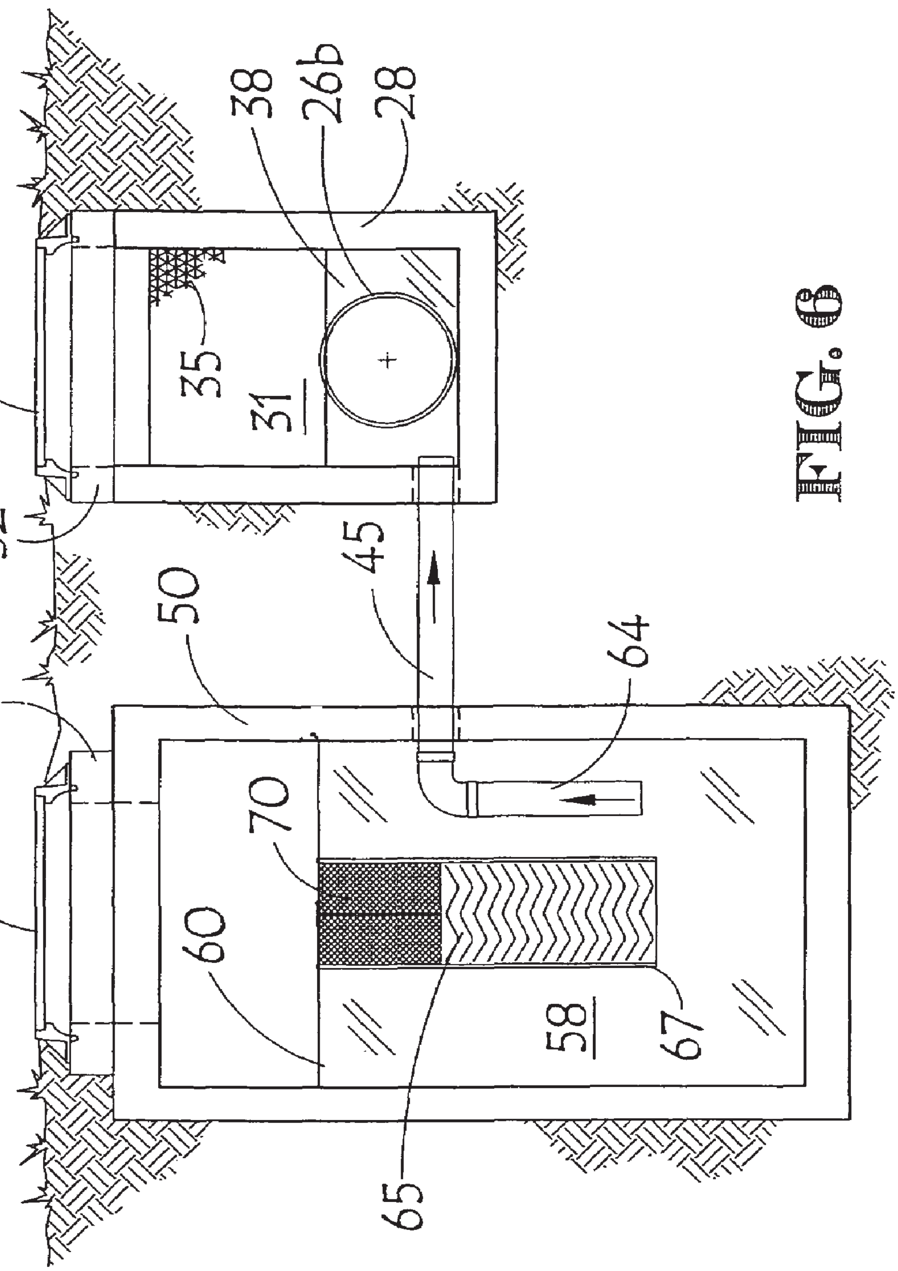

FIG. 6

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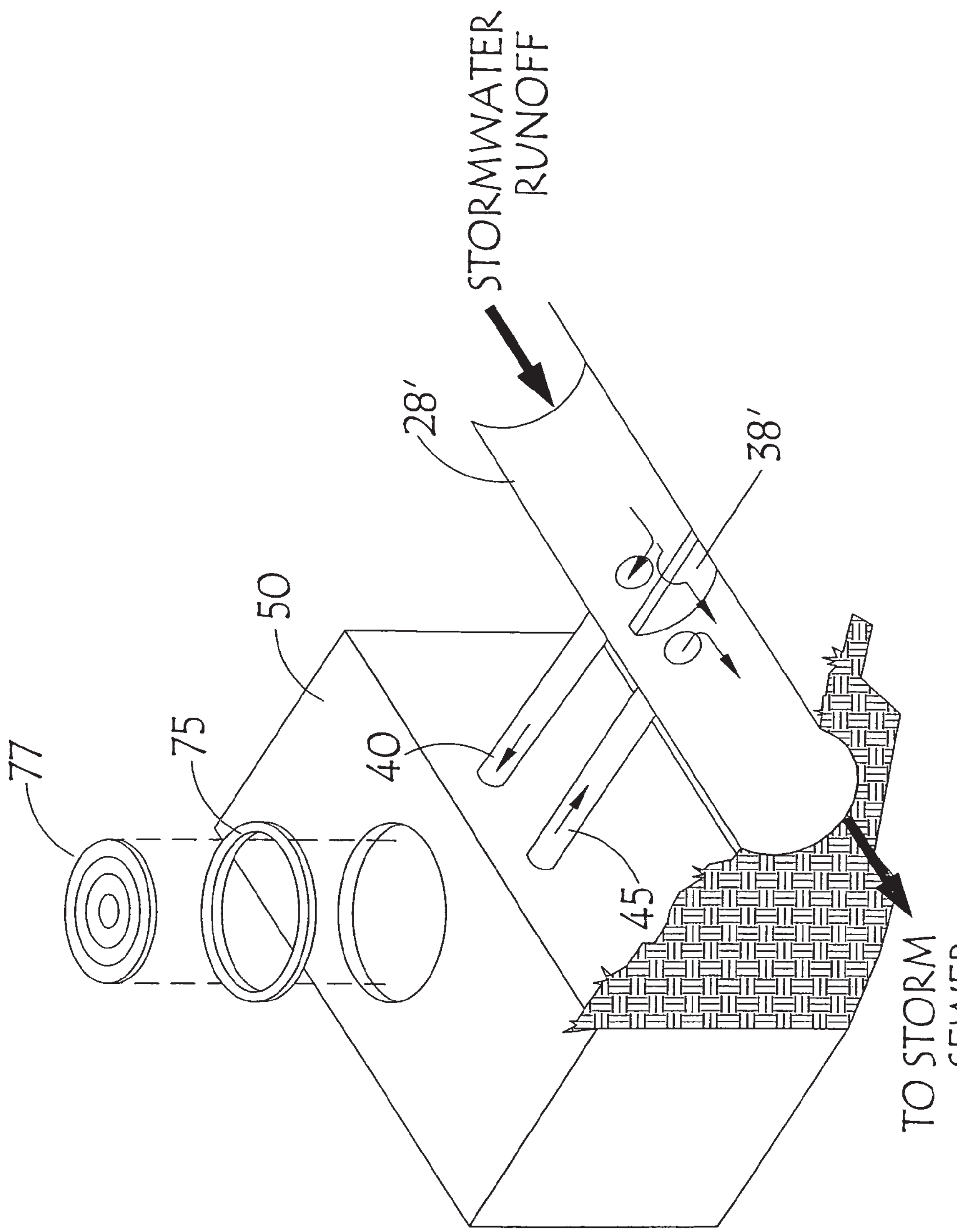

FIG. 7

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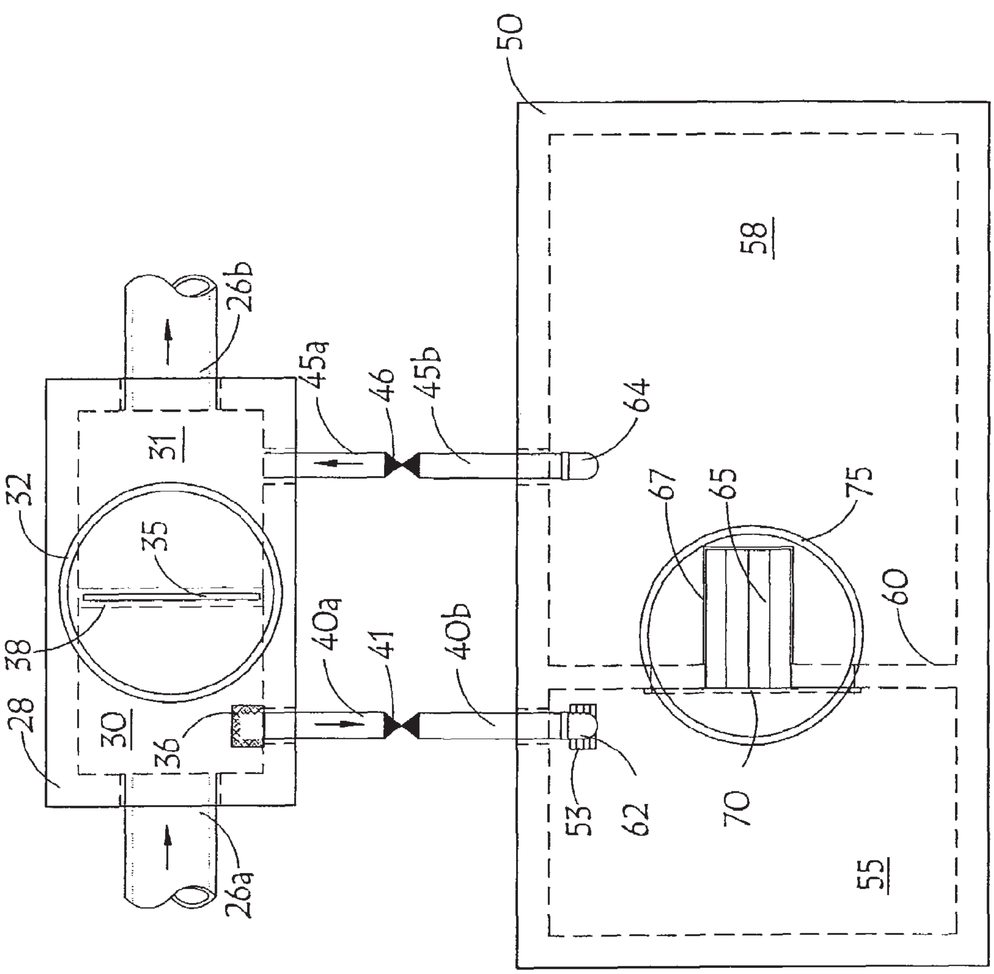

FIG. 8

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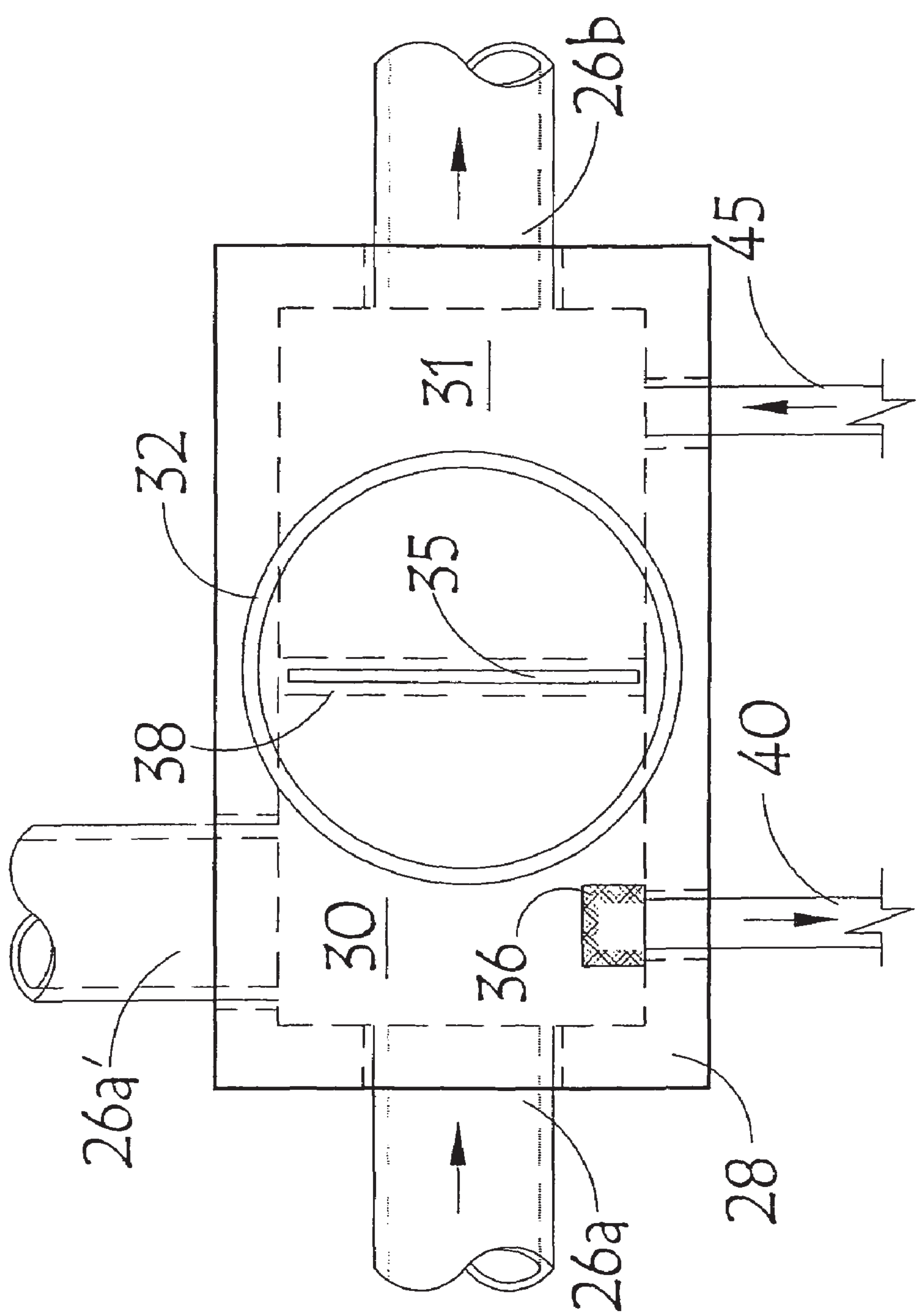

