November 1, 2017

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Storm Water Program  
Municipal Phase II  
Division of Water Quality  
State Water Resources Control Board  
PO Box 1977  
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Subject: Certification Application for Full Capture Trash Control Device  
Reference: Listing on State Water Boards Certified Full Capture Systems List  
Full Capture Device:  *Jensen Deflective Separators*

Good Day Mr. Consentini:

The Stormwater Division of Jensen Precast is pleased to submit this application for the *Jensen deflective separator (JDS)* to be included on the State Water Boards Certified Full Capture System List. This application submittal Cover Letter and the attached Application Package have been prepared in accordance with the *Trash Treatment Control Device Application Requirements*, downloaded from the Trash Implementation Program page of the California State Water Resources Control Board (SWRCB).

### A. GENERAL DESCRIPTION OF TECHNOLOGY

The *Jensen deflective separator (JDS)* is a qualified Full Capture Trash Control Device for stormwater treatment. The *JDS* technology is a non-blocking, screening, swirl concentrating treatment process for both small and large stormwater flows. All treatment flow in a *JDS* unit must pass through its screen. *JDS* screen cylinders have aperture widths of 2.4-millimeter (mm), and 4.7-mm, which are both less than the target 5-mm particle for Full Capture. The *JDS* unit’s treatment flow path does not physically allow the passage of a 5-mm or greater particle. The specific gravity of the particle does not determine its passage if it is ≥ 5-mm. The *JDS*, stormwater treatment unit (SWTU), falls in the category of Hydrodynamic Separators (HDS) and is often referred to as a vortexing unit.
Jensen deploys these *JDS* units in 3 to 16-foot (ft) diameter precast manholes, screening flows from 0.7 cubic feet per second (cfs) to 80-cfs configured to receive flow from:

- grated drop inlets or
- placed in the storm drain’s (SD) pipeline alignment in an “Inline” deployment with integral bypass, or
- placed adjacent to the SD pipeline alignment in an “Offline” configuration with a separate manhole or vault structure having a diversion weir to channel water quality treatment flows into the *JDS* unit. This separate diversion structure enables high conveyance flows, which are greater than the *JDS*’s rated Full Capture Treatment capacity to bypass the *JDS* treatment unit.

The design of each *JDS* SWTU embodies the essential design parameters and aspects of the continuous deflective separation process. The continuous deflective separation process pioneered non-blocking, indirect screening processes for stormwater treatment. The continuous deflective separation (CDS) process is now a public domain treatment process and is no longer a patented or proprietary treatment process. The patent for the continuous deflective separation treatment process expired in June of 2015.

Stormwater treatment units using the continuous deflective separation treatment process have already been included on the certified list as a Full Capture Devices by the SWRCB. Region 4, the California Los Angeles Regional Water Quality Control Board (LARWQCB), considers the continuous deflective separation process to be a Full Capture Device capable of satisfying their Total Maximum Daily Load (TMDL) for trash. LARWQCB refers to the continuous deflective separation process, that is embodied in the *JDS* unit, as a Vortex Separation System. The San Francisco Bay – RWQCB (SFRWQCB), also lists a treatment unit employing the continuous deflective separation process as a Full Capture system.

**B. CONTACT INFORMATION & LOCATION**

**Name:** Stormwater Division
Jensen Precast
521 Dunn Circle
Sparks, NV 89431
C. MANUFACTURING LOCATIONS

Jensen Precast is among the largest independently owned precast concrete companies in the United States. Jensen designs and manufactures standard and custom precast concrete products to meet large-scale infrastructure demands for highway construction, retaining walls, electric and gas utility, telecommunications, water, on-site wastewater, and sewage applications.

Jensen has been providing detention, retention and infiltration systems since 1968. The development of stormwater management and treatment systems deployed in precast structures has been an integral part of the Jensen business in California for more than 25-years. Floatation; sedimentation; coalescing; horizontal and vertical clarification; hydrodynamic separation; and physical and chemical filtration are all treatment processes Jensen offers to provide pollution removal from stormwater.

Jensen Precast started business in 1968, originally precasting underground utilities in Sparks, NV. Today Jensen has eleven precasting facilities in the South Western States of Arizona, Nevada and California, as well as the Hawaii islands.

Jensen Precast’s Corporate Offices are in Northern Nevada at:

825 Steneri Way
Sparks, NV 89431
(775) 352-2700

In California, Jensen Precast operates seven (7x) primary manufacturing facilities at the following locations:

Northern California:

Sacramento, CA
5400 Raley Blvd
Sacramento, CA 95838
Phone: (916) 991-8800

Orland, CA
7210 Highway 32
Orland, CA 95963
Phone: (530) 865-4277
The standard, as well as custom, reinforced precast concrete components of the \textit{JDS} units are manufactured at all of these California locations as well as at the Arizona, Nevada and Hawaii facilities.

The internal metal components of the \textit{JDS} units are manufactured or assembled at Jensen MetalTech located at:

\begin{center}
Jensen MetalTech  
450 E Glendale Ave  
Sparks, NV 89431
\end{center}

Manufacturing of fiberglass components in accordance with design specifications are provided by a specialty fiberglass shop in Sacramento, CA. A specialty HDPE manufacturer in Canada provides high density polyethylene (HDPE) components.

\textbf{D.  LABORATORY TEST SUMMARYING}

Jensen has completed full scale Full Capture Testing of the \textit{JDS} unit. Test results document greater than 98\% capture and retention efficiencies for solid particles greater than or equal to (\geq) 5-mm. This full scale testing also included scour testing of the \textit{JDS} unit at flow rates much greater
than its Full Capture design treatment flow rate to determine if the unit scourcs or “Burps” previously captured solids during high flow bypass hydraulic conditions. This 98% Removal Efficiency (RE%) for the capture and retention of solids was calculated using the Effluent Method and Mass Balance Method. These methods are presented in detail in the report.

Jensen believes that these Full Capture tests are the most current for stormwater gross solids removal efficiency verification procedures. Jensen offers these test procedures and protocols as the basis for the minimum requirement for Full Capture verification testing that should become an explicit requirement for devices to be certified and listed as Full Capture devices. A full-scale testing requirement is a natural evolution for the SWRCB’s management of compliant Full Capture devices.

These gross solids removal tests of particles ≥ 5-mm were performed at the Jensen Stormwater Test Facility (Laboratory Testing), which is located in Sparks, NV.

**Independent Third Party:**

These Full Capture Performance Laboratory Tests were performed under the direct supervision of Professor Keith Dennett. Professor Dennett served as an independent third-party observer of all tests on the JDS unit. Professor Keith Dennett, Ph.D., P.E is an Associate Professor in the Department of Civil and Environmental Engineering, University of Nevada, Reno.

Jensen Precast recommends the incorporation of an Independent Third-Party Observer in Full Capture tests as a future requirement for Certification Listing of Full Capture Devices.

**“Burping” Determination of Previously Captured Solids and Floatables**

Jensen believes that testing should be adopted to include the quantitative determination if a Full Capture Device releases previously capture solids. This “Burping” of previously captured solids is not an allowable performance feature of a Full Capture Device. A Full Capture Device that allows “Burping” of previously captured solids during high flow bypass conditions is not a long term Full Capture Device that enables true compliance with the Trash Amendment. Full Capture devices that allow “Burping” of previously captured solids, especially floatables, should be removed from the State Water Boards Certified Full Capture System List until design modifications eliminate “Burping” and are verified through full scale testing.
E. DEVICE LIMITATION, OPERATIONS, SIZING and MAINTENANCE

Device Limitations

**Site Constrains That Impact Hydraulic Function:** Limitations of the JDS unit when applied as a Full Capture device are typically the result of difficult installation conditions that impact the functioning hydraulic operations of the continuous deflective separation process.

For example, shallow installation sites may not allow sufficient freeboard in the unit’s floatable control cylinder and may require design modifications to physically pin the floatable control cylinder to the soffit of the unit. This eliminates the potential of “Burping” floatables during high conveyance flows that create bypass conditions. The unit may also require a second access lid.

High bypass flows can be accommodated in most Offline JDS units, because they have a project specific designed diversion vault or manhole with either concrete or adjustable stainless steel diversion weirs. High bypass flows may require strengthening of internal components of Inline JDS units by reinforcing the fiberglass (FRP) and HDPE inlet and baffle components. Switching from FRP and HDPE materials to marine grade Aluminum or stainless steel is also an option.

When the JDS units are subject to high bypass flows, especially Inline JDS units, the forces along with both the hydraulic and energy gradelines (EGL & HGL) must be quantitatively evaluated for structural resistance capacities as well as flooding potential.

Tailwater conditions require unit design modifications that typically involve raising the diversion weir and modifying the geometry of the inlet to the screening, swirl concentrating separation chamber to ensure the entire treatment flow enters the screening separation chamber. A more detailed hydraulic analysis of this condition is necessary to ensure that the required balanced hydraulic condition of the continuous deflective separation process is achieved and produces a non-blocking screening process.

Steeply sloped inlet pipes will create a hydraulic jump immediately upstream of the diversion weir in both Inline and Offline units. This hydraulic condition also requires increasing the height of the diversion weir.

These difficult installation conditions, if not considered in the design phase of the project, may result in hydraulic conditions that cause the treatment flow capacity of the JDS unit to vary from the design treatment flow rate. In short, upstream and downstream hydraulic conditions can impact the treatment capacity of the unit, but can be addressed by a simple hydraulic analysis during the design phase.
Larger *JDS* treatment capacity units may experience functional problems when subjected to frequent small inlet flows that are a small percentage of the *JDS* unit’s larger peak rated treatment flow capacity. These larger units never generate the necessary rotational velocities to create an assured non-blocking screen during these “nuisance” flows. These larger installations require consideration of these frequent “nuisance” flow conditions. Jensen has design modifications that have proved successful in mitigating the negative impact of frequent small percentage inflows into large treatment capacity *JDS* units.

**Operations**

As mentioned above, the operation of the *JDS* unit employs the continuous deflective separation process. When successfully deployed, the continuous deflective separation process produces a balanced hydraulic condition that creates a non-blocking screening process in addition to the swirl concentration, vortexing separation treatment processes. The design of all *JDS* units strictly adheres to the governing design tenets of the continuous deflective separation process.

Jensen’s primary *JDS* design engineers: Stein, PE and Kohzad, PhD, have over 20-years’ experience in the design and deployment of the continuous deflective separation treatment process from its genesis in Australia, followed by its introduction to the United States and Europe. They have developed the catalog of precast *JDS* units, which are able to operate through a wide range of flow conditions, while still functionally creating the continuous deflective separation treatment process. Between the two of them, they have designed thousands of units successfully deploying the continuous deflective separation process.

**Sizing**

The sizing of each individual *JDS* unit is a matter of ensuring that the rated treatment flow capacity of the *JDS* unit effectively produces the continuous deflective separation process throughout that specific unit’s rated Full Capture treatment capacity. Hydraulic similitude applies to the continuous deflective separation process and *JDS* units are entirely scalable.

Site development engineers complete their calculation of the Full Capture treatment flow rate using the Rational Method to determine the peak runoff flow rate from a 1-hour duration storm event having a 1-year return frequency. This treatment flow rate determination is per regulations stipulated by both the Regional Water Quality Control Boards (RWQCBs) of San Francisco and Los Angeles, which are Regions 2 & 4, and the SWRCB’s Trash Amendment sizing requirements for Full Capture Devices.

Following this calculation of the Full Capture treatment flow rate, the site engineer selects the *JDS* unit with a commensurate treatment flow rate. Jensen provides a table of 27 standard precast Inline *JDS* units and a table of 30 standard Offline units from which the site engineer can select the *JDS* units.
unit having the adequate Full Capture treatment flow rate capacity. Jensen can also readily provide custom, project specific JDS designs.

**Maintenance**

The frequency for cleaning a JDS unit depends upon the accumulation of trash, debris, oil and sediment, which will vary based on the land use in the watershed draining to the unit.

The attached application includes a more detailed discussion on the proper method and means of maintaining JDS units. Additionally, Jensen design and deployment enhancements for vector control are outlined in the maintenance section of the attached application.

The application packet also includes a complete Operations and Maintenance Manual from an actual project installation as an exhibit.

**F. INSTALLATION LOCATIONS**

Public and private agencies are specifying the Jensen Deflective Separator SWTUs as a preferred “off-patent” continuous deflective separation treatment process. Public agencies are readily accepting the Jensen Deflective Separator HDS units as an equivalent on existing projects.

The following cities have installed Jensen Deflective Separator units as an embodiment of the continuous deflective separation treatment process in the short time since the expiration of the patent:

- Long Beach, CA
- Santa Monica, CA
- Aliso Viejo, CA
- Irvine, CA
- Huntington Beach, CA
- San Francisco, CA
- Truckee, CA
- Las Vegas, Reno, Sparks and Elko, NV
- City of Los Angeles, CA
- West Hollywood, CA
- Signal Hill, CA
- Agoura Hills, CA
- Scottsdale, AZ
- Oro Valley, AZ
- Sahuarita, AZ
- Nevada Department of Transportation

This ready acceptance of Jensen’s offering is a natural transition that happens with all technologies as they eventually come “off-patent”. Once “off-patent”, public agencies, municipalities and private developers can readily specify the Jensen Deflective Separator units for the benefit of the greater public interest and achieve project stormwater treatment goals by the most efficient and economical means.
Contact Information - Three (3x) Installations

Municipality #1: City of Santa Monica, CA

Contact: Selim Eren, P.E.
Civil Engineer
Civil Engineering Division - City of Santa Monica
1437 4th Street, Suite 300, Santa Monica, CA  90401
O 310-458-2200 ext 5107
selim.eren@smgov.net

Project: Los Amigos Park Stormwater Harvesting and Direct Use Demonstration

JDS Model: 9.0-cfs Full Capture Capacity Inline JDS120-6748

Comments: California Stormwater Quality Association (CASQA), Award winning project. JDS120-6748 unit pre-treated all flows before entrance to Cistern. JDS system readily accepted as equivalent to only other continuous deflective separation system.

Municipality #2: Town of Truckee, CA

Contact: Todd Landry, P.E.
Senior Engineer
Engineering & Public Works
10183 Truckee Airport Road
Truckee, CA 96161
(530) 582-2904
ilandry@townoftruckee.com

Project: West River Street Bike Lane

JDS Model: 2.0-cfs Full Capture Capacity Inline JDS72-3624

Comments: JDS72-3624 unit treats all flows before outfall to Truckee River. JDS system readily accepted as equivalent to only other continuous deflective separation system.
Municipality #3: City of Signal Hill, CA

Contact: Larry Tortuya, PE.
Senior Project Manager
GHD
175 Technology Drive, Suite 200
Irvine, CA 92630
Office: (949) 585-5210
Larry.tortuya@ghd.com

Contact Comment: Larry is the design engineer for the contractor on this design build project. Contact information for final owner at the City of Signal Hill not yet identified.

Project: Los Cerritos Channel Sub-Basin 4 Stormwater Capture Facility

JDS Model: 166-cfs Full Capture Capacity Dual Offline JDS162-132132s

Comments: This is a dual treatment system consisting of two 83-cfs capacity JDS162-132132 SWTUs treating all flows before entering an infiltration system having a final storage capacity of 25-acre-feet. This installation is scheduled for December 2017 and will be the world’s largest continuous deflective separation system. All internal components are manufactured from Stainless Steel. The dual JDS SWT system was the preferred continuous deflective separation system.

Though this is a City of Signal Hill capital improvement project, it is being constructed on the South West corner of the Long Beach Airport, in cooperation with the airport authority and the City of Long Beach.

G. CERTIFICATION

The Stormwater Division of Jensen Precast is pleased to submit this application packet for the Jensen Deflective Separators to be added to the State Water Board’s Certified Full Capture System List, and formally state the following:

“I certify under penalty of law that this application document and all attachments were 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 that manage the system or those persons directly
responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

The Jensen Stormwater Division of Jensen Precast looks forward to the favorable review and approval of this Application for the Jensen Deflective Separator units to be included on the State Water Boards Certified Full Capture System List.

If there are any questions regarding this Full Capture Certification Application, the full scale testing or require more information in order to approve this application, please call me at (775) 352-6336 or email wstein@jensenprecast.com.

Respectfully Submitted,

Walter Stein, P.E.
Division Manager
Jensen Stormwater BMP/LID Systems

Attachments:

CERTIFICATION APPLICATION For the Jensen deflective separator (JDS), a FULL CAPTURE TRASH CONTROL DEVICE
CERTIFICATION APPLICATION

For the

*Jensen deflective separator (JDS)*

a

FULL CAPTURE TRASH CONTROL DEVICE

From:

A Division of Jensen Precast Concrete

Full Capture (FC) Systems  
*Jensen Deflective Separator (JDS)*  
Hydrodynamic Separator (HDS), Stormwater Treatment
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1. PHYSICAL DESCRIPTION OF TECHNOLOGY

Background of Treatment Unit’s Process:

The design of each Jensen deflective separator (JDS) stormwater treatment unit embodies the essential design parameters and aspects of the continuous deflective separation process, which pioneered non-blocking, indirect screening processes for stormwater treatment. The Jensen deflective separator (JDS) stormwater treatment unit clearly falls in the category of a Hydrodynamic Separator (HDS).

The continuous deflective separation process within the JDS unit was refined in Australia in 1992 to remove gross solids and other pollutants from stormwater runoff, though initially intended as a treatment unit for combined sewer overflows (CSOs). The continuous deflective separation process of separating solids from liquids has also been successfully applied to water supply, wastewater and industrial fluid treatment.

The continuous deflective separation treatment process was introduced in the United States in 1996 to treat both stormwater and CSOs. Since 1996, it has gained nation wide acceptance, primarily in stormwater treatment. The continuous deflective separation is a proven treatment process that has gone through in-depth third party field performance evaluations and laboratory tests. This treatment process has verified performance capacities to capture gross solids typically defined in a general manner as trash and debris, (including floatables, neutrally buoyant, and negatively buoyant debris), under very high flow rate conditions. This treatment process also has quantified capacities to remove and capture total suspended solids (TSS), sediments, oils and greases.

General Overview of a JDS “Inline” Stormwater Treatment Unit

The Jensen deflective separator (JDS) is a Full Capture Trash Control Device for stormwater treatment. It is a non-blocking, screening, swirling, concentrating treatment process for small as well as very large stormwater flows.

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1 No Affiliation to CDS® as provided by Contech Engineered Solutions or its CDS® mark
JDS units consist of a separation chamber and sump, typically deployed in precast manhole structures. The separation chamber has a specially designed inlet that introduces flow into a floatable control cylinder, which is configured on top of a stainless steel screening cylinder.

Inline JDS units placed within the alignment of the storm drain or channel have internal inlets and bypasses weirs within the separation chamber. Offline units are placed immediately adjacent to the storm drain or channel alignment. These offline units have a separate diversion structure with a diversion weir to divert water quality treatment flows and bypass larger conveyance flows. 

Jensen deflective separator units are designed to treat all flows up to their treatment flow capacity, and bypass larger flows.

The Jensen deflective separator has no moving parts. It is designed in accordance with the continuous deflective separation treatment process of balanced hydraulics to create the following multiple treatment processes in a very tight footprint: swirl concentration, vortex and toroidal flow paths, screening and sedimentation.
The treatment process of the _JDS_ is unique in its ability to screen any gross solid trash or debris material that is 5-millimeter (mm) or larger from the stormwater without its screen blocking. This treatment process readily satisfies the requirements of a “*Full Capture*” trash and debris device. The entire treatment flow must pass through its screening cylinder. The unit’s design also captures Total Suspended Solids (TSS) and other water quality pollutants of concern such as oil and grease.

Floatables pollutants are always captured within the floatable control cylinder. Floatables have a specific gravity (SG) less than 1.0. Styrofoam is a commonly captured floatable in the _JDS_ Unit.

Pollutants like tree leaves and paper products often stay afloat within the cylinder formed by both the floatable control cylinder and the screen cylinder for a period of time before settling as they become water logged. Leaves and paper products also attach themselves to denser sediment. Oil, grease, leaves and paper products may settle in the sump if they have a SG > 1.

Aqueous floatables such as such as oils and greases (O&G) are also captured in the unit’s floatable control cylinder, which also has an integral baffle skirt extending below the inlet invert. O&G typically adhere to floatables and other solids, which are captured in the _JDS_ unit.

Both coarse and finer sediments that are swirl concentrated as well as deflected by the screen will settle in the sump as they move toward the stagnant center region, which is the quiescent zone of the swirl chamber within the _JDS_ unit. The positive, continuous, deflective screening process within the unit captures particles smaller than the screen aperture, which have a wide range of SGs.

Nutrients that are transported as an attachment to sediments and other solids captured in the _JDS_ unit are among the pollutants removed from stormwater flows.

**The Unique Continuous Deflective Treatment Flow Process**

The multiple treatment processes occur in a _JDS_ unit in a balanced hydraulic condition. Stormwater flows are diverted into the separation chamber as a jet. This entrance jet forms across the internal face of a stainless steel screen cylinder located immediately beneath the invert of the jet’s entrance. The design relies upon the development of balanced hydraulics of the inlet flow versus the rotational flow across the face of the screen cylinder. The design ratios to produce balanced hydraulics within the _JDS_ for a large range of treatment flows incorporates the screen functionality design parameter which plays an important role in the unit’s sustained operation. This balance of hydraulics enables the swirl concentrating flow path to enact a continuous, deflective screening process that also acts as a non-blocking screening process with no moving parts. Flows across the inside of the stainless steel screen cylinder’s surface eliminate screen clogging.
The stainless steel cylindrical screen of the JDS units has punched openings oriented to present the “Blind Side” of the screen to the incoming circular flow. This presentation of the “Blind side” of the screen to the rotational flow within the screening cylinder creates a non-blocking positive screening system. The rotational flow across the screen face ensures that debris does not pin itself to the screen face.

This exposed “blind” surface causes the pollutants in the high velocity region near the screen surface to be deflect and move towards the center of the cylinder. At the center of the screen cylinder the flow is mostly stagnant. It is a quiet region and has small velocities in relation to the rotational flow at the screen face.
Figure 4. Bottom Up View of Separation Chamber, Showing an HDPE Inlet Riser on Top of a Stainless Steel Screen Cylinder of an Inline JDS60-2424 Unit.

**Inline, Drop Inlet and Offline JDS Configurations**

*Jensen deflective separator* units are able to be deployed either in the pipeline alignment for “Inline” configurations, receive water from a grated “Drop Inlet,” as well as adjacent to storm drain pipelines in an “Offline” configuration.

For “Inline” and “Drop Inlet” *JDS* units, both the Treatment Flow processed through the units screening cylinder and the larger conveyance flow of the storm drain pipeline, which is typically generated form a storm event having a 10-year return frequency or larger, enter the inlet forebay of the unit, which is typically deployed within a precast manhole. The inlet of this unit has an internal bypass weir, channeling the Treatment Flow into the swirl concentrating treatment chamber of the unit. The weir of this inlet also enables the larger conveyance flow of the storm drain pipeline to bypass the swirl concentrating treatment chamber of the unit.

In its offline configuration, the Treatment Flow is diverted into the *JDS* from a diversion vault or manhole containing a weir within the pipeline alignment. This diversion vault or manhole is a completely separate structure from the *JDS* unit. The Treatment Flow is returned to the pipeline downstream of the diversion structure. Storm drain conveyance flows greater than the “Offline” *JDS*’s Treatment Flow bypass the *JDS* unit and flow over the diversion weir. Flows larger than
the Treatment Flow never enter the JDS unit. Hydraulic conditions both upstream and downstream should be determined through a simple hydraulic analysis in sizing the diversion weir.

1. **Inline:** This configuration of *Jensen deflective separator* is installed within the alignment of the storm drain pipeline of small to mid-size catchment areas. These units have internal bypass weirs to convey large flows around the treatment process. These units may also accommodate multiple inlet pipes as well as flow from grated Drop Inlets.

![Figure 5. View of Inlet Forebay of an Inline JDS Unit, Typically High Density Polyethylene (HDPE) or Fiberglass](image)

*Figure 5. View of Inlet Forebay of an Inline JDS Unit, Typically High Density Polyethylene (HDPE) or Fiberglass*
Figure 6. High Stress, High Flow Resistant Metal Inlets: Non Corrosive Stainless Steel or Marine Grade Aluminum

2. **Drop-Inlet**: These units have a grated inlet to receive inflow directly from the surface and can also simultaneously receive flows from lateral storm drains. Like the “Inline” units, these “Drop-Inlet” units are installed within the alignment of the storm drain pipeline of small to mid-size catchment areas. These units have internal bypass weirs to convey large flows around the treatment process. These function as catch basins or storm drain inlets, but also provide treatment.
Treatment Flow Process Description

1. Stormwater enters the JDS unit from one or more inlet pipes, or a grated drop or curb inlet.
2. Incoming waters collect in the forebay of the inlet trough.
3. Waters enter the separation and screening cylinder through the volute entrance in the diversion weir wall.
4. Water entering the separation cylinder forms a spinning vortex, capturing all floatables and swirl concentrating suspended solids to the center of the separation chamber.
5. The vortex flow pattern produces a washing force across the screen face, preventing it from becoming blocked, while allowing stormwater to pass through the screen and beneath the oil baffle.
6. Oils, greases and other Total Petroleum Hydrocarbons (TPHs) are trapped within the integral oil baffle attached beneath the inlet bay. Screened stormwater moves toward the outlet pipe.
7. Settled and swirl concentrated suspended solids are captured in the sump, which is typically cleaned out by a vacuum truck.
8. Flows larger than the JDS unit’s design water quality treatment flow bypass over the diversion weir. Bypass flows do not scour out previously captured pollutants.

Figure 7. Inline JDS Cut Away Illustration & Treatment Flow Path.
2. **Offline**: “Offline” units are placed immediately adjacent to the storm drain/channel alignment and always have a separate diversion structure with a diversion weir. The diversion structure design can accommodate multiple inlet pipes if needed.

Exhibit A presents tables of the more standard size precast “Inline” and “Offline” JDS units.

**A. Design Drawings for Standard Devices and Alternative Configurations**

Precast JDS units are deployed in manhole structures having internal diameters ranging from 3 to 16-feet (ft). These JDS unit screen stormwater flows from 0.7 cubic feet per second (cfs) to 80-cfs through their screening treatment flow path and bypass larger flows.
Exhibit A of this Certification Application provides a design sizing table of JDS units configured to receive stormwater flows in an “Inline” configuration. The units listed in Exhibit A are also compatible with a “Drop Inlet” configuration. Drawings of each of the twenty-eight (28x) typical JDS units listed in the table are also included in Exhibit A.

Exhibit B provides a design sizing table of “Offline” JDS units to be placed adjacent to the pipeline alignment in an “Offline” configuration. Drawings of each of the thirty-one (31x) typical “Offline” JDS units listed in the table are also included in Exhibit B.

Exhibit C provides example plan and profile drawings for dual JDS system installation, with a JDS unit on both sides of a flow splitting diversion structure. All of the JDS units listed in Exhibits A and B can be configured in a dual system layout to double treatment flow capacities.

**B. Trapping Process for All 5-mm and Greater Particles and Scaling of JDS Units for Varying Flows**

**5-mm Trapping, Screening Process:**

All stormwater flows up to a specific JDS unit’s treatment flow rate must pass through its screening cylinder. All JDS units are equipped with a stainless steel screen cylinder having standard openings of either 2.4-millimeter (mm) (= 2,400-micron (µm) = 0.094-inches (in)), which is essentially 3/32-in, or a 4.7-mm (= 4,700-µm = 0.185-in), which is two (2) thousands of an inch less than 3/16-in. Again, particulates that are greater than or equal to (≥) 5-mm (= 0.196-in ≈ 25/128-in) cannot pass through the unit.

All solids ≥ 5-mm captured in the sump, screen cylinder or in the floatable control cylinder are retained in the unit. Under bypass conditions, these previously captured solids in the sump, screen cylinder and floatable control cylinder are physically separated from bypass flows and cannot wash out or be “Burped” from the unit. Again, the JDS unit retains all previously captured solids ≥ 5-mm.

**Scaling of JDS Units**

The model JDS60-2418 used in the Full Capture Laboratory tests, presented in Section 5 of this Certification Application, is a full-scale JDS unit having the smallest available treatment capacity of 0.7-cfs. All other larger capacity JDS models can be sized for the same 98% plus solids removal efficiency by sizing the diversion weir height to ensure treatment flows are driven through their screening cylinder. Hydraulic scale model laws such as Peclet Law are also properly applied to the recreate the balanced hydraulics of the continuous deflective separation process.

Scaling of the balanced hydraulics within the JDS unit can also be used for distorted JDS models with different aspect ratios of their screen diameters and heights.
A list including references of both literature and performance studies on the continuous deflective separation process is provided in Exhibit I. These literature and performance studies readily substantiate the scalability for the continuous deflective separation process.

Each JDS unit is designed to treat all flows less than or equal to ($\leq$) the design flow rate listed in the sizing tables in Exhibits A and B. As the JDS units become larger, the diversion weir height, screen height, screen diameter and sump capacity all increase. These dimensional variations allow the family of commercially available JDS units to treat a broad range of flow rates.

C. Maximum Trash Capture Capacity

Typical Sump Storage Capacities as well as ultimate Maximum Trash Capture Capacity volumes are listed for “Inline” JDS Units in the Table of JDS Inline units on page one of Exhibit A. These values are also provided for “Offline” units in the Table of JDS Offline units on the first page of Exhibit B.

Operation and Maintenance (O&M) Information is detailed in Section 3 and a Project Example Operations and Maintenance Manual is included in Exhibit F of this Certification Application. If these recommended O&M guidelines are not performed and the sumps are not cleaned when they are full, trash will rise above the sump up into the screening cylinder of the JDS unit. When this happens, the amount of trash captured in a JDS unit can achieve an ultimate Maximum Trash Capture volume greater than the sump storage capacity listed in the tables of “Inline” and “Offline” units on the first pages of Exhibits A and B. This ultimate Trash Capture volume ranges from 28 cubic feet ($ft^3$), to 1,715- $ft^3$ for precast manholes having internal diameters ranging from 4 to 16-ft.

In the event that proper operation and maintenance are not performed, JDS units have a Maximum Trash Capture Capacity volume that is greater than the sump storage volume. Trash, debris and other settable solids will first fill up the sump and then start to fill up in the screening cylinder of the unit. The captured trash and solids will rise to block the inlet into the floatable control cylinder, which is above the screen cylinder. In this ultimate Maximum Trash Capture condition, both the sump and the entire screen cylinder above the sump are completely full. All flows will bypass the JDS treatment process unit until its cleaned out. The JDS unit is a buried trash can under this ultimate Maximum Trash Capture condition. Again, ultimate storage volumes for this Maximum Trash Capture condition range 28-$ft^3$ to 1,715-$ft^3$ for precast manholes having internal diameters from 4 to 16-ft.

