



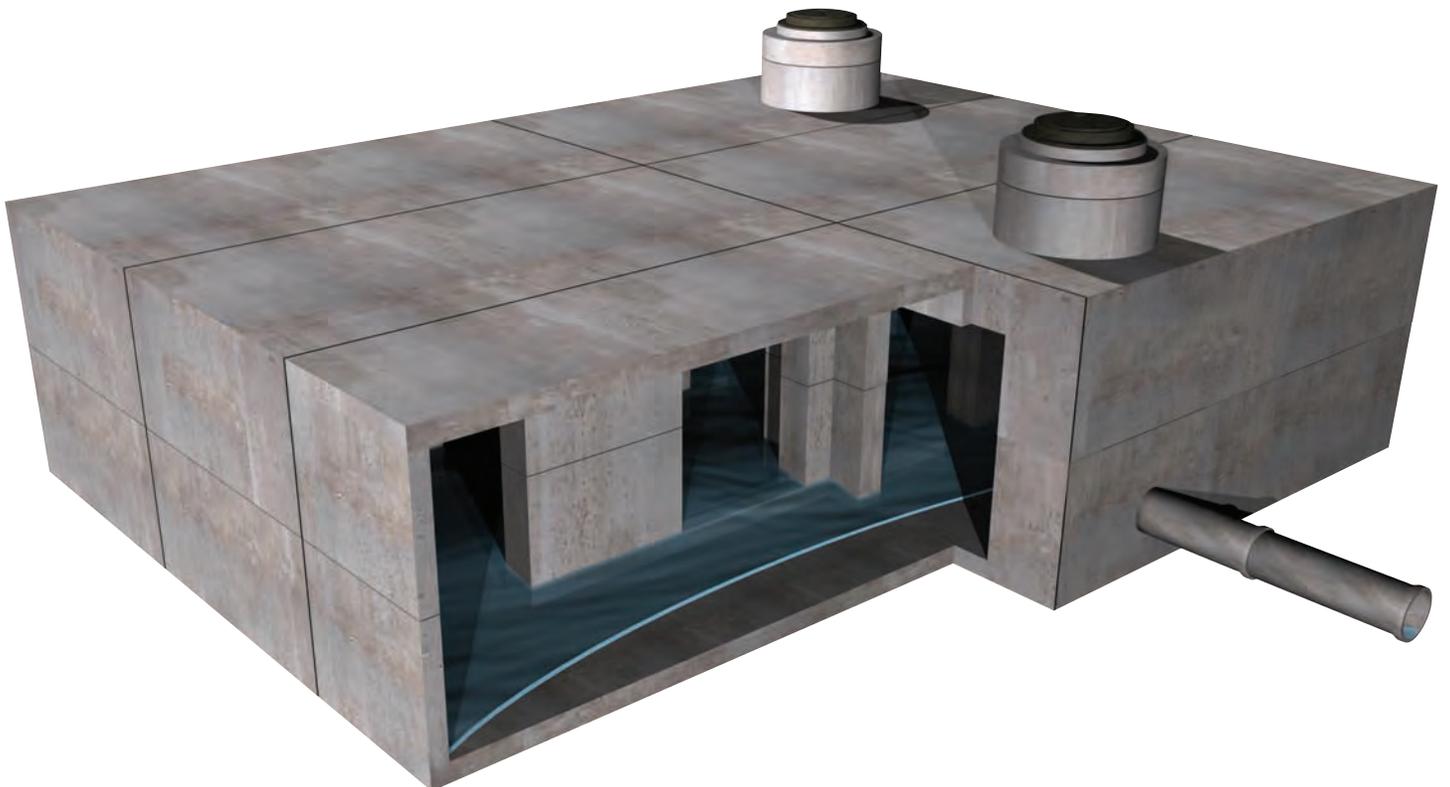
# STORMCAPTURE®

## DETENTION

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### SUBMITTAL PACKAGE

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# SECTION 1

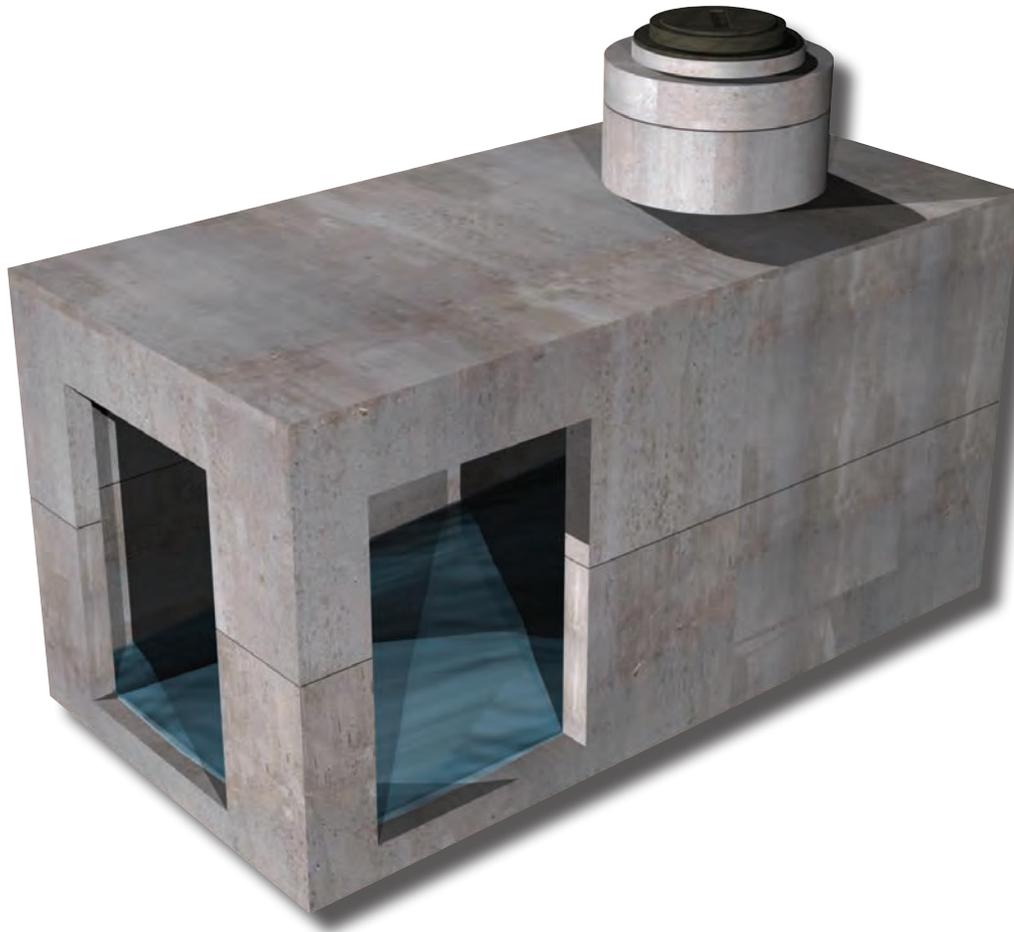
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## FEATURES & BENEFITS

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# STORMCAPTURE<sup>®</sup>

*StormCapture Modular Stormwater Management System  
for Infiltration, Detention, Retention and Treatment*



Call us today **(800) 579-8819** or visit our website for detailed product information, drawings and design tools at [www.oldcastlestormwater.com](http://www.oldcastlestormwater.com)

# StormCapture<sup>®</sup> Module

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## Large Storage Capacity

Smaller system footprint for greater design flexibility.