FIG. 9

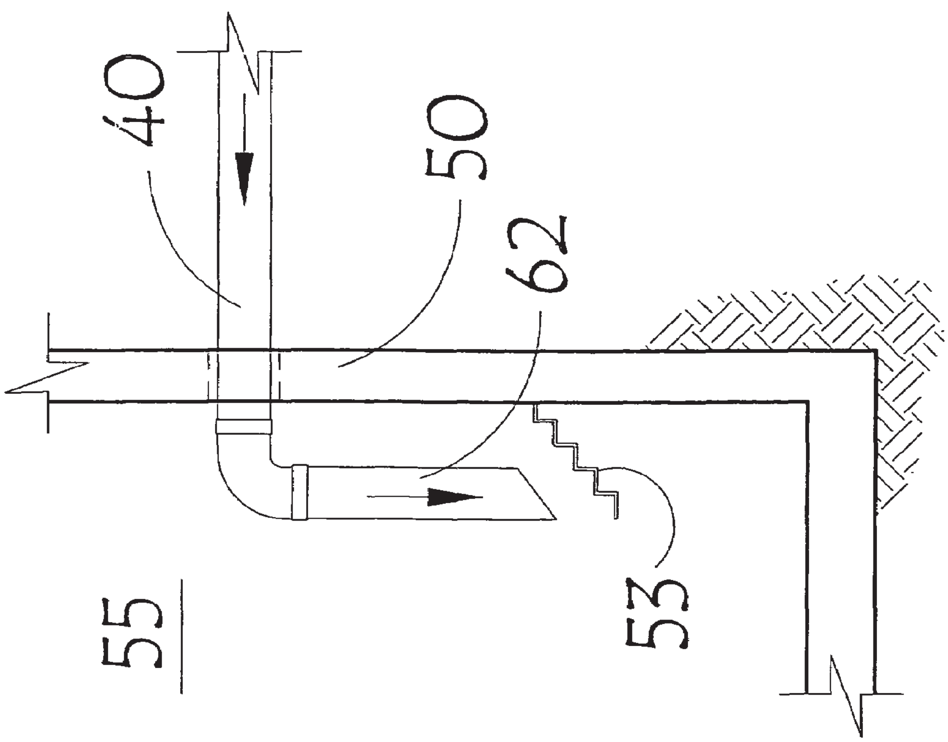

FIG. 10

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SYSTEM FOR STORMWATER ENVIRONMENTAL CONTROL

REFERENCE

Pursuant to 35 U.S.C. 119(e)(1), reference is hereby made to earlier filed provisional patent application Ser. No. 60/520,001 to Christopher N. Eberly for Improved System for Stormwater Environmental Control of filing date Nov. 14, 2003.

FIELD OF THE INVENTION

The present invention relates generally to the environmental control of storm water and its associated contaminants.

BACKGROUND OF THE INVENTION

It is well known in the art that wastewater can be collected into a separator tank to remove debris. Separator tanks have long been used to separate oils from water. Generally, these debris or oils may be called contaminants.

The use of separator tanks poses two problems when used to treat waste water. One, high flow rates create turbulence. The turbulence diminishes the ability of separator tanks to separate the contaminants. The turbulence may also remobilize the already separated contaminants, placing the contaminants back into the waste water to be treated. To avoid these undesired effects, the separator tanks must be made significantly large to overcome the effects of turbulence. Second, the separator tanks must be made large enough to perform during peaks in flow. Peaks in flow mean higher flow rates, causing two effects which impact the total amount of contaminants contained in these flows. First, the high flow rate brings a higher volume of liquid and overall more contaminants. Second, the high flow rate has increased contaminant carrying capacity owing to the higher flow rate itself These two factors, combined, would result in greater total contaminants being brought to the separator tank during peak flows. This phenomenon is particularly apparent with treatment of storm water runoff, where the initial storm water contains the bulk of the contaminants, being the “first flush” of the drainage area. However, there is a limit to the total amount of contaminants available. Even though the high flow rates are capable of carrying and remobilizing a greater amount of contaminants, the drainage area has already been washed by the initial flush of storm water. After this initial flush of storm water, the separator tank then experiences relatively high flow of water that is relatively free of contaminants. If the separator tank is too small, these high flows will remobilize the already separated contaminants. Again, the separator tanks must be designed to be large enough so that these peak high volumes and flow rate do not remobilize the contaminants.

The large size requirements for separator tanks limit their usefulness to treat liquids of variable or high flow. Many attempts have been made to reduce the size requirements of the separator tank.

Of note, U.S. Pat. No. 4,578,188 to Cousino teaches a method to allow low flow to fall into a separator tank or other disposal and high flow to jump across a gap. The gap is contained within a weir such that extremely high flow completely bypasses the gap. Presumably, the low flow will spill into the settlement tank along with its carried contaminants while the high flow has enough kinetic energy to continue on.

U.S. Pat. No. 4,985,148 to Monteith teaches a nearly identical and simplified method to achieve a similar result. Monteith dispenses with the gap but continues to use the weir,

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dumping all low flow into an integrated separator tank. As the separator tank fills, the separated water in the separator tank exits downstream of the weir. Monteith teaches a way to house the weir, separator tank, and return from separator tank all in a single container.

BRIEF SUMMARY OF THE INVENTION—OBJECTS AND ADVANTAGES

The present invention improves environmental control of waste water. The present invention provides a method of installing an environmental control system so as to allow for separate sizing of treatment and bypass capacity while also offering the ability to make or change either treatment or bypass capacities at different times. This is accomplished by containing the treatment and bypass functions in separate chambers, using screen, baffle, or coalescing media pack to further refine effectiveness and capacity of each structure independently. The control structure and interceptor structure may be pre-engineered to a variety of sizes, capacities, or other specifications. This allows simple selection of a specific control structure and a specific interceptor structure from a variety of combinations, eliminating the need for custom engineering for each installation.

While both teachings of Cousino and Monteith provide a way to limit the kinetic energy in the separator area while at the same time allowing high flow to bypass the separator tank altogether, their methods are both limited to a certain range of useful flow rates and contaminant load. It is an object of the present invention to expand the range of useful flow rates and contaminant loads as well as enable application of a greater diversity of separation techniques. As such, the present invention is more desirous and offers significant advantages over the prior art.

It is a further object of this invention to allow fluids to exit the control structure from the side independent of location of a treatment compartment, resulting in the ability to control the quality or ratio of separation for various flow rates.

An object as well as advantage is that different control structure size requirements over treatment interceptor structure sizes may be chosen. With the present invention, these sizes may be independently determined.

The features of the treatment interceptor structure and the specific separation means employed may be designed independently from the control structure.

Either control structure or treatment interceptor structure may be installed at different times, allowing retrofits to existing installations of either.

An advantage of the present invention is its ability to retrofit existing manholes.

The control structure may be designed to allow multiple connections to an array of inlet sources or treatment interceptor structures. The control structure can act as a stand-alone junction box.

The physical separation of control structure from treatment interceptor structure results in more predictable operation.

Independent sizing of the control structure may be guided by the customer’s drainage pipe sizes, reflecting the anticipated maximum capacity of surge flow.

Independent sizing of the treatment interceptor structure and choice of filtering methods reflect the amount and type of anticipated waste pollutants needed to be captured.

A further object and advantage of the present invention is to introduce an environmental control system whereby the coalescing plate media do not have to be disassembled for their proper cleaning. With the present invention, the coalescing plate media are readily and effectively cleaned in situ.

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A further object and advantage is to manufacture the control structure and interceptor structure to a variety of pre-engineered performance specifications. Customers are then able to select a combination of control structure and interceptor structure pairs without the need for custom engineering.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

The present invention and its advantages will be better understood by referring to the following detailed description and the attached drawings in which:

FIG. **1** shows a plan view showing the treatment system in the context of a typical application;

FIG. **2** shows a 3-D perspective view of the treatment system;

FIG. **3** shows a plan view of the treatment system;

FIG. **4** shows a side cross-sectional view of the control structure;

FIG. **5** shows a side cross-sectional view of the interceptor structure;

FIG. **6** shows a side cross-sectional view of the control structure and interceptor structure in a typical arrangement;

FIG. **7** shows a perspective view of an alternate embodiment using an open ditch control structure **28'**;

FIG. **8** shows a plan view of an alternate embodiment of the treatment system;

FIG. **9** shows a plan view of an alternate embodiment of control structure **28**; and

FIG. **10** shows a partial cross section view of interceptor structure **50**, detailing an alternate embodiment of diffusion baffle **53**.

REFERENCE NUMERALS IN DRAWINGS

20 treatment system
22 surface drain structure
22' surface drain structure
24 drain piping
26 convergence drain pipe
26*a* upstream convergence drain pipe
26*a*' upstream convergence drain pipe
26*b* downstream convergence drain pipe
28 control structure
28' open ditch control structure
30 upstream control chamber
31 downstream control chamber
32 control extension riser
34 control access cover
35 control debris screen
36 treatment debris screen
38 control partition
38' control partition
40 treatment water inlet pipe
40*a* control side treatment inlet pipe
40*b* interceptor side treatment inlet pipe
41 inlet cutoff valve
45 treatment water outlet pipe
45*a* control side treatment outlet pipe
45*b* interceptor side treatment outlet pipe
46 outlet cutoff valve
50 interceptor structure
53 diffusion baffle
55 upstream interceptor chamber
58 downstream interceptor chamber
60 interceptor partition
62 interceptor inlet pipe

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64 interceptor outlet pipe
65 coalescing media pack
67 media pack frame
70 interceptor debris screen
75 interceptor extension riser
77 interceptor access cover

DETAILED DESCRIPTION OF THE INVENTION

FIG. **1** shows a plan view showing the treatment system in the context of a typical application. Unprocessed fluids flow into one or more surface drain structures **22**, which convey said unprocessed fluids to drain piping **24**. A connection from a surface drain structure **22'** is made to the upstream convergence drain pipe **26*a***, conveying said unprocessed fluids towards a treatment system **20**. Treatment system **20** provides for varying degrees of separation of contaminants, depending upon the flow conditions, resulting in a conversion of unprocessed fluid to processed fluid. The processed fluid then exits treatment system **20** by way of downstream convergence drain pipe **26*b***.

FIG. **2** shows a 3-D perspective view of the treatment system in a typical embodiment. Unprocessed fluid travels in upstream convergence drain pipe **26*a***, which is connected to control structure **28**. Unprocessed fluid enters control structure **28**. Control extension riser **32** is attached to the topside of control structure **28**, allowing access into control structure **28**. Control access cover **34** rests upon and closes control extension riser **32**. Control structure **28** is connected to interceptor structure **50** by way of treatment water inlet pipe **40**. Fluids being processed are able to exit control structure **28** and enter interceptor structure **50** by way of treatment water inlet pipe **40**. Interceptor extension riser **75** is attached to the topside of interceptor structure **50**, allowing access into interceptor structure **50**. Interceptor access cover **77** rests upon and closes interceptor extension riser **75**. Interceptor structure **50** is connected to control structure **28** by way of treatment water outlet pipe **45**. Fluids returning from interceptor structure **50** to control structure **28** are able to do by way of treatment water outlet pipe **45**. Processed fluids are able to exit by way of downstream convergence drain pipe **26*b***, which is attached to control structure **28**.

FIG. **3** shows a plan view of the treatment system. Control partition **38** divides the interior of control structure **28** into two chambers, upstream control chamber **30** and downstream control chamber **31**. Upstream convergence drain pipe **26*a*** enters that portion of control structure **28** comprising upstream control chamber **30**. A first end of treatment water inlet pipe **40** exits that portion of control structure **28** comprising upstream control chamber **30**. A treatment debris screen **36** may be applied across the first end of treatment water inlet pipe **40**. An inlet cutoff valve **41** may be inserted in the flow path of treatment water inlet pipe **40**, as will be illustrated in FIG. **8**.

Interceptor partition **60** generally divides the interior of interceptor structure **50** into two chambers, upstream interceptor chamber **55** and downstream interceptor chamber **58**. Treatment water inlet pipe **40** enters that portion of interceptor structure **50** comprising upstream interceptor chamber **55**. The second end of treatment water inlet pipe **40** attaches to a first end of interceptor inlet pipe **62**, which bends downward into upstream interceptor chamber **55**. The second end of interceptor inlet pipe **62** opens into upstream interceptor chamber **55**. Liquids held within upstream interceptor chamber **55** communicate via an opening in interceptor partition **60**. Interceptor debris screen **70** covers said opening in interceptor partition **60**. Media pack frame **67** is affixed to inter-

APPENDIX B

ceptor structure **50**, preferably affixed to the interceptor partition **60**, downstream of interceptor debris screen **70** and preferably contained within downstream interceptor chamber **58**.

Coalescing media pack **65** is placed into media pack frame **67**. In the preferred embodiment, coalescing media pack **65** is comprised of multiple plates stacked in a horizontal fashion, at a spacing typically approximately one-quarter to one-half inch. The plates have bi-directional corrugations forming crests and valleys in two directions. The crests and valleys include bleed holes for passage there through of immiscible components mixed with the fluid undergoing treatment. The bi-directional corrugations are approximately orthogonal to one another and approximately sinusoidal. Generally, the wavelength of the corrugations in one direction is greater than the wavelength of corrugations in the other direction, and it is preferred that the direction of flow be parallel to the corrugations formed by the longer wavelengths. Such coalescing media plates are available from Facet International of Tulsa, Okla. under the trademark of Mpak® coalescing plates.

A first end of interceptor outlet pipe **64** opens into downstream interceptor chamber **58**. The second end of interceptor outlet pipe **64** bends outward and attaches to one end of treatment water outlet pipe **45**. An outlet cutoff valve **46** may be inserted in the flow path of treatment water outlet pipe **45**, as will be illustrated in FIG. **8**. Treatment water outlet pipe **45** enters that portion of control structure **28** comprising downstream control chamber **31**. Downstream convergence drain pipe **26***b* exits that portion of control structure **28** comprising downstream control chamber **31**.

FIG. **4** shows a side cross-sectional view of the control structure **28**. Upstream convergence drain pipe **26***a* enters that portion of control structure **28** comprising upstream control chamber **30**. Control partition **38** extends upward from the base of the interior of control structure **28**, generally segregating upstream control chamber **30** from downstream control chamber **31**. Control debris screen **35** further segregates upstream control chamber **30** from downstream control chamber **31**. Downstream convergence drain pipe **26***b* exits that portion of control structure **28** comprising downstream control chamber **31**. Control extension riser **32** is attached to the topside of control structure **28**, allowing access into control structure **28**. Control access cover **34** rests upon and closes control extension riser **32**.