D. Hydraulic Capacity at Maximum Trash Capture Capacity

When filled to the Maximum Trash Capture Capacity, the design of JDS units allows all flows in the storm drain pipeline to flow over the water quality diversion weir whether in the “Inline” or
“Offline” configurations. There is no detrimental impact to the design conveyance capacity of the storm drain pipeline under these conditions.

As explained in subsection C, in the event that proper operation and maintenance is not performed, it is possible for the sump and screen cylinder of the JDS units to completely fill up with trash and solids. Eventually these solids will block the inlet to the screening cylinder and swirl concentration treatment chamber and filling the unit up to its ultimate Maximum Trash Capture Capacity. In this condition, all flows into the JDS unit will top the diversion weir in both the “Inline” and “Offline” configurations. Additionally, very little flow will pass through the treatment path of a JDS unit under these conditions.

**E. Trash Re-introduction**

The design of the JDS treatment unit eliminates the potential to “Burp” and/or release any previously captured trash even when not properly maintained. Physical separation of the treatment and separation flow path from the bypass flow path make this retention possible.

Bypass flows that exceed the runoff rate from the 1-hour duration, 1-year return frequency storm event for a given site are physically separated from the JDS treatment flow path and will not re-introduce or “Burp” any of the trash or solids previously captured in its sump, screening cylinder and swirl separation chamber under any flow conditions.

Figures 1 & 7 demonstrate a caveat for this trash retention performance claim. The crest height of the floatable control cylinder should have a minimum of 6-inches of freeboard above the hydraulic gradeline (HGL) of the peak design conveyance capacity of the storm drain pipeline. If there is not head space for this freeboard due to shallow installation conditions, then the floatable control cylinder is pinned to the ceiling of the unit’s precast top slab, eliminating any potential for re-introduction, or “Burping”, of any previously captured solids from the treatment section of the unit.

The 98% plus retention of captured solids is a unique, test proven performance claim of the JDS unit. The designs of many of the previously approved Full Capture device store the trash and floatables in the treatment and bypass flow paths. These units do not have screens on their bypass flows. So, at a minimum, bypass flows through units designed like this “Burp” the previously captured floatables.

**F. Materials Used to Construct the JDS**

The manufacture of the JDS treatment system can be broken down into Precast Concrete deployment structures, and internal components.
PRECAST CONCRETE:

The precast manholes used for JDS installations are produced at Jensen Precast following standards set forth by the National Precast Concrete Association (NPCA) and the American Society for Testing and Materials, specifically ASTM C478. All Jensen precasting facilities are certified by the NPCA.

If the JDS unit is deployed in a vault, the precast concrete vault will be designed and manufactured in accordance with ASTM C655, C789, C850, C857 and C858. These precast manholes and vaults are designed with an intended operational life of 100-years.

INTERNAL COMPONENTS:

INLETS: Presently, Jensen manufactures the inlet of the JDS system from either: HDPE plastic, inert fiberglass, marine grade aluminum, or ASTM 304 or 316 stainless steel. The inlet material is chosen based on what is best suited for the job at hand.

1. Stainless Steel (SS): SS is the premier material for the inlet. SS grade ASTM 304 is the typical material selected for most all applications in California. If the JDS unit application may be in near a shore subject to salt water or snow runoff containing salt (Sodium Chloride, NaCl), then the more corrosive resistant SS grade ASTM 316 would be suggested.

2. Aluminum (Al): Marine grade Al meeting ASTM 5052 or better such as 6061 or 6063 is used for manufacturing of the inlets. This material represents Jensen’s preferred material for high flow, stress resistant installations. Aluminum inlets with their integral weirs resist the force momentum (F=mv^2) loading from larger flow rates. Aluminum inlets also enable the Inline units to bypass flows twenty (20x) to thirty (30x) times their Full Capture treatment flow rate.

3. HDPE: High Density Polyethylene (HDPE), per ASTM D3261 is frequently used to make the inlets. This is wonderful, inert material that is completely resistant to corrosion. It has more strength than fiberglass and can be reinforced with Al or SS

4. Fiberglass: When Jensen chooses to manufacture the inlet from fiberglass reinforced plastic (FRP), it is manufactured per the National Bureau of Standards PS-15. This fiberglass is laid up using a minimum of 3-ounce (oz) chop mat, 24-oz bi-directional woven fabric per MIL-C-19663 and general-purpose polyester resin per MIL-M-43248. Final structural thickness is typically 3/8-in thick with panels and cylinder walls at 3/16-in.

Fiberglass Material Note: Existing providers of the continuous deflective separation process have been manufacturing these inlets from fiberglass for more than 17-years. It is now clear that that SS, Al & HDPE are better material alternatives for longer life. Over time, the fiberglass inlets will have a tendency to delaminate due to normal wear and tear.
while also being continually submerged. The design life of the fiberglass is guesstimated at 20 to 35-years. For this reason, Jensen Precast recommends the use of HDPE, Aluminum or Stainless Steel rather than the fiberglass used by the other company presently providing the continuous deflective separation system for treatment of stormwater flows in California.

**SCREEN CYLINDERS:** The screen and the structural cage encasing the screen is always manufactured out of ASTM 316 stainless steel. This ensures a durable, long lasting screen that will not readily succumb to even the most aggressive salt-water installation conditions.

**CONNECTION HARDWARE:** All connection hardware and wedge anchor bolts are manufactured from ASTM 316 SS.

### G. JDS Design Life

The precast structure in which the JDS units are deployed have a design infrastructure life of 100-years. The internals components excluding the fiberglass inlets can be expected to last between 50 to 100-years.

### H. Plans/Diagrams for Typical Installation

Exhibits A & B provide plan and profile drawings for the installation of “Inline” and “Offline” JDS units treating flows from 0.7 to 80-cfs.

Example installation plan and profile drawings of Dual Offline JDS systems are also included in Exhibit C. Dual JDS units on both sides of a diversion structure double the treatment capacity of a given installation.
I. Pre/Post Installation Photographs

Figure 9. Assembly of SS Screen to HDPE Inlet for 1.1-cfs Capacity Inline JDS60-2424.
Figure 10. In Yard Assembly of Separation Chamber with Aluminum Inlet and SS Screen Cylinder for 2.0-cfs Capacity JDS72-3624 unit in 72-in ID Manhole.
Figure 11. Completed Separation Chamber Installed with a HDPE Inlet and SS Screen Cylinder, 1.1-cfs Capacity JDS60-2424. Ready for Project Delivery. Handling Consistent with a Typical Manhole.
Figure 12. Separation Chamber of 1.1-cfs Capacity **JDS60-2424** Unit Set in the Field on Top of Sump. The **JDS60-2424** is Handled and Installed as Typical 60-in ID Precast Manhole Riser Piece.
The majority of JDS units are delivered to the project site with the inlets and separation chambers pre-installed in their Separation Chambers. The separation chamber is then handled on site as a typical manhole section or riser barrel. Larger capacity JDS units ’s often require that the inlet and screen cylinder be installed in the field after the precast sump and separation chamber structure have been set. Some underground contractors are practiced and competent installing these internals per instructions provided by Jensen, alternatively Jensen can send out a field crew of experienced installers. It typically takes a half a day for the Jensen field crew to install internals within these larger precast structures.
J. Internal Bypass

Jensen Precast offers both “Inline” and “Offline” JDS units. In the case of an “offline” unit, flows greater than the Full Capture design flow simply pass over the weir in the separate diversion structure and continue to flow down the storm drain pipeline.

Inline JDS units are equipped with two (2x) internal bypass weirs. Inline JDS unit have bypass weirs, which are often called diversion weirs, on both sides of the floatable control cylinder. During high bypass flow conditions, the level of the water will rise above the inlet into the floatable control cylinder and swirl concentrating separation chamber while simultaneously rising above the crest of the two (2x) bypass weirs. The water surface level inside the floatable control cylinder
will be just a bit less than the water level spilling over the bypass weirs, but higher than the water surface level downstream of the bypass weirs. The inlet will be submerged and there will be a pressure differential between these water surfaces. Under this condition, previously captured floatables and solids within the swirl chamber will not flow upstream and out of the inlet. The energy does not exist to create this upstream flow condition.

It is important to acknowledge that the bypass flow path is physically separate from the treatment flow path. Therefore, the bypass flow does not flow through the solids storage zones of the JDS unit.

If properly maintained, flow will also go into the JDS inlet and receive treatment through the unit. This treated flow will join with the bypass flow downstream of the bypass weirs.

It should be understood that floatables will not be captured by the JDS unit in bypass conditions.

This the bypass flow condition and the internal bypass weirs can be seen in Figure 15 below, as well as Figures: 1, 5, 6 & 7.

![Figure 15. View the 2x Internal Bypass Weirs on Both Sides of Floatable Control Cylinder on a 1.1-cfs Capacity “Inline” JDS60-2424 Unit. HDPE Inlet.](image)

Jensen recommends Aluminum or Stainless Steel inlets that can accommodate stresses of bypass flows twenty (20x) to thirty (30x) times the Full Capture treatment flow rate.
2. INSTALLATION INFORMATION

**Inline Units**

Exhibit D contains instructions for installing the internal components of “Inline” JDS units in either the Jensen precast yard or in the field at the project site.

The actual manhole structure of the JDS unit is something that 100 percent of underground contractors are familiar with and competent at installing. The one significant issue that differs from a standard storm manhole installation is that JDS unit’s separation chamber and sump extend below the storm drain pipeline’s invert.

The contractor must confirm the storm drain pipeline’s invert elevation and then determine the subgrade elevation of the exterior bottom of the JDS unit. Exhibit A demonstrates the required depth below pipe invert on the plan and profile drawings for each JDS unit. These drawings are provided to design engineers in AutoCAD format so that these elevations can be clearly called out on the plans.

**Offline Units**

The installation of “Offline” JDS units requires the installation of the diversion structure. The JDS unit is installed essentially as if it were an “Inline” JDS unit. The entrance and exit pipes or conduits from the JDS unit are connected to the diversion structure. The diversion structure is installed within the storm drain pipeline’s alignment as a typical precast or cast in place or drainage structure.

A set of typical specifications for a 2.0-cfs capacity “Inline” Model JDS72-3624 is included in Exhibit E as an example of specifications that are provided by design engineers for all JDS units. These specifications cover:

- SWTU’s Scope of Application
- Performance
- Sizing Criteria
- Requirements for Approval of Alternatives
- Hydraulic Capacity
- Solids and Oil Storage Capacities
- Manufacturing Materials
- Manufacturer
- Installation
- Submittals Requirements
3. OPERATION AND MAINTENANCE INFORMATION

A complete Operations and Maintenance, (O&M), Manual completed for a past project is provided in Exhibit F. A complete O&M Manual is provided with every JDS that is installed as part of the construction submittal process. This O&M manual reiterates the following information for proper maintenance of a JDS unit.

A. Inspection Procedures and Frequency Considerations

The frequency of routine maintenance and cleanouts will be dependent upon the rate of accumulation of trash, sediment, oil and other debris. The accumulation rate will vary based on the land use in the drainage or catchment area. Due to the variability of solids coming off the catchment areas, cleanout and maintenance timelines should be determined based on operating experience for each installation.

Periodic inspections should be performed to determine the rate of solids accumulation in the sump as well as the thickness of the floatables raft retained on top of the swirl chamber. From these inspections, a cleanout frequency can be established to keep pace with the accumulation of solids in a specific unit.

Inspect newly installed units after each runoff event for the initial month or two of the wet season following installation. This inspection should include a check of the inlet area and the screen surface for any obstructions. Additionally, a measurement of accumulated floatable debris at the top of the unit and of solids in the sump should be made using a “dip stick”. During these inspections, the level of oil and grease captured should also be noted to determine a cleanout frequency for the oil baffle.

After the first several months of operation, the appropriate inspection schedule for a rainy season is more definitively developed. In short, the unit should be cleaned at least once a year, immediately prior to the start of the wet season, and inspected at end of the wet season.

During the season ending cleanout and inspection, a thorough assessment of the unit’s internal components should be conducted. This inspection looks for signs of damage within the separation chamber and oil baffle. Any loose components should be fastened and a thorough pressure washing of the screen should be performed.

B. Maintenance Procedures

A vacuum (vactor), truck is the recommended means of cleaning out a JDS unit. This allows the JDS unit to be cleaned safely and quickly from the ground surface. Using a vactor truck, most smaller JDS units can be cleaned in 30 to 40 minutes. Confined space operations must be employed if maintenance personal ever enter the unit.
Disposal of the solids and decant liquid removed from the JDS should be in accordance with the local municipality's requirements. Often decant liquid is simply conveyed to the publicly operated wastewater treatment plant and solids are disposed of in a landfill.

C. Maintenance Frequency Considerations

It is recommended that the JDS sump is cleaned of solids when the sump capacity is filled up to between 50% and 75%. Although cleanout at this stage is recommended, the unit’s performance will not be hindered if the solids accumulation exceeds 75% or even reaches 100% of the sump capacity, right up to the bottom of the SS screen cylinder.

Cleanout of oils and grease captured by the JDS’s standard oil baffle will also need to be conducted. In situations where the unit captures oil and grease greater than 15 mg/L (PPM) in concentration, sorbents can be used to assist the cleanout process.

End of season cleanouts are recommended even if the solids in the sump is not more than 50% full. There is a potential for odor generation from the decomposition of captured material if this end of season cleanout is not performed. This cleanout also prevents the JDS from discharging poor quality water during periods of infrequent runoff events.

D. Device Maintenance Accessibility & Vector Control

Access

The access to clean and perform maintenance on a JDS is typically achieved through cast-iron manhole frames and covers (F&Cs) ranging in diameters from 24 to 42-inches. These manhole F&Cs allow access to the separation chamber, where the inlet and screen are located. They also provide access to the sump. Larger JDS units are designed with multiple F&Cs to increase the ease of access for maintenance to annular space outside the screening, swirl concentrating separation chamber.

The access to JDS units is definitely a design variable. Jensen readily provides different access diameters and locations to JDS units than those shown on the plan and profile drawings in Exhibits A & B. One of the design tenets is to increase the ease of access to the JDS, so that the units can be readily maintained.

Jensen MetalTech can provide most any hatch access alternative to the JDS. Traffic and pedestrian loading rated hatches are also readily available.
Vector Control

One primary method Jensen uses for controlling mosquitos from breeding in the JDS unit, is to physically deny access to enter or egress from the JDS unit. This denial of access falls under the abatement category of Habitat Reduction.

**Physical Option 1 – No “Through” pick holes:** Covers with Jensen recommends the use cast iron F&Cs because these materials allow for pick points that do not completely penetrate the cast iron cover. However, such pick points tend to be shallow and sometimes difficult for maintenance personnel to securely fix their opening tool into for a firm, safe connection. Covers with pick holes
that penetrate all the way through the material are easier to insert a variety of lifting tools into, and are therefore easier to remove. Unfortunately, these holes allow mosquitoes into the *JDS* unit.

**Physical Option 2 – HDPE Inserts:** When the cover does have pick holes that completely penetrate, mosquitoes can be prevented from entering and exiting the *JDS* unit by sealing the space immediately beneath the cover with a readily available HDPE insert. These HDPE inserts are typically used to prevent or reduce inflow and infiltration, see Figures 18 and 19.

![HDPE Insert](image)

**Figure 18.** HDPE Insert that Fits Immediately below Cast Iron Cover.

![HDPE Insert Diagram](image)

**Figure 19.** HDPE Insert Placed in the Frame of the Cast Iron Cover.

The HDPE insert is a practical and durable means of sealing the *JDS* from mosquitoes.
**Physical Option 3 – Netting:** Netting can also be used to prevent mosquitoes from accessing the **JDS** unit through openings in the manhole:

![Mosquito Netting Diagram]

*Figure 20. Mosquito Netting System for Vector Control.*

Feedback from maintenance personnel conclude that the netting alternative for preventing mosquito access rapidly wears out, tears or the Velcro delaminates form the walls of the manway.

**Physical Control to Diversion Vault for Offline Configurations:** One of these three (3x) means of physically controlling the access into the **JDS** Unit shall be used for each installation. When the **JDS** unit is installed in an Offline configuration, the manhole access of the associated diversion vault will also include one to these three physical access control design options. The selection of the physical access control whether a cover with no “Through” pick holes, an HDPE Insert or Netting is at the discretion of the design engineer and most often is per the preferences of the long-term maintainers. Again, the covers with no “Through” pick holes and the HDPE inserts are the most effective long-term means of preventing mosquito access to the **JDS** unit and diversion vault if installed in the offline configuration.

**Other Access Hatch Options:** As stated above in this “**Access**” section, Jensen MetalTech can provide most any hatch access alternative to the **JDS**. These traffic and pedestrian loading rated access hatches shall be equipped with gaskets as necessary to eliminate the physical access of mosquitoes.

Jensen also recommends the use of Mosquito Dunks that have Bacillus thuringiensis israelensis (Bti) as their active ingredient. Bti is preferred for mosquito control, because of its low toxicity to non-target species. It is a naturally occurring soil bacterium that effectively kills mosquito larvae.
present in water. Mosquitos have no documented resistance to Bti as a larvicide. Mosquito dunks or briquettes containing have a sustained-release capacity of larvicide that conveniently floats. The following application dosages and frequencies are recommended to control mosquitos:

1. **SOLID Bti LARVICIDE**: ½ to 1 briquette (typically treats 50-100 sq. ft.) one time per month (30-days) or as directed by manufacturer.

2. **SOLID METHOPRENE LARVICIDE** (not recommended for some locations): ½ to 1 briquette (typically treats 50-100 sq. ft.) one time per month (30-days) to once every 4-½ to 5-months (150-days) or as directed by manufacturer.

The design of the diversion vaults does not have a standing water pool in any part of the diversion vault, so the “Mosquito Dunks” mitigation measure will not of any utility and is not included in the list of control measures to be applied to the diversion vault’s manhole access. “Mosquito Dunks” are only recommended for use in the JDS Units.

Jensen will incorporate in the design of each JDS unit a perforated ABS or PVC tube that shall be located in the annular space of the unit, downstream of the oil baffle skirt in each JDS unit. This perforated tube will retain “Mosquito Dunks” and will be located immediately beneath or immediately adjacent to the access F&Cs. This will allow for the double application of the “Mosquito Dunks” to both the water surface area inside floatable control cylinder as well as to the water surface immediately downstream of the oil baffle, so that all open water surfaces in any JDS unit will be assured to be in direct contact with a “Mosquito Dunks”.

This perforated tube will ensure that “Mosquito Dunks” are not washed out of this annular space, downstream of the oil baffle during any wet or dry weather flows. This is an additional mosquito mitigation enhancement feature that shall be apply to all JDS units. This is a conservative design measure, but it does represent an additional measure to ensure the control mosquitos in a JDS unit.

Finally, following a brief discussion with Mark Hall, Urban Water Program Manager of the Greater Los Angeles County Vector Control District, at the CASQA Conference in Sacramento in September 2017, Jensen has initiated preliminary designs of possible flow flexible screening systems. The design goal of these flexible screening systems would be that they could be fastened to both the inlet and outlet pipes resulting in the reduction or elimination of mosquitos from flying down the storm drain pipelines and into the JDS units.

## 4. RELIABILITY INFORMATION

### A. Device Sensitivity

The non-blocking, screening action of the continuous deflective separation process is developed through balanced hydraulic conditions inside the screening, swirl concentrating cylinder. This
balanced condition in itself is not overly sensitive and the functionality of this non-blocking, screening process is developed in the JDS unit throughout the entire range of flows for a given JDS unit. The standard tenet in the design of balanced hydraulics for each unit includes at least a 40% functional factor to ensure the development of these hydraulics conditions.

As mentioned earlier in Section 1.B, Scaling of JDS Unit, larger units subjected to frequent low flows that area a very low percentage of their peak treatment capacity may not develop the balanced hydraulic conditions for a non-blocking screen. Under these conditions, the rotational washing velocity on the screen is not developed and previously neutrally buoyant material has the opportunity to become pinned on the screen face. This is a rare event, and typically the unit self corrects on the next storm event.

Additionally, out of the thousands of installed units embodying the continuous deflective separation system, the few failures of the non-blocking, screening portion of the treatment process have to do with significant tailwater conditions. The continuous deflective separation process can operate in significant tailwater conditions, but the inlet of the unit must be modified in the design phase to best address the tailwater conditions. Jensen can modify the inlet of an installed JDS unit if later it is determined that tailwater conditions are negatively influencing the functionality of the unit.

Overall, the continuous deflective separation treatment process, through more than 10,000 installations, has shown itself to a very robust treatment process well suited for application to storm drainage systems.

B. Warranty & Certification Information

Warranty:

Jensen Precast provides a standard warranty for all of the Jensen deflective separator hydrodynamic stormwater treatment units against all manufacturers’ defects for a period of one year (12-months) from the date of the of the final project acceptance. Within this warranty, Jensen states that it will, upon its determination, repair, correct or replace any noted manufacturer originated defects advised to Jensen Precast in writing during the warranty period. This warranty also states that it is sole and exclusive, and that no implied-by-law warranties, including those of “merchantability and fitness for a particular purpose”, apply.

This is typical warranty language provided by Jensen for each JDS unit. For any given project, the duration and scope of the warranty can be modified per the request of the customer or owner.
C. Applicant’s Customer Support

PLANNING and ENGINEERING:

Consulting and Municipal Design engineers can size a \textit{JDS} unit and download both pdf and AutoCAD files of a given \textit{JDS} unit from the Jensen website.

Exhibits A, B, and C provide site-specific designs for all \textit{JDS} units.

Jensen engineers provide energy and hydraulic gradeline, (EGL & HGL), calculations to design engineers for both the peak Full Capture flow, from the 1-hour duration, 1-year return frequency storm event, as well as the larger 5 or 10-yr conveyance flow of the storm drainage pipeline. Engineering budget/value estimates for purchase and installation are also provided by Jensen to consulting and municipal design engineers along with bid specifications. Exhibit E provides example specifications.

Exhibit F provides a site-specific O&M manual for each installation.

FIELD INSTALLATION:

Exhibit D provides guidelines for field installations.

Jensen delivery trucks have a crane capable of setting the smaller 60 and 48-in diameter \textit{JDS} units, as well as the 72-in ID units, if the truck can get close to the installation hole. The contractor must coordinate an onsite crane for setting larger diameter \textit{JDS} units. For these larger units, Jensen regularly sends out a field crew of 2 to 3-men to set the internal screening cylinder and inlet.

5. LABORATORY TESTING INFORMATION AND ANALYSIS

A Full Capture experiment was conducted on a 0.7-cfs (315-gpm), Full Capture capacity, full-scale model, \textit{JDS60-2418} unit on May 25\textsuperscript{th} and 26\textsuperscript{th}, 2017 at the Jensen Precast Stormwater Testing Facility. Exhibit G has the complete report entitled “Laboratory Testing for the \textit{Jensen Deflective Separator}, a Full Capture Trash Control Device”.

This Full Capture test consisted of six (6x) flow tests quantifying the removal and retention efficiency (RE\%) equaling 98\% for particles \textgreater_equal{5-mm}. These 6x tests included three capture efficiency tests at 50\%, 75\% and 100\% of the 0.7-cfs (315-gpm) full capture treatment capacity of the \textit{JDS} unit. The solids in the influent water were added at a controlled rate. The remaining three tests were scour, or “Burping”, tests at 125\%, 150\% and 200\% of the \textit{JDS} unit’s treatment flow rate. These burping tests quantify retention efficiency of the solids previously captured in the first three removal efficiency tests.
Engineered plastic spheres we used to simulate gross pollutants particles ≥5-mm in these tests. These engineered plastic spheres had differing specific gravities (SG) ranging from 0.9 to 2.1. Although the spheres had different SGs, they all had the same diameter of (3/16”) 4.76 mm, which is less than the 5-mm particle size criteria for Full Capture. The resulting 98% performance claim for removal and retention are based on these 4.76-mm size spheres that are < 5-mm. So, this 98% capture and retention performance claim is conservative.

These gross solids tests are first generation certification test procedures and protocols done on a standard not previously applied to determine capture and retention efficiencies of Full Capture devices. These tests are uniquely innovative and more importantly, repeatable and scalable.
EXHIBIT A: INLINE JDS UNITS- STANDARD SIZES
EXHIBIT B: OFFLINE JDS UNITS- STANDARD SIZES
EXHIBIT C: EXAMPLE OF DUAL OFFLINE JDS UNITS
EXHIBIT D: INSTALLATION GUIDE/ INTERNAL COMPONENT ASSEMBLY
EXHIBIT E: EXAMPLE SPECIFICATIONS- JDS72-3624
EXHIBIT F: OPERATIONS AND MAINTENANCE MANUAL EXAMPLE
EXHIBIT G: LABORATORY TESTING
EXHIBIT H: JDS BROCHURE
EXHIBIT I: STUDIES AND EVALUATIONS OF THE PUBLIC DOMAIN CDS PROCESS
EXHIBIT A

Table of Inline JDS Units Standard Sizes
## INLINE UNITS

**JENSEN DEFLECTIVE SEPARATOR (JDS)**

<table>
<thead>
<tr>
<th>Precast Model Designation</th>
<th>Treatment Flow Rate (Nominal)</th>
<th>Approximate Treated Catchment Area</th>
<th>Manhole Internal Diameter</th>
<th>Screen Cylinder Diameter &amp; Height</th>
<th>External Foot Print Diameter</th>
<th>Depth Below Pipe Invert</th>
<th>Sump Storage Capacity</th>
<th>Oil Storage Capacity</th>
<th>Maximum Trash Capture Capacity</th>
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Footnotes:
1. Typical and site-specific plan and profile drawings are available for all JDS units.
2. Depth below pipe invert may vary per plan and design of a project, values are estimated standards per JDS model with deep sump. More shallow, smaller storage volume sumps readily available.
3. Sump depths designed to meet project specific settleable solid storage requirements.
4. Baffle designs to meet project specific oil storage requirements, readily available.
5. "G" Suffix on model number designates that unit is configured for grated drop inlet of stormwater.
SLOPED
SLOPED
SLOPED
STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 0.7 - CFS
SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 7.0 - CFS

INV. EL. = XXXX.XX
SUBGRADE EL. = XXXX.XX
RIM EL. = XXXX.XX
SECTION A-A
SCALE= 1:30
4'-10"
4'-0"

INV. EL. = XXXX.XX
5'-3"±(*)
TOP VIEW
SCALE= 1:30

MODEL:
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS48-2418G

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 0.7 - CFS
STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH LEVEL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED GROSS SOLIDS.

TREATMENT:
1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY ConstituENTS INCLUDE:
   · TOTAL SUSPENDED SOLIDS (TSS)
   · HEAVY METALS
   · OIL & GREASE
   · NUTRIENTS
   · FECAL COLIFORM

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS48-2418G

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH LEVEL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED GROSS SOLIDS.

GENERAL NOTES:
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

GENERAL NOTES:
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
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8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

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3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
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7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS48-2418

**HYDRAULICS AND TREATMENT:**

1. **STORMWATER QUALITY DESIGN FLOW (SQDF)**
   - ≤ 0.7 - CFS

2. **STORM DRAIN DESIGN CONVEYANCE FLOW**
   - XX.XX - CFS

3. **RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW**
   - XXXX - YRS

4. SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 7.0 - CFS

**TREATMENT:**

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

**HYDRODYNAMIC SEPARATOR (HDS), SWIRL CONCENTRATING, FULL CAPTURE, NON-BLOCKING SCREENING UNIT**

**EXTERNAL NOTES:**

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

**GENERAL NOTES:**

1. CONTRACTOR TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.
2. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

**INSTALLATION NOTES:**

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

**REGIONAL MANUFACTURING DIFFERENCE:**

**TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.**

**REFERENCES:**

- JENSEN STORMWATER SYSTEMS, www.jensenengineeredsystems.com
- ASTM C-478 AND AASHTO M199
- AASHTO HS-20 WHEEL LOADING
- NPCA CERTIFIED PLANT
- www.jensenengineeredsystems.com

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**JENSEN DEFLECTIVE SEPARATOR MODEL JDS48-2418**

**STORMWATER QUALITY DESIGN FLOW (SQDF)**
- ≤ 0.7 - CFS

**STORM DRAIN DESIGN CONVEYANCE FLOW**
- XX.XX - CFS

**RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW**
- XXXX - YRS

**SUGGEST MAXIMUM INTERNAL BYPASS FLOW**
- ≤ 7.0 - CFS

**JENSEN DEFLECTIVE SEPARATOR MODEL JDS48-2418**

**PROJECT NAME**
- PROJECT LOCATION

**SCALE:**
- 1:30

**SECTION A-A**

**TOP VIEW**

**DRAWN BY**

**SHEET NUMBER**

**SHEET SIZE**

**DRAWN BY**

**Hydraulics and Treatment:**

1. **Stormwater-Quality Design Flow (SQDF)** ≤ 0.7 - CFS
2. **Storm Drain Design Conveyance Flow** XX.XX - CFS
3. **Return Frequency/Period of Peak Design Conveyance Flow** XXXX - YRS
4. Suggest maximum internal bypass flow ≤ 7.0 - CFS

**Treatment:**

1. 100% capture for trash & debris.
2. Jensen Deflective Separator is a non-blocking screening unit.
3. Jensen Deflective Separator designed to process entire SQDF.
4. Capture of other water quality constituents include:
   - Total Suspended Solids (TSS)
   - Heavy Metals
   - Oil & Grease
   - Nutrients
   - Fecal Coliform

**Hydraulic Separator (HDS), Swirl Concentrating, Full Capture, Non-Blocking Screening Unit**

**External Notes:**

1. Contractor to verify all dimensions and elevations in field prior to installation.
2. Precast concrete joints to be sealed using Butyl rubber compound supplied by Jensen Precast.
3. Contractor to grout all pipe penetrations in precast concrete openings in field as necessary.
4. Contractor to adjust elevation of frame and cover in field as necessary.

**General Notes:**

2. Foundation, subgrade, and backfill to be designed by others.
4. Flat tops and base slabs are designed for AASHTO HS-20 wheel loading.
5. Groundwater elevation is assumed to be below the bottom of precast structure. Contact Jensen Stormwater Systems for high groundwater conditions.
6. All precast concrete components to be manufactured in an NPCA certified plant.
7. For complete design and product information, contact Jensen Stormwater Systems.
8. Jensen Stormwater Systems to provide all materials as shown, unless otherwise noted.

**Installation Notes:**

1. Contractor to adjust elevation of frame and cover in field as necessary.
2. Precast concrete joints to be sealed using Butyl rubber compound supplied by Jensen Precast.
3. Contractor to grout all pipe penetrations in precast concrete openings in field as necessary.
4. Contractor to adjust elevation of frame and cover to field as necessary.

**Regional Manufacturing Difference:**

These are template site design drawings. Joint orientations, and final separation and base slab thicknesses vary across Jensen Regional Manufacturing facilities. Confirm final joint orientation and thickness for construction submittal drawings. Adjust final dimensions to exterior invert and subgrade elevation per region difference.