## Traffic Loading

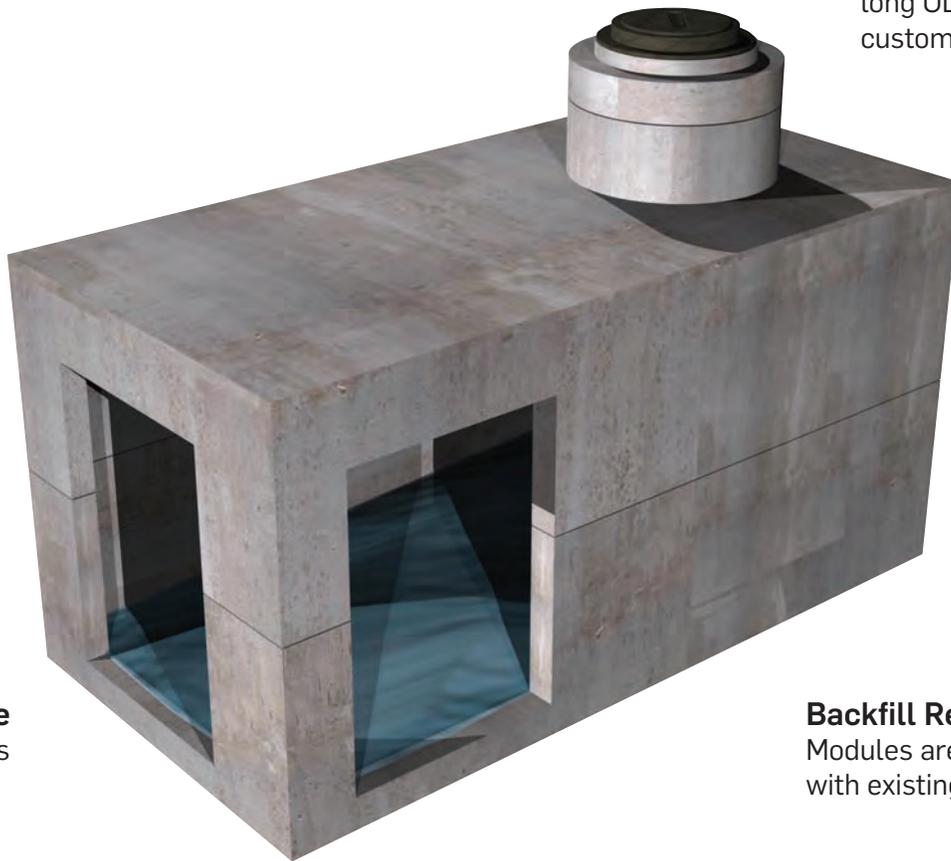
Only requires 6" of cover.

## Modular Design

Precast concrete modules measure 8' wide by 16' long OD, (7' x 15' ID), with customizable heights.

## Custom Sizes

Available in internal heights from 2' to 14' to best-fit site needs.



## Easy to Install

Fast installation with minimal handling.

## Design Assistance

Let our professionals customize for your specific needs.

## Backfill Requirements

Modules are typically backfilled with existing site materials.

## Treatment Train

Available with pre-treatment, post-treatment, or both.

## Construction Site Friendly

Contractor does not have to relinquish any ground on the site once the StormCapture system is installed.



Same-day staging and installation of StormCapture project.



StormCapture offers fast installation with minimal handling.



StormCapture modules are designed for HS20 traffic loading.



StormCapture detention system installed beneath office parking lot.

## StormCapture Advantages

- **Fast Service** - Get help from our national engineering team with layouts and specifications to meet your project's requirements.
- **Cost Savings** - Highly competitive installation and maintenance costs.
- **Quality** - Manufactured to the rigid standards of the Oldcastle quality control program at Oldcastle facilities around the country.
- **Codes** - Designed to the latest codes for HS-20-44 (full truckload plus impact).
- **Sustainability** - The system is maintainable for long-term sustainability.
- **LID** - Ideal for Low-Impact Development (LID).
- **LEED** - Manufactured locally with recycled material for potential LEED credits. *LEED 2009 for New Construction & Major Renovation, U.S. Green Building Council: Sustainable Sites (5.1, 5.2, 6.1, 6.2), Materials & Resources (4.1, 4.2, 5.1, 5.2), Water Efficiency (1.1, 1.2, 3.1, 3.2).*

# Applications

StormCapture offers numerous options for detention, retention, treatment and harvesting to solve your stormwater management needs. Let us show you how we can design and customize a solution for you.