FIG. **5** shows a side cross-sectional view of interceptor structure **50**. Interceptor partition **60** divides the interior of interceptor structure **50** into two chambers, upstream interceptor chamber **55** and downstream interceptor chamber **58**. Interceptor inlet pipe **62** bends downward into upstream interceptor chamber **55**. Diffusion baffle **53** is attached to interceptor structure **50** beneath the opening of interceptor inlet pipe **62**. Liquids held within upstream interceptor chamber **55** communicate via an opening in interceptor partition **60**. Interceptor debris screen **70** covers said opening in interceptor partition **60**. Media pack frame **67** is affixed to interceptor structure **50**, preferably affixed to the interceptor partition **60**, downstream of interceptor debris screen **70** and preferably contained within downstream interceptor chamber **58**. Coalescing media pack **65** is placed into media pack frame **67**. Interceptor outlet pipe **64** bends downward into downstream interceptor chamber **58**. Interceptor extension riser **75** is attached to the topside of interceptor structure **50**, allowing access into interceptor structure **50**. Interceptor access cover **77** rests upon and closes interceptor extension riser **75**.

Coalescing media pack **65** is preferably installed so as to allow for in situ cleaning. This is accomplished by placing the bleed holes of coalescing media pack **65** generally upright so as to allow for ease of access from interceptor extension riser **75**.

FIG. **6** shows a side cross-sectional view of the control structure **28** and interceptor structure **50** in a typical arrangement.

FIG. **7** shows a perspective view of an alternate embodiment using an open ditch control structure **28'**. Open ditch control structure **28'** is generally upwardly open and relatively narrow along the axis that is perpendicular to flow. Flow is partially interrupted by control partition **38'**, acting to divert at least some flow to treatment water inlet pipe **40**. Flow from treatment water inlet pipe **40** enters interceptor structure **50**. Treated fluids return from interceptor structure **50** by way of treatment water outlet pipe **45**. Treatment water outlet pipe **45** enters open ditch control structure **28'** downstream from control partition **38'**.

FIG. **8** shows a plan view of an alternate embodiment of the treatment system. The treatment water inlet pipe **40** of FIG. **3** may be replaced with a control side treatment inlet pipe **40***a*, inlet cutoff valve **41**, and interceptor side treatment inlet pipe **40***b*. A first end of control side treatment inlet pipe **40***a* exits that portion of control structure **28** comprising upstream control chamber **30**. The second end of control side treatment inlet pipe **40***a* connects to inlet cutoff valve **41**. Inlet cutoff valve **41** connects to a first end of interceptor side treatment inlet pipe **40***b*. The second end of interceptor side treatment inlet pipe **40***b* attaches to a first end of interceptor inlet pipe **62**. The treatment water outlet pipe **45** of FIG. **3** may be replaced with a control side treatment outlet pipe **45***a*, outlet cutoff valve **46**, and interceptor side treatment outlet pipe **45***b*. A first end of control side treatment outlet pipe **45***a* exits that portion of control structure **28** comprising downstream control chamber **31**. The second end of control side treatment outlet pipe **45***a* connects to outlet cutoff valve **46**. Outlet cutoff valve **46** connects to a first end of interceptor side treatment outlet pipe **45***b*. The second end of interceptor side treatment outlet pipe **45***b* attaches to a first end of interceptor outlet pipe **64**.

FIG. **9** shows a plan view of an alternate embodiment of control structure **28**. Multiple upstream convergence drain pipes **26***a*, **26***a'* may enter the upstream control chamber **30** of control structure **28**. Control structure **28** can act as a stand-alone junction box.

In an alternate embodiment, a surface grate positioned over the top of upstream control chamber **30** replaces, or is placed in addition to, upstream convergence drain pipe **26***a*. Fluids washing from the surface fall through the surface grate, into upstream control chamber **30** for further processing.

FIG. **10** shows a partial cross section view of interceptor structure **50**, detailing an alternate embodiment of diffusion baffle **53**. Diffusion baffle **53** is shaped so as to form a stair-step pattern of alternating generally horizontal and generally vertical panels. In practice, the horizontal and vertical panels are at approximately ninety-degree angles with respect to each other. The average slope of the resulting surface is approximately forty-five degrees. The second end of interceptor inlet pipe **62** may be cut at an angle to approximately match the average slope of the resulting surface. The relative angle between horizontal and vertical panels is not critical and further alternate embodiments using angles other than ninety-degrees are possible. Likewise, the average slope of the resulting surface may be adjusted to effect a desired amount of flow dispersion.

DETAILED DESCRIPTION OF THE INVENTION—OPERATION

The present invention is a method of installing an environmental control system so as to allow for separate sizing of treatment and bypass capacity while also offering the ability to make or change either treatment or bypass capacities at different times. This is accomplished by containing the treatment and bypass functions in separate chambers, using screen, baffle, or coalescing media pack to further refine effectiveness and capacity of each structure independently.

The control structure and interceptor structure may be pre-engineered to a variety of sizes, capacities, or other specifications. This allows simple selection of a specific control structure and a specific interceptor structure from a variety of combinations, eliminating the need for custom engineering for each installation.

In typical operation, storm water flows into control structure **28** by way of upstream convergence pipe **26***a*. Control partition **38** retains the storm water and its associated debris generally in upstream control chamber **30**. Storm water exits upstream control chamber **30** by way of treatment water inlet pipe **40**. A treatment debris screen **36** may be used to prevent debris from entering treatment water inlet pipe **40**. Fluid levels inside upstream control chamber **30** rise when incoming flow exceeds the capacity of treatment water inlet pipe **40** to drain upstream control chamber **30**. Should upstream control chamber **30** fill across control partition **38**, fluids in that event will exit upstream control chamber **30** and enter into downstream control chamber **31**. Control debris screen **35** retains debris in upstream control chamber **30**, preventing debris from entering downstream control chamber **31**.

Fluids from treatment water inlet pipe **40** enter upstream interceptor chamber **55** via interceptor inlet pipe **62**. Diffusion baffle **53** disperses the flow from interceptor inlet pipe **62** to reduce the velocity of the entering fluids, thereby reducing the amount of disturbance of contaminants contained in upstream interceptor chamber **55**. Interceptor inlet pipe **62** is positioned so as to expel entering fluids towards the lower portion of upstream interceptor chamber **55**, allowing less dense fluids, such as oils, to separate towards the upper portion of upstream interceptor chamber **55**. Debris tend to settle towards the lower portion of upstream interceptor chamber **55**. Interceptor debris screen **70** is positioned above the lowest portion of upstream interceptor chamber **55** and the highest portion of upstream interceptor chamber **55**, preventing debris from passing from upstream interceptor chamber **55** to downstream interceptor chamber **58**. Coalescing media pack **65** is positioned downstream of interceptor debris screen **70** and generally within downstream interceptor chamber **58**, receiving fluids passing from upstream interceptor chamber **55** to downstream interceptor chamber **58**. Coalescing media pack **65** generally removes additional oils from the water and also further disperses the flow to reduce flow velocity, creating a fluid environment relatively more quiet than that experienced in upstream interceptor chamber **55**. Interceptor outlet pipe **64** opens towards the lower portion of downstream interceptor chamber **58**, where fluids tend to be free of debris and oils. Interceptor outlet pipe **64** rises towards and connects to treatment water outlet pipe **45**. Treated fluids flow into interceptor outlet pipe **64** and out of interceptor structure **50** by way of treatment water outlet pipe **45**. Treatment water outlet pipe **45** enters control structure **28** into downstream control chamber **31**, which is downstream from control partition **38**. Fluids entering the downstream side of control partition **38**, from either treatment water outlet pipe **45** or from upstream control chamber **30**, exit control structure **28** by way of downstream convergence drain pipe **26***b*. Control partition **38** generally prevents treated fluids from back flowing into upstream control chamber **30**.

Maintenance and cleaning of control structure **28** is accomplished by entering via control access cover **34** and control extension riser **32**. Debris may be removed from either upstream control chamber **30** or downstream control chamber **31**. Maintenance and cleaning of interceptor structure **50** is accomplished by entering via interceptor access cover **77** and interceptor extension riser **75**. Debris, oils, or other contaminants may be removed from either upstream interceptor chamber **55** or downstream interceptor chamber **58**. Coalescing media pack **65** may be cleaned by introducing a nozzle through the bleed holes of coalescing media pack **65**.

In alternate embodiments, the present invention offers flexibility by choosing the type of control structure used. The control structure can take the form of a typical control manhole, an open ditch containing a weir, a pumped method, or by modifying other existing structures. Elimination of the use of the control structure offers total treatment of all stormwater.

Although the description above contains many specifications, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this present invention. Persons skilled in the art will understand that the method and apparatus described herein may be practiced, including but not limited to, the embodiments described. Further, it should be understood that the invention is not to be unduly limited to the foregoing which has been set forth for illustrative purposes. Various modifications and alternatives will be apparent to those skilled in the art without departing from the true scope of the invention, as defined in the following claims. While there has been illustrated and described particular embodiments of the present invention, it will be appreciated that numerous changes and modifications will occur to those skilled in the art, and it is intended in the appended claims to cover those changes and modifications which fall within the true spirit and scope of the present invention.

Thus, the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.

What I claim as my invention is:

1. A liquid treatment system comprising:

a) a control structure member having a housing containing an upstream control chamber and a downstream control chamber separated by a partition, an upstream convergence drain pipe opening into said upstream control chamber, and a downstream convergence drain pipe opening into said downstream control chamber;

b) a first end of a treatment water inlet pipe extending into the upstream control chamber of said control structure member;

c) a second end of said treatment water inlet pipe connected to an interceptor structure member, said interceptor structure member including a housing containing an upstream interceptor chamber and a downstream interceptor chamber;

d) a first end of a treatment water outlet pipe connected to the downstream interceptor chamber of said interceptor structure member;

e) a second end of said treatment water outlet pipe extending into the downstream control chamber of said control structure member; and

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f) wherein the housing of said control structure member is spaced apart from the housing of said interceptor structure member, whereby said control structure member and said interceptor structure member may be independently constructed and independently installed at different times.

2. The liquid treatment system of claim **1** wherein said control structure member further comprises a debris screen disposed between said upstream control chamber and said downstream control chamber.

3. The liquid treatment system of claim **1** wherein said interceptor structure member further comprises an interceptor debris screen disposed between said upstream interceptor chamber and said downstream interceptor chamber.

4. The liquid treatment system of claim **1** wherein said interceptor structure member further comprises a coalescing media pack disposed in said downstream interceptor chamber, whereby a means for coalescing is provided.

5. The liquid treatment system of claim **4** wherein said media pack further comprises bleed holes disposed in a generally upright position on said media pack.

6. The liquid treatment system of claim **4** wherein said interceptor structure member further comprises an extension riser disposed on said interceptor structure member and wherein said media pack is accessible through said extension riser, whereby a means for insitu cleaning is provided.

7. The liquid treatment system of claim **1** wherein said treatment water inlet pipe further comprises an inlet cutoff valve disposed between said first end of said treatment water inlet pipe and said second end of said treatment water inlet pipe.

8. The liquid treatment system of claim **1** wherein said treatment water outlet pipe further comprises an outlet cutoff valve disposed between said first end of said treatment water outlet pipe and said second end of said treatment water outlet pipe.

9. The liquid treatment system of claim **1** wherein said interceptor structure member further comprises a diffusion baffle disposed beneath said second end of said treatment water inlet pipe.

10. The liquid treatment system of claim **9** wherein said diffusion baffle further comprises a stairstep pattern of alternating generally horizontal and generally vertical panels thereby forming a resulting surface, whereby the average slope of the resulting surface is between 15 and 60 degrees with respect to the longitudinal axis of the second end of said treatment water inlet pipe.

11. The liquid treatment system of claim **10** wherein said second end of said treatment water inlet pipe has an angle with respect to its longitudinal axis that approximately matches the average slope of said resulting surface.

12. The liquid treatment system of claim **10** wherein said average slope of said resulting surface is adjustable.

13. The liquid treatment system of claim **9** wherein said diffusion baffle further comprises a stairstep pattern of alternating generally horizontal and generally vertical panels thereby forming a resulting surface, whereby the average slope of the resulting surface is approximately 45 degrees.

14. The liquid treatment system of claim **13** wherein said second end of said treatment water inlet pipe has an angle with respect to its longitudinal axis that approximately matches the average slope of said resulting surface.

15. The liquid treatment system of claim **13** wherein said average slope of said resulting surface is adjustable.

16. The liquid treatment system of claim **1** wherein said interceptor structure member further comprises an extension riser disposed on said interceptor structure member, whereby a means for insitu cleaning is provided.

17. The liquid treatment system of claim **1** wherein said upstream control chamber further comprises a plurality of inlets, thereby forming a junction box.

18. The liquid treatment system of claim **1** wherein said control structure member further comprises a surface grate disposed on said control structure member and in fluid communication with said upstream control chamber.

19. The liquid treatment system of claim **1** wherein said interceptor structure member is used to treat approximately all water entering said liquid treatment system.

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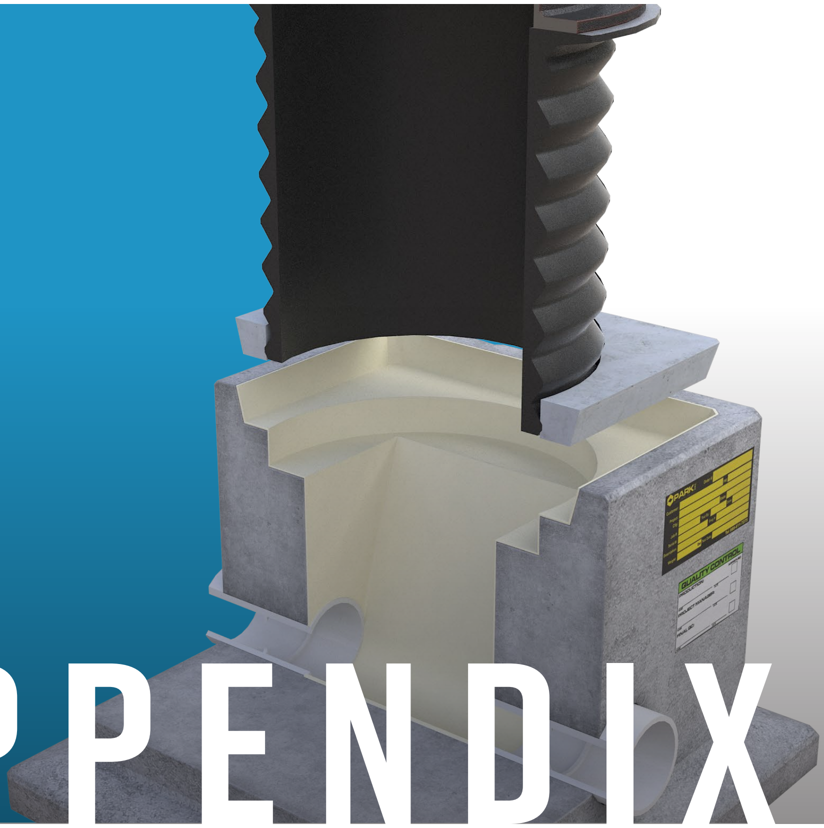

APPENDIX C

NOTES

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November 1, 2002

Messrs. Pat Schrum and Chris Eberly, P.E.
Park Environmental Services
7015 Fairbanks N. Houston
Houston, Texas 77040

Re: Surveillance of Tests Conducted on Representative StormTrooper™ Interceptor Models ST-06C and ST-08, SwRI® Project No. 01.06061.01.901

Dear Mr. Schrum:

This will summarize my trip to your manufacturing facilities in Houston, Texas, on October 25, 2002, to witness tests on representative StormTrooper™ Interceptor Models ST-06C and ST-08 (600 and 800-gallon capacity, respectively), with coalescing plates. The interceptors were subjected to tests described in a test protocol titled "Testing Procedure of StormTrooper™ Storm Water Intercerptors," dated August 2002.