---

**Scale:**
- 1:30

**Project Name**
- Project Location

**Sheet Number**
- Sheet Size

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JENSEN DEFLECTIVE SEPARATOR, MODEL JDS48-2424

HYDRAULICS AND TREATMENT:

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE STORMWATER QUALITY DESIGN FLOW (SQDF).
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

TREATMENT:

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

GENERAL NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
5. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

REGIONAL MANUFACTURING DIFFERENCE:

THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINTS ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.

(*) REGIONAL MANUFACTURING DIFFERENCE:

These are template site design drawings. Joint orientations, and final separation and base slab thicknesses vary across Jensen’s regional manufacturing facilities. Confirm final joint orientation and thickness for construction submittal drawings. Adjust final dimensions to exterior invert and subgrade elevation for region difference.

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STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 1.6 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XXXX - YRS
SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 7.0 - CFS

A V A R I E S, (*)

INV. EL. = XXXX.XX'
SUBGRADE EL. = XXXX.XX'
RIM EL. = XXXX.XX'

SECTION A-A
SCALE= 1:30
4'-10"
4'-0"
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS60-2418

Hydraulics and Treatment:

1. 100% capture for trash & debris.
2. JENSEN DEFLECTIVE SEPARATOR is a non-blocking screening unit.
3. JENSEN DEFLECTIVE SEPARATOR is designed to process entire SQDF.
4. Capture of other water quality constituents include:
   - Total Suspended Solids (TSS)
   - Heavy Metals
   - Oil & Grease
   - Nutrients
   - Fecal Coliform

Hydrodynamic Separator (HDS), Swirl Concentrating, Full Capture, Non-blocking Screening Unit

General Notes:

2. Foundation, subgrade, and backfill to be designed by others.
4. Flat tops and base slabs are designed for AASHTO HS-20 wheel loading.
5. Groundwater elevation is assumed to be below the bottom of precast structure. Contact Jensen Stormwater Systems for high groundwater conditions.
6. All precast concrete components to be manufactured in an NPCA certified plant.
7. For complete design and product information, contact Jensen Stormwater Systems.
8. Jensen Stormwater Systems to provide all materials as shown, unless otherwise noted.

Installation Notes:

1. Contractor to verify all dimensions and elevations in field prior to installation.
2. Precast concrete joints to be sealed using Butyl rubber compound supplied by Jensen Precast.
3. Contractor to adjust all PIP penetrations in precast concrete openings in field as necessary.
4. Contractor to adjust elevation of frame and cover in field as necessary.

Regional Manufacturing Difference:

These are template site design drawings. Joint orientations, and final separation and base slab thicknesses vary across Jensen’s regional manufacturing facilities. Confirm final joint orientation and thickness for construction submittal.

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STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 1.1 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS
SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 10 - CFS

VARIES
6'-3"±, (*)

VARIES
6'-0"
5'-0"

VARIES
INV. EL. = XXXX.XX' ±

VARIES, (*)

SUBGRADE EL. = XXXX.XX' ±, (*)

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS60-2424

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

TREATMENT:
1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDES:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDES:
- TOTAL SUSPENDED SOLIDS (TSS)
- HEAVY METALS
- OIL & GREASE
- NUTRIENTS
- FECAL COLIFORM

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS60-2424
HYDRAULICS AND TREATMENT:
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M-199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

GENERAL NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

INSTALLATION NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

REGIONAL MANUFACTURING DIFFERENCE:
These are template site design drawings. Joints orientations, and final separation and base slab thickened vary across JENSEN's regional manufacturing facilities. Confirm final joint orientation and thickness for construction submittal. Drawings adjust final dimensions to exterior invert and subgrade elevation per region difference.
HYDRAULICS AND TREATMENT:


2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.

4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.

5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

GENERAL NOTES:

1. 100% CAPTURE FOR TRASH & DEBRIS.

2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

5. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

6. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

7. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

8. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

TREATMENT:

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED GROSS SEDIMENT.

INSTALLATION NOTES:

- THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINT ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGIONAL DIFFERENCE.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS72-3624

HYDRAULICS AND TREATMENT:

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

TREATMENT:

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   -總懸浮物質 (TSS)
   -重金屬
   -石油及礦物
   -營養物
   -大腸桿菌

HYDRAULIC SEPARATOR (HDS), SWIRL CONCENTRATING, FULL CAPTURE, NON-BLOCKING SCREENING UNIT

STORM DRAIN DESIGN CONVEYANCE FLOW

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW

TOP VIEW

SEPARATION SCREEN

SOLIDS STORAGE SUMP

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

INLET PIPE

INLET PIPE

OUTLET PIPE

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

INLET PIPE

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

INLET PIPE

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

INLET PIPE

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

INLET PIPE

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

INLET PIPE

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

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INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

INLET PIPE

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

INLET PIPE

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

INLET PIPE

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

INLET PIPE

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

OUTLET PIPE

INLET PIPE
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS72-3630

HYDRAULICS AND TREATMENT:

1. STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED GROSS SOLIDS.

2. TOTAL SURFEESED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - Fecal Coliform

3. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

4. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

5. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - Fecal Coliform

6. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

7. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

8. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

9. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

GENERAL NOTES:

1. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

2. 100% CAPTURE FOR TRASH & DEBRIS.

3. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

4. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

5. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - Fecal Coliform

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

(*) REGIONAL MANUFACTURING DIFFERENCE:

1. JENSEN DEFLECTIVE SEPARATOR MODEL JDS72-3630.

2. HYDRAULIC SEPARATOR (HDS), SWIRL CONCENTRATING, FULL CAPTURE, NON-BLOCKING SCREENING UNIT.

3. JENSEN DEFLECTIVE SEPARATOR, SWIRL CONCENTRATING, FULL CAPTURE, NON-BLOCKING SCREENING UNIT.

4. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

5. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

6. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

7. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

8. THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINT ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION FOR REGIONAL DIFFERENCE.
HYDRAULICS AND TREATMENT:

1. JENSEN DEFLECTIVE SEPARATOR (JDS) IS A NON-BLOCKING SCREENING UNIT.
2. JENSEN DEFLECTIVE SEPARATOR (JDS) IS DESIGNED TO PROCESS ENTIRE SQDF.
3. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

TREATMENT:

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

TREATMENT NOTES:

2. FOUNADATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

* (REGIONAL MANUFACTURING DIFFERENCE):

THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINTS ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS72-3636

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STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 3.8 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS
SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 14 - CFS

HYDRAULICS AND TREATMENT

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDES:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

TREATMENT:

- STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED GROSS SOLIDS.

GENERAL NOTES:

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

REMARKS:

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS72-3642

HYDRAULICS AND TREATMENT:

- RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS
- SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 14 - CFS

TREATMENT:

- STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED GROSS SOLIDS.

GENERAL NOTES:

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

REMARKS:

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS72-3642

HYDRAULICS AND TREATMENT:

- RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS
- SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 14 - CFS

TREATMENT:

- STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED GROSS SOLIDS.

GENERAL NOTES:

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

REMARKS:
MODEL: JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230

PROJECT: PROJECT NAME
PROJECT LOCATION

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED GROSS SOLIDS.

TREATMENT:
1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

GENERAL NOTES:
2. FUNDAMENTAL, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

TREATMENT:
STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. Precast concrete joints to be sealed using butyl rubber compound supplied by Jensen Precast.
3. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

INLET CYLINDER WITH INTEGRAL OIL Baffle SKIRT
XX" Ø HDPE/PVC/CP/CORE
INLET PIPE
36" Ø CAST IRON FRAME AND COVER (TYP.). ALTERNATE HATCH OR GRATE SYSTEMS READILY AVAILABLE.
XX" Ø HDPE/PVC/CP/CORE
OUTLET PIPE
36" Ø GRADE RINGS AS REQUIRED
SEPARATION SCREEN
SOLIDS STORAGE SUMP
SUBGRADE EL. = XXXX.XX' ±

SECTION A-A
SCALE 1:1.5

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230
HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 2.7 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS
### Stormwater Quality Design Flow (SQDF)

≤ 3.6 CFS

### Storm Drain Design Conveyance Flow

XX.XX CFS

### Return Frequency/Period of Peak Design Conveyance Flow

XX YRS

### Suggested Maximum Internal Bypass Flow

≤ 14 CFS

### Hydrostatics and Treatment

**JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4236**

Hydrodynamics and Treatment:

2. Foundation, Subgrade, and Backfill to be designed by others.
4. Flat tops and base slabs are designed for AASHTO HS-20 wheel loading.
5. Groundwater elevation is assumed to be below the bottom of precast structure. Contact Jensen Stormwater Systems for high groundwater conditions.
6. **All Precast Concrete Components to be manufactured in an NPCA Certified Plant.**
7. For complete design and product information, contact Jensen Stormwater Systems.
8. Jensen Stormwater Systems to provide all materials as shown, unless otherwise noted.

**JENSEN DEFLECTIVE SEPARATOR**

**HYDRAULICS AND TREATMENT**

- 100% Capture for Trash & Debris.
- Jensen Deflective Separator is a Non-Blocking Screening Unit.
- Jensen Deflective Separator designed to process entire SQDF.
- Capture of other water quality constituents include:
  - Total Suspended Solids (TSS)
  - Heavy Metals
  - Oil & Grease
  - Nutrients
  - Fecal Coliform

**GENERAL NOTES**

- Installation Notes:
  - Stormwater treatment unit employing the continuous deflective separation treatment process to produce a non-blocking screening system with swirl concentration. This hydrodynamic separation treatment is equipped with an internal bypass that produces complete bypass of storm drain pipeline conveyance flow without scour of captured gross solids.

- Treatment:
  - 1. 100% Capture for Trash & Debris.
  - 2. Jensen Deflective Separator is a Non-Blocking Screening Unit.
  - 3. Jensen Deflective Separator designed to process entire SQDF.
  - 4. Capture of other water quality constituents include:
    - Total Suspended Solids (TSS)
    - Heavy Metals
    - Oil & Grease
    - Nutrients
    - Fecal Coliform

- General Notes:
  - Hydrodynamics and Treatment:
    - JENSEN DEFLECTIVE SEPARATOR employs the CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS to PRODUCE a NON-BLOCKING SCREENING SYSTEM with SWIRL CONCENTRATION. This HYDRODYNAMIC SEPARATION TREATMENT is EQUIPPED with an INTERNAL BYPASS that PROVIDES COMPLETE BYPASS of STORM DRAIN PIPELINE CONVEYANCE FLOW without SCOUR of CAPTURED GROSS SOLIDS.

- Return Frequency/Period of Peak Design Conveyance Flow:
  - XX YRS

- Storm Drain Design Conveyance Flow:
  - XX.XX CFS

- Stormwater Quality Design Flow (SQDF):
  - ≤ 3.6 CFS

- Suggested Maximum Internal Bypass Flow:
  - ≤ 14 CFS

**JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4236**

Hydrodynamics and Treatment:

- 2. Foundation, Subgrade, and Backfill to be designed by others.
- 4. Flat tops and base slabs are designed for AASHTO HS-20 wheel loading.
- 5. Groundwater elevation is assumed to be below the bottom of precast structure. Contact Jensen Stormwater Systems for high groundwater conditions.
- 6. All Precast Concrete Components to be manufactured in an NPCA Certified Plant.
- 7. For complete design and product information, contact Jensen Stormwater Systems.
- 8. Jensen Stormwater Systems to provide all materials as shown, unless otherwise noted.

Installation Notes:

- 1. Contractor to verify all dimensions and elevations in field prior to installation.
- 2. Precast concrete joints to be sealed using butyl rubber compound supplied by Jensen Precast.
- 3. Contractor to adjust all PIP penetrations in precast concrete openings in field as necessary.
- 4. Contractor to adjust elevation of Frame and Cover in field as necessary.

(*) Regional Manufacturing Difference:

These are template site design drawings. Joints, orientations, and final separation and base slab thicknesses vary across Jensen Regional Manufacturing Facilities. Confirm final joint orientation and thickness for construction submittal drawings. Adjust final dimensions to exterior invert and subgrade elevation for regional difference.

**Model:**

- JDS84-4236

**Project:**

- JENSEN DEFLECTIVE SEPARATOR

**Project Name:**

- PROJECT NAME

**Project Location:**

- PROJECT LOCATION

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**Sheet Number:**

- SHEET NUMBER

**Sheet Size:**

- SHEET SIZE

**Drawn By:**

- DRAWN BY

**Scale:**

- N.T.S

- AS SHOWN

**Revision Date:**

- XX/XX/XXXX

**Scale:**

- 11" X 17"
STORMWATER QUALITY DESIGN FLOW (SQDF) \[\leq 5.5 \text{ CFS} \]

STORM DRAIN DESIGN CONVEYANCE FLOW \[XX.XX \text{ CFS} \]

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW \[XX \text{ yrs} \]

SUGGEST MAXIMUM INTERNAL BYPASS FLOW \[\leq 14 \text{ CFS} \]

VARIES \[9'-4" \pm, (*) \]

VARIES, (*) \[ \]

RIM EL. = XXXX.XX' ±

INV. EL. = XXXX.XX' ±

SUBGRADE EL. = XXXX.XX' ±, (*)

HYDRODYNAMIC SEPARATOR (HDS), SWIRL CONCENTRATING, FULL CAPTURE, NON-BLOCKING SCREENING UNIT

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4248

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4248

HYDRAULICS AND TREATMENT:
2. FOUNADATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

GENERAL NOTES:
1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

INSTALLATION NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

64" I.D. MANHOLE

84" I.D. MANHOLE

XX" Ø HDPE/PVC/RCP INLET PIPE

XX" Ø HDPE/PVC/RCP OUTLET PIPE

XX" Ø HDPE/PVC/RCP INLET PIPE

XX" Ø HDPE/PVC/RCP OUTLET PIPE

SECTION A-A

SCALE: N.T.S

TOP VIEW

SCALE: N.T.S

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

9'-4" (*)

VARIES

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

VARIES

SEPARATION SCREEN

SOLIDS STORAGE SUMP

SUBGRADE EL. = XXXX.XX' ±, (*)

INLET CYLINDER WITH INTEGRAL OIL BATTLE SKIRT

36" Ø GRADE RINGS AS REQUIRED

VARIES

36" Ø CAST IRON FRAME AND COVER (TYP.). ALTERNATE HATCH OR GRATE SYSTEMS READILY AVAILABLE.

VARIES

X" Ø HDPE/PVC/RCP INLET PIPE

X" Ø HDPE/PVC/RCP OUTLET PIPE

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4248

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4248

PROJECT: JENSEN DEFLECTIVE SEPARATOR

MODEL: JDS84-4248

PROJECT NAME

PROJECT LOCATION

X.XXXX X.XXXX JDS84-4248

VARIES (*)

11" X 17"

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JENSEN DEFLECTIVE SEPARATOR, MODEL JDS96-4836

HYDRAULICS AND TREATMENT:

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

** REGIONAL MANUFACTURING DIFFERENCE:**

TREATMENT:

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PRODUCES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

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STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 6.0 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS
SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 24 - CFS

VARIES
INLET CYLINDER WITH INTEGRAL OIL BAFFLE SKIRT
24" Ø CAST IRON FRAME AND COVER (TYP.). ALTERNATE HATCH OR GRATE SYSTEMS READILY AVAILABLE.
4"-2"X, ('')
SECTION A-A
SCALE: N.T.S

18'6" I.D. MANHOLE
24" Ø GRADE RINGS AS REQUIRED

HYDRAULICS AND TREATMENT:
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

JENSEN DEFLECTIVE SEPARATOR, MODEL JD96-4848
HYDRAULICS AND TREATMENT:
1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   · TOTAL SUSPENDED SOLIDS (TSS)
   · HEAVY METALS
   · OIL & GREASE
   · NUTRIENTS
   · FECAL COLIFORM

TREATMENT:
STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT UNIT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

VDW/04/08, 521 DUNN CIRCLE, SPARKS, NV 89431-6312
(877) 649-0095  FAX (775) 440-2013
www.jensenengineeredsystems.com
JENSEN DEFLECTIVE SEPARATOR, MODEL JD96-4848
HYDRAULICS AND TREATMENT:
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

GENERAL NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

INSTALLATION NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

REGIONAL MANUFACTURING DIFFERENCE:
THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINTS ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.

JENSEN DEFLECTIVE SEPARATOR, MODEL JD96-4848
HYDRAULICS AND TREATMENT:
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

GENERAL NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

INSTALLATION NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

REGIONAL MANUFACTURING DIFFERENCE:
THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINTS ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.

JENSEN DEFLECTIVE SEPARATOR, MODEL JD96-4848
HYDRAULICS AND TREATMENT:
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
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8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

GENERAL NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
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3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

INSTALLATION NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

REGIONAL MANUFACTURING DIFFERENCE:
THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINTS ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.
Hydraulics and Treatment:

1. 100% capture for trash & debris.
2. Jensen Deflective Separator is a non-blocking screening unit.
3. Jensen Deflective Separator designed to process entire stormwater quality design flow.
4. Capture of other water quality constituents includes:
   - Total suspended solids (TSS)
   - Heavy metals
   - Oil & grease
   - Nutrients
   - Fecal coliform

General Notes:

1. Contractor to verify all dimensions and elevations in field prior to installation.
2. Precast concrete joints to be sealed using butyl rubber compound supplied by Jensen Precast.
3. Contractor to grout all pipe penetrations in precast concrete openings in field as necessary.
4. Contractor to adjust elevation of frame and cover in field as necessary.

Installation Notes:

Jensen Deflective Separator, Model JDS96-4854

Hydrodynamic Separator (HDS), swirl concentrating, full capture, non-blocking screening unit

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS96-4854

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These are template site design drawings. Joints, orientations, and final separation and base slab thicknesses vary across Jensen's regional manufacturing facilities. Confirm final joint orientation and thickness for construction submitted drawings. Adjust final dimensions to exterior invert and subgrade elevation per region difference.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6748


2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.

4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.

5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

90% CAPTURE FOR TRASH & DEBRIS.

JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:

- TOTAL SUSPENDED SOLIDS (TSS)
- HEAVY METALS
- OIL & GREASE
- NUTRIENTS
- FECAL COLIFORM

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 9.0 - CFS

STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 50 - CFS

HYDRAULICS AND TREATMENT:

JENSEN DEFLECTIVE SEPARATOR EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

GENERAL NOTES:


2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.

4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.

5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

REGIONAL MANUFACTURING DIFFERENCE:

THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINT ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL.

REFERENCES TO SITE DESIGN DRAWINGS, JOINT ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL.

ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.

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2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.

4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.

5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

9. 100% CAPTURE FOR TRASH & DEBRIS.

2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 11.0 - CFS

STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 50 - CFS

HYDRAULICS AND TREATMENT:

TREATMENT:

GENERAL NOTES:

INSTALLATION NOTES:

521 DUNN CIRCLE, SPARKS, NV 89431-6312
(877) 649-0095  FAX (775) 440-2013
www.jensenengineeredsystems.com
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6764

**HYDRAULICS AND TREATMENT:**

<table>
<thead>
<tr>
<th>STORMWATER QUALITY DESIGN FLOW</th>
<th>4.25 - CFS</th>
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</thead>
<tbody>
<tr>
<td>RETURN FREQUENCY/PERIOD OF PEAK DESIGN FLOW</td>
<td>10 YRS</td>
</tr>
<tr>
<td>STORM DRAIN DESIGN CONVEYANCE FLOW</td>
<td>XX - XFS</td>
</tr>
<tr>
<td>TREATED GROUNDWATER DISCHARGE FLOW</td>
<td>2 - XFS</td>
</tr>
</tbody>
</table>

**TREATMENT**:

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

**GENERAL NOTES:**

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

**INSTALLATION NOTES:**

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

**REGIONAL MANUFACTURING DIFFERENCE:**

1. THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINT ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.

**DRAWING INFORMATION:**

- **ORG. DWG. DATE**: XX/XX/XXXX
- **PROJECT NAME**: CITY, STATE
- **SCALE**: SHEET NUMBER
- **SHEET SIZE**: X.XXXX
- **DRAWN BY**: 11" X 17" JDS120-6764
- **REV. DWG. DATE**: XX/XX/XXXX
- **MODEL**: JENSEN DEFLECTIVE SEPARATOR
- **PROJECT**: JDS120-6764

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JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6770

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 15.0 CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS
SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 50 CFS

TREATMENT:

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   · TOTAL SUSPENDED SOLIDS (TSS)
   · HEAVY METALS
   · OIL & GREASE
   · NUTRIENTS
   · FECAL COLIFORM

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

GENERIC NOTES:

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6782

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 19.0 - CFS

STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 50 - CFS

TREATMENT:

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

NOTE:


2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.

4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.

5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

SECTION A-A

SCALE: N.T.S

INLET CYLINDER WITH OIL BAFLE SKIRT

INLET PIPE

30" Ø CAST IRON FRAME AND COVER (TYP.) Alternate Hatch or Grate Systems, Readily Available

120° O. MANHOLE

OUTLET PIPE

XX" Ø HDPE/PVC/RCP

INLET CYLINDER WITH OIL BAFLE SKIRT

INLET PIPE

XX" Ø HDPE/PVC/RCP

OUTLET PIPE

XX" Ø HDPE/PVC/RCP

SEPARATION SCREEN

SOLIDS STORAGE SUMP

SUBGRADE EL. = XXXX.XX' ±

10'-0"

11'-0"

3'-0"

VARIES

11'-6"±, (*)

RIM EL. = XXXX.XX' ±

INV. EL. = XXXX.XX' ±

10'-6"

VARIES

11'-6"±, (*)

TOP VIEW

SCALE: N.T.S

A

10'-0"

11'-10"

VARIES

VARIES

VARIES
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6794

HYDRAULICS AND TREATMENT:

- STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 25.0 - CFS
- STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
- RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS
- SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 50 - CFS

VARIES

- RIM EL. = XXXX.XX' ±
- INV. EL. = XXXX.XX' ±
- SUBGRADE EL. = XXXX.XX' ±, (*)

HYDRODYNAMIC SEPARATOR (HDS), SWIRL CONCENTRATING, FULL CAPTURE, NON-BLOCKING SCREENING UNIT

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT SYSTEM IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED GROSS SOLIDS.

TREATMENT:

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

VARIES, (*)

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

SEPARATION SCREEN

SOLIDS STORAGE SUMP

24° Ø CAST IRON FRAME AND COVER (TYP.). ALTERNATE HATCH OR GRATE SYSTEMS READILY AVAILABLE.

120°/D. MANHOLE

18" Ø HDPE/PVC/RCP (INLET PIPE)

SEPARATION SCREEN

SOLIDS STORAGE SUMP

24° Ø CAST IRON FRAME AND COVER (TYP.). ALTERNATE HATCH OR GRATE SYSTEMS READILY AVAILABLE.

13'-6"±, (*)

13'-6"±, (*)

12° 47', L (*)

10'-0"

11'-10"

10'-0"
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6794

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW \( \leq 25.0 - \text{CFS} \)

STORM DRAIN DESIGN CONVEYANCE FLOW \( XX.XX - \text{CFS} \)

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW \( XX - \text{YRS} \)

SUGGEST MAXIMUM INTERNAL BYPASS FLOW \( \leq 50 - \text{CFS} \)

HYDRAULICS AND TREATMENT:

VARIES

12'-6"±, (*)

RIM EL. = XXXX.XX' ±

INV. EL. = XXXX.XX' ±

SUBGRADE EL. = XXXX.XX' ±, (*)

TOP VIEW

SCALE: N.T.S

SECTION A-A

SCALE: N.T.S

A

10'-0"

11'-10"

VARIES, (*)

VARIES

INV. EL. = XXXX.XX' ±

SUBGRADE EL. = XXXX.XX' ±, (*)

1/2" @ CAST IRON FRAME AND COVER (TYP.). ALTERNATE HATCH OR GRATE SYSTEMS READILY AVAILABLE.

1/2" @ HPD/PVC/RCP INLET PIPE

3/8" @ HPD/PVC/RCP OUTLET PIPE

XX" Ø HDPE/PVC/RCP INLET PIPE

XX" Ø HDPE/PVC/RCP OUTLET PIPE

24" Ø CAST IRON FRAME AND COVER (TYP.). ALTERNATE HATCH OR GRATE SYSTEMS READILY AVAILABLE.

30" Ø CAST IRON FRAME AND COVER (TYP.). ALTERNATE HATCH OR GRATE SYSTEMS READILY AVAILABLE.

TOP VIEW SCALE: N.T.S

SECTION A-A SCALE: N.T.S

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6794

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

TREATMENT:

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

GENERAL NOTES:

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

(*) REGIONAL MANUFACTURING DIFFERENCE:

THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINTS ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN’S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

(*) REGIONAL MANUFACTURING DIFFERENCE:

THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINTS ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN’S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.

26
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS144-8484

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF)
≤ 25.2 - CFS

STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 50 - CFS

HYDRAULICS AND TREATMENT:

VARIES

RIM EL. = XXXX.XX' ±

INV. EL. = XXXX.XX' ±

SUBGRADE EL. = XXXX.XX' ±, (*)

TOP VIEW

SCALE: N.T.S

SECTION A-A

A 12'-0" ±

A 14'-0"

VARIES, (*)

INLET PIPE

OUTLET PIPE

30" Ø CAST IRON FRAME AND COVER (TYP.)

ALTERNATE HATCH OR GRATE SYSTEMS READILY AVAILABLE.

13'-0" ±, (*)

INLET CYLINDER WITH OIL Baffle Skirt

SEPARATION SCREEN

SOLIDS STORAGE SUMP

SUBGRADE EL. = XXXX.XX' ±, (*)

14'-0"

2'-6"

27

12'-0’

12'-0’

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www.jensenengineeredsystems.com


2. FOUNDERATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.

4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.

5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

9. 100% CAPTURE FOR TRASH & DEBRIS.

10. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

11. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

12. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:

- TOTAL SUSPENDED SOLIDS (TSS)
- HEAVY METALS
- OIL & GREASE
- NUTRIENTS
- FECAL COLIFORM

13. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

14. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

15. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

16. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

17. THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINT ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS144-9480

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 25.7 - CFS

STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 50 - CFS

HYDRAULICS AND TREATMENT:

VARIES

RIM EL. = XXXX.XX’ ±

INV. EL. = XXXX.XX’ ±

SUBGRADE EL. = XXXX.XX’ ±, (*)

TOP VIEW

SECTION A-A


2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.

4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.

5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

1. 100% CAPTURE FOR TRASH & DEBRIS.

2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:

   · TOTAL SUSPENDED SOLIDS (TSS)
   · HEAVY METALS
   · OIL & GREASE
   · NUTRIENTS
   · FECAL COLIFORM

5. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

6. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

7. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

8. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

TREATMENT:

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT UNIT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PRODUCES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

GENERAL NOTES:


2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.

4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.

5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

REGIONS MANUFACTURING DIFFERENCE:

THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINTS ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS144-9490

HYDRAULICS AND TREATMENT:

| STORMWATER QUALITY DESIGN FLOW (SQDF) | 31.2 - 445 |
| STORM DRAIN DESIGN CONVEYANCE FLOW | XX - XX |
| RETURN FREQUENCY/CYCLE OF PEAK DESIGN CONVEYANCE FLOW | XX - XX |
| TREATMENT EFFICIENCY (RELEVANT BP EFF.) | XX - XX |

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

GENERAL NOTES:

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

TREATMENT:

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

1. THESE ARE TEMPLATE SITE DESIGN DRAWINGS. JOINTS ORIENTATIONS, AND FINAL SEPARATION AND BASE SLAB THICKNESSES VARY ACROSS JENSEN'S REGIONAL MANUFACTURING FACILITIES. CONFIRM FINAL JOINT ORIENTATION AND THICKNESS PER CONSTRUCTION SUBMITTAL DRAWINGS. ADJUST FINAL DIMENSIONS TO EXTERIOR INVERT AND SUBGRADE ELEVATION PER REGION DIFFERENCE.

(*) REGIONAL MANUFACTURING DIFFERENCE:

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

GENERAL NOTES:

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
5. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
6. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

TREATMENT:

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED-GROSS SOLIDS.

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(*) REGIONAL MANUFACTURING DIFFERENCE:

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

GENERAL NOTES:

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
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   - NUTRIENTS
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GENERAL NOTES:

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7. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE ALL MATERIALS AS SHOWN, UNLESS OTHERWISE NOTED.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS144-94102

HYDRAULICS AND TREATMENT:

- STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 38.0 - CFS
- STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
- RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS

SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 50 - CFS

TREATMENT:
1. 100% CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

GENERAL NOTES:
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
4. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
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INSTALLATION NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

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STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 44.0 CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XX - YRS
SUGGEST MAXIMUM INTERNAL BYPASS FLOW ≤ 50 CFS

HYDRAULICS AND TREATMENT:

VARIES

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M199.
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TREATMENT:

GENERAL NOTES:

INSTALLATION NOTES:

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8. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
EXHIBIT  B

Table

of

Offline $JDS$ Units

Standard Sizes
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<tr>
<th>Casting</th>
<th>Model Designation¹</th>
<th>Treatment Flow Rate</th>
<th>Approximate Treated Catchment Area</th>
<th>Manhole Internal Diameter</th>
<th>Screen Cylinder Diameter &amp; Height</th>
<th>External Foot Print Diameter</th>
<th>Depth Below Pipe Invert²</th>
<th>Sump Storage Capacity³</th>
<th>Oil Storage Capacity³</th>
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Footnotes:
1. Typical and site-specific plan and profile drawings are available for all JDS units.
2. Depth below pipe invert may vary per plan and design of a project, values are estimated standards per JDS model with deep sump. More shallow, smaller storage volume sumps readily available.
3. Sump depths designed to meet project-specific settleable solids storage requirements.
4. Baffle design to meet project-specific oil storage requirements, readily available.
1. 100% FULL CAPTURE FOR TRASH & DEBRIS, WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE OFFLINE JDS UNIT.

2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN HIGH GROUNDWATER CONDITIONS.


6. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

7. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

GENERAL NOTES:


2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR CUSTOM DESIGNS.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO NOTIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO ADJUST ALL PIPE PFAKCTIONS IN PRECAST CONCRETE STRUCTURES IN FIELD AS NECESSARY.

4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POUR IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY DETAILS.

6. ALL DIMENSIONS ARE IN FOOT-INCH.

7. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-478, C-857 AND LACSD S-A-206, WHEN IN LA COUNTY.

8. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

9. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

DIVERSION STRUCTURE DESIGN NOTES:

1. FINAL DIVERSION STRUCTURE DIMENSIONS TO BE DETERMINED (TBD) FROM ENGINEERING AND HYDRAULIC & ENERGY GRADELINE ANALYSES.

2. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

DIVERSION TREATMENT:

1. TREATMENT CAPACITY FOR TRASH & DEBRIS IS 50 LITERS PER CYCLE.

2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

STORMWATER QUALITY TREATMENT:

1. 100% FULL CAPTURE FOR TRASH & DEBRIS, WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE OFFLINE JDS UNIT.

2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

PROJECT INFORMATION:

1. PROJECT NAME: JENSEN DEFLECTIVE SEPARATOR

2. PROJECT LOCATION: 10900-10904 1/25" "1/16" 9.000x 1

3. PROJECT: JENSEN DEFLECTIVE SEPARATOR

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

DIVERSION TREATMENT:

1. TREATMENT CAPACITY FOR TRASH & DEBRIS IS 50 LITERS PER CYCLE.

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DIVERSION TREATMENT:

1. TREATMENT CAPACITY FOR TRASH & DEBRIS IS 50 LITERS PER CYCLE.

2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

STORMWATER QUALITY TREATMENT:

1. 100% FULL CAPTURE FOR TRASH & DEBRIS, WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE OFFLINE JDS UNIT.

2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS72-3624 OFFLINE

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN PERIOD/FREQUENCY OF PEAK DESIGN CONVEYANCE FLOW XXX - 1%-
DIVERSION BOX VAULT DESIGN CONVEYANCE FLOW XXX - 1%
2,400 or 4,700 MICRON SCREEN APERTURE

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATOR TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SOIL CONCENTRATION. THE DEPLOYMENT OF THIS HYDRODYNAMIC SEPARATION TREATMENT UNIT IN THE OFFLINE CONSTRUCTION CONTEXT ON THIS SITE REQUIRED A SEPARATE DIVERSION STRUCTURE CONSTRUCTED WITHIN THE MOW TO ABATE DIVERT THE STORMWATER QUALITY FLOW LISTED IN THE TABLE ABOVE AS WELL AS ENSURE THE BYPASS OF THE PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE CAPTURE BOX UNIT.

TREATMENT:
1. 100% FULL CAPTURE FOR TRASH & DEBRIS, >5mm
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   • TOTAL SOLIDS (TSS)
   • OIL & GREASE
   • NUTRIENTS
   • FECAL COLIFORM
   • N-GLYCOLX
   • TOTAL PHOSPHORUS
   • TOTAL ORGANIC CARBON
   • HUMAN PATHOGENS
   • NITRITE + NITRATE
   • BOD5

DIVERSION STRUCTURE DESIGN NOTES:
1. FINAL DIVERSION STRUCTURE/VAULT DIMENSIONS TO BE DETERMINED (TBD) FROM ENGINEERING AND HYDRAULIC & ENERGY GRADELINE ANALYSIS.
2. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUIT BETWEEN STRUCTURE.
6. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
7. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUIT BETWEEN STRUCTURE.
10. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
12. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
13. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
14. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUIT BETWEEN STRUCTURE.
16. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
17. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

GENERAL NOTES:
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUIT BETWEEN STRUCTURE.
6. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
7. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUIT BETWEEN STRUCTURE.
10. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
11. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
12. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUIT BETWEEN STRUCTURE.
14. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
15. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
16. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUIT BETWEEN STRUCTURE.
CONCRETE CASING COLLARS POURED IN FIELD BY CONTRACTOR

30" Ø EAST IRON FRAME AND COVER ALTERNATE MATCH SYSTEM READY AVAILABLE (TYP.)

HOPE, FIBERGLASS, OR STAINLESS STEEL SEPARATION CYLINDER

3/8" B.D. MANHOLE

STAINLESS STEEL SEPARATION CYLINDER

SOLID STORAGE SUMP

DIVERSION WEB

INLET PIPE

OUTLET PIPE

WEB CREST EL. = XXXX.XX' ±

WEIR CREST EL. = XXXX.XX' ±

RIM EL. = XXXX.XX' ±

SUBGRADE EL. = XXXX.XX' ±

6" Ø 90° 3/4" HDPE/PVC/CPVC OUTLET Pipe

6" Ø 90° 3/4" HDPE/PVC/CPVC INLET Pipe

6" Ø 90° 3/4" HDPE/PVC/CPVC DESIGN PIPE

DIVERSION BOX/VAULT STRUCTURE

DIVERSION WEIR

CONCRETE CASING COLLARS POURED IN FIELD BY CONTRACTOR

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS72-3636 OFFLINE

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW:

DIVERSION WEB CREST ELEVATION:

DIVERSION SCREEN APERTURE:

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING UNIT DESIGNED TO PROCESS ENTIRE SQDF.

TOTAL SUSPENDED SOLIDS (TSS)

HEAVY METALS

OIL & GREASE

Fecal Coliform

6. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.

7. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

1. ALL DIMENSIONS AND ELEVATIONS IN FOOT-INCH UNLESS OTHERWISE NOTED.

4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS BETWEEN STRUCTURES.

3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.

2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

1. STANDARD CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE READILY AVAILABLE. CONTACT JENSEN STORMWATER SYSTEMS FOR CUSTOM DESIGNS.

JENSEN PRECAST TO PROVIDE THE FOLLOWING CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SPECIFIC IDEAS/UNIQUE REQUIREMENTS.

1. STANDARD CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE READILY AVAILABLE. CONTACT JENSEN STORMWATER SYSTEMS FOR CUSTOM DESIGNS.

4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SPECIFIC IDEAS/UNIQUE REQUIREMENTS.

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

2. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR ALTERNATE HATCH SYSTEMS.

3. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN STRUCTURES.

DIVERSION STRUCTURE DESIGN NOTES:

1. DIVERT THE STORMWATER QUALITY FLOW LISTED IN THE TABLE ABOVE AS WELL AS ENSURE THE BYPASS OF THE PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE CAPTURED SOLIDS UNIT.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO ADJUST BIMETAL RUBBER COMPACTED BETWEEN STRUCTURES.

1. STANDARD CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE READILY AVAILABLE. CONTACT JENSEN STORMWATER SYSTEMS FOR CUSTOM DESIGNS.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SPECIFIC IDEAS/UNIQUE REQUIREMENTS.

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

2. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR ALTERNATE HATCH SYSTEMS.

3. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN STRUCTURES.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN STRUCTURES.

2,400 or 4,700 MICRON SCREEN APERTURE

3. JENSEN DEFLECTIVE SEPARATOR HAS THE FOLLOWING SPECIFICATIONS:

4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

3. CONCRETE SHALL HAVE A MINIMUM COMpressive STRENGTH F'c = 5,000 PSI AT 28-DAYS.

2. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-478, C-857 AND LACSD S-A-206, WHEN IN LA COUNTY.

1. ALL DIMENSIONS ARE IN FOOT-INCH UNLESS OTHERWISE NOTED.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS BETWEEN STRUCTURES.

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

2. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR ALTERNATE HATCH SYSTEMS.

3. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN STRUCTURES.

DIVERSION STRUCTURE DESIGN NOTES:

1. DIVERT THE STORMWATER QUALITY FLOW LISTED IN THE TABLE ABOVE AS WELL AS ENSURE THE BYPASS OF THE PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE CAPTURED SOLIDS UNIT.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO ADJUST BIMETAL RUBBER COMPACTED BETWEEN STRUCTURES.

1. STANDARD CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE READILY AVAILABLE. CONTACT JENSEN STORMWATER SYSTEMS FOR CUSTOM DESIGNS.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SPECIFIC IDEAS/UNIQUE REQUIREMENTS.

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

2. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR ALTERNATE HATCH SYSTEMS.

3. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN STRUCTURES.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS BETWEEN STRUCTURES.

2,400 or 4,700 MICRON SCREEN APERTURE

3. JENSEN DEFLECTIVE SEPARATOR HAS THE FOLLOWING SPECIFICATIONS:

4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

3. CONCRETE SHALL HAVE A MINIMUM COMpressive STRENGTH F'c = 5,000 PSI AT 28-DAYS.

2. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-478, C-857 AND LACSD S-A-206, WHEN IN LA COUNTY.

1. ALL DIMENSIONS ARE IN FOOT-INCH UNLESS OTHERWISE NOTED.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN STRUCTURES.

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

2. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR ALTERNATE HATCH SYSTEMS.

3. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN STRUCTURES.

DIVERSION STRUCTURE DESIGN NOTES:

1. DIVERT THE STORMWATER QUALITY FLOW LISTED IN THE TABLE ABOVE AS WELL AS ENSURE THE BYPASS OF THE PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE CAPTURED SOLIDS UNIT.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO ADJUST BIMETAL RUBBER COMPACTED BETWEEN STRUCTURES.

1. STANDARD CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE READILY AVAILABLE. CONTACT JENSEN STORMWATER SYSTEMS FOR CUSTOM DESIGNS.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SPECIFIC IDEAS/UNIQUE REQUIREMENTS.

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

2. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR ALTERNATE HATCH SYSTEMS.

3. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN STRUCTURES.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE: INLET & OUTLET CONDUITS BETWEEN STRUCTURES.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4230 OFFLINE

HYPOTHESIS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW Q X 2.7 - 2X

STORMWATER DESIGN CONVEYANCE FLOW XX.XX - CFS

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XXX - YRS

DIVERSION WEIR CREST ELEVATION XXXX.XX'

3.00% OR 3,000 PARTS PER MILLION (PPM) LIMIT

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH BIPOLAR CONCENTRATION. THE DEPLOYMENT OF THIS HYDRODYNAMIC SEPARATION TREATMENT UNIT IN THE OFFLINE CONFIGURATION SHOWN ON THIS SHEET BOLSTERS A PIPED SCRIMNABILITY STRUCTURE CONSTRUCTED WITHIN THE PIPELINE ALIGNMENT TO DIVERGE THE STORMWATER QUALITY FLOW LISTED IN THE TABLE ABOVE AS WELL AS ENSURE THE RHYTHM OF THE PIPELINE CONVEYANCE FLOW WITHOUT GROSS OF CAPTURED SCOUR FROM THE DRAINAGE INLET UNIT.

TREATMENT:

1. EDDY COIL, CAPTURE FOR TRASH & DEBRIS, >10mm.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE INLET.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - OIL & GREASE
   - HEAVY METALS
   - FECAL COLIFORM
   - NUTRIENTS
   - TOTAL SOLIDS
   - TSS

DIVERSION STRUCTURE DESIGN NOTES:

1. FINAL DIVERSION STRUCTURE/VAULT DIMENSIONS TO BE DETERMINED (TBD) FROM ENGINEERING AND HYDRAULIC & ENERGY GradeLINE ANALYSES.
2. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

GENERAL NOTES:

1. STANDARD CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE READILY AVAILABLE. CONTACT JENSEN STORMWATER SYSTEMS FOR CUSTOM DESIGNS. www.jensenstormwater.com
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE, JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTORS TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTORS TO ADJUST ALL PIPE PENDATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTORS TO ADJUST ELEVATION OF FRAMES AND COVER IN FIELD AS NECESSARY.
5. CONTRACTORS TO POUR CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POUR IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY DETAILS.

MATERIALS:

1. ALL DIMENSIONS ARE IN FOOT-INCH
2. PIPE PENDATIONS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-857, C-697 AND ASME B-36.10M, WHEN IN A COUNTY.
3. PRECAST SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH Fc = 5,000 psi AT 28 DAYS.
4. THE FLOORING CONCRETE LAYED IN THE PRECAST SECTION SHALL MEET THE REQUIREMENTS OF TYPE V HIGH SULFATE RESISTANT CEMENT IN ACCORDANCE WITH ASTM C-595.
5. RAWWATER COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM C-478 AND AASHTO M1996.
6. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING
7. ALL PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
STORMWATER QUALITY DESIGN FLOW

GENERAL NOTES:
2. FOUNDATION, SURFACES, AND MOWING TO BE DESIGNED BY OTHERS.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

DIVERSION STRUCTURE DESIGN NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY ALTERNATE HATCH SYSTEMS.
6. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

CONCRETE CASING COLLARS
POURED IN FIELD BY CONTRACTOR

HOP, FIBERGLASS, OR STAINLESS STEEL
SEPARATION CYLINDER

30" Ø CAST IRON FRAME AND COVER ALTERNATE HATCH SYSTEMS READY AVAILABLE (TYP.)

CONCRETE CASING COLLARS
POURED IN FIELD BY CONTRACTOR

HOP, FIBERGLASS, OR STAINLESS STEEL
SEPARATION CYLINDER

30" Ø CAST IRON FRAME AND COVER ALTERNATE HATCH SYSTEMS READY AVAILABLE (TYP.)

STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 3.6 - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XXX - YRS
DIVERSION WEIR CREST ELEVATION XXXX.XX' ±
DIVERSION WIR ELEVATION XXXX.XX' ±
DIVERSION STRUCTURE ELEVATION XXXX.XX' ±
DIVERSION RIDGE ELEVATION XXXX.XX' ±
INLET WEIR ELEVATION XXXX.XX' ±
OUTLET WEIR ELEVATION XXXX.XX' ±
INLET PIPE Ø HDPE/PVC/RCP
OUTLET PIPE Ø HDPE/PVC/RCP
CONCRETE CASING COLLAR Ø HDPE/PVC/RCP
CONCRETE CASING COLLAR Ø HDPE/PVC/RCP
INirut SLIDE Ø HDPE/PVC/RCP
OUTLET PIPE Ø HDPE/PVC/RCP

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4236 OFFLINE

STORMWATER TREATMENT UNIT, EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THE DEPLOYMENT OF THIS HYDRODYNAMIC SEPARATION TREATMENT UNIT IN THE OFFLINE CONSTRUCTION DEMONSTRATES THE NEED FOR A SEPARATE DIVERSION STRUCTURE CONSTRUCTED TO PROVIDE SUFFICIENT FLOW TO DISPERSE THE STORMWATER QUALITY FLOW LOST IN THE TABLE ABOVE AS WELL AS ENSURE THE Bypass OF THE PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE CAPTURED UNIT.

TREATMENT:
1. 100% FULL CAPTURE FOR TRASH & DEBRIS, > 5mm
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDES:
   • TOTAL SUSPENDED SOLIDS (TSS)
   • OIL & GREASE
   • NUTRIENTS
   • HEAVY METALS
   • Fecal Coliform
   • STAINLESS STEEL
   • ALTERNATE HATCH SYSTEMS

DIVERSION STRUCTURE:
STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THE DEPLOYMENT OF THIS HYDRODYNAMIC SEPARATION TREATMENT UNIT IN THE OFFLINE CONSTRUCTION DEMONSTRATES THE NEED FOR A SEPARATE DIVERSION STRUCTURE CONSTRUCTED TO PROVIDE SUFFICIENT FLOW TO DISPERSE THE STORMWATER QUALITY FLOW LOST IN THE TABLE ABOVE AS WELL AS ENSURE THE Bypass OF THE PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE CAPTURED UNIT.

TREATMENT:
1. 100% FULL CAPTURE FOR TRASH & DEBRIS, > 5mm
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDES:
   • TOTAL SUSPENDED SOLIDS (TSS)
   • OIL & GREASE
   • NUTRIENTS
   • HEAVY METALS
   • Fecal Coliform
   • STAINLESS STEEL
   • ALTERNATE HATCH SYSTEMS

DIVERSION STRUCTURE:
STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THE DEPLOYMENT OF THIS HYDRODYNAMIC SEPARATION TREATMENT UNIT IN THE OFFLINE CONSTRUCTION DEMONSTRATES THE NEED FOR A SEPARATE DIVERSION STRUCTURE CONSTRUCTED TO PROVIDE SUFFICIENT FLOW TO DISPERSE THE STORMWATER QUALITY FLOW LOST IN THE TABLE ABOVE AS WELL AS ENSURE THE Bypass OF THE PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE CAPTURED UNIT.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4248 OFFLINE

HYDRAULIC AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 5.5 - CFS

STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS

RETURN FLOW DURING PERIOD OF PEAK DESIGN CONVEYANCE FLOW X X - X

DIVERSION W/ PUMP ELEVATION XXXX.XX ±

2,800 L/Min 70Micron Screen Aperture

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THE DEPLOYMENT OF THIS HYDRODYNAMIC SEPARATION TREATMENT UNIT IN THE OFFLINE CONSTRUCTION SEQUENCING SIMPLIFIES THE drm REQUIRES A SEPARATE DIVERSION STRUCTURE DESIGN NOTED WITH THE PUMP ALIGNMENT. DIVERT THE STORMWATER QUALITY FLOW LISTED IN THE TABLE ABOVE AS WELL AS ENSURE THE BYPAS OF THE PIPELINE CONVEYANCE FLOW WITHOUT LOADING OF CAPTURED SOLIDS FROM THE CAPTURE UNIT.

TREATMENT:

1. 100% FULL CAPTURE FOR TRASH & DEBRIS,
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT,
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - Fecal Coliform
   - Oil & Grease
   - Heavy Metals
   - Nutrients
   - Fecal Coliform

DIVERSION STRUCTURE DESIGN NOTES:

1. FINAL DIVERSION STRUCTURE DIMENSIONS TO BE DETERMINED (TBD) FROM ENGINEERING AND HYDRAULIC & ENERGY GRADELINE ANALYSIS.
2. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

GENERAL NOTES:

2. FOUNDATION, SURFACES, AND MOORING TO BE DESIGNED BY OTHERS.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR CUSTOM DESIGN.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE, DIVERSIONS/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO ADJUST ALL PER PONTOINETIONS IN PRECAST CONCRETE STRUCTURES IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR.
6. CONTACT JENSEN FOR ANY QUESTIONS CONCERNING THE INSTALLATION.

MATERIALS:

1. 24" Ø CAST IRON FRAME AND COVER READY AVAILABLE (TYP)
2. 84" Ø I.D. MANHOLE READY AVAILABLE (TYP)
3. JENSENSOSEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. HDS AND DIVERSIONS/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

DIVERSION BOX/VAULT DESIGN NOTES:

1. ALTERNATE HATCH SYSTEMS READILY AVAILABLE (TYP).

DIVERSION WEIR CREATION:

2. FOUNDATION, SURFACES, AND MOORING TO BE DESIGNED BY OTHERS.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR CUSTOM DESIGN.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE, DIVERSIONS/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO ADJUST ALL PER PONTOINETIONS IN PRECAST CONCRETE STRUCTURES IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR.
6. CONTACT JENSEN FOR ANY QUESTIONS CONCERNING THE INSTALLATION.

MATERIALS:

1. 24" Ø CAST IRON FRAME AND COVER READY AVAILABLE (TYP)
2. 84" Ø I.D. MANHOLE READY AVAILABLE (TYP)
3. JENSENSOSEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. HDS AND DIVERSIONS/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

DIVERSION BOX/VAULT DESIGN NOTES:

1. ALTERNATE HATCH SYSTEMS READILY AVAILABLE (TYP).
1. 100% FULL CAPTURE FOR TRASH & DEBRIS, WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE OFFLINE JDS UNIT.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - HEAT METALS
   - OIL & GREASE
   - NUTRANTS
   - VESICULAR CONFORM

DIVERSION STRUCTURE DESIGN NOTES:
1. FINAL DIVERSION STRUCTURE/VAULT DIMENSIONS TO BE DETERMINED (TBD) FROM ENGINEERING AND HYDRAULIC & ENERGY GRADELINE ANALYSES.
2. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE, JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN HIGH GROUNDWATER CONDITIONS.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY ALTERNATE HATCH SYSTEMS.

INSTALLATION NOTES:
1. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE, JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN HIGH GROUNDWATER CONDITIONS.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SECONDARY DEFINITIONS.

GENERAL NOTES:
2. FOUNDATION, SURGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE, JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN HIGH GROUNDWATER CONDITIONS.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SECONDARY DEFINITIONS.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE, JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN HIGH GROUNDWATER CONDITIONS.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SECONDARY DEFINITIONS.
6. JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4836 OFFLINE
7. HYDRODYNAMIC SEPARATOR (HDS), SWIRL CONCENTRATING, VARIES
8. JENSEN STORMWATER SYSTEMS TO PROVIDE, JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN HIGH GROUNDWATER CONDITIONS.
9. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SECONDARY DEFINITIONS.
10. JENSEN STORMWATER SYSTEMS TO PROVIDE, JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN HIGH GROUNDWATER CONDITIONS.
11. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SECONDARY DEFINITIONS.

JENSEN DEFLECTIVE SEPARATOR
2. FOUNDATION, SURGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE, JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN HIGH GROUNDWATER CONDITIONS.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SECONDARY DEFINITIONS.

JENSEN STORMWATER SYSTEMS TO PROVIDE, JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN HIGH GROUNDWATER CONDITIONS.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SECONDARY DEFINITIONS.

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS84-4836 OFFLINE
2. FOUNDATION, SURGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE, JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN HIGH GROUNDWATER CONDITIONS.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SECONDARY DEFINITIONS.

JENSEN STORMWATER SYSTEMS TO PROVIDE, JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN HIGH GROUNDWATER CONDITIONS.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY SECONDARY DEFINITIONS.
24" Ø CAST IRON FRAME AND COVER
ALTERNATE HATCH SYSTEMS
READILY AVAILABLE (TYP.)

10'-2" X 17"1
FACIAL CAPTURE, NON-BLOCKING SCREENING UNIT

24" Ø CAST IRON FRAME AND COVER
ALTERNATE HATCH SYSTEMS
READILY AVAILABLE (TYP.)

60" Ø I.D. MINIMUM
HOPE, FIBERGLASS, OR STAINLESS STEEL
SEPARATION CYLINDER

6″-8″ Ø HDPE/PVC/CP
INLET/OUTLET PIPE

20'-0" Varies

CONCRETE CAGING COLLARS
POURED IN FIELD BY CONTRACTOR

20'-0" X 17"1
FULL CAPTURE, NON-BLOCKING SCREENING UNIT

10'-2" X 17"1
FACIAL CAPTURE, NON-BLOCKING SCREENING UNIT

VIKING CROWN DESIGN CONVEYANCE FLOW
6.00 - 9.50
RETURN FREQUENCY PERIOD OF PEAK DESIGN CONVEYANCE FLOW
30 - 60
DIVERSION BOX/VAULT DESIGN CONDITIONS
440 - 480

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS96-4848 OFFLINE

WOODSTOCK, QUAINT DESIGN CONVEYANCE FLOW
3.00 - 4.50

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN CONVEYANCE FLOW
6.00 - 9.50

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN CONVEYANCE FLOW
6.00 - 9.50

STORMWATER QUALITY DESIGN CONVEYANCE FLOW
6.00 - 9.50

STORMWATER QUALITY DESIGN CONVEYANCE FLOW
6.00 - 9.50

STORMWATER QUALITY DESIGN CONVEYANCE FLOW
6.00 - 9.50

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STORMWATER QUALITY DESIGN CONVEYANCE FLOW
6.00 - 9.50
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS96-4854 OFFLINE

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 7.5 - CFS

RETURN FREQUENCY PERIOD OF PEAK DESIGN CONVEYANCE FLOW XXX - YRS

DIVERSION BOX/Vault STRUCTURE

DIVERSION WEIR

INLET PIPE

OUTLET PIPE

HOPE, FIBERGLASS, OR STAINLESS STEEL SEPARATION CYLINDER

STAINLESS STEEL SEPARATION SCREEN

SOLID STORAGE SUMP

ROSS EL. = XXXX.XX' ±

SUBGRADE EL. = XXXX.XX' ±

DISTRIBUTION STRUCTURE DESIGN NOTES:

1. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT. THE DEPLOYMENT OF THIS HYDRODYNAMIC SEPARATION TREATMENT UNIT IN THE OFFLINE CONSTRUCTION SPECIFICATION SHOWN HERE REQUIRES A SEPARATE DIVERSION STRUCTURE CONSTRUCTED WITHIN THE PIPELINE ALIGNMENT. EJECT THE STORMWATER QUALITY FLOW LISTED IN THE TABLE ABOVE AS WELL AS ENSURE THE BYPASS OF THE PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE CAPTURE DS UNIT.

2. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SCALED USING BUTT, RUBBER COMPOUND SUPPORTED BY JENSEN PRECAST.

3. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

5. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

6. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

6. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

INSTALLATION NOTES:

1. ALL DIMENSIONS ARE IN FOOT-INCH

2. PROJECT MATERIALS AND MANUFACTURING METHODS SHALL COMPLY WITH ASTM C-478, C-857 AND LACSD S-A-206, WHEN IN LA COUNTY.

3. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F'c = 5,000-psi AT 28-DAYS.

4. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-478, C-857 AND LACSD S-A-206, WHEN IN LA COUNTY.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY DETAILS.

6. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

7. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

ALTERNATE HATCH SYSTEMS

24" Ø CAST IRON FRAME AND COVER

24" Ø HDPE/PVC/RCP

OUTLET PIPE

DISSOLVED OXYGEN

PH

SOLID STORAGE SUMP

REMOVABLE 0.24 - 0.47MM SCREEN APERTURE

REV. DWG. DATE

ORG. DWG. DATE

REV. DWG. DATE

ORG. DWG. DATE

REV. DWG. DATE

ORG. DWG. DATE

5. CONCRETE CasING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN STORMWATER SYSTEMS FOR ANY DETAILS.

6. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

7. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

ALTERNATE HATCH SYSTEMS

24" Ø CAST IRON FRAME AND COVER

24" Ø HDPE/PVC/RCP

OUTLET PIPE

DISSOLVED OXYGEN

PH

SOLID STORAGE SUMP

REMOVABLE 0.24 - 0.47MM SCREEN APERTURE

REV. DWG. DATE

ORG. DWG. DATE

REV. DWG. DATE

ORG. DWG. DATE

REV. DWG. DATE

ORG. DWG. DATE

5. CONCRETE CasING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN STORMWATER SYSTEMS FOR ANY DETAILS.

6. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

7. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

ALTERNATE HATCH SYSTEMS

24" Ø CAST IRON FRAME AND COVER

24" Ø HDPE/PVC/RCP

OUTLET PIPE

DISSOLVED OXYGEN

PH

SOLID STORAGE SUMP

REMOVABLE 0.24 - 0.47MM SCREEN APERTURE

REV. DWG. DATE

ORG. DWG. DATE

REV. DWG. DATE

ORG. DWG. DATE

REV. DWG. DATE

ORG. DWG. DATE

5. CONCRETE CasING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN STORMWATER SYSTEMS FOR ANY DETAILS.

6. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

7. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6748-OFFLINE

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 9.0 - CFS

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XXX - YRS

IN-LINE PROJECTED RECEIVED OF PEAK DESIGN CONVEYANCE FLOW 600 - 900

DIMENSION IS IN RE-ESTIMATED 6000 - 64

SECONDARY SCREENING UNIT TO BE DESIGNED TO PROCESS ENTIRE SQDF.

CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:

- TOTAL SUSPENDED SOLIDS (TSS)
- HEAVY METALS
- NUTRIENTS
- Fecal Coliform

DIVERSION STRUCTURE/DENAL NOTES:

1. FINAL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. JENSEN STORMWATER SYSTEMS TO PROVIDE JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLETS & OUTLETS CONDUITS BETWEEN THESE STRUCTURES.

4. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F'c = 5,000-psi AT 28-DAYS.

5. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM, C-478 AND AASHTO M199.

6. THE PORTLAND CEMENT USED IN THE PRECAST SECTION SHALL MEET THE REQUIREMENTS OF TYPE II/V HIGH SULFATE RESISTANT CEMENT IN ACCORDANCE WITH ASTM CLASS M C-150.

7. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

8. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

9. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

10. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

11. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

12. STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 9.0 - CFS


4. JENSEN STORMWATER SYSTEMS TO PROVIDE JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLETS & OUTLETS CONDUITS BETWEEN THESE STRUCTURES.

5. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

6. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

7. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

8. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

9. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

10. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F'c = 5,000-psi AT 28-DAYS.

11. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM, C-478 AND AASHTO M199.

12. THE PORTLAND CEMENT USED IN THE PRECAST SECTION SHALL MEET THE REQUIREMENTS OF TYPE II/V HIGH SULFATE RESISTANT CEMENT IN ACCORDANCE WITH ASTM CLASS M C-150.

13. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

14. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-476, C-657 AND LACSD S-2A-00, WHEN IN LA COUNTY.

15. CONCRETE SHALL HAVE A MINIMUM COMPREHENSIVE STRENGTH F'c = 2,000-psi AT 28-DAYS.

16. THE PORTLAND CEMENT USED IN THE PRECAST SECTION SHALL MEET THE REQUIREMENTS OF TYPE II/V HIGH SULFATE RESISTANT CEMENT IN ACCORDANCE WITH ASTM CLASS M C-150.

17. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM, C-478 AND AASHTO M199.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6758-OFFLINE

TREATMENT AND TREATMENT

STORMWATER QUALITY DESIGN FLOW (SQDF) 11 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW 330 - CFS
INLET FREQUENCY/PERIOD OF NEW DESIGN CONSTRUCTION FROM 1:100 - YR

DIVERSION CREST ELEVATION XXXX.XX' ±
2,400 or 4,700 MICRON SCREEN APERTURE

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THE DEPLOYMENT OF THIS HYDRODYNAMIC SEPARATION TREATMENT UNIT IN THE CONSTRUCTION CONFIGURATION SHOWN ON THIS SHEET REQUIRES A SEPARATE DIVERSION STRUCTURE CONSTRUCTED WITHIN THE PIPELINE ALIGNMENT TO DIVERT THE STORMWATER QUALITY FLOW FROM LINERS IN THE TUBE AREA AS WELL AS TO ENSURE THE BYPASS OF THE OFFLINE CONVEYANCE FLOW WITHOUT LOSS OF CAPTURE SOLES FROM THE OFFLINE JES UNIT.

TREATMENT:
1. 100% FULL CAPTURE FOR TRASH & DEBRIS.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - TSS
   - OIL & GREASE
   - Fecal Coliform
   - NUTRIENTS
   - OIL & GREASE
   - HEAVY METALS
   - TOTAL SUSPENDED SOLIDS (TSS)
   - ALTERNATE HATCH SYSTEMS

GENERAL NOTES:
1. STANDARD CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE READILY AVAILABLE. CONTACT JENSEN STORMWATER SYSTEMS FOR CUSTOM DESIGNS.
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. GROUNDWATER ELEVATION IS ASUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION VAULT/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO ASSIST IN ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN PRECAST FOR ANY DETAILS.