Maintenance Module



**DETENTION**

Harvesting Equipment Skid with Sanitation, Pumps and Controls



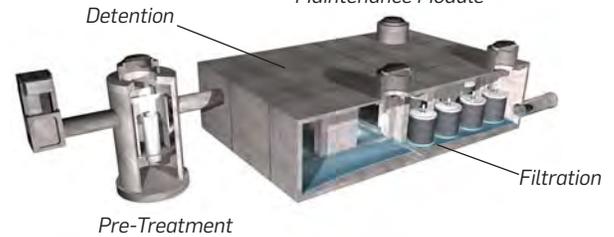
**HARVESTING**

Pump Module



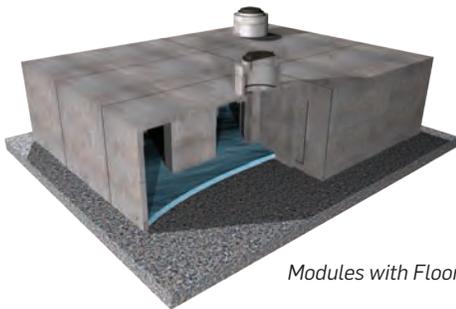
**RETENTION**

Maintenance Module



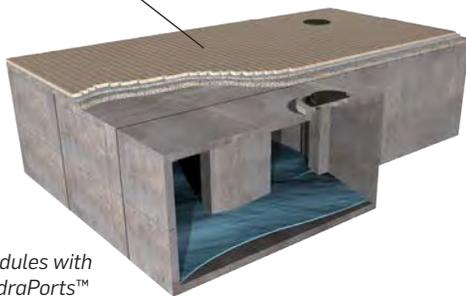
**TREATMENT**

Modules with Floor Openings



**INFILTRATION**

Permeable Interlocking Concrete Pavers



**PERMECAPTURE**

Modules with HydraPorts™

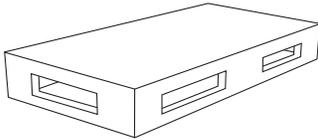


**CISTERNS**

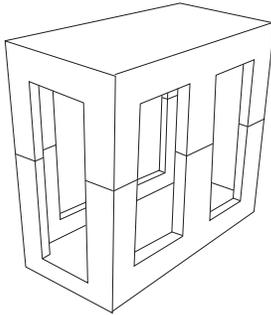


INSTALLED IN JUST ONE DAY

## Module Sizes



**SC1** - Single piece modules can be used for applications from 2' to 7' tall. Appropriate for cisterns, infiltration, detention and retention systems. SC1 modules are typically installed on minimally compacted gravel base, depending on specific project requirements.

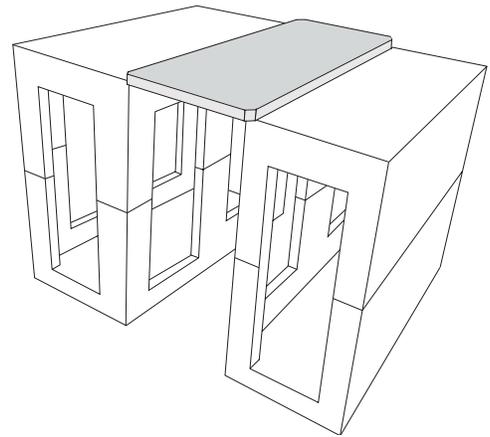


**SC2** - Two piece modules can be used for applications from 7' to 14' tall for maximum storage capacity in a condensed footprint. Appropriate for cisterns, infiltration, detention and retention systems. SC2 modules are typically installed on compacted native subgrade.

### Module Capacity

Size (ft.)	Capacity (ft <sup>3</sup> )	Size (ft.)	Capacity (ft <sup>3</sup> )
7x15x2	226	7x15x9	1027
7x15x3	343	7x15x10	1144
7x15x4	460	7x15x11	1257
7x15x5	577	7x15x12	1374
7x15x6	690	7x15x13*	1491
7x15x7	807	7x15x14*	1608
7x15x8	910		

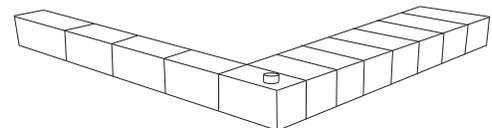
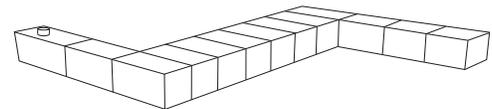
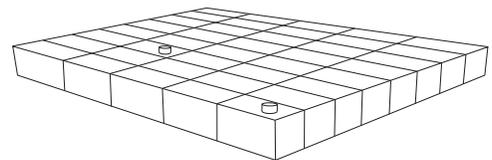
\* Special design considerations required and limited availability. All dimensions are inside dimensions.



**Link Slab** - Unique design allows for significant reduction in the quantity of modules and associated costs, while providing maximum storage capacity.