StormTrooper™ Interceptor model ST-06C was subjected to flows of 100, 150, and 200 gallons/minute and model ST-08 was subjected to flows of 100, 200, and 300 gallons/minute. The influent water stream contained suspended solids with a particle size distribution ranging in diameter from 840 micron to 44 micron, with a nominal concentration of 590 mg/l. Samples from the influent and effluent streams were collected and sent to an independent laboratory, Severn Trent Services, where the samples were analyzed for Total Suspended Solids (TSS) by Test Method EPA 160.2. Collection efficiency ("%TSS Efficiency"), defined as the ratio of effluent TSS to influent TSS times 100, ranged from a minimum of 85.08% to a maximum of 96.93%, as shown in Table 1.

Table 1. Interceptor Collection Efficiency

Model	Capacity (gal.)	Flow rate (gpm)	% TSS Efficiency
ST-06C	600	100	96.93
ST-06C	600	150	96.67
ST-06C	600	200	91.32
ST-08	800	100	94.78
ST-08	800	200	92.15
ST-08	800	300	85.08

SwRI Project No. 01.06061.01.901
November 1, 2002
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Tests were also conducted for Total Petroleum Hydrocarbon (TPH) performance on representative ST-06C and ST-08 models, under the same flow conditions show in Table 1, except the influent stream was loaded with a petroleum oil at a nominal concentration of 517 mg/l. Samples of the influent and effluent streams were collected and sent to an independent laboratory, Severn Trent Services, where the samples were analyzed by Test Method EPA 1664. In all cases tested, the effluent TPH concentration was below the detectable limits of laboratory instruments. Assuming an effluent concentration of 5 mg/l (lowest detection level), the collection efficiencies are above 99%. This efficiency is consistent with visual observations taken, where no oil sheen was observed on the water flowing to the output collection reservoir.

Based on the tests described above, the representative StormTrooper™ Interceptor Model ST-06C has TSS efficiencies greater than 90% and the representative Interceptor Model ST-08 has TSS efficiencies greater than 85%. The TPH efficiency for both models is greater than 99%.

We at SwRI appreciate the opportunity to be of service. If you have any questions or comments, or if I can be of further assistance, please feel free to contact me by phone at 210/522-2325, by fax at 210/522-3270, or by e-mail at james.johnson@Swri.org.

Sincerely,

GMM

James E. Johnson
Principal Engineer
Department of Fuels and Lubricants Research

Approved:

Marc L. Janssens, Ph.D.
Director
Department of Fire Technology

JEJ/la

cc: Gladys M. Miller, Listing and Labeling Section

Testing Procedure

of

StormTrooper® Storm Water Interceptor

Testing Laboratory:

Southwest Research Institute (SwRI)

Prepared By:
Pat Schrum
Chris Eberly, P.E.

August 2002

Table of Contents

1.0 General Information

1.1 *StormTrooper®* Description

Park Environmental has been a designer and manufacturer of wastewater treatment products for over 20 years. Within this period, many types of interceptor systems have been manufactured and field-proven. Among these interceptors, several different types were designed for treating stormwater.

In response to increasing federal, state, and local regulations regarding stormwater quality, Park has developed the ***StormTrooper®*** Interceptor. The StormTrooper® Interceptor is designed to provide effective treatment of stormwater runoff.

The ***StormTrooper®*** Interceptor System operates by diverting runoff with a properly sized control manhole that directs flow through the interceptor. Subsequent flows beyond the rated capacity of the interceptor are “bypassed” into the stormwater sewer or receiving waters.

1.2 Pollutants in Stormwater

The stormwater being used in the test, will be created by adding pollutants to fresh water. The pollutants to be added for this test, are rationalized based on nationally conducted studies that have documented stormwater contents.

The EPA Nationwide Urban Runoff Program (NURP) has established that stormwater from urban areas can contain significant concentrations of pollutants that adversely affect water quality in receiving streams (EPA-821-R-99-012). The EPA has recognized the following ten constituents as significant contributors to stormwater pollution:

- Total Suspended Solids (TSS)
- Chemical Oxygen Demand (COD)
- Total Phosphorus (TP)
- Soluble Phosphorus (SP)
- Total Kjeldahl Nitrogen (TKN)
- Nitrate + Nitrite (N)
- Total Copper (Cu)
- Total Lead (Pb)
- Total Zinc (Zn)

In addition to above ten contaminants, petroleum hydrocarbons have been identified for their acute toxicity at low concentrations (Schueler, 1987). Studies that were performed by Shepp (1996), documented amounts of petroleum hydrocarbons in stormwater. The ***StormTrooper®*** test will include Oil & Grease as a contaminant in the stormwater.

The initial concentration of contaminates introduced into the test stormwater is based on a “Mixed Use” of residential and commercial urban land use (EPA-841-S-83-109).

APPENDIX C

Pollutant	Influent Composite
Total Suspended Solids (TSS)	67 mg/l
Chemical Oxygen Demand (COD)	65 mg/l
Biological Oxygen Demand (BOD)	7.8 ugl/l
Total Phosphorus (TP)	263 ug/l
Soluble Phosphorus (SP)	56 ug/l
Total Kjeldahl nitrogen (TKN)	1288 ug/l
Nitrate + Nitrite (N)	558 ug/l
Cu (Copper)	27 ug/l
Pb (Lead)	114 ug/l
Zn (Zinc)	154 ug/l
Oil & Grease	10 mg/l
Trash/Debris	20 LBS

The ***StormTrooper*®** Interceptor System will collect and detain floatable debris, bed load particulate, free oil and grease, low solubility and other insoluble petroleum hydrocarbons, settle able sediments, and pollutants including heavy metals, nitrogen and phosphorus nutrients, and organic compounds that may absorb or adhere to the solids in stormwater.

Although the ***StormTrooper*®** Interceptor System will have removal capacity for all stormwater pollutants, ***this test will focus on the Total Suspended Solids (TSS) and Total Petroleum Hydrocarbon (TPH) removal efficiencies exclusively.***

The EPA has established an 80% TSS removal standard (EPA-840-B-92-002). The ***StormTrooper*®** test will document the performance in meeting and exceeding this standard.

1.3 TSS Particle Distribution

TSS is made up of various particle sizes. Sartor (1972) investigated contaminants in street surface runoff. He noted the following distribution: 6% < 43 micron, 37% ranging from 43 to 246 micron, and 57% < 246 micron.

In similar studies, Shaheen (1975a) documented the following distribution: 10% < 75 micron, 32% ranging from 75 to 250 micron, 24% ranging from 250 to 420 micron, 19% ranging from 420 to 850 micron, and 15% ranging from 850 to 3350 micron.

Another study by Sansalone (1997) documented runoff from a freeway; 10% < 100 micron, 25% ranging from 100 to 400 micron, 15% ranging from 400 to 600 micron, 20% ranging from 600 to 1000 micron, and 30% ranging from 1000 to 10,000 micron.

Combining this data and normalizing, the particle distribution is as follows:

Particle Size Distribution	
Diameter (µm)	Percent (%wt)
44	20%
88	20%
177	20%
300	20%
600	20%

1.4 Test Stormwater Composition

The ***StormTrooper®*** test will require us to simulate stormwater with a predetermined amount of pollution. From the previous data, the stormwater will contain the following:

TSS At least 500 mg/l according to the particle distribution (PSD)
Debris Nominal amounts of large size pollutants (>1 cm dia)
TPH Free oil with a sg=.85, concentration of at least 500 mg/l

1.5 Testing Team

The testing of the ***StormTrooper®*** Interceptor will be observed and certified by third party participants. All lab work will be performed by certified laboratory. The test team consists of the following organizations and individuals:

Park Environmental
- Chris Eberly, P.E., Application Engineer
- Pat Schrum, Applications Specialist
- George Eberly, Technical Consultant
- Larry King, Applications Technician

Severn Trent Laboratories
- Sean Sundquist

Southwest Research Institute
- James Johnson

1.6 Testing Summary

This test design will be performed on two ***StormTrooper®*** sizes, one cylindrical and one retangular. This testing will allow for accurately determining the removal efficiencies of TSS & TPH and the flow rates for StormTrooper's®.

The test performance criteria is based on the EPA established 80% TSS removal standard (EPA-840-B-92-002).

The ***StormTrooper®*** test will document the performance in meeting or exceeding this standard.

2.0 Definitions and Clean Water Act Stormwater Management Basics

2.1 **Best Management Practices (BMP)** - Means the scheduling of activities and maintenance procedures, the creation of non-structural and structural controls, and other management practices to prevent or reduce pollution discharging into the MS4 and the waters of the United States

2.2 **Stormwater Pollution Prevention Plan (SWPPP)** is an erosion, sediment and waste chemical control plan. All regulated entities must file a SWPPP with EPA to be granted a stormwater permit.

2.3 **Maximum Extent Practicable (MEP)** - Stormwater permits require that the discharge of pollutants into storm drains be reduced to the "maximum extent practicable".

2.4 **CFR** - Code of Federal Regulations, as it may be amended from time to time.

2.5 **"Clean Water Act"** - Means the Federal Water Pollution Control Act, as amended (33 U.S.C. § 1251 et/seq.)

2.6 **Regulations** – Stormwater Management Regulations are a key component of EPA's Clean Water Act.

2.7 **Overriding Goal** – To protect the quality of U.S. waterways by reducing the discharge of sediment, oil and chemicals into storm drains, surface water and groundwater.

2.8 **Who is Regulated?** Three main categories must comply; Industrial, Municipalities and Construction Activities.

2.9 **Discharge** - Means the introduction or addition of any pollutant, storm water, or any other substance whatsoever into the MS4 or into the waters of the United States, or to cause, suffer, allow, or permit any such introduction or addition.

2.10 **Impervious Surface** - Means any area that does not readily absorb water including, but not limited to, building roofs, parking and driveway areas, compacted or rolled areas, sidewalks and paved recreation areas.

2.11 **Municipal Separate Storm Sewer System (MS4s)** - Means the system of man-made conveyances owned or operated by a municipality, county, or flood control district, and designed or used for collecting or conveying storm water and which is not used for collecting or conveying sewage.

2.12 **Non-Structural Controls** – Means a maintenance or operational practice designed to prevent or reduce the potential of storm water runoff contact with pollution-causing activities.

2.13 **NPDES** – National Pollutant Discharge Elimination System

2.14 **Pollutant(s)** – Means dredged soil, solid waste, incinerator residue, sewage, garbage, sewage sludge, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wreaked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into the MS4 or any waters in the state, or waters of the United States.

2.15 **Total Maximum Daily Load (TMDL)** – a tool for establishing the allowable loadings of a given pollutant in a surface water resource to meet predetermined water quality standards.

2.16 **Representative Storm Event** – Shall mean a storm event that is greater than one tenth (0.1) of an inch in magnitude and that occurs at least seventy-two (72) hours from the previously measurable (greater than one tenth (0.1) of an inch rainfall) storm event.

2.17 **Urban Runoff** – Stormwater from urban areas, which tends to contain heavy pollutants from vehicles and industry

2.18 **Structural Control** – Means a structure or vegetative practice that is generally designed to reduce pollutant levels in storm water runoff.

2.19 **Coalescing Media Pack (CMP)** – Polypropylene plate unit used within a ***StormTrooper®*** Interceptor. As oil/water/solids mixture travels through the plates, oil rises to the top and solids drop to the bottom through dedicated surfaces and weep holes. See Figure F1 for plate performance specifications and the *Stoke's Law* sizing criteria.

2.20 **Oil Sheen** – A thin, glistening layer of oil on the surface of water

2.21 **Retention** – A process that halts the downstream progress of stormwater runoff. This is typically accomplished using total containment involving the creation of storage areas that use infiltration devices, such as ***StormTrooper®***, to dispose of stored stormwater via percolation over a specified period of time.

2.22 **Sediment Trap** – A device like ***StormTrooper®*** for removing sediment from water flows, usually installed at points of outflow.

2.23 **Sediment/Silt** – Soil, sand and materials washed from land into water after rain. Sediment can destroy fish-nesting areas, clog animal habitats and cloud water so that sunlight does not reach aquatic plants.

2.24 **Total Solids** – refers to matter suspended or dissolved in water or wastewater, and is related to both specific conductance and turbidity. Total Solids includes both Total suspended solids and Total dissolved solids.

2.25 **Total Suspended Solids (TSS)** – are solids in water that can be trapped by a filter. TSS can include a wide variety of material, such as silt, decaying plant and animal mater, industrial wastes, and sewage. High concentrations of TSS can cause many problems to stream health and aquatic life. EPA permits generally have no numeric effluent limits for stormwater, but TSS concentrations greater than 300 mg/L are usually unacceptable by municipalities in wastewater.

2.26 **Total Dissolved Solids (TDS) –** are solids in water that can pass through a filter (usually with a pore size of 0.45 micrometers). TDS is a measure of the amount of material dissolved in water. TDS is generally used to estimate the quality of drinking water and only applies to stormwater in abnormally high concentrations.