MATERIALS:
1. ALL DIMENSIONS ARE IN FOOT-INCH.
2. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-476, C-657 AND LACSD S-A-206, WHERE IN LA COUNTY.
3. CONCRETE SHALL HAVE A MINIMUM COMPRRESSIVE STRENGTH F’C = 5,000-psi AT 28-DAYS.
4. THE PORTLAND CEMENT USED IN THE PRECAST SECTION SHALL MEET THE REQUIREMENTS OF TYPE II/V HIGH SULFATE RESISTANT CEMENT.
5. CONCRETE ADHESIVE TO BE APPLIED TO CAST IN PLACE CONCRETE AT JENSEN STORMWATER SYSTEMS.
6. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.
7. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN ANY NPCA CERTIFIED PLANT.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6764-OFFLINE

**HYDRAULIC AND TREATMENT**

STORMWATER QUALITY DESIGN FLOW (SQDF): ≤ 14 - CFS

STORM DRAIN DESIGN CONVEYANCE FLOW: ≤ 24 - CFS

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW: 100 - YRS

DEGREE OF WATER QUALITY CONCENTRATION: ≤ 0.10%

DIVERSION WEIR CREST ELEVATION: XXXX.XX' ±

DIVERSION STRUCTURE/VAULT DIMENSIONS TO BE DETERMINED (TBD) FROM ENGINEERING AND HYDRAULIC & TREATMENT ANALYSES.

**GENERAL NOTES:**


2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE, INSTALL, AND DIVERSION WEIR TO FINISH GRADE WITH INLET AND OUTLET MANHOLE CONNECTED IN BETWEEN THESE STRUCTURES.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY INSTALLATION NOTES:

6. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

7. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-476, C-857 AND LACSD S-A-206, WHEN IN LA COUNTY.

**DIVERSION STRUCTURE DESIGN NOTES:*

1. 100% FULL CAPTURE FOR TRASH & DEBRIS, WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE OFFLINE JDS UNIT.

2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.

3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESSE ENTIRE SQDF.

4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDES:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - NUTRIENTS
   - OIL & GREASE

5. JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6764-OFFLINE

6. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   - FECAL COLIFORM
   - OIL & GREASE
   - NUTRIENTS
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS

7. ALTERNATE HATCH SYSTEMS

**INSTALLATION NOTES:**

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET PIPE MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY DETAILS.

6. ALL DIMENSIONS ARE IN FOOT-INCH.


8. THE PORTLAND CEMENT USED IN THE PRECAST SECTION SHALL MEET THE REQUIREMENTS OF TYPE II/V HIGH SULFATE RESISTANT CEMENT IN ACCORDANCE WITH ASTM C-150.

9. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM, C-476 AND AASHTO M1996.

10. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.

11. ALL PRECAST CONCRETE COMPONENTS TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT.

12. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
24" Ø CAST IRON FRAME AND COVER
ALTERNATE HATCH SYSTEMS
NEATLY AVAILABLE (TYP.)

CONCRETE CASING COLLARS
POURED IN FIELD BY CONTRACTOR

STROM DRAIN DESIGN CONVEYANCE FLOW
XX.XX - CFS

DIVERSION WEIR
XX" Ø HDPE/PVC/RCP
OUTLET PIP.

JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6770-OFFLINE

PROJECTS

11'-10" ± 10'-6"

VARIES

VARIES

VARIES

CONCRETE CASING COLLARS
POURED IN FIELD BY CONTRACTOR

DIVERSION BOX/VAULT STRUCTURE.

STAINLESS STEEL SEPARATION CYLINDER

TABLE OF WATER QUALITY CONSTITUENTS

1. 100% FULL CAPTURE FOR TRASH & DEBRIS,
2. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
3. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH CONDUITS IN BETWEEN STRUCTURES.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY ALTERNATE HATCH SYSTEMS
6. INLET PIPE

SEPARATOR

JDS120-6770-OFFLINE

REACT FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW
XXX - YRS

TABLE OF WATER QUALITY CONSTITUENTS

2. PRECAST FigurALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM-C-478, C-857 AND LACSD S-A-206, WHEN IN LA COUNTY.
3. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F'c = 5,000-psi AT 28-DAYS WITHIN COST.
4. ALL PRECAST CONCRETE COMPONENTS TO BE TRANSPORTED TO THE CONSTRUCTION SITE IN GOOD CONDITION AND TO BE MANUFACTURED IN AN NPCA CERTIFIED PLANT ACCORDANCE WITH ASTM CLASS M C-150.
5. MANHOLE COMPONENTS CONFORM TO CURRENT SPECIFICATIONS, ASTM, C-478 AND AASHTO M1996. FLAT TOPS AND BASE SLABS ARE DESIGNED FOR AASHTO HS-20 WHEEL LOADING HIGH GROUNDWATER CONDITIONS.
6. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
7. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
8. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH CONDUITS IN BETWEEN STRUCTURES.
9. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY DETAILS.
10. ALL DIMENSIONS ARE IN FOOT-INCH.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS120-6794-OFFLINE

HYDRAULICS AND TREATMENT:


2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION VÁULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

4. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN PRECAST FOR ANY QUESTIONS.

6. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION VÁULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

MATERIALS:

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F’c = 5,000-psi AT 28-DAYS.

2. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-478, C-857 AND LACSD S-A-206, WHEN IN LA COUNTY.

3. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

4. THE PORTLAND CEMENT USED IN THE PRECAST SECTION SHALL MEET THE REQUIREMENTS OF TYPE II/V HIGH SULFATE RESISTANT CEMENT IN ACCORDANCE WITH ASTM CLASS M C-150.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN PRECAST FOR ANY QUESTIONS.

6. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION VÁULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

GENERAL NOTES:


2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION VÁULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

4. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN PRECAST FOR ANY QUESTIONS.

MATERIALS:

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F’c = 5,000-psi AT 28-DAYS.

2. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-478, C-857 AND LACSD S-A-206, WHEN IN LA COUNTY.

3. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

4. THE PORTLAND CEMENT USED IN THE PRECAST SECTION SHALL MEET THE REQUIREMENTS OF TYPE II/V HIGH SULFATE RESISTANT CEMENT IN ACCORDANCE WITH ASTM CLASS M C-150.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN PRECAST FOR ANY QUESTIONS.

6. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION VÁULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

GENERAL NOTES:


2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.

4. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION VÁULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.

2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.

3. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

4. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN PRECAST FOR ANY QUESTIONS.

MATERIALS:

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F’c = 5,000-psi AT 28-DAYS.

2. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-478, C-857 AND LACSD S-A-206, WHEN IN LA COUNTY.

3. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

4. THE PORTLAND CEMENT USED IN THE PRECAST SECTION SHALL MEET THE REQUIREMENTS OF TYPE II/V HIGH SULFATE RESISTANT CEMENT IN ACCORDANCE WITH ASTM CLASS M C-150.

5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN PRECAST FOR ANY QUESTIONS.

6. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION VÁULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.
HDPE, FIBERGLASS, OR STAINLESS STEEL

Sheet Size

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ELEVATION VIEW

HYDRODYNAMIC SEPARATOR (HDS), SWIRL CONCENTRATING,

DRAWN BY

REV. DWG. DATE

ORG. DWG. DATE

SCALE:

SHEET NUMBER

www.jensenengineeredsystems.com

SEPARATOR

(877) 649-0095  FAX (775) 440-2013

14'-0"

521 DUNN CIRCLE, SPARKS, NV 89431-6312

CITY, STATE

PROJECT NAME

MODEL:

24

ACCORDANCE WITH ASTM CLASS M C-150.

1. 100% FULL CAPTURE FOR TRASH & DEBRIS ≤ 0.400 in.
2. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE WEF.
4. CEMENT OR OTHER WATER QUALITY CONSTITUENTS INCLUDE:
   • TOTAL SUSPENDED SOLIDS (TSS)
   • ORGANICS
   • PHOSPHORUS
   • NITROGEN
   • Fecal Coliform
   • Nutrients
   • Oil & Grease
   • E.W. & Hydrocarbons
   • Heavy Metals
   • Other

DIVERSION STRUCTURE DESIGN NOTES:

1. FINAL DIVERSION STRUCTURE/VAULT DIMENSIONS TO BE DETERMINED (TBD) FROM ENGINEERING AND HYDRAULIC & ENERGY GRADELINE ANALYSES.
2. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

GENERAL NOTES:

2. FOUNTAIN, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO ADJUST ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.

MATERIALS:

1. ALL DIMENSIONS ARE IN FOOT-INCH.
2. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL COMPLY TO ASTM C 476, C 857 AND LACSD S-206, WHEN IN LA COUNTY.
3. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F'c = 5,000-psi AT 28-DAYS.
4. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

NOTES:

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO ADJUST ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF Frame AND COVER IN FIELD AS NECESSARY.

MATERIALS:

1. ALL DIMENSIONS ARE IN FOOT-INCH.
2. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL COMPLY TO ASTM C 476, C 857 AND LACSD S-206, WHEN IN LA COUNTY.
3. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F'c = 5,000-psi AT 28-DAYS.
4. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

NOTES:

2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO ADJUST ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF Frame AND COVER IN FIELD AS NECESSARY.

MATERIALS:

1. ALL DIMENSIONS ARE IN FOOT-INCH.
2. PRECAST MATERIALS AND MANUFACTURING METHODS SHALL COMPLY TO ASTM C 476, C 857 AND LACSD S-206, WHEN IN LA COUNTY.
3. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F'c = 5,000-psi AT 28-DAYS.
4. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.

NOTES:

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4. JENSEN STORMWATER SYSTEMS TO PROVIDE JDS AND DIVERSION BOX/VAULT TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO ADJUST ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF Frame AND COVER IN FIELD AS NECESSARY.

MATERIALS:

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3. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F'c = 5,000-psi AT 28-DAYS.
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NOTES:

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2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO ADJUST ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF Frame AND COVER IN FIELD AS NECESSARY.
STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 31.2 - CFS
STORM DRAIN DESIGN CONVEYANCE FLOW XX.XX - CFS
RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW XXX - YRS
DIVERSION WEIR CREST ELEVATION XXXX.XX' ±
DIVERSION BOX/EVALUATE TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

INSTALLATION NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
5. CONCRETE CASING COLLARS AROUND INLET AND OUT CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY ADDITIONAL INSTRUCTIONS.

GENERAL NOTES:
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR ALTERNATE HATCH SYSTEMS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE: JDS AND DIVERSION BOX/EVALUATE TO FINISHED GRADE WITH INLET & OUTLET CONDUITS BETWEEN THESE STRUCTURES.

DIVERSION STRUCTURE DESIGN NOTES:
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3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
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GENERAL NOTES:
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5. CONCRETE CASING COLLARS AROUND INLET AND OUT CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY ADDITIONAL INSTRUCTIONS.

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3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR ALTERNATE HATCH SYSTEMS.
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1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PRECAST CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
5. CONCRETE CASING COLLARS AROUND INLET AND OUT CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY ADDITIONAL INSTRUCTIONS.
2. Foundation, subgrade, and backfill to be designed by others.
3. Foundation elevation is assigned to be below the bottom of precast structure. Contact Jensen Stormwater Systems for high groundwater conditions.
4. Jensen Stormwater Systems to provide JDS and diversion box/vault to finished grade with inlet & outlet conduits between these structures.

**Installation Notes:**

1. Contractor to verify all dimensions and elevations in field prior to installation.
2. Precast concrete joints to be sealed using Butyl rubber compound supplied by orange precast.
3. Contractor to grout all pipe penetrations in precast concrete openings in field as necessary.
4. Contractor to adjust elevation of frame and cover in field as necessary.
5. Concrete casing collars around inlet and outlet conduits must be poured in field by contractor. Contact Jensen for all inquiries.

**Materials:**

1. All dimensions are in feet-inch.
3. Concrete shall have a minimum compressive strength f'c = 5,000 psi at 28-days.
4. Foundation, subgrade, and backfill to be designed by others.
5. Foundation elevation is assigned to be below the bottom of precast structure. Contact Jensen Stormwater Systems for high groundwater conditions.
6. Jensen Stormwater Systems to provide JDS and diversion box/vault to finished grade with inlet & outlet conduits between these structures.

**Application Notes:**

1. Final diversion structure/vault dimensions to be determined (TBD) from engineering and hydraulic & energy grade line analyses.
2. For complete design and product information, contact Jensen Stormwater Systems.

**JENSEN DEFLECTIVE SEPARATOR, MODEL JDS144-94114-OFFLINE**

**Overview:**

1. 100% full capture for trash & debris, 25 mm.
2. Jensen Deflective Separator is a non-blocking screening unit.
3. Jensen Deflective Separator designed to process entire sewer.
4. Capture of other water quality constituents include:
   - Total Suspended Solids (TSS)
   - Oil & Grease
   - Heavy Metals
   - Total Pollutants
   - Nutrients

**Industrial Treatment:**

1. Stormwater treatment unit employing the continuous deflective separation treatment process to produce a non-blocking screening system with fine concentration. The deployment of this hydrodynamic separation treatment unit in the shown configuration shown on this sheet requires a separate diversion structure constructed within the pipeline alignment to divert the stormwater quality flows listed in the table above as well as ensure the width of the pipeline conveyance flow without scour of captured solids from the offsite JDS unit.

**General Notes:**

1. Foundation, subgrade, and backfill to be designed by others.
2. Foundation elevation is assigned to be below the bottom of precast structure. Contact Jensen Stormwater Systems for high groundwater conditions.
3. Jensen Stormwater Systems to provide JDS and diversion box/vault to finished grade with inlet & outlet conduits between these structures.

**Installation Notes:**

1. Contractor to verify all dimensions and elevations in field prior to installation.
2. Precast concrete joints to be sealed using Butyl rubber compound supplied by orange precast.
3. Contractor to grout all pipe penetrations in precast concrete openings in field as necessary.
4. Contractor to adjust elevation of frame and cover in field as necessary.

**Materials:**

1. 100% full capture for trash & debris, 25 mm.
2. Jensen Deflective Separator is a non-blocking screening unit.
3. Jensen Deflective Separator designed to process entire sewer.
4. Capture of other water quality constituents include:
   - Total Suspended Solids (TSS)
   - Oil & Grease
   - Heavy Metals
   - Total Pollutants
   - Nutrients

**Application Notes:**

1. Final diversion structure/vault dimensions to be determined (TBD) from engineering and hydraulic & energy grade line analyses.
2. For complete design and product information, contact Jensen Stormwater Systems.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS192-12072-OFFLINE

HYDRAULICS AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (SQDF) ≤ 28 - CFS

RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW

99% - 10 YR

HYDRAULIC GRADE LINE EXCURSIONS PER 1500' ± 2.5'

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PROCESS A NON-BLOCKING WATER QUALITY FLOWblind to additional filtering and cleaning devices. The equipment is designed to provide 100% full capture of trash and debris, and to divert all stormwater and treatment flows from capturing solids from the pipeline conveyance flow. The separation cylinder captures the majority of trash and debris, and permits the bypass of the pipeline conveyance flow.

TREATMENT:

1. 100% FULL CAPTURE FOR TRASH & DEBRIS, WITHOUT SCOUR OF CAPTURED SOLIDS FROM THE OFFLINE JDS UNIT.
2. JENSEN DEFLECTIVE SEPARATOR IN A NON-DEFLECTIVE SCREENING UNIT.
3. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SELF.
4. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDES:
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - VITAL POLLUTANTS
   - Fecal Coliform
   - Heavy Metals
   - Nutrients
   - Oil & Grease
   - Total Suspended Solids (TSS)

DIVERSION STRUCTURE DESIGN NOTES:

1. FINAL DIVERSION STRUCTURE CONFIGURATIONS TO BE DETERMINED FROM ENGINEERING AND HYDRAULIC & ENERGY GRADELINE ANALYSES.
2. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.

GENERAL NOTES:

2. FOUNDATIONS, SURFACES, AND MACHINES TO BE DESIGNED BY OTHERS.
3. GROUNDWATER ELEVATION IS ASSUMED TO BE BELOW THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR HIGH GROUNDWATER CONDITIONS.
4. JENSEN STORMWATER SYSTEMS TO PROVIDE; JDS AND DIVERSION BOOKEHIT TO FINISHED GRADE WITH INLET & OUTLET CONDUCTS BETWEEN THOSE STRUCTURES.

INSTALLATION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. PREFAB CONCRETE JOINTS TO BE SCALED USING JENSEN PRECAST SUPPLIED BY JENSEN PRECAST.
3. CONTRACTOR TO ADJUST ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
5. CONTRACTOR TO USE SPECIAL CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS.
6. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
7. CONTRACTOR TO SEAL JOINTS WITH BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
8. CONTRACTOR TO PLACE CONCRETE CASING COLLARS IN FIELD AS NECESSARY.

ADDITIONAL:

1. ALL DIMENSIONS ARE IN FOOT-INCH.
2. PREFAB MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-476, C-857 AND LACSD S-A-206, WHEN IN LA COUNTY.
3. CONCRETE JOINTS TO BE SEALED WITH BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
4. CONTRACTOR TO ADJUST ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
5. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
6. CONTRACTOR TO PLACE CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUCTS.
7. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
8. PREFAB CONCRETE JOINTS TO BE SEALED USING JENSEN PRECAST SUPPLIED BY JENSEN PRECAST.
9. CONTRACTOR TO ADJUST ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
JENSEN DEFLECTIVE SEPARATOR, MODEL JDS192-120120-OFFLINE

HYDROSYSTEM AND TREATMENT:

STORMWATER QUALITY DESIGN FLOW (QSTW):

100% FULL CAPTURE, NON-BLOCKING SCREENING UNIT

RETURN FREQUENCY (PERIOD) OF RAIN DESIGN CONVEYANCE FLOW:

XX.XX - YRS

STORMWATER QUALITY DESIGN FLOW (SQDF):

≤ 61 - CFS

RETURN FREQUENCY (PERIOD) OF PIPELINE CONVEYANCE FLOW:

XX.XX - YRS

INSTALLATION NOTES:

1. CONTRACTOR TO INSTALL TWO MANHOLE SYSTEMS ALONG THE OUTER PERIMETER OF THE DIVERSION STRUCTURE.

2. CONTRACTOR TO PROVIDE ALL CONCRETE JOINTS WITH A NON-BLOCKING SCREENING UNIT.

3. CONTRACTOR TO PROVIDE ALL CONCRETE JOINTS WITH A NON-BLOCKING SCREENING UNIT.

4. CONTRACTOR TO INSTALL A SECOND SEPARATION CYLINDER AT THE OUTER PERIMETER OF THE DIVERSION STRUCTURE.

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6. CONTRACTOR TO INSTALL A SECOND SEPARATION CYLINDER AT THE OUTER PERIMETER OF THE DIVERSION STRUCTURE.

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29. CONTRACTOR TO INSTALL A SECOND SEPARATION CYLINDER AT THE OUTER PERIMETER OF THE DIVERSION STRUCTURE.

30. CONTRACTOR TO INSTALL A SECOND SEPARATION CYLINDER AT THE OUTER PERIMETER OF THE DIVERSION STRUCTURE.
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EXHIBIT C

Dual Offline *JDS* Units

Example

Plan and Profile Drawings
1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
2. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
3. FOUNDATION ELEVATION IS ASSUMED TO BE ABOVE THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR DESIGN GUIDELINES.
4. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
5. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY REQUIRED SPECIFICATIONS.
6. CONCRETE CASING COLLARS AROUND INLET AND OUTLET CONDUITS MUST BE POURED IN FIELD BY CONTRACTOR. CONTACT JENSEN FOR ANY REQUIRED SPECIFICATIONS.
7. CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
8. FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN STORMWATER SYSTEMS.
10. JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.
11. JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.
12. CONTRACTOR TO GROUT ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
13. JENSEN DEFLECTIVE SEPARATOR, MODEL JDS144-94102-DUAL-OFFLINE.
14. HYDRAULIC SEPARATOR (HDS), SWIRL CONCENTRATING, SCALE:SHEET NUMBER.
15. REMAINING CONSTRUCTION IS SHOWN. ALTERNATE CONFIGURATIONS ARE READILY AVAILABLE. CONTACT JENSEN STORMWATER SYSTEMS FOR CUSTOM DESIGNS. www.jensenengineeredsystems.com.
16. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
17. CONTRACTOR TO ASSURE ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
18. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
19. CONTRACTOR TO ASSURE ALL PIPE PENETRATIONS IN PRECAST CONCRETE OPENINGS IN FIELD AS NECESSARY.
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35. CONCRETE JOINTS TO BE SEALED USING BUTYL RUBBER COMPOUND SUPPLIED BY JENSEN PRECAST.
36. FOUNDATION, SUBGRADE, AND BACKFILL TO BE DESIGNED BY OTHERS.
37. FOUNDATION ELEVATION IS ASSUMED TO BE ABOVE THE BOTTOM OF PRECAST STRUCTURE. CONTACT JENSEN STORMWATER SYSTEMS FOR DESIGN GUIDELINES.
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47. CONTRACTOR TO ADJUST ELEVATION OF FRAME AND COVER IN FIELD AS NECESSARY.
48. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO INSTALLATION.
EXHIBIT D

INSTALLATION GUIDE

INTERNAL COMPONENT ASSEMBLY

for

YARD & FIELD

Inline *JDS* Units
WEIR CYLINDER

STAINLESS STEEL SCREEN

PRECAST CONCRETE
SEPARATION
CHAMBER
TOOLS REQUIRED FOR INSTALLATION

- RECIPROCATING SAW
- ROTARY HAMMER
- 3/8" Ø MASONRY BIT FOR 3-1/4" WEDGE ANCHORS
- RATCHET WRENCH
- 3/4" SOCKET FOR 1/2" BOLTS
- 9/16" SOCKET FOR 3/8" WEDGE ANCHORS
- ADJUSTABLE CRESCENT WRENCH
- MALLET HAMMER
- SEALANT GUN
- WATER TIGHT SEALANT
- TAPE MEASURE
- PAINT MARKER OR EQUAL
COMPONENTS AND HARDWARE

1. WEIR CYLINDER
2. STAINLESS STEEL SCREEN/CYLINDER
3. TOTAL OF (4) 1/2" Ø x 1-1/2" LONG BOLTS
4. TOTAL OF (12) 1/2" Ø FLAT WASHERS
5. TOTAL OF (4) 1/2" Ø LOCK WASHERS
6. TOTAL OF (4) 1/2" Ø HEX NUTS
7. TOTAL OF (8) 3/8" Ø X 3-1/4" LONG WEDGE ANCHORS
1. POSITION WEIR CYLINDER UPSIDE DOWN AS SHOWN ON FIGURE JDS-1.
2. PLACE S.S. SCREEN WITH THE TOP SIDE SETTING ON WEIR CYLINDERS FLANGE AS SHOWN ON FIGURE JDS-2.
3. USE MARKER TO MATCH S.S. SCREEN FLANGE HOLES TO WEIR CYLINDER.
4. USE 9/16" BIT TO MATCH DRILL HOLES ON WEIR CYLINDER.
5. ONCE HOLES ARE DRILLED, MATCH CYLINDER S.S. SCREEN AGAIN AS SHOWN ON FIGURE JDS-2.
6. USE (4) 1/2" Ø x 1-1/2" LONG BOLTS, (8) 1/2" Ø FLAT WASHERS, (4) 1/2" Ø LOCK WASHERS, AND (4) 1/2" Ø HEX NUTS TO CONNECT WEIR CYLINDER AND S.S. SCREEN. AS SHOWN ON FIGURE JDS-3.
7. ROTATE WEIR CYLINDER AND S.S. SCREEN ASSEMBLY INTO UPRIGHT POSITION. USE MECHANICAL MEANS IF AVAILABLE.
8. LIFT ASSEMBLY INTO PRECAST CONCRETE SEPARATION CHAMBER. USE MECHANICAL MEANS TO LIFT IF AVAILABLE.
9. CENTER S.S. SCREEN OVER OPENING IN PRECAST SEPARATION SLAB. ROTATE ASSEMBLY AS NECESSARY SO INLET PIPE ENTERS AT CORRECT LOCATION. SEE FIGURE JDS-4 ON PAGE 5.

10. SECURE S.S. SCREEN TO SEPARATION SLAB USING ROTARY HAMMER, 3/8" Ø WEDGE ANCHORS, HAMMER, ETC. USE TABS AS SHOWN IN FIGURE JDS-2, THIS PAGE.

11. SECURE WEIR CYLINDER TO INSIDE OF PRECAST CONCRETE COMPONENT BY DRILLING THROUGH WEIR CYLINDER AND USING (4) 3/8" Ø WEDGE ANCHORS WITH (4) 1/2" Ø FLAT WASHERS. SEE FIGURE JDS-5, THIS PAGE.
12. USE RECIPROCATING SAW TO CUT WEIR CYLINDER FOR INLET PIPE ACCESS. USE WATER TIGHT SEALANT TO SEAL BETWEEN WEIR CYLINDER AND CONCRETE. SEE FIGURE JDS-6.
EXHIBIT E

Example Specifications For Inline JDS72-3624 Unit Performance Product Material and Installation Specifications
GENERAL SWTU SPECS

1.1 Scope

The Contractor shall install a precast storm water treatment unit(s) (SWTUs) in accordance with the notes and details shown on the drawings and in conformance with these Specifications. The precast SWTU(s) shall be a (2.0)-cubic foot per second (-cfs [-ft³/s]) treatment flow rate capacity Jensen Deflective Separator (JDS), model JDS72-3624 as manufactured by Jensen Precast. This type of SWTU(s) is typically categorized as a Hydrodynamic Separation (HDS) unit.

The Contractor shall furnish all labor, equipment and materials necessary to install the SWTU(s) along with any required appurtenances. The SWTU(s) shall be a precast underground structure capable of achieving the treatment and hydraulic performance and materials requirements of these SWTU(s), Stormwater Quality Specifications.

The SWTU(s) shall be non-mechanical and gravity driven. The SWTU(s) shall come equipped with a stainless steel expanded metal screen cylinder configured in the separation chamber. This expanded screen shall have openings of (4,700)-micron (0.185 inches). The treatment flow through the separation screen cylinder assembly shall be self-cleaning and non-blocking for all flows diverted to it, even when flows within the storm drain pipeline exceed the SWTU's treatment flow capacity listed above.

SWTU(s) must have approval prior to implementation.

The following specifications sections also apply to the installation of this SWTU

Excavation & Backfill Specification Section
Shoring Specification Section
Dewatering Specification Section

SWTU(s) TREATMENT, HYDRAULIC AND MATERIALS SPECS

2.1 PERFORMANCE

A. Solids Removal Efficiencies (RE%)

1. The specified SWTU(s), is a Full Capture shall capture and retain 98% of all gross solid trash and debris particles ≥ 5-mm than (≥) 5-mm = 0.196-in ≈
25/128-in.

2. Particles ≥ 5-mm shall not pass through the unit when operating at or below its Full Capture treatment flow rate of 2.0-cfs. Additionally, 98% of these solids shall be retained in the unit when flows exceed 2.0-cfs.

3. The unit shall not release, “Burp” previously capture solids under any flow condition.

4. The SWTU(s) shall be capable of achieving an 80 percent (%) average annual reduction in the total suspended solids (TSS).

5. The SWTU(s) shall be capable of capturing and retaining 100% of pollutants greater than or equal to (≥) 4.7-millimeters (mm) regardless of the specific gravity of the pollutant, whether the pollutant is a floatable or neutrally buoyant for flows up to the SWTU’s water quality design treatment flow rate capacity.

6. There shall be no flow path through the SWTU(s)’ listed treatment flow capacity that allows the passage of a 4.7-mm or larger neutrally buoyant object. The SWTU(s) must have positive, non-blocking screening process.

7. The SWTU(s) shall be designed to retain all previously captured pollutants even during bypass flow conditions.

8. The SWTU(s) device shall be capable of achieving greater than 65% removal efficiency (RE%) of particles typically found in roadside sediments.

9. Solids RE% shall be supported by independent third-party research utilizing Particle Size Distributions consistent with the New Jersey Department of Environmental Protection’s or the City of Indianapolis’s SW BMP certification programs in accordance with their evaluation protocols or a (PSD) consistent with the National Urban Runoff Program’s (NURP) findings.

10. The SWTU(s) shall be capable of capturing and retaining Total Petroleum Hydrocarbons (TPH), also known as oils and greases (O&G). The SWTU(s) shall be capable of achieving the following RE%TPH:

   • RE%TPH = 92% when hydraulically loaded at 25% percent of its rated-treatment capacity.

   • RE%TPH = 78% when hydraulically loaded at 50% percent of its rated-treatment capacity.

These RE%TPH shall be based on independent third-party research for
influent oil concentrations representative of storm water runoff of 20-mg/L, ± 5-mg/L.

8. The SWTU(s) shall be greater than 99% effective in controlling oil spills during dry weather.

9. The SWTU(s) shall be capable of utilizing sorbent media to enhance removal and retention of petroleum based pollutants.

B. **Treatment Sizing Criteria:** The treatment sizing methodology and design criteria for this SWTU(s) shall conform to the following:

1. The specified SWTU(s), is a Full Capture non-blocking screening device designed in accordance with the governing tenets of the continuous deflective separation treatment process for the capture and retain 98% of all gross solid trash and debris particles ≥ 5-mm than (≥) 5-mm = 0.196-in ≈ 25/128-in. Particles ≥ 5-mm shall not pass through the unit when operating at or below its Full Capture treatment flow rate of 2.0-cfs. Additionally, 98% of these solids shall be retained in the unit when flows exceed 2.0-cfs. The unit shall not release, “Burp” previously capture solids under any flow condition.

2. treatment of the water quality runoff rate at its critical flow depth in the inlet, to achieve a RE% = 80% for TSS. This 80% TSS RE% shall be based on an average particles size of D₅₀=63-microns (μm).

3. The specified SWTU(s), is a swirl concentrating non-blocking screening HDS designed in accordance with the governing tenets of the continuous deflective separation treatment process for the treatment of the water quality runoff rate at its critical flow depth in the inlet, to achieve a RE% = 80% for TSS. This 80% TSS RE% shall be based on an average particles size of D₅₀=63-microns (μm).

4. This HDS, vortex-type separation system has been designed so that the surface hydraulic loading rate in the plan view of the separation chamber does not exceed 24-gpm/ft² at any time of operation up to the SWTU’s treatment flow rate listed above.

C. **Alternative SWTUs:** Alternative SWTU(s) may be considered and must be approved before implementation. At a minimum, an alternative SWTU(s) system shall have treatment sizing methodology and design criteria that conform with these entire specifications to include the following:

1. Alternative-Gravity-based separation systems based on “Stokes Law” for gravity settling of particles shall not have a surface hydraulic loading rate in their primary sedimentation chamber that exceeds 6-gpm/ft², plan view, at
the peak of the treatment flow rate. Solids RE% claims of 80% TSS removal based on an average particles size of \(D_{50}=63-\mu m\) when the unit has a surface hydraulic loading rate, in the plan view, more than 6-gpm/ft\(^2\) will not be accepted.

These gravity units shall not exceed laminar flow condition parameters in their primary treatment chamber. Additionally, they will be design to include a bypass system to prevent turbulence from occurring in their primary treatment sedimentation chamber.

2. The performance of alternative treatment processes shall have been evaluated by a third party and verified in a program that allows a reasonable comparison to other technologies on an essentially equal Particle Size Distribution (PSD) basis.

3. Solids RE% performance should be third party verified, and removal efficiencies across the spectrum of particle sizes reported, at a range of hydraulic loading rates varying over a range of at least 25% to 125% of the manufacturer’s advertised ‘water treatment’ loading rate.