## Endless Configurations

*Contact us today to start designing your system!*



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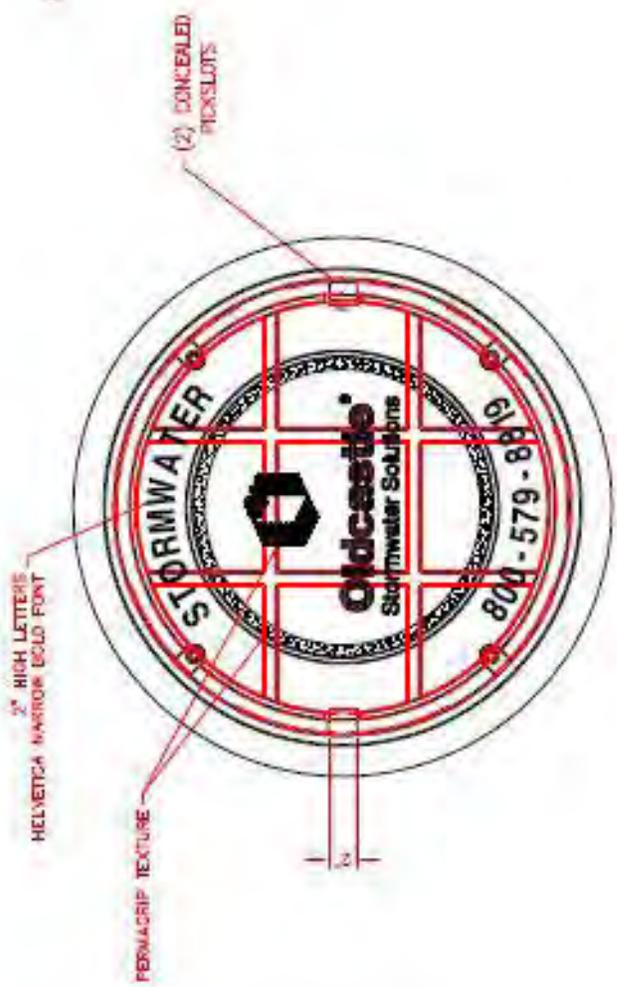
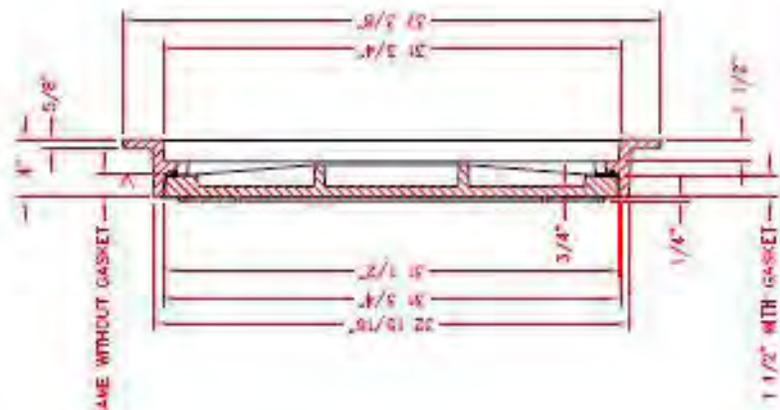
## SECTION 2

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### ACCESSORIES

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# 1296-RT05-1 B8



FURNISHED WITH MACHINED SURFACE ON SEAT OF FRAME AND LID.  
 FURNISHED WITH A T-GASKET IN FRAME.

COMPONENT NOS.: FRAME 1296-0513, LD 1296-5154 (NEW #)  
 LID EQUIPMENT NOS.: 1296 COPE AND DRAG, 3 NEW INSERTS  
 MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B  
 FINISH: NO PAINT  
 WEIGHT: FRAME 125#, LD 210#

MANHOLE RING IS REVERSIBLE AND CAN  
 BE INSTALLED WITH FLANGE UP OR DOWN.  
 TO ORDER FRAME MACHINED FLANGE UP USE  
 ORDER # 1296-RFU. TO ORDER FRAME MACHINED  
 FLANGE DOWN USE ORDER # 1296-RFD.