2.27 **Total Petroleum Hydrocarbons (TPH)** – the measurable amount of petroleum-based hydrocarbon in an environmental media. EPA municipal NPDES stormwater permits generally have no numeric effluent limits for oil and grease, however NPDES for wastewater discharge permits is 10-15 mg/L. Expected sources of oil and grease in stormwater, such as parking lots and gas stations rarely have oil and grease concentrations that exceed 5 mg/L.

2.28 **Biochemical Oxygen Demand (BOD)** - is a measure of the amount of oxygen that is consumed by the bacteria as they decompose the organic components of waste and relies on the accurate determination of oxygen levels over a period of five days. EPA permits generally have no numeric effluent limits for stormwater, but BOD concentrations greater than 250 mg/L are usually unacceptable by municipalities in wastewater.

2.29 **Chemical Oxygen Demand (COD)** - is often measured as a rapid indicator of organic pollutant in water. It is normally measured in both municipal and industrial wastewater treatment plants and gives an indication of the efficiency of the treatment process. COD is measured on both influent and effluent water. The efficiency of the treatment process is normally expressed as COD Removal, measured as a percentage of the organic matter purified during the cycle.

2.30 **Total Kjeldahl Nitrogen (TKN)** - Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), organic nitrogen and ammonia (all expressed as N). Note that for laboratory analysis purposes, Total Kjeldahl Nitrogen (TKN) is a test performed that is made up of both organic nitrogen and ammonia.

3.0 Test Overview

StormTrooper® Interceptor System will be tested in a full-scale simulation by flowing storm water through the interceptor system and analyzing samples to determine the removal efficiency of the interceptor system.

The testing system apparatus will test two different sized ***StormTrooper***® Interceptor Systems; Model STSW-08 (rectangular design) and Model STSW-06 (cylindrical design). Each system will consists of an Interceptor Module and a Control Manhole. The Control Manhole will common to both systems. The interceptors will be activated/deactivated by the use of valves.

The test apparatus is a closed-loop system recycling the water for the continual testing. The test apparatus will simulate actual gravity flow through the interceptor system. Refer to Figure .1 - StormTrooper® Test Station Layout.

The test will include multiple procedures to determine the effectiveness of each of the ***StormTrooper***® Interceptor Systems. The test will be grouped into two different tests;

Group A - Determine the TSS Removal Efficiency *With* Coalescing Media

Group B - Determine the TPH Removal Efficiency *With* Coalescing Media

Test water will be stored and recycled through the system. Water will be pumped utilizing a submersible pump capable of producing maximum flow of 526 gpm. A flow meter apparatus will be used regulate flow of the simulated stormwater. The simulated stormwater water will be pumped into a surge tank where it changes to gravity flow. Pre-measured solids and floatables will be introduced into the flow pattern.

The simulated stormwater mixture will then flow into the ***StormTrooper***® Control Manhole, and then into the ***StormTrooper***® Interceptor. Separated effluent will flow to the control manhole outlet to a sample well where test effluent samples will be taken.

4.0 Testing Equipment Descriptions

Refer to Figure .1 - StormTrooper® Test Station Layout for a diagram of the test system

4.1 Reserve Tank - The Reserve Tank has the capacity of approximately 2500 gallons. Inside this tank is a 4” discharge centrifugal pump capable of up to 526 gallons per minute. The pump is a constant speed pump. The total water reserve for the entire system (not including interceptors) is 3,250 gallons.

4.2 Water Meter - A 4” turbine water meter will register flow from the pump. The pump discharge flow rate is regulated by adjusting valves #V1 and #V2. The meter registers the amount of water flow in gallons. The flow rate will be determined by the following method:

4.2.1 Setting the Flow Rate - Adjust the valves #V1 & #V2 to permit water flow. The valve #V2 is a bypass to prevent the pump from overloading. With a stopwatch time the number of seconds it takes to flow 30 gallons. Use the

Flow Rate Charts (Table 1) to determine the flow rate. Use the 50 & 100 Gallon charts to "fine-tune" the flow rate. Repeat this procedure until the desired flow rate is obtained.

4.3 Surge Tank - The Surge Tank is a precast concrete tank with a capacity of approximately 750 gallons. This tank will normalize the pumped flow from the reserve tank to the control manhole. The flow is gravity flow to simulate natural stormwater runoff. Slight variations in water level in this tank will occur due to water turbulence.

4.4 Sample Port #A - This sample port consist of an 8" Tee fitting with a ball valve on the bottom of the piping. Samples from this port will be analyzed on each test run to determine the water quality prior to adding additional pollutants.

4.4.1 Taking a Sample – A Sample will be taken prior to each test run. To take a sample, first "blow-down" any accumulated debris by opening valve for 3 seconds then closing. Next position a new sample bottle under this valve and fill. Close bottle and label.

4.4.2 Influent Water Quality Determination – The water sample taken from this sample port will determine the "baseline" water quality prior to adding additional pollutants. The actual Influent Water Quality will be determined by mathematically calculating the added pollutants to the "baseline" water condition.

4.4.3 Influent Water Quality Determination Example:

In testing the 600 gallon capacity Interceptor for a flow rate of 100 GPM, the test will run for (1) full "change-out" of the interceptor capacity. The test duration T_d is calculated;

$$T_d = 600 \text{ gallons}/100 \text{ GPM} = 6 \text{ minutes}$$

At the commencement of the test, the pollutants will be "dosed" into the flow stream at the Mixing Port. The pollutants will be dosed into the flow stream throughout the full duration of the test, in this case 6 minutes.

The concentration of pollutants introduced during the test cycle will be predetermined and the amount of pollutants will be calculated;

For 600 gallons of flow and 500 mg/l TSS_{MP} the amount of pollutants to be added is calculated to be 3,402 grams (7.50 lbs)

Assuming that the "baseline" sample from Sample Port #A was lab analyzed to contain 50 mg/l TSS_A the resulting influent water condition is calculated by adding the two samples together:

$$TSS_A + TSS_{MP} = TSS_{Influent}$$

4.3 Mixing Port - The Mixing Port is a station to allow for the introduction of pollutants. The station consists of a bin with a 1" hand-operated ball valve at the bottom. Pollutants will be introduced into the flow stream by opening the valve #VMP. At the commencement of the test, the pollutants will be "dosed" into the flow stream at the Mixing Port. The pollutants will be dosed into the flow stream throughout the full duration of the test.

4.4 Control Manhole - The Control Manhole is the first stage of the ***StormTrooper®*** Interceptor System. The control manhole regulates flow rate from the influent stormwater stream into the Interceptor stage of the system. Under low to moderate flow, the flow stream is directed into the interceptor. During excessively high flow rates, the flow stream is "by-passed" over the by-pass weir to the manhole discharge. This bypassed water is not treated by the interceptor.

The stormwater by-pass method is an industry recognized method of regulating the flow rate into a stormwater interceptor. Excessive flow rates through the interceptor beyond the rated capacities will cause adverse affects in the interceptor from improper treatment to scouring of retained pollutants from the interceptor. The low to moderate flow rates have been proven to contain the majority of pollutants from a given site.

4.5 Sample Port #B - Sample Port #B consist of an 8" Tee fitting with a ball valve on the bottom of the piping. Samples from this port will be analyzed on each test run to determine the ***Effluent*** water quality after treatment of the interceptor.

4.5.1 Taking a Sample – Four samples will be taken during each test run. To insure a complete "change-out" through the interceptor, the samples will be staged during intervals after the commencement of the test, at different multiples of the Test Duration T_d

Sample #1 @ T_d x 1.0	(e.g. 6 min x 1.0 = 6.00 min)
Sample #2 @ T_d x 1.5	(e.g. 6 min x 1.5 = 9.00 min)
Sample #3 @ T_d x 2.0	(e.g. 6 min x 2.0 = 12.00 min)
Sample #4 @ T_d x 2.5	(e.g. 6 min x 2.5 = 15.00 min)
Sample #5 @ T_d x 3.0	(e.g. 6 min x 3.0 = 18.00 min)

To take a sample, first "blow-down" any accumulated debris by opening valve for 3 seconds then closing. Next position a new sample bottle under this valve and fill. Close bottle and label.

4.5.2 Effluent Water Quality Determination – The water samples taken from this sample port will be lab analyzed for water quality. The samples will be averaged to determine the Effluent Water Quality.

4.6 Interceptor Model ST-08 - The Interceptor model ST-08, is a *rectangular* design, 800 gallon capacity with the inlet & outlet on opposing ends of the interceptor. The location of the inlet/outlet will vary according to the application, and an alternate location will be on the same side. This Interceptor will be tested at (3) different flow rates: 100, 200, & 300 gpm.

4.6.1 Test Configuration – Valve configurations are as follows:
Valves Open: VC1, VC2, VR1, VR2
Valves Closed VD1, VD2, VL1, VL2

4.7 Interceptor Model ST-06 - The Interceptor model ST-06 is a *cylindrical* design, 600 gallon capacity with the inlet & outlet on opposing ends of the interceptor. The location of the inlet/outlet will vary according to the application, and an alternate location will be on the same side. This Interceptor will be tested at (3) different flow rates: 100, 150, & 200 gpm.

4.7.1 Test Configuration – Valve configurations are as follows:
Valves Open: VC1, VC2, VD1, VD2
Valves Closed VR1, VR2, VL1, VL2

5.0 Testing Procedures

1. Each test will be conducted adding a mathematically calculated quantity of pollutants. Note the appropriate Data Chart and note the following the Group and Model Tested. Refer to Tables 2.A, 2.B, or 2.C
2. Energize Pump and adjust Control Valve to Flowrate (Q) gpm
3. Observe the Flow Meter and adjust as described in Section 4.3
4. Observe the Surge Tanks to verify water flow
5. Observe the Sample Port #A to verify water flow
6. Observe the Mixing Port to verify water flow
7. Observe the Control Manhole to verify water flow
8. Observe the Sample Port #B to verify water flow
9. Observe the Reserve Tank to verify water flow
10. Adjust the Control Manhole to permit bypass of the water *IF* the flow rate exceeds test (Q) gpm
11. Let the system run until determined stable at the constant Flowrate (Q)
12. Fill Mixing Port Hopper with pre-mixed, pre-measured, solids or oil
13. The test will start at when signaled. Open Mixing Port Valve #VMP to dose in pollutants per Section 4.3
14. Within 30 seconds of the start of the test, take one sample of water from Sample Port #A per Section 4.5.1
15. At the predetermined times, take a water sample from Sample Port #B per Section #4.7.1
16. Enter appropriate data in tables 2.A & 2.B
17. Observe Interceptor Sludge Chamber for any measurable solids

At the end of each test, samples are to be labeled and stored in an ice cooler. Within 24 hours, the samples will be taken to the certified laboratory to be analyzed.

Repeat this test for the remainder of the procedures.

6.0 Expected Conclusions

The ***StormTrooper®*** Interceptor System is designed to separate and detain pollutants that are typically found in stormwater.

Testing will prove that the Park ***StormTrooper®*** Stormwater Interceptor is a Best Management Practice for "Structural Oil/Grit Separators," designed to the maximum extent practicable (MEP) in treating discharges of pollutants and other substances into the MS4 or into any other bodies of water in the United States.

Sampling results will prove that ***StormTrooper®*** Interceptors will be an approved National Pollutant Discharge Elimination System (NPDES) that complies with EPA regulations of the "Clean Water Act" (NPDES, 40 CFR 122.26 (1999)) and a system that can be used to obtain an EPA NPDES Permit.

The ***StormTrooper®*** performance of each interceptor will be determined by compiling the data in Table 2.

The following are the expected results that will be shown in the test samples:

Pollutant	Influent Composite	Removal Rate (%)
TSS	Min 500 mg/L	> 80%
TPH	Min 500 mg/L	> 90%
Trash/Debris (1cm dia)	TBD	> 80%