4. The manufacturer of an alternative SWTU shall be vetted to confirm their suitability to provide an acceptable SWTU. At a minimum, alternative manufacturer shall have been regularly engaged in the engineering design and production of stormwater treatment systems deployed for at least five (5) years with a proven record of providing quality SWTUs as well as a history of successful production and delivery.

A. Hydraulic Treatment and Bypass Capacity

1. The SWTU shall have a treatment flow rate capacity of not less than 1.29-cfs (ft\(^3/s\)), before bypass flow is allowed.

2. The SWTU shall maintain the peak conveyance capacity of the drainage network as defined by the Engineer.

B. Solids and Oil Storage Capacity

1. The SWTU shall be designed with a sump chamber for the storage of captured sediments and other negatively buoyant pollutants in between maintenance cycles. The minimum storage capacity provided by the sump chamber shall be 2.1 cubic yards (yd\(^3\)).

The sump chamber shall be hydraulically and physically separate from the treatment process flow path of the SWTU(s) to minimize re-suspension
potential of fine particles. Access ways shall be no smaller in diameter then 20-inches.

2. The SWTU shall have an oil storage capacity of 146-gallons for retention of oil and fuel spills during dry-weather.

4.2 MATERIALS

A. Precast Concrete Components: Precast concrete components shall conform to applicable sections of ASTM C 478, ASTM C 857 and ASTM C 858 and the following:
   1. Concrete shall achieve a minimum 28-day compressive strength of 3,000 pounds per square-inch (psi);
   2. Unless otherwise noted, the precast concrete sections shall be designed to withstand lateral earth and AASHTO H-20 traffic loads;
   3. Cement shall conform to ASTM C 150;
   4. Aggregates shall conform to ASTM C 33;
   5. Reinforcing steel shall be deformed billet-steel bars, welded steel wire or deformed welded steel wire conforming to ASTM A 615, A 706, A 185 or A 497; and
   6. Joints shall be sealed with preformed joint sealing compound conforming to ASTM C 990.

B. Internal Components and Appurtenances: Internal Components and Appurtenances shall conform to the following:

   1. Screen and support structure shall be manufactured of Type 316 and 316L stainless steel;
   2. Connection hardware shall be manufactured of Type 316 stainless steel;
   3. Inlet Weir Cylinder shall be manufactured from high density polypropylene (HDPE), marine grade aluminum or stainless steel 304 or 316; and
   4. Access system(s) shall conform to the following:
      a. Manhole cast iron frames and covers shall withstand AASHTO H-20 loadings and cast-iron material shall conform to ASTM A 48 Class 30.
      b. Hatch systems shall be designed to withstand the site loading
conditions, and shall be manufactured from either steel or aluminum and must be approved before implementation.

4.3 MANUFACTURER

In accordance with these Specifications and the Drawings, the SWTU(s) shall be a Jensen Deflective Separator (JDS) SWTU manufactured by:

Jensen Stormwater Systems
521 Dunn Circle
Sparks, NV 89431
(877) 649-0095

INSTALLATION SPECS

3.1 HANDLING AND STORAGE: The contractor shall handle and store the SWTU and any of its components with care upon receipt and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted and unloading has commenced shall be the responsibility of the contractor.

3.2 INSTALLATION

A. The SWTU shall be installed in accordance with the manufacturer’s recommendations, these specifications, and per the drawings. The manufacturer shall provide the contractor installation instructions and offer guidance during critical stages of the installation. Reasonable notice shall be provided to the manufacturer prior to installation to coordinate onsite guidance.

B. The contractor shall grout fill all voids in the precast concrete that are associated with lifting connection pockets in the concrete sections. Use non-shrink grout to fill pockets and strike flush with adjacent finished surfaces. The contractor shall trim all protruding lifting provisions flush with the adjacent concrete surface, leaving no sharp points or edges.

C. Inspection: All components shall be subject to inspection by the Engineer at the place of manufacture and/or installation. All components are subject to be rejected or identified for repair if the quality of materials and manufacturing do not comply with the requirements of this specification. Components which have been identified as defective may be subject for repair. Final acceptance of the component is at the discretion of the Engineer.

3.3 SUBMITTALS

A. Shop Drawings & Catalog Cut Sheets Details: The contractor shall submit shop drawings for approval by the Engineer. Shop drawings shall be annotated to indicate
all materials to be used and all applicable standards for materials, required tests of
materials, and design assumptions for structural analysis. The shop drawings shall
detail horizontal and vertical dimensioning, reinforcement, and pipe type and
locations. Supporting Catalog Cut Sheets of associated components and
appurtenances shall also be included in the submittal packet substantiating materials
and dimensions.

B. Warranty: The manufacturer shall guarantee the SWTU(s) components against all
manufacturer-originated defects in materials or workmanship for a period of
twelve (12) months from the date of installation. The manufacturer shall be
notified of repair/replacement issues in writing within the referenced warranty
period. The manufacturer shall, upon its determination: repair, correct or replace
any manufacturer-originated defects identified by the written notice within the
referenced warranty period. The use of SWTU components shall be limited to the
application for which it was specifically designed.

C. Manufacturer’s Performance Certificate: The SWTU manufacturer shall submit a
“Manufacturer’s Performance Certification” certifying that each SWTU can
achieve the specified removal efficiencies as listed in these specifications. The
certification shall be supported by pervious independent third-party research of the
continuous deflective treatment process.
### Jensen Deflective Separator (JDS)

Stormwater Treatment Units (SWTUs), Hydrodynamic Separator (HDS), Full Capture (FC), Non-Blocking Screening, Swirl Concentrating Units

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<td>JDS384-288192</td>
<td>273</td>
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<td>208.5</td>
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1. This depth below pipe invert may vary in accordance with regional precast capacities. Sump base and separation slab thickness vary by few inches across regional Jensen Precast Facilities: AZ, CA, HI & NV. Custom height sumps readily available.

2. "G" Suffix on the model number means that unit is configured to receive flow from a grated drop or curb inlet.

3. This is an approximate storage volume. Final Storage volume varies as a function of the outlet pipe diameter.
EXHIBIT F

Project Example

Operations & Maintenance Manual
Operations & Maintenance
Operations and Maintenance Guidelines for the

Jensen Deflective Separator (JDS) Unit Model JDS72-3624

Project:   West River Street Bike Lane

Location:  Town Of Truckee, CA

Subject:   Stormwater Treatment / Water Quality Unit

INTRODUCTION

The Jensen Deflective Separator (JDS) Stormwater Treatment unit (SWTU) is an important and effective component of the stormwater management program and proper operation and maintenance of the unit are essential to demonstrate project’s compliance with local, state and/or federal water pollution control requirements.

The JDS SWTU features the Continuous deflective separation non-blocking, indirect screening technique to treat Stormwater runoff and is highly effective in capturing floatables, suspended solids, large particles and even fine sediments. Because of its non-blocking screening capacity, the JDS unit is un-matched in its ability to capture and retain gross pollutants such as trash and debris that are greater than 0.05 inch. In addition it is also very effective in capturing 80-90% of fine sand particles and other storm water pollutants to such as free oil and grease when sorbents are placed in the separation chamber.

OPERATIONS

The JDS unit is a non-mechanical self-operating system and will function any time there is flow in the storm drainage system. The unit will continue to effectively capture pollutants even during extreme rainfall events when the influent flow exceeds the design flow. The pollutants captured previously in the JDS unit’s separation chamber and sump will be retained even when the units design capacity is exceeded.

JDS UNIT CLEANOUT

The frequency of cleaning the JDS unit will depend upon the accumulation of trash, debris and sediments based on the application and the land use activity in the drainage watershed. Cleanout and preventive maintenance schedules shall be determined based on operating experience unless precise pollutant loadings have been determined. The unit should be periodically inspected to determine the amount of accumulated pollutants
and to ensure that the cleanout frequency is adequate to handle the predicted pollutant load being processed by the JDS unit. The recommended cleanout of solids within the JDS unit’s sump should be done at 50% to 75% of the sump capacity; however, there will be no significant impact to the JDS unit’s performance even when the accumulated solids exceeds 75% of the sump’s capacity.

Access to the JDS unit is typically achieved through the manhole access cover. The access cover allows for the inspection and cleanout of the separation chamber (screen/cylinder) & sump.

Recommendations for Achieving Optimal Performance from JDS SWTU:

NEW INSTALLATIONS – The condition of the unit should be checked after every runoff event for the first 30 days. The visual inspection should ascertain that the unit is functioning properly (no blockages or obstructions to inlet and/or separation screen), measuring the amount of solid materials that have accumulated in the sump, the amount of fine sediment accumulated behind the screen, and determining the amount floating trash and debris in the separation chamber. This can be done with a calibrated “dip stick” so that the depth of deposition can be tracked. Schedules for inspections and cleanout should be based on storm events and pollutant accumulation.

ONGOING OPERATION – During the rainfall season, the unit should be inspected at least once every 30 days. The floatables should be removed and the sump cleaned when it is 50-75% full. If floatables accumulate more rapidly than the settleable solids, the floatables should be removed using a vactor truck or dip net before the layer thickness exceeds one to two feet.

Cleanout of the JDS unit at the end of a rainfall season is recommended because of the nature of pollutants collected and the potential for odor generation from the decomposition of material collected and retained. This end of season cleanout will assist in preventing the discharge of pore water from the JDS unit during summer months.

USE OF SORBENTS – It needs to be emphasized that the addition of sorbents is not a requirement for the JDS units to effectively control oil and grease from storm water. The conventional oil baffle within the unit assures satisfactory oil and grease removal. However, the addition of sorbents will enhance the capacity to capture oil and grease beyond that attainable by conventional oil baffle systems.
Under normal operations, JDS units will provide effluent concentrations of oil and grease that are less than 15 parts per million (ppm) for all dry weather spills where the volume is less than or equal to the spill capture volume of the JDS unit. During wet weather flows, the oil baffle system can be expected to remove between 40 and 70% of the free oil and grease from the storm water runoff.

**Jensen** only recommends the addition of sorbents to the separation chamber if there are specific land use activities in the catchment watershed that could produce exceptionally large concentrations of oil and grease in the runoff; concentration levels well above typical amounts. If site evaluations merit an increased control of free oil and grease then oil sorbents can be added to the JDS unit to thoroughly address these particular pollutants of concern.

**Recommended Oil Sorbents**

ClearTec™ Rubberizer® products sorb and transform into a rubber-like material many petroleum products to include typical oil and greases in stormwater runoff. **Jensen** recommends Rubberizer® Particulate 8-4 mesh Particulate for Filtration, HPT4100 or equal. Rubberizer® is supplied by Haz-Mat Response Technologies, Inc. 4626 Santa Fe Street, San Diego, CA 92109 (800) 618-13856, [www.rubberizer.com](http://www.rubberizer.com).

The amount of sorbent to be added to the JDS separation chamber can be determined if sufficient information is known about the concentration of oil and grease in the runoff. Frequently the actual concentrations of oil and grease are too variable and the amount to be added and frequency of cleaning will be determined by periodic observation of the sorbents.

As an initial application, it is recommended that approximately 4 to 8 pounds of sorbent material be added to the separation chamber of the JDS units per acre of parking lot or road surface per year. Typically this amount of sorbent results in a ½ inch to one (1”) inch depth of sorbent material on the liquid surface of the separation chamber. The oil and grease loading of the sorbent material should be observed after major storm events. Oil Sorbent material may also be furnished in pillow or boom configurations.

The sorbent material should be replaced when it is fully discolored by skimming the sorbent from the surface. The sorbent may require disposal as a special or hazardous waste, but will depend on local and state regulatory requirements.
CLEANOUT AND DISPOSAL

A vactor truck is recommended for cleanout of the JDS unit and can be easily accomplished in less than 30-40 minutes for most installations. Standard vactor operations should be employed in the cleanout of the unit. Disposal of material from the JDS unit should be in accordance with the local municipality’s requirements.

Disposal of the decant liquid/material to a Publically Operated Waste Water Treatment Plant is recommended. Field decanting to the storm drainage system is not recommended, unless through a proven fine filtration process.

Solids can be disposed of in a similar fashion as those materials collected from street sweeping operations and catch-basin cleanouts.

MAINTENANCE

The JDS unit should be pumped down at least once a year and a thorough inspection of the separation chamber (inlet/cylinder and separation screen) and oil baffle should be performed. The unit’s internal components should not show any signs of damage or any loosening of the bolts used to fasten the various components to the manhole structure and to each other. Ideally, the screen should be power washed for the inspection. If any of the internal components are damaged or if any fasteners appear to be damaged or missing, please contact Jensen Precast (Jensen Stormwater Systems) to make arrangements to have the damaged items repaired or replaced:

Jensen Stormwater Systems (Jensen Precast)
521 Dunn Circle
Sparks, NV 89431
Toll Free:  (877) 649-0095
Fax:   (775) 440-2013

The screen assembly is fabricated from ASTM Type 316 stainless steel and fastened with Type 316 stainless steel fasteners that are easily removed and/or replaced with conventional hand tools. Damaged screen assembly should be replaced with the new expanded metal screen assembly placing the expanded apertures in the same orientation as existing screen section that was removed.
CONFINED SPACE

The JDS unit is a confined space environment and only properly trained personnel possessing the necessary safety equipment should enter the unit to perform maintenance or inspection procedures. Inspections of the internal components can, in most cases, be accomplished through observations from the ground surface.

RECORDS OF OPERATION AND MAINTENANCE

JDS recommends that the owner maintain annual records of the operation and maintenance of the JDS unit to document the effective maintenance of this important component of your storm water management program. The attached Annual Record of Operations and Maintenance form (see Appendix A) is suggested and should be retained for a minimum period of three years.
Appendix A

Annual record of Operations & Maintenance and Clean Out Sketch
Jensen Deflective Separator (JDS) ANNUAL RECORD OF OPERATION AND MAINTENANCE

OWNER: __________________________________________________________

ADDRESS: _______________________________________________________

OWNER REPRESENTATIVE: ___________________ PHONE: __________________

JDS INSTALLATION:

MODEL DESIGNATION: ___________________ DATE: ___________________

SITE LOCATION: ___________________________________________________

DEPTH FROM COVER TO BOTTOM OF SUMP: _____________________________

VOLUME OF SUMP: ________ CUYD VOLUME/INCH DEPTH: ________ CUYD

INSPECTIONS:

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<th>DATE/INSPECTOR</th>
<th>SCREEN INTEGRITY</th>
<th>FLOATABLES DEPTH</th>
<th>SEDIMENT VOLUME</th>
<th>SORBENT DISCOLORATION</th>
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OBSERVATIONS OF FUNCTION: ___________________________________________

CLEANOUT:

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<th>DATE</th>
<th>VOLUME FLOATABLES</th>
<th>VOLUME SEDIMENTS</th>
<th>METHOD OF DISPOSAL OF FLOATABLES, SEDIMENTS, DECANT AND SORBENTS</th>
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</table>

OBSERVATIONS OF FUNCTION: ___________________________________________

SCREEN MAINTENANCE:

DATE OF POWER WASHING, INSPECTION AND OBSERVATIONS: __________________

CERTIFICATION: ___________________ TITLE: _______________ DATE: ___________
CLEAN OUT SKETCH - JENSEN DEFLECTIVE SEPARATOR (JDS) STORMWATER TREATMENT UNIT

36" FRAME AND COVER

10'-3½" MIN. DEPTH TO SOLID MATERIAL STORED IN SUMP

36" Ø CYLINDER

36" Ø SCREEN

SUMP

SOLIDS

REMOVE SOLIDS PRIOR TO EXCEEDING 50% OF SUMP CAPACITY.

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Appendix B

Site Location Plans
INSTALL JENSEN DEFLECTIVE SEPARATOR (JDS) MODEL JDS72-3624 STORMWATER TREATMENT UNIT (SWTU) INSTALLATION PLAN AND PROFILE DETAIL ATTACHED

EXTERIOR INVERT ELEV = 5813.9
Appendix C
Plan & Profile Drawings
**JENSEN DEFLECTIVE SEPARATOR, MODEL JDS72-3624**

**STORMWATER QUALITY DESIGN FLOW (SQDF)**
- \( \leq 2.0 \) - CFS

**STORM DRAIN DESIGN CONVEYANCE FLOW**
- XX - XX CFS

**RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW**
- XX - YRS

**SUGGEST MAXIMUM INTERNAL BYPASS FLOW**
- \( \leq 14 \) - CFS

**TREATMENT**
1. **TOTAL SUSPENDED SOLIDS (TSS)**
2. **HEAVY METALS**
3. **NUTRIENTS**
4. **FECAL COLIFORM**

**CONSTRUCTION NOTES**
1. CONTRACTOR TO VERIFY VERTICAL DIMENSIONS OF ALL PRECAST PIECES IN FIELD.
2. VERIFY SUBBASE ELEVATION BEFORE PLACING PRECAST COMPONENTS OR BACKFILLING.
3. APPLY BUTYL MASTIC AND/OR GROUT TO SEAL JOINTS OF MANHOLE STRUCTURE.
4. APPLY LOAD TO MASTIC SEAL IN JOINTS OF MH SECTIONS TO COMPRESS SEALANT IF NECESSARY. UNIT MUST BE WATER TIGHT, HOLDING WATER UP TO FLOWLINE INVERT (MINIMUM).
5. CONTRACTOR TO GROUT SEAL INLET AND DISCHARGE PIPE PENETRATIONS THROUGH MANHOLE WALL.
6. ALL INTERNAL COMPONENTS INSTALLED BY MANUFACTURER.
7. BLOCK AND/OR GROUT PACK BENEATH FRAMES AND COVERS TO MATCH FINISHED GRADE.
8. CONTRACTOR TO TRIM ENTRANCE AND EXIT PIPES TO MATCH INTERNAL DIAMETER CIRCUMFERENCE OF MANHOLE.

**MATERIALS**
1. **STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SAWD CONCENTRATION.**
2. **TOTAL CAPTURE FOR TRASH & DEBRIS.**
3. **JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.**
4. **JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.**
5. **CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:**
   - **TOTAL SUSPENDED SOLIDS (TSS)**
   - **HEAVY METALS**
   - **OIL & GREASE**
   - **NUTRIENTS**
   - **FECAL COLIFORM**

**SOLIDS STORAGE SUMP**
- **FIBERGLASS SEPARATION CYLINDER AND INLET**

**SECTION A-A**

**SCALE:** N.T.S

**DRAWN BY:**

**521 DUNN CIRCLE, SPARKS, NV 89431-6312**

**(877) 649-0095  FAX (775) 440-203**

**JENSEN PRECAST**

**DATE:** 5/18/2016

**AS SHOWN**

**11" x 17"**

**STORMWATER SYSTEMS**

**5330 LAS VEGAS CIRCLE, LAKEWOOD, CA 90714-3652**

**JDS72-3624**

**MODEL JDS72-3624**

**JENSEN DEFLECTIVE SEPARATOR**

**WEST RIVER STREET BIKE LANE PROJECT TRUCKEE, CA**

**PROJECT:**

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**NOTE:**
- **100% CAPTURE FOR TRASH & DEBRIS.**
- **JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.**
- **JENSEN DEFLECTIVE SEPARATOR DESIGNED TO PROCESS ENTIRE SQDF.**
- **CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE:**
  - **TOTAL SUSPENDED SOLIDS (TSS)**
  - **HEAVY METALS**
  - **OIL & GREASE**
  - **NUTRIENTS**
  - **FECAL COLIFORM**

**STORMWATER QUALITY DESIGN FLOW (SQDF)**
- \( \leq 2.0 \) - CFS

**STORM DRAIN DESIGN CONVEYANCE FLOW**
- XX - XX CFS

**RETURN FREQUENCY/PERIOD OF PEAK DESIGN CONVEYANCE FLOW**
- XX - YRS

**SUGGEST MAXIMUM INTERNAL BYPASS FLOW**
- \( \leq 14 \) - CFS

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**MATERIALS**
1. **ALL DIMENSIONS ARE IN DECIMAL INCHES.**
2. **PRECAST MATERIALS AND MANUFACTURING METHODS SHALL CONFORM TO ASTM C-478 AND LACSD S-A-206, WHEN IN LA COUNTY.**
3. **CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH \( f'c = 5,000-\)psi AT 28-DAYS.**
4. **THE PORTLAND CEMENT USED IN THE PRECAST SECTION SHALL MEET THE REQUIREMENTS OF TYPE II/V HIGH SULFATE RESISTANT CEMENT IN ACCORDANCE WITH ASTM CLASS M C-150.**

**STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SAWD CONCENTRATION.**

**TOTAL CAPTURE FOR TRASH & DEBRIS.**

**JENSEN DEFLECTIVE SEPARATOR IS A NON-BLOCKING SCREENING UNIT.**

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EXHIBIT G

LABORATORY TESTING

For the

Jensen Deflective Separator

a

FULL CAPTURE TRASH
CONTROL DEVICE
LABORATORY TESTING

for the

*Jensen Deflective Separator (JDS)*

Hydrodynamic Separator (HDS), Stormwater Treatment

a

FULL CAPTURE TRASH CONTROL DEVICE

From:

A Division of Jensen Precast Concrete
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DESCRIPITON OF TECHNOLOGY

The Jensen deflective separator (JDS) is a Full Capture Trash Control Device for stormwater treatment.

The JDS technology is a non-blocking screening treatment process that also includes swirl concentrating separation, which is appropriate for small to very large stormwater flows.

Figure 1. Flow of Typical “Inline” JDS Unit

JDS units consist of a separation chamber and a sump, typically deployed in precast manhole structures. The separation chamber has a specially designed inlet that introduces flow into a floatable control cylinder, which is configured on top of a stainless steel screening cylinder.

Inline JDS units placed within the alignment of the storm drain or channel have internal inlets and bypasses weirs within the separation chamber. Offline units are placed immediately adjacent to the storm drain or channel alignment. These offline units have a separate diversion structure with a diversion weir to divert water quality treatment flows and bypass larger conveyance flows. The
**Jensen deflective separator** units are designed to treat the water quality flows and bypass larger flows.

The **Jensen deflective separator** has no moving parts. It is designed in accordance with the continuous deflective separation treatment process of balanced hydraulics to create the following multiple treatment processes in a very tight footprint: swirl concentration, vortex and toroidal flow paths, screening and sedimentation.

The treatment process of the **JDS** is unique in its ability to screen any gross solid trash or debris material that is 5-millimeter (mm) or larger from the stormwater without blocking its screen. This treatment process readily satisfies the requirements of a “Full Capture” trash and debris device. The entire treatment flow must pass through its screening cylinder, leaving no path that does not cross through its stainless steel screen. The unit’s design also captures Total Suspended Solids (TSS) and other water quality pollutants of concern such as oil and grease.

**Unit Used in Testing**

The **Jensen deflective separator** has no moving parts. It is designed in accordance with the continuous deflective separation treatment process of balanced hydraulics to create the following multiple treatment processes in a very tight footprint: swirl concentration, vortex and toroidal flow paths, screening and sedimentation.

This Full Capture performance test used is a full-scale 0.7-cubic foot per second (cfs) treatment capacity, model **JDS60-2418** unit. This tested unit has some modifications to ease cleanout between tests runs if necessary. However, the dimensions and flow paths within the treatment process are identical to commercial units of the same size. For the purpose of mimicking a state in which the sump is partially full, a false floor was installed within this test **JDS** unit.

Again, this false floor also provides advantages related to clean out as the unit must be cleaned and washed thoroughly between different tests conducted at the Stormwater Test Facility. As mentioned, the false floor has no impact on the treatment process, capacity or flow paths of the unit. The false floor is adjustable so that full sump conditions can be replicated and measured during test runs.

**LABORATORY TESTING**

Laboratory testing for Full Capture performance was conducted at the Jensen Precast Stormwater Test Facility located between Jensen MetalTech buildings 460 and 470, Dunn Circle in Sparks, NV.

These Full Capture Performance tests were performed under the direct supervision of Professor Keith E. Dennett, Ph.D, P.E., an Associate Professor in the Department of Civil and Environmental
Engineering at the University of Nevada, Reno. Professor Dennett served as an independent third party observer of all tests on the JDS unit.

These Full Capture Tests were completed on May 25th and 26th of 2017.

Testing was performed in accordance with the “Full Capture Experimental Protocol” and the “Full Capture Experimental Procedure” written by Fariar Kohzad, Ph.D., and Walter Stein, P.E., Jensen Stormwater Division. The Full Capture Test Protocols and Procedures specific to the JDS unit tested are provided in Appendices A and C of this Test Report. The general form of these Protocols and Procedures for Full Capture Testing of HDS units can found as Appendices E & F.

Appendix G contains a signed non-conflict of interest statement from Prof. Dr. Keith Dennett establishing him as a truly independent, third party observer.

LABORATORY SETUP

As mentioned above, testing was performed in-house at the Jensen Precast Test Facility. The test facility is equipped with numerous flow measurement devices, water storage tanks, sampling chambers, pump skids controlled by a Variable Frequency Drive (VFD), and an extensive data acquisition system. The V-notch weir was used as the primary flow measurement device during testing and was calibrated using a timed fill volume in the return tank. A detailed description of each component within the test facility is provided in Appendix D as well as drawings and schematics showing the test facility layout, flow diagrams and data acquisition schematics.

PLASTIC SPHERES (GROSS POLLUTANTS)

Plastic spheres of differing specific gravities (SGs), used to mimic gross pollutants having a particle size equal to or greater than $\geq 5$-mm. The specific gravities of these spheres ranged from 0.9 to 2.1 to better represent the solids in stormwater, which have various SGs. Since water has a specific gravity of 1.0, this range adequately represents stormwater solids that float, are neutrally buoyant or settleables.

89% of the spheres used had a diameter of 4.76-mm and the other 11% appeared just slightly larger, but still smaller than the 5-mm particle size that must be removed to be granted Full Capture certification. These plastic spheres were sent to an independent laboratory operated by the Wood Rodgers, Inc., consulting civil engineering firm, for a particle size distribution (PSD) analysis. The results of that analysis are presented in Appendix B.

Figure 2 shows a sample of the spheres used to mimic gross pollutants. The lighter colors are representative of lower specific gravities.
BRIEF OF JDS TEST PROCEDURE

Removal Efficiency Test #1

The first test conducted was a removal efficiency (RE%) test a flow rate of 0.35-cfs (157-gpm), which is equal to 50% of the 0.7-cfs (315-gpm) full capture treatment design flow of the JDS60-2418 unit. The Variable Frequency Drive on the water supply pumps was used in cooperation with the Datalogger and V-Notch weir to set the flow rate before the test commenced. The flow was allowed to stabilize for approximately 10-minutes (min) before the plastic spheres were added to the system at the Upstream Sampling (U/S) Chamber. A 6.09-pound (lbs) mix of plastic spheres was introduced to the flow manually over a period of approximately 10-min at fairly constant feed rate.

The feed rate of the solids was not a precise measurement item for these tests, though the concentration of the stream of “gross pollutants” making their way to the unit could be roughly calculated at 465-milligrams per liter (mg/l). Whether the plastic spheres are dumped upstream of the unit in a slug load or fed evenly over a 10-min interval has no bearing on the screening efficiency determination of the test.

After the pollutants (plastic spheres), were added, the system was operated for 10-min before the flow was stopped and the effluent mesh sampling bag, which as a 0.125-in (3.175-mm) square...
mesh, was checked for any plastic spheres (pollutants) that may have passed through the JDS unit. All plastic spheres captured in this effluent mesh bag were removed and weighed.

**Removal Efficiency Test #2**

The second test was conducted in the same manner as Test #1, for a flow of 0.52-cfs (236-gpm), which equal to 75% of the JDS unit’s 0.7-cfs full capture design flow. The flow was set and allowed to stabilize before 6.05-lbs of plastic spheres were added over a 10-min period. Due to the increased flow rate, the influent pollutant concentration dropped to roughly 307-mg/l. The flow was again allowed to run for another 10-min and the effluent mesh sampling bag was checked for pollutants that passed through the unit. Again, all plastic spheres captured in this effluent mesh bag were removed and weighed.

**Removal Efficiency Test #3**

Test #3 was run at 0.7-cfs (315-gpm), which is 100% of the Full Capture design flow capacity of the JDS60-2418. This test was the final RE% test and was conducted in a manner consistent to Tests #1 and #2. 6.14-lbs of plastic spheres were added to the influent flow for this test. The influent pollutant concentration decreased to roughly 234-mg/l. During this 100% flow test, some flow was observed to overtop the bypass weir in the form of wave action. This resulted in a small amount, less than 2% by mass, of floatable plastic spheres making their way to the effluent mesh sampling bag.

A total of 18.28-lbs of plastic spheres was added to the influent for the three (3x) Capture RE% Tests (#1 through #3).

**Burping (Scour) Testing (Tests #4-#6)**

Burping Tests were conducted in a similar manner to Full Capture RE% Tests #1 through #3. The major difference between the Burping and Full Capture RE% Tests is that there is no need for the addition of gross pollutants, (plastic spheres), to the influent during the Burping Tests. The purpose of these tests is to quantify the JDS unit’s retention efficiency of the previously captured solids in Full Capture RE% Tests #1 through #3.

Tests #4, #5 and #6 were conducted at flow rates of 0.875-cfs, 1.05-cfs and 1.4-cfs, which is 125%, 150% and 200% the JDS’s 0.7-cfs full capture treatment capacity respectively. In each of these Burp Tests, the effluent mesh sampling bag having a $\frac{1}{8}$-in = 0.125-inches = 3.17-mm mesh was securely fastened completely around the discharge pipe in the sampling box downstream of the JDS unit. The flow rate for each test was reached and allowed to stabilize for 10-min. After the flow was stabilized, the pumps remained operational for an additional 10-min. This 20-min period was used to determine if the unit would “burp” any of the previously captured materials. Once the
final 10-min of constant test flow expired, the effluent mesh sampling bag was checked for plastic spheres (gross pollutants) before continuing to the next flow rate.

For Test #6, at the 200% of the JDS60-2418’s Full Capture treatment capacity of 1.4-cfs (630-gpm), the screen was blocked using a plastic cylinder fitted to cover the entire screen surface area of the screen cylinder. This simulated a completely full sump and screen cylinder, which is at a “Maximum Trash Capture Capacity” situation during which the screen was clogged.

The Step-By-Step test procedure with the data tables of the plastic spheres and measured values for each test run are documented in Appendix A: “JDS Specific Test Procedure”.

Sample Processing

Effluent Samples

The samples collected downstream of the JDS from the effluent mesh sampling bag were placed in plastic bags, sealed and labelled immediately after each test run. These samples were then placed in ceramic evaporating dishes and oven dried at 140-degrees Fahrenheit (140°F) for 30-min to ensure no moisture was retained within the sample. After the drying, the samples were weighed using a calibrated scientific balance and the mass was recorded in grams. This data was then used to calculate RE% by both the Effluent and the Mass Balance Methods presented in the ANALYSIS OF DATA section of this report.