DR.	CM&C	SCALE	1/8"=1'	TITLE	DF-1296-RFD
DN.					BOLTED FRAME & LID
APP.					
DATE	07-13-2015			NEENAH FOUNDRY	
				NEENAH REGION 3496 1815C WISCONSIN ST NEENAH, WISCONSIN 54956 Phone 920-734-1144	
				www.nfoos.com	
				NF-1296-RT05 B	

# ConSeal™ CS-102

## Butyl Rubber Sealant



## Butyl Rubber Sealant for All Precast Concrete Structures - Meets ASTM C-990

### Applications

For concrete joints in: Manholes, Concrete Pipe, Vaults, Box Culverts, Septic Tanks, and Vertical Panel Structures. **Not intended for use in expansion joints or joints that move.**

### Sealing Properties

- Provides permanently flexible watertight joints.
- Low to high temperature workability: 30°F to 120°F (-1°C to +48°C)
- Rugged service temperature: -30°F to +200°F (-34°C to +93°C)
- Excellent chemical and mechanical adhesion to clean dry surfaces.
- Greater cohesive and adhesive strengths.
- Sealed joints will not shrink, harden or oxidize upon aging.
- Controlled flow resistance for application ease.
- No priming normally necessary. When confronted with difficult installation conditions, such as wet concrete or temperatures below 40°F (4°C), priming the concrete will improve the bonding action. Consult Concrete Sealants for the proper primer to meet your application.

### Hydrostatic Strength

ConSeal CS-102 meets the hydrostatic performance requirement as set forth in ASTM C-990 section 10.1 (Performance requirement: 10psi for 10 minutes in straight alignment – in plant, quality control test for joint materials.)

### Specifications

ConSeal CS-102 meets or exceeds all of the requirements of Federal Specification SS-S-210 (210-A), AASHTO M-198B, and ASTM C-990-91.

### Physical Properties

#### Description

	Spec	Required	CS-102
Color			Black
Specific Gravity, 77°F	ASTM D71	1.15-1.50	1.25
Ductility, 77°F	ASTM D113	5.0 min.	10
Penetration, cone 77°F (25°C), 150 gm, 5 sec.	ASTM D217	50-100 mm	55-60 mm
Penetration, cone 32°F (0°C), 150 gm, 5 sec.	ASTM D217	40 mm min.	40-65 mm
Flash Point, C.O.C., °F	ASTM D92	350°F min.	450°F
Fire Point, C.O.C., °F	ASTM D92	375°F min.	475°F

*Don't Just Seal It, ConSeal It!*

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**Concrete Sealants, Inc.** 9325 State Route 201 ■ Tipp City, OH 45371 ■ P.O. Box 176 ■ New Carlisle, OH 45344  
**P.** 937.845.8776 **F.** 937.845.3587 **Toll Free** 800.332.7325 ■ [www.conseal.com](http://www.conseal.com)



# ConSeal™ CS-102

## Butyl Rubber Sealant



Butyl Rubber Sealant for All Precast  
Concrete Structures - Meets ASTM C-990

### Chemical Composition

#### Description

	Spec	Required	CS-102
Hydrocarbon plastic content % by weight	ASTM D4 (mod.)	50% min.	51%
Inert mineral filler % by weight	AASHTO T111	30% min.	35%
Volatile Mater % by weight	ASTM D6	2% max.	1.2%
Recycled Content, % by weight			
Post Consumer:			8.41%
Post Industrial:			10.85%

### Immersion Testing

**30-Day Immersion Testing:** No visible deterioration when tested in 5% Caustic Potash, 5% Hydrochloric Acid, 5% Sulfuric Acid, and 5% saturated Hydrogen Sulfide.

**One Year Immersion Testing:** No visible deterioration when tested in 5% Formaldehyde, 5% Formic Acid, 5% Sulfuric Acid, 5% Hydrochloric Acid, 5% Sodium Hydroxide, 5% Hydrogen Sulfide, and 5% Potassium Hydroxide.

### Limited Warranty

This information is presented in good faith, but we cannot anticipate all conditions under which this information and our products, or the products of other manufactures in combination with our products, may be used. We accept no responsibility for results obtained by the application of this information or the safety and suitability of our products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each such product or product combinations for their own purposes. It is the **users' responsibility** to satisfy himself as to the suitability and completeness of such information for this own particular use. We sell this product without warranty, and buyers and users assume all responsibility and liability for loss or damage arising from the handling and use of this product, whether used alone or in combination with other products.