APPENDIX C

7.0 Figures and Tables

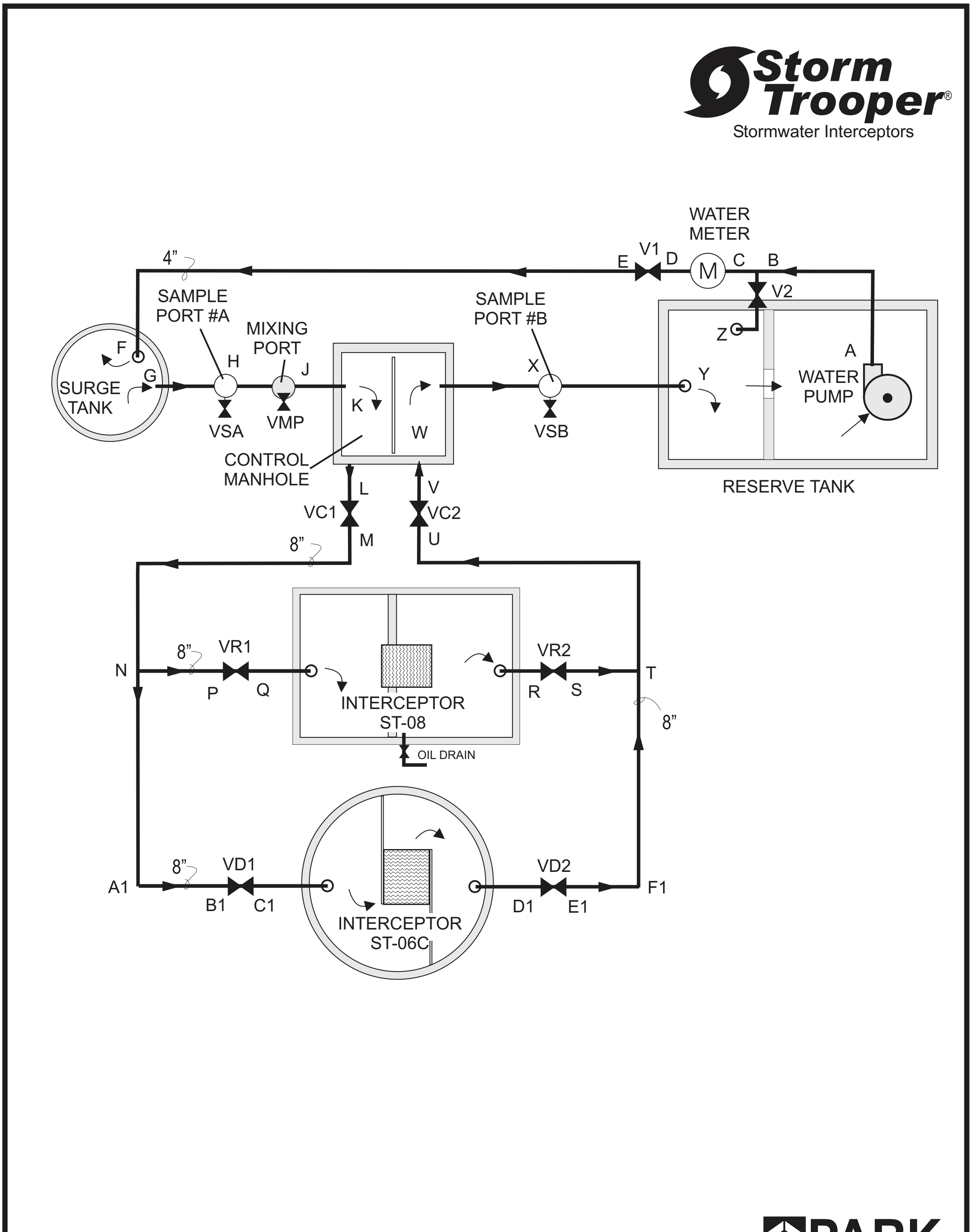

Figure 1. STORMTROOPER TEST STATION LAYOUT

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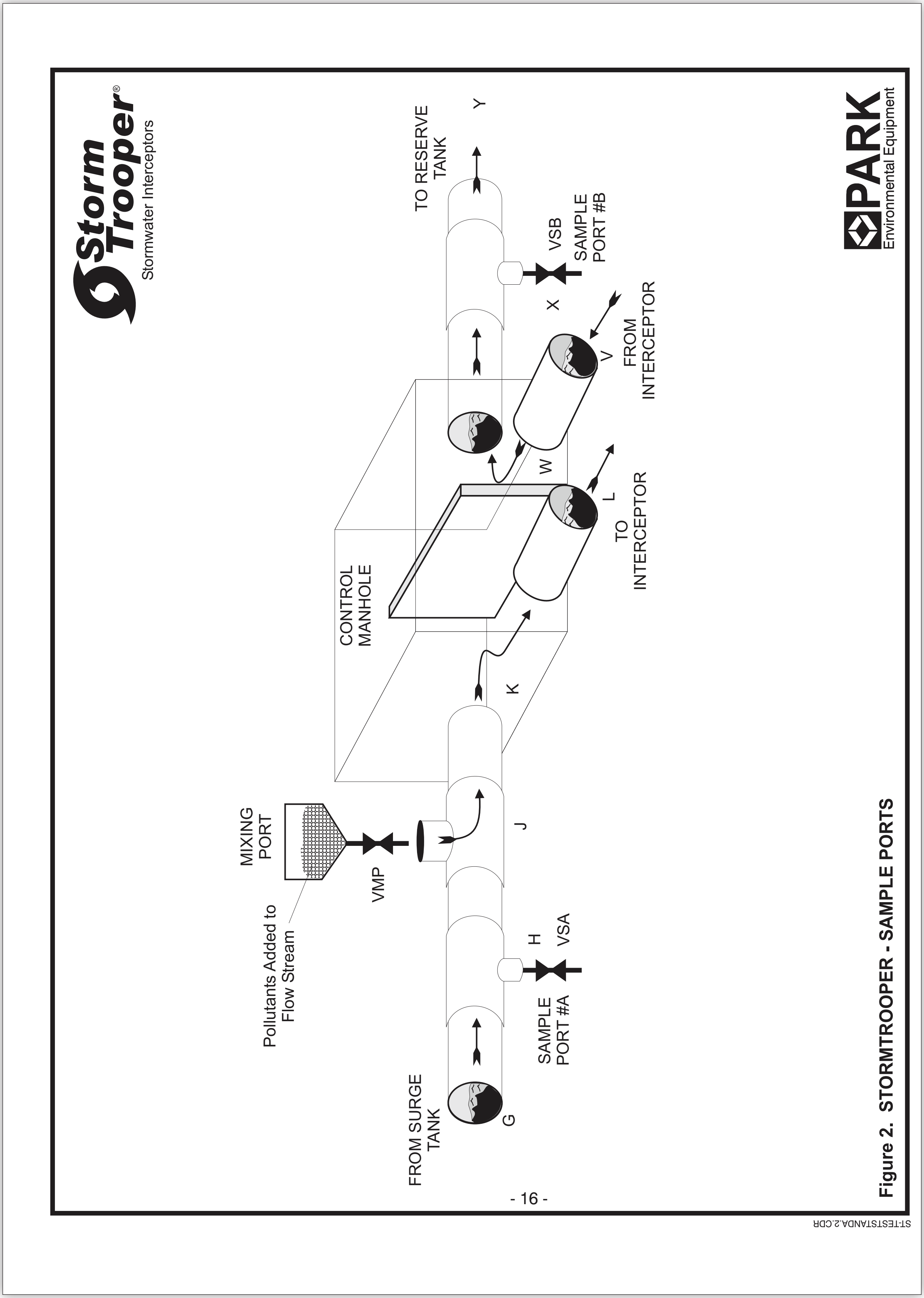

Figure 2. STORMTROOPER - SAMPLE PORTS

Storm Trooper®
Stormwater Interceptors

Table 1. Flow Rate Tables

100 Gallon Scale — Use this chart by timing 100 gallons

Seconds	Flow Rate GPM	Seconds	Flow Rate GPM	Seconds	Flow Rate GPM	Seconds	Flow Rate GPM	Seconds	Flow Rate GPM
6	1000	26	231	46	130	66	91	86	70
7	857	27	222	47	128	67	90	87	69
8	750	28	214	48	125	68	88	88	68
9	667	29	207	49	122	69	87	89	67
10	600	**30**	**200**	50	120	70	86	90	67
11	545	31	194	51	118	71	85	91	66
12	**500**	32	188	52	115	72	83	92	65
13	462	33	182	53	113	73	82	93	65
14	429	34	176	54	111	74	81	94	64
15	**400**	35	171	55	109	75	80	95	63
16	375	36	167	56	107	76	79	96	63
17	353	37	162	57	105	77	78	97	62
18	333	38	158	58	103	78	77	98	61
19	316	39	154	59	102	79	76	99	61
20	**300**	**40**	**150**	**60**	**100**	80	75	100	60
21	286	41	146	61	98	81	74	101	59
22	273	42	143	62	97	82	73	102	59
23	261	43	140	63	95	83	72	103	58
24	250	44	136	64	94	84	71	104	58
25	240	45	133	65	92	85	71	105	57

50 Gallon Scale — Use this chart by timing 50 gallons

Seconds	Flow Rate GPM	Seconds	Flow Rate GPM	Seconds	Flow Rate GPM	Seconds	Flow Rate GPM	Seconds	Flow Rate GPM
4	750	24	125	44	68	64	47	84	36
5	600	25	120	45	67	65	46	85	35
6	**500**	26	115	46	65	66	45	86	35
7	429	27	111	47	64	67	45	87	34
8	375	28	107	48	63	68	44	88	34
9	333	29	103	49	61	69	43	89	34
10	**300**	**30**	**100**	50	60	70	43	90	33
11	273	31	97	51	59	71	42	91	33
12	250	32	94	52	58	72	42	92	33
13	231	33	91	53	57	73	41	93	32
14	214	34	88	54	56	74	41	94	32
15	**200**	35	86	55	55	75	40	95	32
16	188	36	83	56	54	76	39	96	31
17	176	37	81	57	53	77	39	97	31
18	167	38	79	58	52	78	38	98	31
19	158	39	77	59	51	79	38	99	30
20	**150**	40	75	60	50	80	38	100	30
21	143	41	73	61	49	81	37	101	30
22	136	42	71	62	48	82	37	102	29
23	130	43	70	63	48	83	36	103	29

30 Gallon Scale — Use this chart by timing 30 gallons

Seconds	Flow Rate GPM	Seconds	Flow Rate GPM	Seconds	Flow Rate GPM	Seconds	Flow Rate GPM	Seconds	Flow Rate GPM
1	1800	21	86	41	44	61	30	81	22
2	900	22	82	42	43	62	29	82	22
3	600	23	78	43	42	63	29	83	22
4	450	24	75	44	41	64	28	84	21
5	360	25	72	45	40	65	28	85	21
6	**300**	26	69	46	39	66	27	86	21
7	257	27	67	47	38	67	27	87	21
8	225	28	64	48	38	68	26	88	20
9	**200**	29	62	49	37	69	26	89	20
10	180	30	60	50	36	70	26	90	20
11	164	31	58	51	35	71	25	91	20
12	**150**	32	56	52	35	72	25	92	20
13	138	33	55	53	34	73	25	93	19
14	129	34	53	54	33	74	24	94	19
15	120	35	51	55	33	75	24	95	19
16	113	36	50	56	32	76	24	96	19
17	106	37	49	57	32	77	23	97	19
18	**100**	38	47	58	31	78	23	98	18
19	95	39	46	59	31	79	23	99	18
20	90	40	45	60	30	80	23	100	18

flowrate-Swri Test

Table 2.A

StormTrooper Perfomance Analysis - Group A - Final SwRI Results
TSS with Coalescing Plates

Storm Trooper®
Stormwater Interceptors

StormTrooper Model	Volume Capacity (Gal)	Flowrate Q (GPM)	Change Over (minutes)	Test Duration T_d (minutes)	Added Sediment (lbs)	Influent Concentration (mg/l) Sample Port #A: TSS-A	TSS-AA	TSS_{Infl} (Average TSS 1-2)	TSS_{MP} (calculated)	TSS_{Infl} (calculated)	Effluent Concentration (mg/l) Sample Port #B: Sample #1 Elapsed Time (minutes)	Sample #1 TSS mg/l	Sample #2 Elapsed Time (minutes)	Sample #2 TSS mg/l	Sample #3 Elapsed Time (minutes)	Sample #3 TSS mg/l	Sample #4 Elapsed Time (minutes)	Sample #4 TSS mg/l	Sample #5 Elapsed Time (minutes)	Sample #5 TSS mg/l	Average TSS mg/l	Performance: Percent TSS Reduction	Particle Size Distribution
EXAMPLE	600	100	6.00	18.00	7.50	50	50	50	500	550	6	25	9	25	12	25	15	45	18	25	29	94.73%	
ST-06	600	100	6.00	18.00	7.50	170	120	145	500	645	6	30	9	20	12	20	15	9	18	20	19.8	**96.93%**	06-100-PSD1 06-100-PSD2 06-100-PSD3
ST-06	600	150	4.00	12.00	7.50	40	40	40	500	540	4	20	6	20	8	20	10	10	12	20	18	**96.67%**	
ST-06	600	200	3.00	9.00	7.50	30	30	30	500	530	3	40	4.5	50	6	50	7.5	50	9	40	46	**91.32%**	06-200-PSD1 06-200-PSD2 06-200-PSD3

StormTrooper Model	Volume Capacity (Gal)	Flowrate Q (GPM)	Change Over (minutes)	Test Duration T_d (minutes)	Added Sediment (lbs)	Influent Concentration (mg/l) Sample Port #A: TSS-A	TSS-AA	TSS_{Infl} (Average TSS 1-2)	TSS_{MP} (calculated)	TSS_{Infl} (calculated)	Effluent Concentration (mg/l) Sample Port #B: Sample #1 Elapsed Time (minutes)	Sample #1 TSS mg/l	Sample #2 Elapsed Time (minutes)	Sample #2 TSS mg/l	Sample #3 Elapsed Time (minutes)	Sample #3 TSS mg/l	Sample #4 Elapsed Time (minutes)	Sample #4 TSS mg/l	Sample #5 Elapsed Time (minutes)	Sample #5 TSS mg/l	Average TSS mg/l	Performance: Percent TSS Reduction
EXAMPLE	800	100	8.00	24.00	10.00	50	50	50	500	550	8	25	12	25	16	25	20	60	24	60	39	92.91%
ST-08	800	100	8.00	24.00	10.00	40	110	75	500	575	8	40	12	30	16	30	20	30	24	20	30	**94.78%**
ST-08	800	200	4.00	12.00	10.00	30	40	35	500	535	4.00	30	6	50	8.00	50	10.00	40	12	40	42	**92.15%**
ST-08	800	300	2.67	8.00	10.00	120	60	90	500	590	2.67	70	4	80	5.33	100	6.67	90	8	100	88	**85.08%**

Table 2.B

StormTrooper Performance Analysis - Group B - Final SwRI Results

TPH with Coalescing Plates

StormTrooper Stormwater Interceptors

						Influent Concentration (mg/l) Sample Port #A						Effluent Concentration (mg/l) Sample Port #B											Performance
												Sample #1		Sample #2		Sample #3		Sample #4		Sample #5			
StormTrooper Model	Volume Capacity (Gal)	Flowrate Q (GPM)	Change Over (minutes)	Test Duration T_d (minutes)	Added Oil (ounces)	TPH-A	TPH-AA	TPH-AAA	TPH_{Infl} (Average TSS 1-3)	TPH_{MP} (calculated)	TPH_{Infl} (calculated)	Elapsed Time (minutes)	TPH mg/l	Elapsed Time (minutes)	TPH mg/l	Elapsed Time (minutes)	TPH mg/l	Elapsed Time (minutes)	TPH mg/l	Elapsed Time (minutes)	TPH mg/l	Average TPH mg/l	Percent TPH Reduction
EXAMPLE	600	100	6.00	18.00	108.00	50	50	50	50	500	550	6	25	9	25	12	25	15	45	18	45	33	94.00%
ST-06	600	100	6.00	18.00	108.00	5	5	5	5	500	505	6	5	9	5	12	5	15	5	18	5	5	**99.01%**
ST-06	600	150	4.00	12.00	108.00	5	5	5	5	500	505	4	5	6	5	8	5	10	5	12	5	5	**99.01%**
ST-06	600	200	3.00	9.00	108.00	5	5	5	5	500	505	3	5	4.5	5	6	5	7.5	5	9	5	5	**99.01%**

						Influent Concentration (mg/l) Sample Port #A						Effluent Concentration (mg/l) Sample Port #B											Performance
												Sample #1		Sample #2		Sample #3		Sample #4		Sample #5			
StormTrooper Model	Volume Capacity (Gal)	Flowrate Q (GPM)	Change Over (minutes)	Test Duration T_d (minutes)	Added Oil (ounces)	TPH-A	TPH-AA	TPH-AAA	TPH_{Infl} (Average TSS 1-3)	TPH_{MP} (calculated)	TPH_{Infl} (calculated)	Elapsed Time (minutes)	TPH mg/l	Elapsed Time (minutes)	TPH mg/l	Elapsed Time (minutes)	TPH mg/l	Elapsed Time (minutes)	TPH mg/l	Elapsed Time (minutes)	TPH mg/l	Average TPH mg/l	Percent TPH Reduction
EXAMPLE	800	100	8.00	24.00	144.00	50	50	50	50	524	574	8	25	12	25	16	25	20	60	24	60	39	93.21%
ST-08	800	100	8.00	24.00	144.00	5	5	5	5	524	529	8	5	12	5	16	5	20	5	24	5	5	**99.05%**
ST-08	800	200	4.00	12.00	144.00	5	5	5	5	524	529	4.00	5	6	5	8.00	5	10.00	5	12	5	5	**99.05%**
ST-08	800	300	2.67	8.00	144.00	5	5	5	5	524	529	2.67	5	4	5	5.33	5	6.67	5	8	5	5	**99.05%**

APPENDIX C

Storm Trooper®
Stormwater Interceptors

Table 2.C

SwRI Test Sediment Particle Distribution-TSS

Particle No.	Sieve Size		Micron Size			Millimeter	Inches	PDA	UNIT-06 (LBS)	UNIT-08 (LBS)
	min	max	max	min	Avg			%	7.5	10
#03	20	30	840	590	715	0.715	0.02815	20%	1.5	2
#05	40	50	420	297	359	0.359	0.014114	20%	1.5	2
#07	60	80	250	177	214	0.214	0.008406	20%	1.5	2
#10	100	170	149	88	119	0.119	0.004665	20%	1.5	2
#13	170	325	88	44	66	0.066	0.002598	20%	1.5	2
								100%	7.5	10.0

8.0 **References:**

Shepp, D.L. 1996. *Petroleum Hydrocarbon Concentrations Observed in Runoff from Discrete, Urbanized Automotive-Intensive Land Uses*. Metropolitan Washington Council of governments, Washington, D.C.