Retained Material

The material retained by the JDS throughout the course of the experiment was processed in a slightly different manner. After the complete inlet and screen cylinder and the false floor of the JDS60-2418 were hoisted out of the 60-inch internal diameter (ID) precast manhole, the sump was washed out and the contents were collected in the same effluent mesh sampling bag used to capture the effluent samples. This bag was securely clamped around the 4-in discharge pipe from the sump before draining down and washing out the sump.

This material was then spread out in a thin layer on a large black tarp and allowed to dry in the sun for 6-hours. Once there was no sign of moisture on the spheres, they were taken and weighed using the same scientific balance in groups of approximately 1,000-grams (g). These weight values were used to determine the capture and retention efficiencies of the DJS unit using the Mass Balance Method, which is also presented in the ANALYSIS OF DATA section.
FULL CAPTURE TEST RESULTS

As mentioned, the Full Capture removal and retention efficiency of the JDS was measured and calculated to be greater than 98%. The full scale testing produced the following results for the Removal Efficiency (RE%) portion of the evaluations: Tests #1 through #3. Table 1 presents the RE% for these three Full Capture tests.

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Test</th>
<th>Flow (cfs)</th>
<th>Removal Efficiency (RE%)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal</td>
<td>1</td>
<td>0.35</td>
<td>100.00</td>
<td>None</td>
</tr>
<tr>
<td>Removal</td>
<td>2</td>
<td>0.52</td>
<td>100.00</td>
<td>None</td>
</tr>
<tr>
<td>Removal</td>
<td>2</td>
<td>0.70</td>
<td>99.29</td>
<td>Floatables passed over the weir</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td>99.76</td>
<td>No material passed through screen</td>
</tr>
</tbody>
</table>

Table 2 calculates a 98%+ retention efficiency to prevent Burping of previously capture solids from the JDS unit. The combined results from Tables 1 and 2 documents Capture and Retention Efficiencies of 98%+.

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Test</th>
<th>Flow</th>
<th>Retention Efficiency (%)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scour</td>
<td>4</td>
<td>0.87</td>
<td>99.91</td>
<td>Floatables passed over the weir</td>
</tr>
<tr>
<td>Scour</td>
<td>5</td>
<td>1.05</td>
<td>99.89</td>
<td>Floatables passed over the weir</td>
</tr>
<tr>
<td>Blocked Scour</td>
<td>6</td>
<td>1.40</td>
<td>99.87</td>
<td>Floatables passed over the weir, Screen blocked to simulate “Maximum Trash Capture Capacity”</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td>99.89</td>
<td>No material appeared to passed through screen during the test, only over the bypass weir</td>
</tr>
</tbody>
</table>

Combining the Removal and Retention Efficiency results creates and average Full Capture and retention rate of 99.83%, exceeding the claim of a 98% capture and retention rate. Due to the scalability of JDS technology, these RE% and Retention Efficiencies can be achieved by any standard commercial or custom designed JDS unit produced by Jensen Precast.

The test run data was also used to calculate Full Capture RE% and Retention Efficiencies using a Mass Balance Method. This alternative calculation method resulted in an overall Full Capture efficiency of 98.65%, exceeding the RE% claim of 98%. This Mass Balance Method combines the Removal and Burping results into one analysis.
Calculations for RE% and Retention Efficiency reported above for both the Effluent and the Mass Balance methods are provided following ANALYSIS OF DATA section.

It should be acknowledged that these 98%+ RE% were determined on particles between 4.76 and mm 5-mm plastic spheres. The performance of the JDS unit on particles greater than 5-mm should be 100%.

**ANALYSIS OF DATA**

**Effluent Method**

The RE% and Retention efficiency results displayed in Tables 1 and 2 above were calculated using the Effluent Method, which uses the following equation:

\[
RE\% = \left(\frac{M_F - M_P}{M_F}\right) \cdot 100\%
\]

Variable definitions:

- \(RE\%\) - Removal Efficiency
- \(M_F\) - Mass of pollutant fed into the system
- \(M_P\) - Mass of pollutant in the effluent mesh sampling bag

The Effluent Method was also used to calculate retention efficiencies during the Burping Tests by the following equation:

\[
Retained\% = \left(\frac{M_R - M_S}{M_R}\right) \cdot 100\%
\]

Variable definitions:

- \(Retained\%\) - Percentage of material that the unit prevented from burping
- \(M_R\) - Mass of pollutant that was in the sump before the burping test began
- \(M_S\) - Mass that burped out of the unit

**Mass Balance Method**

The Mass Balance Method provides a quality check of the Full Capture RE% and Retention Efficiencies to compare to the results for these efficiencies calculated using the Effluent Method.

The Mass Balance Method differs from the Effluent Method because it does not evaluate each flow rate discretely and then sum the results and provide an average as does the Effluent Method.
The Mass Balance Method measures the total amount of plastic spheres (gross pollutants) that entered the system and amount of spheres (pollutant) retained in the control cylinder and sump at the end of testing, the Mass Balance Method analyzes all tests and flow rates together.

The Mass Balance Method uses the following equation to calculate the Full Capture RE% of the **JDS** via the Mass Balance Method:

\[
RE\% = 100 - \left( \frac{M_E - M_R}{M_E} \right) \times 100\%
\]

Variable definitions:

- \(RE\%\) - Full Capture efficiency of the unit
- \(M_R\) - Mass retained by the unit
- \(M_E\) - Amount of mass that entered the system

The data from Test Runs #1 through # that the equations above were applied to can be found in Appendix A.

**REFERENCES**

2. County of Los Angeles, DPW, Letter October 17, 2006, Catch Basin Best Practice by 4 Cities. Website: CAL-EPA.
4. Full Capture Experimental Procedure, by Stormwater Division, Jensen Precast Concrete, Sparks, NV, April 2017
APPENDIX A

JDS SPECIFIC TEST PROCEDURE

Full Capture Experimental Procedure- JDS60-2418

This procedure is specific to the Jensen Test Facility.

Prepared by Fariar Kohzad, PhD, and Walter Stein, PE of Jensen Precast Concrete, Sparks, NV
April, 2017

1. Setup the Test Facility

   A. Turn on Data Logger, connect it physically to laptop.
   B. Login the laptop, run LoggerNet, connect CR3000 to LoggerNet via Connect Button.
   C. Install all Pressure Transducers.
   D. Turn on Main Circuit Breaker.
   E. Open Supply and Return Tank valves and make sure the other valves are open according to the flow directions.
   F. Start VFD and select the Target Flow, best to start with a flow of 100 to 200-gpm.
   G. Release air from pumps.

2. Run Removal Efficiency Test

   A. Take the total amount of mixed plastic spheres (gross pollutants), to be used in the test from the Excel Spreadsheet: “Full Capture Performance of TCD-Calc-FK.xlsx” in the stormwater performance testing folder. A pre-specified mass should be allocated for each test.
   B. Mix the simulated pollutants to be uniform.
   C. Insert the effluent bag with 1/8-in mesh openings over the end of the pipe flowing into the downstream (D/S) Sampling Chamber. Clamp effluent mesh sampling bag tightly over pipe to ensure capture of all plastic sphere that passed the JDS60-2418.
D. Set Test Flow as “Target” in the VFD panel. The first test should be for 50% of the JDS design flowrate. That is 50%•Q_{design} = 0.35-cfs. Check the flowrate on the DataLogger screen for the V-Notch weir to see if it reads the test flowrate. If not, modify the VFD Target flow until the test flowrate is seen in the DataLogger screen for the V-Notch Weir. Wait 5 to 10-min (min) for the flowrate to stabilize.

E. Feed the total plastic spheres into the flow over a period of about 10-min at the U/S Sampling Chamber.

F. Check the effluent mesh sampling bag clamped over pipe end at the discharge into the D/S Sampling Chamber 10-min after the end of the simulated pollutants feed.

G. Keep zip-lock plastic bags and a Sharpie to label the bags:
   i. Test Name / Test Run #
   ii. Test Flowrate
   iii. Date and time

H. If there were any plastic spheres in the effluent mesh sampling bag, take them out and put the contents into a clear zip-lock plastic bag and label it as described in (G).

I. Change flowrate to 75%•Q_{design} = 0.52-cfs and follow step (A) to (H).

J. Change flowrate to 100%•Q_{design} = 0.7-cfs and follow steps (A) to (H) once more.

3. Burping (Scour) Tests Runs

A. Set the Target flow to 125%•Q_{design} = 0.87-cfs, in the VFD and check the Datalogger to confirm the flowrate in the V-Notch Weir.

B. Wait approximately 10-min for the flow to stabilize.

C. Run the targeted flow rate for 10-min.

D. Check the effluent mesh sampling bag in the D/S Sampling Chamber

E. If any gross pollutants (Plastic Spheres) are in the effluent mesh sampling bag, take them out and place them into a zip-lock bag. Label the bag as described in (G) of the Removal Efficiency Procedure.

F. Change the flow rate to 150%•Q_{design} = 1.05-cfs in the VFD and confirm the flowrate through the V-Notch weir using the Datalogger. Wait until the flow gets to a steady and stable state.

G. Follow steps (B) to (E) above.

H. Change flowrate to 200%•Q_{design} = 1.4-cfs.

I. Repeat steps (B) to (E) for a second time.
Samples Added During Removal Efficiency Testing

A breakdown of the plastic spheres added to the influent of Test #1 is provided in Table 1.

Table 1. Gross pollutant information for the 50% design flow Test #1.

<table>
<thead>
<tr>
<th>Material</th>
<th>Composition</th>
<th>Color</th>
<th>Diameter (in)</th>
<th>Diameter (mm)</th>
<th>Specific Gravity (SG)</th>
<th>Mass Added (lbs)</th>
<th>Mass Added (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Polypropylene</td>
<td>Clear</td>
<td>0.1875</td>
<td>4.763</td>
<td>0.90</td>
<td>1.2470</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>Nylon</td>
<td>Yellowish</td>
<td>0.1875</td>
<td>4.763</td>
<td>1.13</td>
<td>2.1089</td>
<td>0.96</td>
</tr>
<tr>
<td></td>
<td>PVC</td>
<td>Black</td>
<td>0.1875</td>
<td>4.763</td>
<td>1.41</td>
<td>2.4893</td>
<td>1.13</td>
</tr>
<tr>
<td></td>
<td>PTFE</td>
<td>White</td>
<td>0.1875</td>
<td>4.763</td>
<td>2.10</td>
<td>0.2476</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total=</td>
<td>6.0927</td>
<td>2.7636</td>
</tr>
</tbody>
</table>

Polypropylene (PP)
Nylon (Nylon)
Polyvinyl Chloride (PVC)
Polytetrafluoroethylene (PTFE)
The sample that was added during Test #2 is shown in Table 2.

Table 2. Gross pollutant information for the 75% design flow Test #2.

<table>
<thead>
<tr>
<th>Material</th>
<th>Color</th>
<th>Diameter (in)</th>
<th>Specific Gravity (SG)</th>
<th>Mass Added (lbs)</th>
<th>(kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polypropylene</td>
<td>Clear</td>
<td>0.1875</td>
<td>0.90</td>
<td>1.2457</td>
<td>0.57</td>
</tr>
<tr>
<td>Nylon</td>
<td>Yellowish</td>
<td>0.1875</td>
<td>1.13</td>
<td>2.0101</td>
<td>0.91</td>
</tr>
<tr>
<td>PVC</td>
<td>Black</td>
<td>0.1875</td>
<td>1.41</td>
<td>2.5470</td>
<td>1.16</td>
</tr>
<tr>
<td>PTFE</td>
<td>White</td>
<td>0.1875</td>
<td>2.10</td>
<td>0.2454</td>
<td>0.11</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>6.0482</td>
<td>2.7435</td>
</tr>
</tbody>
</table>

The sample used in Test #3 is broken down in Table 3.

Table 3. Gross pollutant information for the 100% design flow Test #3.

<table>
<thead>
<tr>
<th>Material</th>
<th>Color</th>
<th>Diameter (in)</th>
<th>Specific Gravity (SG)</th>
<th>Mass Added (lbs)</th>
<th>(kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polypropylene</td>
<td>Clear</td>
<td>0.1875</td>
<td>0.90</td>
<td>1.2438</td>
<td>0.56</td>
</tr>
<tr>
<td>Nylon</td>
<td>Yellowish</td>
<td>0.1875</td>
<td>1.13</td>
<td>2.0616</td>
<td>0.94</td>
</tr>
<tr>
<td>PVC</td>
<td>Black</td>
<td>0.1875</td>
<td>1.41</td>
<td>2.5872</td>
<td>1.17</td>
</tr>
<tr>
<td>PTFE</td>
<td>White</td>
<td>0.1875</td>
<td>2.10</td>
<td>0.2487</td>
<td>0.11</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>6.1413</td>
<td>2.7857</td>
</tr>
</tbody>
</table>

Data Collected

The data collected during each test run is displayed in Table 4.

Table 4. Data collected during the test.

<table>
<thead>
<tr>
<th>Test #</th>
<th>Flow (cfs)</th>
<th>Mass In (lbs)</th>
<th>Mass Captured in Effluent Mesh Sampling Bag (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.350</td>
<td>6.09</td>
<td>0.00000</td>
</tr>
<tr>
<td>2</td>
<td>0.525</td>
<td>6.05</td>
<td>0.00000</td>
</tr>
<tr>
<td>3</td>
<td>0.700</td>
<td>6.14</td>
<td>0.04359</td>
</tr>
<tr>
<td>4</td>
<td>0.875</td>
<td>0.00</td>
<td>0.01611</td>
</tr>
<tr>
<td>5</td>
<td>1.050</td>
<td>0.00</td>
<td>0.00457</td>
</tr>
<tr>
<td>6</td>
<td>1.400</td>
<td>0.00</td>
<td>0.00336</td>
</tr>
<tr>
<td>Total</td>
<td>18.28</td>
<td>0.06763</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX B

PARTICLE SIZE DISTRIBUTION (PSD)

LABORATORY TEST RESULTS
May 22, 2017
Project No. 2892.100

Dr. Fariar Kohzad, PhD
JENSEN STORMWATER SYSTEMS
521 Dunn Circle
Sparks, Nevada 89431

RE: ASTM C117/136 Sieve Analysis
Sample - Plastic Balls

Dear Dr. Kohzad:

Per your request, we have performed a sieve analysis on the sample of plastic balls you delivered to our laboratory on May 18, 2017. Results of the testing performed are tabulated below.

<table>
<thead>
<tr>
<th>U.S. Standard Sieve Size</th>
<th>Cumulative Percent by Weight Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8 Inch (9.50 mm)</td>
<td>100</td>
</tr>
<tr>
<td>No. 4 (4.75 mm)</td>
<td>89</td>
</tr>
<tr>
<td>No. 5 (4.00 mm)</td>
<td>0</td>
</tr>
<tr>
<td>No. 8 (2.36 mm)</td>
<td>0</td>
</tr>
<tr>
<td>No. 16 (1.18 mm)</td>
<td>0</td>
</tr>
<tr>
<td>No. 30 (0.600 mm)</td>
<td>0</td>
</tr>
<tr>
<td>No. 50 (0.300 mm)</td>
<td>0</td>
</tr>
<tr>
<td>No. 100 (0.150 mm)</td>
<td>0</td>
</tr>
<tr>
<td>No. 200 (0.075 mm)</td>
<td>0</td>
</tr>
</tbody>
</table>

We appreciate the opportunity to provide our laboratory testing services. If you have any questions or require further information, please do not hesitate to call.

Sincerely,

Wood Rodgers, Incorporated

Casey Engel
Laboratory Supervisor
### Sieve Analysis of Aggregate

**AASHTO T27, T11 / ASTM C136, C117**

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Jensen Stormwater Sys. - SAO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Loc:</td>
<td>Wood Rodgers Job No.: 2892.100</td>
</tr>
<tr>
<td>Material Type:</td>
<td>Wood Rodgers Lab No.: 4030</td>
</tr>
<tr>
<td>Material Source:</td>
<td>Date: 05/18/17</td>
</tr>
</tbody>
</table>

#### (For Split Sieve Use Only) Total Weight of Sample Used

<table>
<thead>
<tr>
<th>Description</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet Wt. Sample + Tare</td>
<td>(A)</td>
</tr>
<tr>
<td>Tare Wt.</td>
<td>(B)</td>
</tr>
<tr>
<td>Wet Wt. Sample</td>
<td>(C) = (A) - (B)</td>
</tr>
<tr>
<td>Total Wt. #4</td>
<td>(D) = Total of Sieves 6&quot; -- #4</td>
</tr>
<tr>
<td>Total Wt. - #4</td>
<td>(E) = (C) - (D)</td>
</tr>
<tr>
<td>Total Dry Wt. - #4</td>
<td>(F) = (E)/(1+(Moisture as a Decimal))</td>
</tr>
<tr>
<td>Total Dry Sample</td>
<td>(G) = (D) + (F)</td>
</tr>
<tr>
<td>Factor</td>
<td>(I) = (F)/(G)</td>
</tr>
</tbody>
</table>

#### Moisture

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pan ID:</td>
<td>Moisture Loss: 0.3</td>
</tr>
<tr>
<td>Wet Wt. + Tare</td>
<td>Dry Wt. 90.3</td>
</tr>
<tr>
<td>Dry Wt. + Tare</td>
<td>% Moisture 0.6</td>
</tr>
<tr>
<td>Tare Wt.</td>
<td>Dry Wt. 90.3</td>
</tr>
</tbody>
</table>

#### Total Wt. Before Wash

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part ID:</td>
<td>Wet Wt. + Tare 90.3</td>
</tr>
<tr>
<td>Dry Wt. + Tare</td>
<td>Dry Wt. 90.3</td>
</tr>
<tr>
<td>Tare Wt.</td>
<td>Dry Wt. 90.3</td>
</tr>
</tbody>
</table>

#### Total Wt. After Wash

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Wt. + Tare</td>
<td>90.3</td>
</tr>
<tr>
<td>Tare Wt.</td>
<td>0.0</td>
</tr>
<tr>
<td>Dry Wt. w/o Tare</td>
<td>90.3</td>
</tr>
</tbody>
</table>

### Tested By:

[Signature]

### Submitted By:

Brian T. Clark, PE
Laboratory Manager
Appendix B. Particle Size Distribution Analysis and Results November 2017

Jensen Deflective Separators

![Graph showing particle size distribution analysis.](image)

<table>
<thead>
<tr>
<th>COBBLES</th>
<th>GRAVEL</th>
<th>SAND</th>
<th>SILT OR CLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>Sample Source</td>
<td>Classification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plastic Balls</td>
<td>Plastic Balls</td>
<td></td>
</tr>
</tbody>
</table>

SIEVE ANALYSIS
Jensen Stormwater Sys. - SAC
Brian Clark, PE
Laboratory Manager

WOOD RODGERS
1361 Corporate Blvd, Reno, NV 89502
Phone 775.823.4068 Fax 775.823.4066

DRAWN JOB NUMBER APPROVED DATE REVISED DATE
2892.100 05/22/17
APPENDIX C

JDS SPECIFIC TEST PROTOCOLS

Prepared by Fariar Kohzad, PhD, and Walter Stein, PE of Jensen Precast Concrete, Sparks, NV, April, 2017

Tested Stormwater Treatment Technology

JDS60-2418 with 2400-micron screen = 2.4-mm < 5.0-mm required mesh size, having a design treatment flow of 0.70-cfs = Qdesign. A 4700 micron can also be used as well to achieve the required removal, because 4.7-mm < 5.0-mm.

Full Capture Criteria

The definition of a "full capture system" is defined as follows:

"A full capture system is any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate (Q) resulting from a one-year, one-hour, storm in the subdrainage area. Rational equation is used to compute the peak flow rate: Q = C x I x A, where Q = design flow rate (cubic feet per second, cfs); C = runoff coefficient (dimensionless); I = design rainfall intensity (inches per hour, as determined per the rainfall isohyetal map), and A = subdrainage area (acres).”

“A full-capture device is any device or system that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow resulting from a one-year, one-hour, storm (determined to be 0.6-inch per hour for the Los Angeles River Watershed, and assumed to be similar for the Ballona Creek Watershed).”

In the above definition, the mesh specification of 5-mm can be used in experimental studies, but the full capture treatment flow runoff flow rate for a given development site is derived from regional hydrological applied to the specific site runoff.
Materials Used to Simulate Gross Pollutants

1. Plastic spheres of 3/16” (4.76mm) in diameter with differing specific gravities:

   Table 1. Specific Gravities - Plastic Spheres

<table>
<thead>
<tr>
<th>Plastic Sphere Material</th>
<th>Specific Gravity (SG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polypropylene, (PP) PP</td>
<td>0.90</td>
</tr>
<tr>
<td>Polyvinyl Chloride (PVC) PVC</td>
<td>1.41</td>
</tr>
<tr>
<td>Nylon</td>
<td>1.13</td>
</tr>
<tr>
<td>Polytetrafluoroethylene (PTFE) PTFE</td>
<td>2.10</td>
</tr>
</tbody>
</table>

2. The individual and total masses of all plastic sphere samples added to the influent of the first three (3x) test runs:

   Table 2. Influent Mass - Plastic Spheres

<table>
<thead>
<tr>
<th>Test Number (#)</th>
<th>Mass (lbs)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.093</td>
<td>2.76</td>
</tr>
<tr>
<td>2</td>
<td>6.048</td>
<td>2.74</td>
</tr>
<tr>
<td>3</td>
<td>6.141</td>
<td>2.78</td>
</tr>
<tr>
<td>Total</td>
<td>18.282</td>
<td>8.28</td>
</tr>
</tbody>
</table>

Testing Flowrates

Based on the JDS60-2418 design flow rate \( Q_{\text{design}} = 0.70\text{-cfs} = 314\text{-gpm} \):

- Test #1 50\%\( Q_{\text{design}} \) Capturing Performance.
- Test #2 75\%\( Q_{\text{design}} \) Capturing Performance.
- Test #3 100\%\( Q_{\text{design}} \) Capturing Performance.
- Test #4 125\%\( Q_{\text{design}} \) Resuspension Check.
- Test #5 150\%\( Q_{\text{design}} \) Resuspension Check.
- Test #6 200\%\( Q_{\text{design}} \) Resuspension Check w/ blocked screen.

Feeding Gross Pollutants in the Flow

Allow 5 to 15-min for the flow to stabilize before adding gross pollutants during each test run.

For each test, the plastic spheres are to be fed into the flow at the Upstream (U/S) Sampling Chamber at a precomputed rate. The U/S Chamber is approximately 40-ft upstream of the JDS60-
2418. This will provide an adequate distance for the materials to mix well within the flow before encountering the unit.

Feed the plastic spheres into the flow over a period of approximately 10-min and determine a rough influent concentration for each test.

\[ C = \frac{Q_s}{Q_w} = [\text{mg/s}] / [\text{l/s}] = [\text{mg/l}] \]

Variable Definitions:

- \( C \) - Concentration of pollutants in water [mg/l]
- \( Q_s \) - Pollutants discharge [mg/s]
- \( Q_w \) - Flow rate [l/s]

Other units should be converted to keep consistency.

Flowrates and Gross Pollutant Feed Rates can be determined for the treatment flow, \( Q_{\text{design}} \), of the technology to be tested and recorded in the Table 3.

<table>
<thead>
<tr>
<th>Test [#]</th>
<th>( Q ) [%( Q_{\text{design}} )]</th>
<th>( Q ) [cfs]</th>
<th>( Q ) [gpm]</th>
<th>Purpose [Test type]</th>
<th>Feed Concentration [mg/L]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td></td>
<td></td>
<td>Capture Performance</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>75</td>
<td></td>
<td></td>
<td>Capture Performance</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td></td>
<td></td>
<td>Capture Performance</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>125</td>
<td></td>
<td></td>
<td>Resuspension Check</td>
<td>N/A</td>
</tr>
<tr>
<td>5</td>
<td>150</td>
<td></td>
<td></td>
<td>Resuspension Check</td>
<td>N/A</td>
</tr>
<tr>
<td>6</td>
<td>200</td>
<td></td>
<td></td>
<td>Resuspension check with blocked screen</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Collecting, Cleaning and Measuring Captured Materials

Materials will be captured at two locations:

1. In the JDS sump, consisting of settled and floatable materials.
2. In the effluent mesh screen bag of 3.175-mm, (1/8-in), mesh at the outlet pipe in the Sampling Chamber Downstream Sampling (D/S) of the JDS. The effluent mesh screen bag is for the material that may pass the JDS unit or over the bypass weir.

After the tests, the JDS can be decanted in a number of ways such as the use of a vacuum pump, gravity or other appropriate method, but a 3.175-mm, (1/8-in) screen must be used to make sure
the captured materials are not lost. At the Jensen Test Facility, there is a drain tube at the bottom of the sump with a valve. A 3.175-mm effluent mesh screen bag can be used to collect the captured materials.

The materials should then be collected, dried and weighed to determine the captured mass.

**Capture Performance Computation**

**Effluent Method**

The Effluent Method of evaluating the performance of the JDS used data collected from each individual test run during the Removal Efficiency testing. This method determined the removal efficiency of the unit by using the following equation:

\[
RE\% = \left( \frac{M_F - M_P}{M_F} \right) \times 100\%
\]

Where:

- \(RE\%\) - Removal Efficiency
- \(M_F\) - Mass of pollutant fed into the system
- \(M_P\) - Mass of pollutant in the effluent sampling bag

The data collected during Removal Efficiency (RE%) Testing and results from the Effluent Method were recorded in the following table.

<table>
<thead>
<tr>
<th>Test</th>
<th>Mass In [kg]</th>
<th>Mass Captured [kg]</th>
<th>Capture Performance [%]</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8.28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mass Balance Method

The Mass Balance Method compares the total amount of pollutants introduced to the system to the amount of pollutants found in the sump after both Removal Efficiency and Burping Tests. The following equation was used:

\[
RE\% = 100 - \left[ \left( \frac{M_E - M_R}{M_E} \right) \cdot 100\% \right]
\]

Where:

- \(RE\%\) - Overall efficiency of the unit
- \(M_R\) - Mass retained by the unit
- \(M_E\) - Mass introduced to the system upstream of the unit

References:


2. County of Los Angeles, DPW, Letter October 17, 2006, Catch Basin Best Practice by 4 Cities. Website: CAL-EPA.


4. Trash Amendment to the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) to Control Trash and Part 1 Trash Provision of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries (ISWEBE Plan), April 7 & 15, 2015, State Water Board
APPENDIX D

BRIEF OF JENSEN TEST FACILITY

The Stormwater Test Facility located between Jensen MetalTech buildings 460 and 470, Dunn Circle, Sparks, NV. The facility has been constructed and equipped to perform experiments with accurate and precise measurements in a repeatable manner.

Layout drawings of this Stormwater Test Facility are attached to the end of this brief. These drawings provide a list of the installed equipment. Additionally, Flow diagrams and Data Acquisition Schematic are also attached to the brief.

The flowing brief describes the major components and installed equip on the stormwater Test Facility and discusses the flow process, test operations and measurements and the capture of the data from the measurements.

Water Storage Tanks

The Stormwater Test Facility has two precast concrete storage tanks on site. These two tanks are referred to as the Supply and Return Tanks. Both tanks are identical in shape and size having internal diameters and heights of 8-ft and 10-ft, respectively. By filling these storage vessels to an appropriate depth, water is circulated through the test system. These tanks ensure there is always an adequate amount of water to conduct testing. Figure 1 shows the Supply Tank in the foreground with the JDS and Return Tank in the background. The position occupied by the JDS unit can accommodate many different, larger stormwater treatment process. The stormwater device under testing can be readily changed out in this position.

Figure 1. Supply Tank in the foreground with the JDS60-2418 and Return Tank in the background.
**JDS60-2418 Full Capture Test Unit**

The **JDS60-2418** test unit is located between the Supply and Return Tanks. The **JDS60-2418** unit is also displayed in Figure 1. This **JDS60-2418** has a relatively small footprint. This model **JDS** unit is deployed in a 60-in internal diameter (ID) precast concrete manhole. There is access space adjacent to the test JDS unit, which allows for the internals to be completely lifted from the precast manhole with a boom truck for thorough clean outs between tests if necessary.

Different stormwater treatment units can be installed and tested at this location. There is room for much larger treatment processes to be tested such as sedimentation systems.

**Pumping System**

Two sets of pumps produce the flows and driving head for performance tests on treatment units and recirculate the water back to the Supply Tank from the Return Tank. These pump sets are configured on skids located immediately adjacent to the Supply and Return Tanks. The skids are named according their respective functions and locations. The Supply Pump Skid located near the Supply Tank provides the needed energy to supply water to the unit being tested. Similarly, the Return Pump Skid is located near the Return Tank and pushes the flow back to the Supply Tank after driving it through a membrane filter system which is also configured on a skid.

The two pumping skids are each equipped with one small pump and one large pump. The smaller pumps are able to produce a maximum flow rate of 250-gpm and 18.68-ft of head while the large pumps are capable of producing 700-gpm and 23.3-ft of head. When the pumps are running in parallel, each pump skid is capable of producing well over 700-gpm which is far beyond any flow rate that will be needed for the purpose of testing a full scale stormwater treatment unit. Figure 2 shows both the Supply and Return Pump Skids.

![Figure 2. Supply Pump Skid (left) and Return Pump Skid (right).](image-url)
The pump skids are also equipped with a flow meter on each of their intake pipes. These meters will be discussed in greater detail in the Flow Measurement and Control section of this brief.

**Filtration**

The water is driving from the return pump skid through a set of membrane filters then to the Supply Tank. These membrane filters keep background TSS concentrations low throughout the course of a test.

The pipeline that originates at the smaller pump leads to two small filters that are configured in parallel to process the flow from the smaller pump. Each of these filters are able to process up to 125-gpm, having a combined capacity of 250-gpm. The flow from the larger return pump is directed to one large membrane filter capable of treatment to 600-gpm.

These filter capacities allow the Test Facility to recycle more than enough flow through the Filtration Skid to perform both Removal and Burping Testing without needing to empty and refill the storage tanks.

All three filtration units are equipped with 5-micron (µm) filter media. Figure 3 shows the Filtration Skid with two small filter units and one larger unit.

![Figure 3. Filtration Skid with 2x smaller filters (left) and large filter (right).](image)

**Flow Measurement and Control**

The Stormwater Test Facility is equipped with various flow measurement devices that include mag meters, a Parshall flume, a V-shaped flume and a V-Notch weir. Of all these flow measurement
devices, the V-Notch has been selected as the governing flow measurement device for reporting flows through a test unit.

The magnetic flowmeters send flow measurement readings directly to the Variable Frequency Drive (VFD) where a flowmeter display gives the pump flow and the pumps can be adjusted. The VFD allows each of the four pumps to be controlled individually on an automatic or manual basis. This type of customizable control makes it easy to produce flow rates ranging from 5-gpm to 650-gpm.