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# ConSeal™ CS-212

## Polyolefin Backed Exterior Joint Wrap



## Membrane Waterproofing and Exterior Joint Wrap for Precast Concrete Joints

### Applications

For joints in: Box Culverts, Underground Concrete Vaults, Segmented Bridge Structures, Wastewater Structures and Arched Bridge Structures, Manholes. **Not intended for use in expansion joints or joints that move.**

### Sealing Properties

- Excellent resistance to puncture, tear and abrasions.
- Aggressively bonds to concrete and metal structures.
- Provides a permanent flexible water and soil barrier.
- Will not shrink, harden or oxidize upon aging.
- Available in numerous standard sizes.
  - Standard thicknesses: 0.065" and 0.100"
  - Standard widths: 4", 6", 8", 12", 24", 36" and 48"
- Custom widths and lengths available upon request.
- No priming normally necessary. When confronted with difficult installation conditions, such as wet concrete or temperatures below 40°F (4°C), priming the concrete will improve the bonding action. Consult Concrete Sealants for the proper primer to meet your application.

### Specifications

ConSeal CS-212 meets ASTM E-1745, C-877, C-990 Specifications, and AASHTO M198 Type B.

### Technical Data

**ASTM E-1745:** Standard specification for plastic water vapor retarders used in contact with soil or granular fill under concrete slabs.

Class C. Specification	Test Method	E-1745 Requirement	CS-212
Water Vapor Permeance	ASTM F-1249	0.30 perms, max.	0.045 perms, max.
Tensile Strength	ASTM E-154	13.6 lbs./ inch, min.	21.0 lbs./ inch, min.
Puncture Resistance	ASTM D-1709	475 grams, min.	864 grams, min.

**ASTM C-877:** Standard specification for external sealing bands for non-circular concrete sewer, storm drain and culvert pipe.

Type III, Specification	E-1745 Requirement	CS-212
Backing Bond Element	4 Mil, min. thickness	4 Mil
Butyl Rubber Adhesive	0.03 inch, min. thickness	0.065, min.

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# ConSeal™ CS-212

## Polyolefin Backed Exterior Joint Wrap



### Membrane Waterproofing and Exterior Joint Wrap for Precast Concrete Joints

#### Technical Data Continued

**ASTM C-990:** Standard specification for joints for concrete pipe, manholes and precast box sections using preformed flexible joint sealants.

Section 6, Specification	Test Method	C-990 Requirements	CS-212
Hydrocarbon blend content % by weight	ASTM D-4	50-70%	52, min.
Inert mineral filler % by weight	ASTM C-990	30% min.	45, min.
Volatile Matter % by weight	ASTM C-990	2.0 max.	1.20
Specific Gravity	ASTM C-990	1.15-1.50	1.20-1.25
Ductility, 7°F	ASTM D-113	5.0, min.	12, min.
Penetration, cone 77°F, 150 gm. 5 sec.	ASTM D-217	50-120 mm	70-80 mm
Softening point, °F	ASTM D-36	320°F, min.	335°F, min.

#### Limited Warranty

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# Mirafi 160N



Mirafi 160N is a needle-punched, non-woven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi 160N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. Mirafi 160N meets AASHTO M288-06 Class 2 for Elongation >50%.

TenCate Geosynthetics Americas Laboratories are accredited by [A2LA](#) (The American Association for Laboratory Accreditation) and Geosynthetic Accreditation Institute - Laboratory Accreditation - ([GAI-LAP](#)). [NTPEP Number: GTX-2012-01-003](#)

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D4632	lbs (N)	160 (712)	160 (712)
Grab Tensile Elongation	ASTM D4632	%	50	50
Trapezoid Tear Strength	ASTM D4533	lbs (N)	60 (267)	60 (267)
CBR Puncture Strength	ASTM D6241	lbs (N)	410 (1825)	
Apparent Opening Size (AOS) <sup>1</sup>	ASTM D4751	U.S. sieve (mm)	70 (0.212)	
Permittivity	ASTM D4491	sec <sup>-1</sup>	1.5	
Flow Rate	ASTM D4491	gal/min/ft <sup>2</sup> (l/min/m <sup>2</sup> )	110 (4481)	
UV Resistance (at 500 Hours)	ASTM D4355	% strength retained	70	

<sup>1</sup>ASTM D4751: AOS is a Maximum Opening Diameter Value

Physical Properties	Unit	Typical Value <sup>2</sup>
Roll Dimensions (width x length)	ft (m)	15 x 300 (4.5 x 91)
Roll Area	yd <sup>2</sup> (m <sup>2</sup> )	500 (418)
Estimated Roll Weight	lb (kg)	215 (97)

<sup>2</sup> ASTM D4439 Standard Terminology for Geosynthetics: typical value, *n*—for geosynthetics, the mean value calculated from documented manufacturing quality control test results for a defined population obtained from one test method associated with on specific property.