US EPA. 1999. *Preliminary Data Summary of Urban Stormwater Best Management Practices*. EPA-821-R-99-012. Washington, D.C.

US EPA. 1983. *Results of the Nationwide Urban Runoff Program: Volume 1 – Final Report*. Water Planning Division Washington D.C., NTIS Publication No. 83-185552 (Exec Summary EPA-841-S-83-109). Washington, D.C.

U.S. EPA. 1993. *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. Issued under authority of Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990. No. 840-B-92-002. EPA Office of Water. Washington, D.C.

Sansalone, John J., Koran, Joseph M., Smithson, Joseph A., Buchberger, Steven G. 1997a. *Characterization of Solids Transported from an Urban Roadway Surface*. WEFTEC '97

Shaheen, Donald G. 1975. *Contribution of Urban Roadway Usage to Water Pollution*. EPA-600/2-75-004

Sartor, J.D. and G.B. Boyd. 1972. *Water Pollution Aspects of Street Surface Contaminants*. EPA-R2-72-081

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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF FIRE TECHNOLOGY
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FAX (210) 522-4518

September 7, 2012

Chris Eberly, P.E.
ParkUSA (Park Environmental Equipment Company, LTD)
7015 Fairbanks N. Houston
Houston, TX 77040

Re: Surveillance of Tests Conducted on Representative StormTrooper® Interceptor Model SWAQ_15, SwRI® Project No. 08.58999

Mr. Eberly,

This will summarize my trip to our manufacturing facilities in Houston, Texas, on May 18th, 2010, to witness tests on representative StormTrooper® Interceptor Model SWST_15. The interceptor was subjected to tests described in the attached test protocol titled "Testing Procedure of StormTrooper® Storm Water Interceptor," dated April 2010.

Verification testing was completed on a W8' x L5' x D5' SWST_15 Storm Water Interceptor. The StormTrooper® Interceptor System was tested in accordance with the Edward's Aquifer Innovative Technology and NJDEP testing protocol for Storm Water Treatment Devices. The guideline requires, at a minimum, documentation showing the capture efficiency of particles ranging from 1 to 1000 microns, for five (5) flows, at an average concentration of 200 mg/l per flow. The test matrix was expanded to include suspended sediment concentration (SSC) and Particle Size Distribution (PSD) analysis. Table 1 shows the results of the SSC analysis for tests ran with ¼" spaced coalescing plates and without coalescing plates.

Table 1. Interceptor Collection Efficiency

StormTrooper® Model	Flowrate (gpm)	Removal Eff. w/o Plates	Removal Eff. w/ Plates
SWAQ_15	200	28%	51%
SWAQ_15	400	20%	35%
SWAQ_15	600	22%	32%
SWAQ_15	800	21%	26%
SWAQ_15	1000	21%	24%

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Table 2 shows the actual particle size distribution analysis (PSD) determined, on average, for each test ran. Samples from the influent and effluent streams were collected and sent to an independent laboratory located at the University of Texas Department of Civil, Architectural and Environmental Engineering (Dr. Desmond F. Lawler). Samples were analyzed for SSC (Suspended Solids Concentration) and PSD (Particle Size Distribution).

Table 2	
dp (μm)	**% Finer**
1	0%
2	11%
8	52%
16	77%
45	80%
75	84%
212	91%
425	100%

The purpose of the test was to receive product approval, by the Texas Commission on Environmental Quality (TCEQ), and acceptance as an approved vendor within RG-348 "Complying with Edwards Aquifer Rules Technical Guidance on Best Management Practices." Under 30 TAC Chapter 213, 80% of the increase in annual TSS load resulting from development must be removed.

Laboratory testing proved that the StormTrooper® Storm Water Interceptor is a Best Management Practice for "Structural Oil/Grit Separators," designed to the maximum extent practicable (MEP) in treating discharges of pollutants and other substances into the MS4 or into any other bodies of water in the United States. Sampling results prove that StormTrooper® Interceptors are an approved National Pollutant Discharge Elimination System (NPDES) that complies with The Edward's Aquifer Rules that require a reduction of 80% of the increase in annual TSS load resulting from new impervious development. Table 3 shows the StormTrooper® efficiencies (Removal Eff. (%) Vs. Overflow Rate (gpm/ft^2)) generated using results from laboratory test and continuous simulation modeling.

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Table 3 StormTrooper® BMP Efficiency vs. Overflow Rate (V_{OR})							
Eff (%)	V_{OR} (fps)	Eff (%)	V_{OR} (fps)	Eff (%)	V_{OR} (fps)	Eff (%)	V_{OR} (fps)
99%	0.00018	84%	0.00925	69%	0.04526	54%	0.10602
98%	0.00030	83%	0.01151	68%	0.04830	53%	0.11010
97%	0.00042	82%	0.01377	67%	0.05134	52%	0.11418
96%	0.00054	81%	0.01603	66%	0.05439	51%	0.11826
95%	0.00066	80%	0.01829	65%	0.05743	50%	0.12234
94%	0.00113	79%	0.02061	64%	0.06117	49%	0.12808
93%	0.00160	78%	0.02292	63%	0.06492	48%	0.13382
92%	0.00208	77%	0.02524	62%	0.06866	47%	0.13957
91%	0.00255	76%	0.02756	61%	0.07241	46%	0.14531
90%	0.00302	75%	0.02987	60%	0.07615	45%	0.15105
89%	0.00381	74%	0.03234	59%	0.08131	44%	0.15987
88%	0.00461	73%	0.03481	58%	0.08647	43%	0.16870
87%	0.00540	72%	0.03728	57%	0.09163	42%	0.17752
86%	0.00619	71%	0.03975	56%	0.09678	41%	0.18634
85%	0.00699	70%	0.04222	55%	0.10194	40%	0.19516

(For explanation of sizing, please see attached addendum)

Approved:

James E. Johnson
Principle Engineer
Department of Fuels and Lubricants Research

Cc: Pat Schrum

SwRI®

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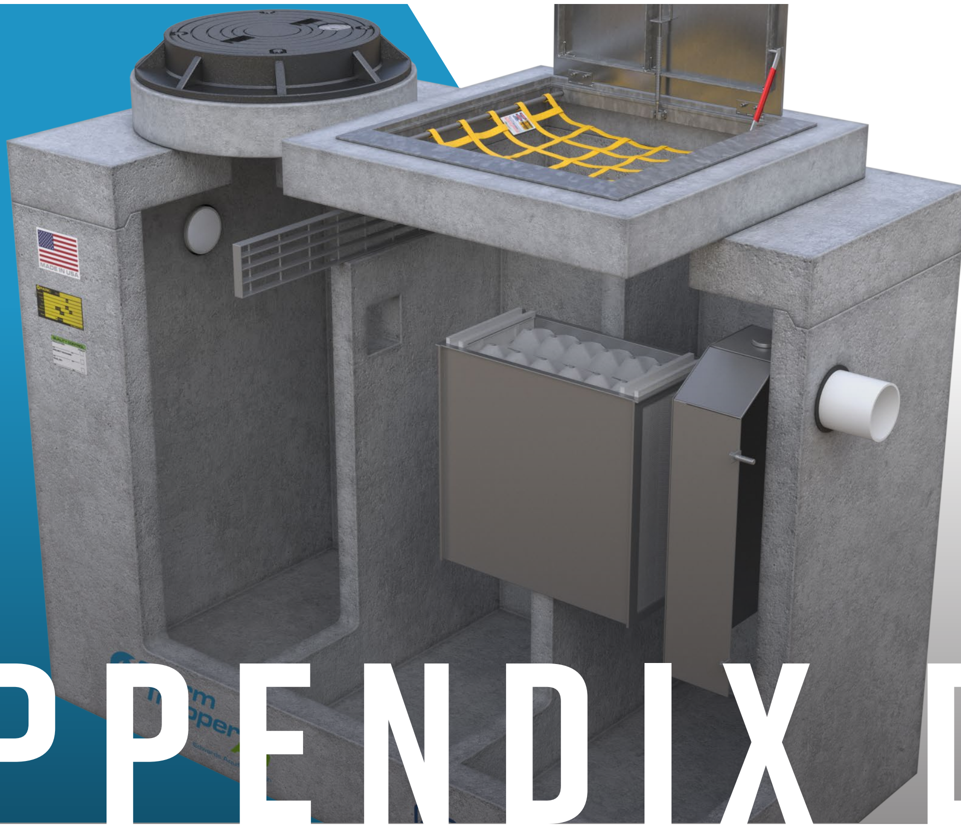

APPENDIX D

NOTES

Addendum Sheet

Complying with the Edwards Aquifer Rules
Technical Guidance on Best Management Practices
RG-348 (Revised July 2005)

July 5, 2012

This addendum sheet lists additional information that is approved for inclusion in "Complying with the Edwards Aquifer Rules Technical Guidance on Best Management Practices" (Revised July 2005). The list indicates the location (chapter and section) where this additional information will be placed in a subsequent revision of the manual and provides the specific technical language that has been approved by the TCEQ Edwards Aquifer Protection Program.

RG-348 Location	RG-348 Language	Justification
Section 3.2.21	**StormTrooper®** StormTrooper® is a patented stormwater treatment system used as a best management practice to intercept free oils, grease, TSS, debris, and other pollutants commonly found in storm water runoff. StormTrooper is manufactured in Texas by ParkUSA and is third-party tested by Southwest Research Institute (SwRI) in San Antonio.	TCEQ Approval of Innovative Technology

Figure 1. The StormTrooper® Stormwater Separator

The StormTrooper Storm Water Treatment System utilizes "Enhanced" Gravity Separation. Enhanced Gravity Separation has been predominantly used in industrial applications of the separation of free oil and suspended solids from effluent water.

Enhanced Gravity Separation is an improvement over "gravity separation." Gravity separation is the phenomenon where a phase with higher density will settle and the phase with lower density will float to the surface of fluid. Enhanced Gravity Separation is achieved by utilizing CMP technology (coalescing media plates).

CMP technology introduces multi layer separation which provides an extensive reduction in surface area and ultimately smaller separators. Surface area requirements are reduced according to the number of CMP plates utilized. The StormTrooper System makes it feasible to achieve high levels of separation not typically achieved by a larger surface area separator.

Operation of StormTrooper® Storm Water Treatment System

Untreated storm water enters the first chamber of the unit known as the "grit chamber." Larger particles, as well as semi-buoyant material, are captured in this chamber to prevent excessive clogging and obstruction of the frontal area of the coalescing media plates. This reduces the potential for short circuiting and higher velocities through the plates. The "diffusion baffle," which separates the two chambers, works to perform two vital functions. First, it distributes flow evenly through the entire cross-section of the unit allowing for a more uniform delivery of pollutants through the plate. Next, a water quality orifice regulates flow through the plates and lower section of unit to prevent re-suspension of pollutants. Each StormTrooper has a specific maximum flow rate that has been pre-calibrated. Higher flow rates by-pass the system once the pre-calibrated flow rates are exceeded.

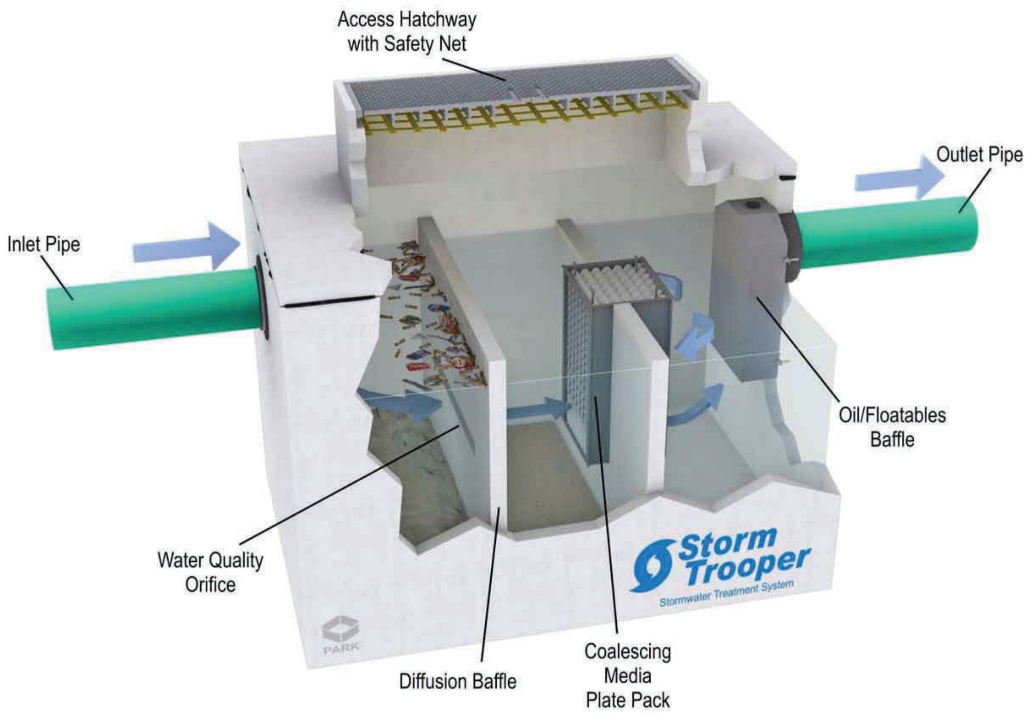

Figure 2. StormTrooper® Components

As the treatable flow of pollutants travel through the CMP (coalescing media plate pack) oil rises to the top and solids drop to the bottom through dedicated surfaces and weep holes. Plate supports at the bottom allow for easy removal of the solids that collect beneath the plates. Because of the steep angles and short travel distances, oils and solids are quickly released eventually floating to the surface of the StormTrooper unit or settling to the bottom of the unit.