In the event that the magnetic flowmeter and V-Notch weir readings differ, the VFD will be adjusted until the flow rate reading through the V-Notch weir displays the desired flow regardless of the magnetic flowmeter reading. The flow through the V-Notch weir has been calibrated by measuring the time to fill a known volume in the return tank during steady constant flow conditions. Flow measurement through the V-Notch are considered to be the most accurate of all the devices.

The flow rate over the V-Notch weir is recorded by the CR3000 DataLogger. The equation for flow through the V-Notch is a calibrated equation and processed by LoggerNet software so that depth of flow is converted to a flowrate in real time. The depth of flow over the V-Notch is measured by a pressure transducer located in the V-Notch weir chamber. The depths measurement provided by the pressure transducer have also been calibrated by physical depth measurements. A description of the DataLogger is provided in detail below.

By using a V-Notch weir that has been calibrated over the course of several months at countless flow rates, the Test Facility creates an environment in which different flow rates can be produced and adjusted quickly, accurately and consistently. Figure 4 shows the v-notch weir that is used for flow measurement during testing.

*Figure 4. V-notch weir used for flow measurement.*
Sediment Feed System

The Vibra Screw sediment feed component of the facility is absolutely necessary for determining total suspended solids removal efficiencies. This system was not used in this gross test and will not be described, because it was not part of this testing.

Data Acquisition

Throughout the Stormwater Test Facility, there are thirteen (13x) pressure transducers and two probes that monitor temperature and hydraulic conductivity respectively. These different sensors convey measurements to the CR3000 DataLogger that is located near the VFD. With the help of LoggerNet software, these measurements are instantly turned into useful information such as head loss, flow rate, water temperature and hydraulic conductivity that is displayed in real time on the laptop connected to the CR3000.

The entire testing operation is monitored and the data archived in real time from this one location. Figure 5 shows the CR3000 housed within a weather proof container.

Figure 5. CR3000 DataLogger housed within a weatherproof box.

Sampling Chambers

Manual grab samples need to be taken throughout the course of any test. The Stormwater Test Facility has locations for grab samples across the entire flow section. These locations are the Upstream (U/S) and Downstream (D/S) Sampling Chambers, with the tested device located between them.
The U/S Sampling chamber is located several feet immediately downstream of the V-Notch weir and Vibra Screw sediment feed location. This U/S Sampling chamber mixes influent and then provides a free spilling flow stream where the entire cross section of the flow can be easily sampled as the water falls into this U/S Sampling Chamber.

The chamber itself is a precast concrete box with inner dimensions of 3-ft wide, 5-ft long and 3-ft deep. It is also equipped with sloping aluminum sides to channel the flow into the pipe flowing to the test unit. Water flowing into the U/S Sampling Chamber is illustrated in Figure 6.

![Figure 6. Water flowing into the U/S Sampling Chamber.](image)

The D/S Sampling Chamber is very similar to the U/S Chamber with the exception of the aluminum channel. The water enters an unlined 3×5×3-ft precast concrete box from a 10-in diameter PVC pipe. The outfall flow stream from this PVC pipe enables a sample to be drawn from the entire cross-stream to enable the take of the most representative sample possible. The D/S Sampling Chamber is shown in Figure 7.
Figure 7. The D/S Sampling Chamber and free outfall for sampling.

**Water Heating System**

The test water temperature can be regulated by the installed heating system. However, the heating system, like the Vibra Screw sediment feed system was not used in this gross solids screening test and will not be described further in this brief. The heating system is a more germane influence on oil coalescing tests. Figure 8 shows the heating system.

Figure 8. Water heating system and propane tank.
Test Facility Layout

Figures 9 through 13 show the location of the major components of the Stormwater Test Facility. These drawings show a plan view and two different profile views of the Facility’s layout and include itemization of the major pieces of equipment and components.

A process flow diagram as well as a schematic of the data acquisition system is also provided.
### Site Plan

#### Equipment & Component Description

<table>
<thead>
<tr>
<th>Item</th>
<th>Equipment &amp; Component Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Staircase Leading to West Platform</td>
</tr>
<tr>
<td>2</td>
<td>VFD Control Panel</td>
</tr>
<tr>
<td>3</td>
<td>West Raised Platform</td>
</tr>
<tr>
<td>4</td>
<td>Staircase Leading to Vibra-Screw and V-Notch Weir</td>
</tr>
<tr>
<td>5</td>
<td>Discharge for Large Supply Pump</td>
</tr>
<tr>
<td>6</td>
<td>V-Notch Weir</td>
</tr>
<tr>
<td>7</td>
<td>Vibra-Screw</td>
</tr>
<tr>
<td>8</td>
<td>Upstream Sampling Discharge</td>
</tr>
<tr>
<td>9</td>
<td>Upstream Sampling Chamber</td>
</tr>
<tr>
<td>10</td>
<td>Upstream Supply Pipeline</td>
</tr>
<tr>
<td>11</td>
<td>Supply Pump Skid</td>
</tr>
<tr>
<td>12</td>
<td>Upstream Supply Pipeline</td>
</tr>
<tr>
<td>13</td>
<td>Air Release Pipe</td>
</tr>
<tr>
<td>14</td>
<td>Water Heater</td>
</tr>
<tr>
<td>15</td>
<td>Propane Tank</td>
</tr>
<tr>
<td>16</td>
<td>8' Diameter I.D. Supply Tank Wet Well</td>
</tr>
<tr>
<td>17</td>
<td>Small Return Pump Flexible Hose</td>
</tr>
<tr>
<td>18</td>
<td>Large Return Pump Flexible Hose</td>
</tr>
<tr>
<td>19</td>
<td>Platform Placeholder for Technology to Be Tested</td>
</tr>
<tr>
<td>20</td>
<td>Jensen Deflective Separator Placemoter</td>
</tr>
<tr>
<td>21</td>
<td>Main Circuit Breaker</td>
</tr>
<tr>
<td>22</td>
<td>Staircase Leading to South Platform</td>
</tr>
<tr>
<td>23</td>
<td>Downstream Sampling Chamber</td>
</tr>
<tr>
<td>24</td>
<td>Concrete Retaining Vault</td>
</tr>
<tr>
<td>25</td>
<td>Parshall Trough</td>
</tr>
<tr>
<td>26</td>
<td>Small Flow Weir</td>
</tr>
<tr>
<td>27</td>
<td>Water Filtration System</td>
</tr>
<tr>
<td>28</td>
<td>Small Return Pump</td>
</tr>
<tr>
<td>29</td>
<td>Large Return Pump</td>
</tr>
<tr>
<td>30</td>
<td>Return Skid</td>
</tr>
<tr>
<td>31</td>
<td>Return Pump Skid Flexible Pipe</td>
</tr>
<tr>
<td>32</td>
<td>8' Diameter I.D. Return Tank Wet Well</td>
</tr>
<tr>
<td>33</td>
<td>Flexible Hose for Overflow</td>
</tr>
</tbody>
</table>

#### Figure 9. Test Facility plan view drawing.

** SITE PLAN **

### Site Plan

#### Stormwater Treatment Test Facility

- **NORTH BUILDING**
  - 470 Dunn Circle

---

Figure 9. Test Facility plan view drawing.
Figure 10. Test Facility North-South profile view drawing.
Figure 11. Test Facility West-South profile view drawing.
Figure 12. Test Facility East-West profile view drawing.
Figure 13. Test facility Process Flow Diagram.
Figure 14. Test Facility Process Flow/ Data Acquisition Schematic.
APPENDIX E

GENERALIZED FULL CAPTURE EXPERIMENTAL PROCEDURE

Full Capture Experimental Procedure

Prepared by Fariar Khozad, Ph.D. and Walter Stein, P.E. of Jensen Precast Concrete, Sparks, NV, April 2017

1. Setup the Test Facility or Laboratory
   A. Turn on data acquisition software and check all appropriate connections.
   B. Install and check all pressure transducers and/or flow measurement devices.
   C. Turn on/check main power supply.
   D. Open all necessary valves.
   E. Start VFD or other flow control mechanism and select the Target Flow.
   F. Release air from pumps if necessary.

2. Run the Capturing Performance Test
   A. Obtain and prepare the total amount of mass (plastic spheres) to be introduced to the system.
   B. Mix the simulated pollutants to be uniform.
   C. Insert the 1/8-in opening screen bag at a downstream point where a free outfall from a pipe exists.
   D. Set the desired flow rate using the VFD or other flow control device. The first test should be for 50% of the unit’s design flowrate. Check the flowrate using a calibrated flow measurement device. Wait for 5 to 15-minutes (min) for the flowrate to stabilize.
   E. Feed the gross pollutants (spheres) into the flow upstream of the unit as specified in the experimental protocol.
   F. Run the flow for an additional 10-min after the last pollutants have been added.
   G. Check the Screen Bag downstream of the unit after the 10-min has passed and the test is declared over.
H. Place any contents from the screen bag into sealable plastic bags and label them with the following information:
   i. Test Run Number
   ii. Flowrate
   iii. Date and time
I. Change flowrate to 75%•Q_{design} and follow step (A) to (H).
J. Change flowrate again and run the test for flowrate 100%•Q_{design} and repeat steps (A) to (H).

3. Run the Burping (Scour) Tests
   A. Set the Target flow to 125%•Q_{design} in the VFD or other flow control device and check the flowrate via a physical measurement.
   B. Allow the flow to stabilize for 5 to 10-min.
   C. Run the flow for an additional 10-min.
   D. Check the Screen Bag downstream of the unit.
   E. Take any gross pollutants from the screen bag and place them into sealable plastic bags labeled as discussed in the Effluent Test section.
   F. Change the flow rate to 150%•Q_{design} in the VFD/other control device and allow 5 to 10-min for flow stabilization.
   G. Repeat steps (A) to (F) above.
   H. Change flowrate to 200%•Q_{design} and repeat steps (A) to (F)
APPENDIX F

GENERALIZED FULL CAPTURE EXPERIMENTAL PROTOCOL

Full Capture Experimental Protocol

Prepared by Fariar Khozad, Ph.D. and Walter Stein, P.E., Jensen Precast, April 2017

In California a "full capture system" is defined as:

"A full capture system is any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate (Q) resulting from a one-year, one-hour, storm in the subdrainage area. Rational equation is used to compute the peak flow rate: \( Q = C \times I \times A \), where \( Q \) = design flow rate (cubic feet per second, cfs); \( C \) = runoff coefficient (dimensionless); \( I \) = design rainfall intensity (inches per hour, as determined per the rainfall isohyetal map), and \( A \) = subdrainage area (acres).\(^{(1,2,3 & 4)}\)

“A full-capture device is any device or system that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow resulting from a one-year, one-hour, storm (determined to be 0.6-inch per hour for the Los Angeles River Watershed, and assumed to be similar for the Ballona Creek Watershed).”\(^{(1)}\)

In the above definition, the mesh specification of 5-mm can be used in experimental studies, but the full capture treatment flow runoff flow rate for a given development site is derived from regional hydrological applied to the specific site runoff.

Materials used to simulate Gross Pollutants

A mix of 3/16-inch (4.76mm) diameter Plastic Spheres consisting of the following material and specific gravities (SGs):

<table>
<thead>
<tr>
<th>Plastic Sphere Material</th>
<th>Specific Gravity (SG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polypropylene, (PP)</td>
<td>PP</td>
</tr>
<tr>
<td>Polyvinyl Chloride (PVC)</td>
<td>PVC</td>
</tr>
<tr>
<td>Nylon</td>
<td>Nylon</td>
</tr>
<tr>
<td>Polytetrafluoroethylene (PTFE)</td>
<td>PTFE</td>
</tr>
</tbody>
</table>
A mixture of the listed types of plastic balls should be used and the mass of each type should be recorded.

**Testing Flowrates**

Test flowrates should be based on the treatment units rated design flow rate as follows:

<table>
<thead>
<tr>
<th>Test #</th>
<th>Flowrate</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>50% • $Q_{design}$</td>
<td>Capturing Performance.</td>
</tr>
<tr>
<td>#2</td>
<td>75% • $Q_{design}$</td>
<td>Capturing Performance.</td>
</tr>
<tr>
<td>#3</td>
<td>100% • $Q_{design}$</td>
<td>Capturing Performance.</td>
</tr>
<tr>
<td>#4</td>
<td>125% • $Q_{design}$</td>
<td>Resuspension Check.</td>
</tr>
<tr>
<td>#5</td>
<td>150% • $Q_{design}$</td>
<td>Resuspension Check.</td>
</tr>
<tr>
<td>#6</td>
<td>200% • $Q_{design}$</td>
<td>Resuspension Check w/ blocked screen.</td>
</tr>
</tbody>
</table>

*Test #6 should be conducted to simulate a blocked screen if applicable.

To ensure an accurate and precise flow rate, allow 5 to 15-min for flow stabilization before initiating each test.

**Feeding Gross Pollutants in the Flow**

For each test the materials prepared to simulate gross pollutants are to be fed into the flow at an upstream location that provides adequate time for the particles to mix into the flow. A distance of 10-ft or more is recommended.

Based on the flow rates to be tested, the amount of time needed to feed the gross pollutants into the flow should be recorded to calculate a rough influent concentrations for each test.

$$C = \frac{Q_s}{Q_w} = \frac{[\text{mg/s}]}{[\text{L/s}]} = \text{[mg/L]}$$

- $C$ - Concentration of pollutants in water [mg/L]
- $Q_s$ - Pollutants discharge [mg/s]
- $Q_w$ - Flow rate [L/s]

Influent concentrations are not seen as a critical influence on the determination of the screening capture efficiency of the test unit. The dumping of the plastic spheres in a single slug is not seen as poor protocol.

Flow and Gross Pollutant feed rates should be determined for each test required and recorded in the template table given as Table 1.
Table 2. Flow and Gross Pollutant Feed rate template table.

<table>
<thead>
<tr>
<th>Test (#)</th>
<th>% of Q&lt;sub&gt;design&lt;/sub&gt; (%)</th>
<th>Test Flowrate (cfs)</th>
<th>Test Purpose</th>
<th>Concentration (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>Capture Performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>75</td>
<td>Capture Performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>Capture Performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>125</td>
<td>Resuspension Check</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>150</td>
<td>Resuspension check</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>200</td>
<td>Resuspension check</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Collecting, Cleaning and Measuring Captured Materials

Materials will be captured at two locations:

1. In the treatment unit’s sump, consisting of settled and floatable materials.
2. In the screen bag having 1/8-in, (3.175-mm), mesh at a pipe outlet downstream of the treatment process.

The treatment unit’s sump can be emptied in a number of ways such vacuum pump, gravity, or other appropriate process, but a 1/8-in, 3.175-mm, screen must be used to make sure the captured materials are not lost.

The materials should then be collected, dried and weighed to determine the captured mass.

Capture Performance Computation

Effluent Method

The Effluent Method of evaluating performance uses data collected from each individual test run. This method determines the removal efficiency of the unit by using the following equation:

\[ RE(\%) = \left( \frac{M_F - M_P}{M_F} \right) \cdot 100\% \]

Variable Definitions:

- \( RE\% \) - Removal Efficiency
- \( M_F \) - Mass of pollutant fed into the system
- \( M_P \) - Mass of pollutant in the effluent sampling bag
Mass Balance Method

The Mass Balance Method removal efficiency can be computed as:

$$RE\% = 100\% - \left( \left( \frac{M_E - M_R}{M_E} \right) \cdot 100\% \right)$$

Variable Definitions:

- $RE\%$ - Overall efficiency of the unit
- $M_R$ - Mass retained by the unit
- $M_E$ - Mass introduced to the system upstream of the unit

Note

The above protocols should be strictly followed and both computational methods should be used in testing a stormwater treatment device for Full Capture Performance.

References:


2. County of Los Angeles, DPW, Letter October 17, 2006, Catch Basin Best Practice by 4 Cities. Website: CAL-EPA.


4. Trash Amendment to the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) to Control Trash and Part 1 Trash Provision of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries (ISWEBE Plan), April 7 & 15, 2015, State Water Board
APPENDIX G

CONFLICT OF INTEREST STATEMENT

3rd Party Independent Observer
Date: October 30, 2017

Subject: Statement of Independent Third Party Observer

Reference: Full Capture Testing for Certification Application for Full Capture Trash Control Device California State Water Resources Control Board

Treatment System: Jensen deflective separator (JDS)

Procedure and Protocol Compliance Statement

I served as an independent, third-party observer for Full Capture Testing conducted by the Stormwater Division of Jensen Precast Concrete. These Full Capture Tests were performed on the Jensen deflective separator (JDS) stormwater treatment technology to evaluate and quantify the efficiencies of solids capture and retention. All tests were performed at the Jensen Stormwater Testing Facility located at 470 Dunn Circle, Sparks, NV.

These tests were performed in accordance with the “Full Capture Experimental Procedure” and the “Full Capture Experimental Protocol” developed by Farriar Khozad, Ph.D., and Walter Stein, P.E., of the Jensen Stormwater Division.

Conflict of Interest Statement

I, Dr. Keith Dennett, Ph.D., P.E., am a non-biased, independent, third-party observer and a full-time faculty member in the Department of Civil and Environmental Engineering at the University of Nevada, Reno (UNR). I declare that I do not have any vested interest in the Jensen deflective separator product or any other Jensen product offering or any companies affiliated with Jensen. There is no financial, personal, or professional conflict of interest between myself and Jensen Precast Concrete.

If I can provide any additional information, please do not hesitate to contact me by telephone at (775) 784-4056 or by e-mail at kdennett@unr.edu.

Sincerely,

Keith E. Dennett, Ph.D., P.E.  
Associate Professor
EXHIBIT H

Jensen Deflective Separator

BROCHURE

a

FULL CAPTURE TRASH CONTROL DEVICE
Jensen Deflective Separator (JDS)

Stormwater Treatment Unit
The Jensen Deflective Separator (JDS) is a full-capture, screening, swirl-concentrating, stormwater treatment system. With no moving parts, the JDS is uniquely able to screen trash and debris (including floatables and both neutrally and negatively buoyant materials), from stormwater, all without blocking the screen. The JDS also captures total suspended solids (TSS); sediments; as well as oil, grease, and other total petroleum hydrocarbon (TPH) pollutants from stormwater runoff. Captured pollutants are retained without scouring, even under high-flow bypass conditions.
JDS units are available in precast manholes as Inline units with integral bypass weirs. For larger storm conveyance systems, Offline units connect to the storm drain pipeline by a diversion manhole or vault structure. The smallest units can also be deployed in drop-inlets or catch-basins.

LAND USE APPLICATIONS:
- New and Existing Residential and Urban Developments
- Commercial Developments
- Industrial Sites
- Roadway Improvements
- Parking Lots
- Pre-treating Detention and Infiltration systems
- Pre-treating Bio-Retention and Bio-Infiltration

“We’re pleased to introduce the new, proven JDS treatment process; designed to meet the stormwater needs of municipal and private developments.”

— Walter Stein, PE
Jensen Stormwater Systems
Division Manager
Key Features & Benefits

TREATMENT APPLICATIONS
- Full Capture Trash & Debris Storm Water Treatment Unit (SWTU)
- Stand-alone SWTU
- Pre-treatment:
  - Detention & Infiltration
  - Bio-Retention & Bio-Infiltration
  - Rainwater Harvesting Cisterns
  - Fine Media, Membrane and Sand Filters
  - Wetlands, Ponds and Swales
  - Oil/Water Separators
  - Pump Stations

EFFICIENT CAPTURE & CONTAINMENT
- Non-blocking, swirl concentrating screening unit
- Total Suspended Solids (TSS)
- Course sediment and sand
- Full Capture — 100% of trash and debris equal to or greater than the screen aperture
- 100% floatables control
- 90% of sediment as small as one third the screen aperture
- Removal of free oil and grease with the use of an oil baffle
- Additional oil sorbent options available
- Screen, non-scouring sump, and oil baffle retain all captured pollutants for removal

NEW & RETROFIT DEVELOPMENT APPLICATIONS
- Residential, Commercial and Industrial
- Parking Lots and Parking Structures
- Roads, Streets, Highways and Freeways
- Intermodal Transportation Facilities
- Solid Waste Transfer Yards and Landfills

NON-BLOCKING & NON-MECHANICAL
- No moving parts
- Screen will not clog
- No power requirements
- Configured within the existing drainage infrastructure
COST-EFFECTIVE TREATMENT ALTERNATIVE
JDS is a more cost effective treatment per Cubic Feet per Second (CFS) of stormwater processed as compared to other structural BMPs.

UNOBTRUSIVE & EASY TO INSTALL
JDS units are configured inside typical precast manholes and installed below ground as typical storm drain structures.

ECONOMICAL & EASY MAINTENANCE
• Standard vactor/vacuum truck readily removes all pollutants
• Maintenance cleanout achieved from the surface
• No confined space entry
• Safe, and eliminates exposure to personnel
The JDS features a large treatment flow range. Precast Inline and Offline units treat flows from 0.7 to 73 CFS. Cast-in-place units treat flows from 73 to 273 CFS.

**Treatment Flow Process**

Using the proven continuous deflective treatment process, the JDS Full Capture device captures 100% of trash and debris particles equal to or greater than the screen apertures of either 2400 or 4700-micron (µm).

**Vortex separation settles fines through a larger range of flow rates than in**
Stormwater enters the JDS unit from one or more inlet pipes, a grated drop or curb inlet.

Incoming waters collect in the bay of the inlet trough.

Waters enter the separation and screening cylinder through the volute entrance in the diversion weir wall.

Water entering the separation cylinder forms a spinning vortex, capturing all floatables and swirl concentrating suspended solids to the center of the separation chamber.

The vortex flow pattern produces a washing force across the screen face, preventing it from becoming blocked, while allowing stormwater to pass through the screen and flow beneath the oil baffle.

Oils, greases and other Total Petroleum Hydrocarbons (TPHs) are trapped within the integral oil baffle attached beneath the inlet bay.

Screened stormwater moves toward the outlet pipe.

Settled and swirl concentrated suspended solids are captured in the sump which is typically cleaned out by a vactor truck.

Flows larger than the JDS unit’s design treatment flow bypass over the diversion weir. Bypass flows do not scour out previously captured pollutants.

JDS Offline units are placed adjacent to the storm drain or channel alignment and have a separate diversion structure with a high-flow bypass weir.

a classic settling tank of the same size.
<table>
<thead>
<tr>
<th>Precast Model Designation1</th>
<th>Treatment Flow Rate (Nominal) (ft³/s)</th>
<th>Approximate Treated Catchment Area (acres)</th>
<th>Manhole Internal Diameter (ft)</th>
<th>Screen Cylinder Diameter &amp; Height (in)</th>
<th>External Foot Print Diameter (ft)</th>
<th>Depth Below Pipe Invert² (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>JDS48-2418(G³)</td>
<td>0.7</td>
<td>4 - 6</td>
<td>4</td>
<td>24 18</td>
<td>4.8</td>
<td>5.3</td>
</tr>
<tr>
<td>JDS48-2424</td>
<td>1.1</td>
<td>6 - 9</td>
<td>4</td>
<td>24 24</td>
<td>4.8</td>
<td>5.7</td>
</tr>
<tr>
<td>JDS48-2430</td>
<td>1.6</td>
<td>9 - 13</td>
<td>4</td>
<td>24 30</td>
<td>4.8</td>
<td>6.2</td>
</tr>
<tr>
<td>JDS60-2418</td>
<td>0.7</td>
<td>4 - 6</td>
<td>5</td>
<td>24 18</td>
<td>6.0</td>
<td>5.8</td>
</tr>
<tr>
<td>JDS60-2424</td>
<td>1.1</td>
<td>6 - 9</td>
<td>5</td>
<td>24 24</td>
<td>6.0</td>
<td>6.2</td>
</tr>
<tr>
<td>JDS60-2430</td>
<td>1.6</td>
<td>9 - 13</td>
<td>5</td>
<td>24 30</td>
<td>6.0</td>
<td>6.8</td>
</tr>
<tr>
<td>JDS72-3624</td>
<td>2.0</td>
<td>11 - 17</td>
<td>6</td>
<td>36 24</td>
<td>7.2</td>
<td>6.3</td>
</tr>
<tr>
<td>JDS72-3630</td>
<td>2.4</td>
<td>13 - 20</td>
<td>6</td>
<td>36 30</td>
<td>7.2</td>
<td>6.8</td>
</tr>
<tr>
<td>JDS72-3636</td>
<td>3.0</td>
<td>17 - 25</td>
<td>6</td>
<td>36 36</td>
<td>7.2</td>
<td>7.3</td>
</tr>
<tr>
<td>JDS72-3642</td>
<td>3.8</td>
<td>21 - 32</td>
<td>6</td>
<td>36 42</td>
<td>7.2</td>
<td>7.8</td>
</tr>
<tr>
<td>JDS84-4230</td>
<td>2.7</td>
<td>15 - 23</td>
<td>7</td>
<td>42 30</td>
<td>8.3</td>
<td>7.9</td>
</tr>
<tr>
<td>JDS84-4236</td>
<td>3.6</td>
<td>20 - 30</td>
<td>7</td>
<td>42 36</td>
<td>8.3</td>
<td>8.4</td>
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<tr>
<td>JDS84-4242</td>
<td>4.4</td>
<td>24 - 37</td>
<td>7</td>
<td>42 42</td>
<td>8.3</td>
<td>8.8</td>
</tr>
<tr>
<td>JDS84-4248</td>
<td>5.5</td>
<td>31 - 46</td>
<td>7</td>
<td>42 48</td>
<td>8.3</td>
<td>9.3</td>
</tr>
<tr>
<td>JDS84-4836</td>
<td>5.5</td>
<td>31 - 46</td>
<td>7</td>
<td>48 36</td>
<td>8.3</td>
<td>8.3</td>
</tr>
<tr>
<td>JDS96-4836</td>
<td>4.5</td>
<td>25 - 38</td>
<td>8</td>
<td>48 36</td>
<td>9.5</td>
<td>8.3</td>
</tr>
<tr>
<td>JDS96-4848</td>
<td>6.0</td>
<td>33 - 50</td>
<td>8</td>
<td>48 48</td>
<td>9.5</td>
<td>9.3</td>
</tr>
<tr>
<td>JDS96-6754</td>
<td>7.5</td>
<td>42 - 63</td>
<td>8</td>
<td>67 54</td>
<td>9.5</td>
<td>9.7</td>
</tr>
<tr>
<td>JDS120-6748</td>
<td>9.0</td>
<td>50 - 75</td>
<td>10</td>
<td>67 48</td>
<td>11.8</td>
<td>8.7</td>
</tr>
<tr>
<td>JDS120-6758</td>
<td>11</td>
<td>61 - 92</td>
<td>10</td>
<td>67 58</td>
<td>11.8</td>
<td>9.5</td>
</tr>
<tr>
<td>JDS120-6764</td>
<td>14</td>
<td>78 - 117</td>
<td>10</td>
<td>67 64</td>
<td>11.8</td>
<td>10.0</td>
</tr>
<tr>
<td>JDS120-6770</td>
<td>15</td>
<td>84 - 127</td>
<td>10</td>
<td>67 70</td>
<td>11.8</td>
<td>10.5</td>
</tr>
<tr>
<td>JDS120-6782</td>
<td>19</td>
<td>106 - 158</td>
<td>10</td>
<td>67 82</td>
<td>11.8</td>
<td>11.5</td>
</tr>
<tr>
<td>JDS120-6794</td>
<td>25</td>
<td>139 - 208</td>
<td>10</td>
<td>67 94</td>
<td>11.8</td>
<td>12.5</td>
</tr>
<tr>
<td>JDS144-8484</td>
<td>25</td>
<td>140 - 210</td>
<td>12</td>
<td>84 84</td>
<td>14.2</td>
<td>12.0</td>
</tr>
<tr>
<td>JDS144-9480</td>
<td>26</td>
<td>143 - 214</td>
<td>12</td>
<td>94 80</td>
<td>14.2</td>
<td>11.7</td>
</tr>
<tr>
<td>JDS144-9490</td>
<td>31</td>
<td>173 - 260</td>
<td>12</td>
<td>94 90</td>
<td>14.2</td>
<td>12.5</td>
</tr>
<tr>
<td>JDS144-94102</td>
<td>38</td>
<td>209 - 313</td>
<td>12</td>
<td>94 102</td>
<td>14.2</td>
<td>13.5</td>
</tr>
<tr>
<td>JDS144-94114</td>
<td>44</td>
<td>244 - 367</td>
<td>12</td>
<td>94 114</td>
<td>14.2</td>
<td>14.5</td>
</tr>
</tbody>
</table>

1. Typical and site-specific plan and profile drawings are available for all JDS units.
2. Depth below pipe invert may vary per plan and design of a project, values are estimated standards per JDS model with deep sump. More shallow, smaller storage volume sumps readily available.
3. “G” Suffix on model number designates that unit is configured for grated drop inlet of stormwater.
EXHIBIT I

INDEPENDENT 3rd PARTY STUDIES AND EVALUATIONS OF THE PUBLIC DOMAIN CONTINUOUS DEFLECTIVE SEPARATION STORMWATER TREATMENT PROCESS
Exhibit I
INDEPENDENT 3RD PARTY STUDIES AND EVALUATIONS OF THE PUBLIC DOMAIN CONTINUOUS DEFINITIVE SEPARATION STORMWATER TREATMENT PROCESS

The continuous deflective separation process for the treatment of stormwater has been extensively studied and evaluated from 1995 to 2012. The following is a short list of the publically available studies, most all of which are meet the criteria as being independent.

Independent Studies & Public Docs Referencing Independent Studies:


Stenstrom, Michael K., and Lau, Sim-Lin, (1998), Oil and Grease Removal by Floating Sorbent in a CDS Device, Civil and Environmental Engineering Department, UCLA
Attachment C

INDEPENDENT 3RD PARTY STUDIES AND EVALUATIONS OF THE PUBLIC DOMAIN CONTINUOUS DEFLECTIVE SEPARATION STORMWATER TREATMENT PROCESS


Wells, Scott A. and Schwarz, Tracy A. (1999), Stormwater Particle Removal Using a Cross-Flow Filtration and Sedimentation Device, Department of Civil Engineering, Portland State University


California Department of Transportation, (2000), Caltrans Litter Management Study (LMPS) Final Report, Caltrans Doc. No. CT-SW-RT-00-01


Wells, Scott A. and Slominski, Spencer. (2003), Oil and Grease Removal using Continuous Deflection Separation with an Oil Baffle, Department of Civil Engineering, Portland State University
Attachment C

INDEPENDENT 3RD PARTY STUDIES AND EVALUATIONS OF THE PUBLIC DOMAIN CONTINUOUS DEFLECTIVE SEPARATION STORMWATER TREATMENT PROCESS


Sansalone, John J., Jong-Yeop Kim and Srikanth Pathapathi (2006), Testing and Optimization of CDS L-Unit, Department of Environmental Engineering Sciences, Gainesville, FL.