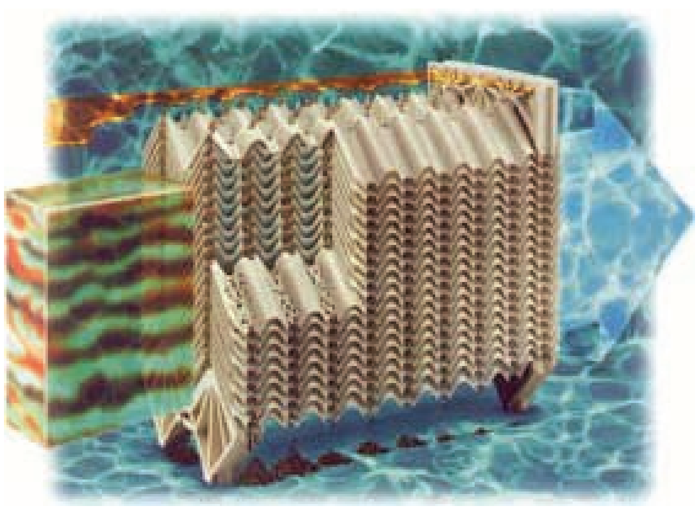

Figure 3. Coalescing Media Plates

	A submerged oil/floatable baffle is located around the effluent pipe to allow for the capture and containment of these pollutants. Collected pollutants will remain in the interceptor until removal. Because no filter cartridges are required operating costs are minimal. Furthermore, the StormTrooper System has no moving parts substantially reducing maintenance costs. Selection Criteria • Use when space constraints make installation of a surface treatment system infeasible • Achieves greater than 80% TSS removal when properly sized, so can be used as a standalone BMP, as well as in a treatment train • Provides smallest footprint possible and safest entry • Appropriate for retrofits as well as new development Limitations • Below grade installation requires pump out to remove accumulated sediment and other pollutants • Manhole covers must be removed to determine whether maintenance is required • Requires regular maintenance for optimum efficiently	
3.4.20	**StormTrooper® Design Criteria** As a flow-based BMP, the StormTrooper is designed using the treatment flow rate for the site, as calculated using the Rational Method. The runoff rate from the tributary area is calculated using Equation 3.4: $Q = CIA$ Where: Q = flow rate (ft^3/s) C = runoff coefficient for the tributary area I = design rainfall intensity (1.1. in/hr) A = drainage area (ac) The runoff coefficient is calculated as the weighted average of the impervious and pervious areas. Runoff coefficient for impervious areas is assumed to be 0.90 and the runoff coefficient for pervious areas is assumed to be 0.03. The overflow rate (hydraulic loading rate) is calculated using Equation 3.5: $V_{OR} = Q/A$ Where: V_{OR} = overflow rate (ft/s) Q = runoff rate calculated with Equation 3.4 (ft^3/s)	

A = surface Area of Unit (ft^2)

The overflow rate can then be used with Table 3 to determine the StormTrooper unit that provides the desired TSS removal.

The StormTrooper system is available in several models. The table below summarizes the various unit models and their corresponding dimensions.

Table 1. StormTrooper® *SWAQ* Models

Storm Trooper Model SWAQ	System Length (in)	System Width (in)	Minimum Settling Depth (in)	Vault Surface Area (sf)	Number of Plate Columns	Number of Stack Feet / Column	Projected Surface Area of Plates (sf)	Total Surface Area of System (sf)
05	84	36	48	21	1	2	79	100
10	90	48	48	30	1	3	119	149
20	120	60	48	50	2	2.5	198	248
25	144	72	48	72	3	2.5	297	369
40	180	90	48	113	4	3	475	588
70	204	96	48	136	5	3	594	730
110	240	120	48	200	6	3	713	913

The characteristics of the catchment area are defined as Effective Area (EA). The Effective Area is the number of acres draining to a single treatment unit and is calculated using the following equation:

$$EA = (A_i * 0.9) + (A_p * 0.3)$$

Where:

EA = Effective Area (ac)

A_i = Impervious Area (ac)

A_p = Pervious Area (ac)

StormTrooper models can be selected from Table 2 below that will achieve an 80% TSS reduction at the corresponding Effective Areas shown.

Table 2. StormTrooper® Sizing Chart (for 80% Reduction)

Effective Area - EA Acres	StormTrooper® Model
Less than 0.13	SWAQ-05
0.14 - 0.20	SWAQ-10
0.21 - 0.33	SWAQ-20
0.34 – 0.50	SWAQ-25
0.51 – 0.79	SWAQ-40
0.80 – 0.98	SWAQ-70
0.99 – 1.23	SWAQ-110

The **StormTrooper® SWAQ** system for the Edwards Aquifer is designed using the overflow rates provided in Table 3. These were calculated based on the surface area of the vault alone and a rainfall intensity of 1.1 in/hr.

Table 3. StormTrooper® BMP Efficiency vs. Overflow Rate (V_{OR})

Eff (%)	V_{OR} (fps)	Eff (%)	V_{OR} (fps)	Eff (%)	V_{OR} (fps)	Eff (%)	V_{OR} (fps)
40%	1.74E-02	55%	6.28E-03	70%	2.54E-03	85%	8.38E-04
41%	1.66E-02	56%	6.00E-03	71%	2.42E-03	86%	7.78E-04
42%	1.58E-02	57%	5.72E-03	72%	2.30E-03	87%	7.18E-04
43%	1.51E-02	58%	5.44E-03	73%	2.18E-03	88%	6.58E-04
44%	1.43E-02	59%	5.16E-03	74%	2.06E-03	89%	5.98E-04
45%	1.35E-02	60%	4.87E-03	75%	1.93E-03	90%	5.36E-04
46%	1.27E-02	61%	4.59E-03	76%	1.81E-03	91%	4.95E-04
47%	1.20E-02	62%	4.35E-03	77%	1.69E-03	92%	4.54E-04
48%	1.12E-02	63%	4.11E-03	78%	1.57E-03	93%	4.13E-04
49%	1.04E-02	64%	3.87E-03	79%	1.45E-03	94%	3.72E-04
50%	9.65E-03	65%	3.63E-03	80%	1.33E-03	95%	3.31E-04
51%	8.88E-03	66%	3.39E-03	81%	1.23E-03	96%	2.90E-04
52%	8.11E-03	67%	3.14E-03	82%	1.13E-03	97%	2.49E-04
53%	7.34E-03	68%	2.90E-03	83%	1.04E-03	98%	2.08E-04

Example:

A civil engineer is designing a 1.0 acre office park located over the Edward's Aquifer. 0.90 acres, which is 90% impervious, is draining to a single StormTrooper unit. 0.10 Acres, which is 10% impervious, cannot be treated and therefore TSS removal must be compensated within the single unit. Below is a detailed example of how to calculate annual load reduction of the StormTrooper model chosen.

PROJECT: StormTrooper® SWAQ - 40 Example **AREA #: 1** **DATE: 6/10/2011**

Table 2. Sizing Chart for 80% Reduction

Effective Area (Ac.)	StormTrooper® Model	Total Surface Area (ft^2)
E.A. < 0.13	SWAQ - 05	100
0.14 < E.A. < 0.20	SWAQ - 10	149
0.21 < E.A. < 0.33	SWAQ - 20	248
0.34 < E.A. < 0.50	SWAQ - 25	369
0.51 < E.A. < 0.79	SWAQ - 40	588
0.80 < E.A. ≤ 0.98	SWAQ - 70	730
0.99 < E.A. ≤ 1.23	SWAQ - 110	913

Use additional sheets for additional units.
A_I = Impervious Cover (Acres)
A_P = Pervious Cover (Acres)
A = Total Area (Acres)
P = Avg. Annual Rainfall (33" for Example)
A_N = Net Impervious Cover (Acres)

List only the uncaptured area being compensated for in the unit. TSS compensation for uncaptured areas can be divided up between multiple units or BMP's.

BMP Catchment Area "A"	**Untreated Catchment Area "A" - Compensation Req'd**
$A_{I1} =$ 0.81	$A_{I2} =$ 0.01
$A_{P1} =$ 0.09	$A_{P2} =$ 0.09
$A_1 =$ 0.90	$A_2 =$ 0.1
$A_{N1} =$ 0.81	$A_{N2} =$ 0.01
$L_{M1} =$ 1534.90	$L_{M2} =$ 8.98

APPENDIX D

1 **StormTrooper® Model Sizing based on Individual Catchment Areas to the BMP.**

Effective Area (EA) = (0.9 x A $_I$) + (0.03 x A $_P$)

EA = (0.9 x 0.81) + (0.03 x 0.09) = 0.7317 Acres — ***Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)***

From Table 2 choose an initial Model: SWAQ - 40

Surface Area of Model: 588 Sq. Ft.

Required TSS removal for catchment area:

$L_{M1} = 27.2 \times A_N \times P$ — ***Equation 3.3 "RG-348"***

$L_{M1} = 27.2 \times 0.81 \times 33 = 727.06$

2 **Overflow Rate**

V_{OR} = Q/S.A. where: Q = i(EA) — ***Equation 3.4 & 3.5 "RG-348"***

Page 3-30 "RG-348" (i = 1.1 in./hr., 90% Volume Treated)

Q = (i x EA)/Model Surface Area

Q = (1.1 x 0.7317) / 588 = 0.00137 fps

3 **BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.**

V_{OR} =	0.00133 fps
BMP Eff. (%) =	80 %

4 **Maximum TSS Removal of BMP: L_{R1}**

L_r = (BMP Efficiency) x P x (A_i x 34.6 + A_p x 0.54) — ***Equation 3.8 "RG-348"***

L_r = Load Removed by BMP

BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{R1} = 0.80 x 33 x (0.81 x 34.6 + 0.09 x 0.54) = 741.17 #TSS

TSS removal exceeding required L_M to be counted towards untreated area = L_C

$L_C = L_{R1} - L_{M1}$

LC = 741.17 - 727.06 = 14.11 #TSS

Required TSS removal for untreated area:

L_{M2} = 27.2 x 0.01 x 33 = 8.98 #TSS < 14.11 #TSS => O.K.

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS!!

3.5.24 **StormTrooper® Maintenance Guidelines**

A preventative maintenance cleanout schedule is the most valuable tool for maintaining the proper operation of StormTrooper. Separator maintenance costs will be greatly reduced if a good housekeeping plan for the property is developed i.e., trash pickup, lawn maintenance, dumpster control, etc.

StormTrooper separators have no moving parts and no filter cartridges. The manufacturer recommends quarterly ongoing inspections for accumulated pollutants. Pollutant deposition may vary from year to year. Quarterly inspections ensure that the system is serviced at the appropriate times. Table 4 lists recommended maximum capacities of oil and sediment. Professional vacuum services should be considered when capacities exceed these recommended levels.

Table 4. StormTrooper®

1 **StormTrooper® Model Sizing based on Individual Catchement Areas to the BMP.**

Effective Area (EA) = (0.9 x A_I) + (0.03 x A_P)

EA = (0.9 x 0.81) + (0.03 x 0.09) = 0.7317 Acres — ***Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)***

From Table 2 choose an initial Model: SWAQ - 40

Surface Area of Model: 588 Sq. Ft.

Required TSS removal for catchment area:

L_{M1} = 27.2 x A_N x P — ***Equation 3.3 "RG-348"***

L_{M1} = 27.2 x 0.81 x 33 = 727.06

2 **Overflow Rate**

V_{OR} = Q/S.A. where: Q = i(EA) — ***Equation 3.4 & 3.5 "RG-348"***

Page 3-30 "RG-348" (i = 1.1 in./hr., 90% Volume Treated)

Q = (i x EA)/Model Surface Area

Q = (1.1 x 0.7317) / 588 = 0.00137 fps

3 **BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.**

V_{OR} =	0.00133 fps
BMP Eff. (%) =	80 %

4 **Maximum TSS Removal of BMP: L_{R1}**

L_r = (BMP Efficiency) x P x (A_i x 34.6 + A_p x 0.54) — ***Equation 3.8 "RG-348"***

L_r = Load Removed by BMP

BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{R1} = 0.80 x 33 x (0.81 x 34.6 + 0.09 x 0.54) = 741.17 #TSS

TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C = L_{R1} - L_{M1}

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Table 4. StormTrooper®

APPENDIX D

ENGINEERED PRODUCT GROUPS

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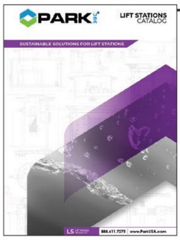
FUEL SYSTEMS

SUPERVAULT



LIFT STATIONS

EFFLUENT | AXIAL PUMPS | VERTICAL TURBINES | NON-CLOG PUMPS | GRINDERS

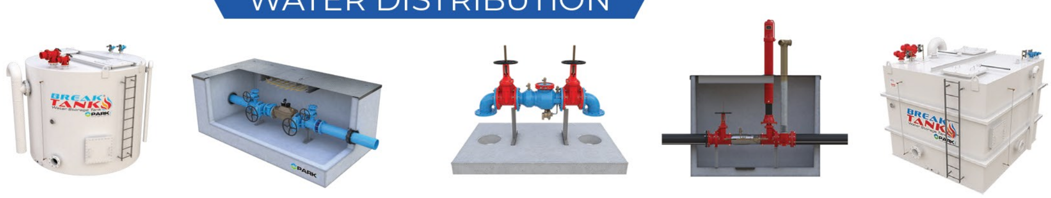
PARK PROCESS

EDUCTORS | DEWATERING | FILTRATION | SEPARATION | MIXING/BLENDING

WASTEWATER

GREASE INTERCEPTORS | OIL/WATER SEPARATORS | ACID NEUTRALIZATION | DECON SYSTEMS

WATER DISTRIBUTION



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