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GAI-LAP-25-97



Testing Lab 1291.01 & 1291.02

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materials that make a difference

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# Precast Products Manual

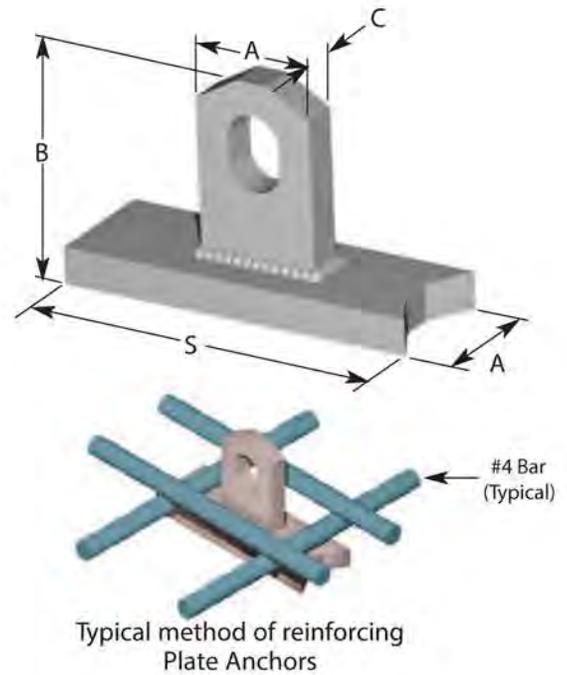
## Rapid Lift System Anchors

(6060) RL-24 PLATE ANCHOR  
2-Ton, 4-Ton and 8-Ton

The RL-24 Plate Anchor is designed with a plate welded to the bottom to provide high pullout strength with a low profile. This design makes the anchor ideal for face and back lifts of thin-wall units and stripping, handling and erection applications. The Plate Anchor is available in the sizes shown in the table and in plain or hot dip galvanize finish.

**Reinforcing Recommendation:**

Criss-cross the lower plate of the anchor with four (4) 18" long #4 rebar as shown in the sketch.



36 **NOTE:** The Plate Anchor has allowable face shear loads that are equal to or greater than the face tension loads for anchors located in a panel or concrete unit at a distance of at least  $3B+A$  from the edges.

RL-24 RAPID LIFT PLATE ANCHOR DATA										
Ring Clutch System	Clutch I.D.	Item Number	A	B	C	S	Allowable Unreinforced Tension Load 4:1 SF (lbs)	Allowable Reinforced Tension Load 4:1 SF (lbs)	Ultimate Mechanical Load Tension (lbs)	Weight Per Piece (lbs)
2T/2.5T	2.5T	79128	1 1/4"	2 1/4"	3/8"	3 3/4"	952	4,000	16,000	0.71
4T/5T	5T	45846 <sub>3</sub>	1 1/2"	3"	5/8"	3"	3,574	8,000	32,000	1.21
4T/5T	5T	45847 <sub>3</sub>	1 1/2"	3 1/2"	5/8"	3"	4,700	8,000	32,000	1.31
4T/5T	5T	79044	1 1/2"	4 3/8"	5/8"	3 7/8"	4,732	8,000	32,000	1.91
8T/10T	10T	79054	2 1/2"	6 1/4"	3/4"	5"	6,350	12,000	64,000	4.29
8T/10T	10T	79043	-	7 1/8"	-	-	Discontinued: See Plate Anchor Item 79042			
8T/10T	10T	79042	2 1/2"	7 1/8"	3/4"	5"	10,000	16,000	64,000	5.55

- Table is based on dead load only, 150 PCF and a standard concrete compressive strength of 3,500 psi and a minimum edge distance of  $(3B+A)/2$ .
- Tension values shown are based on 3,000 psi standard weight concrete, a minimum edge distance of 10" and #4 rebar cut to 18" lengths reinforcing the anchor as shown in the sketch.
- Available with plate anchor base.

To order, specify: quantity, name, item number and finish.

(6190) RL-60 PLATE ANCHOR BASE  
4-Ton

The RL-60 Plate Anchor Base is a plastic base designed for use with specific RL-24 Plate Anchor 4-Ton units (item numbers 45846 and 45847) to hold and position the anchors in face lift applications.

To order, specify: quantity, name and item number.



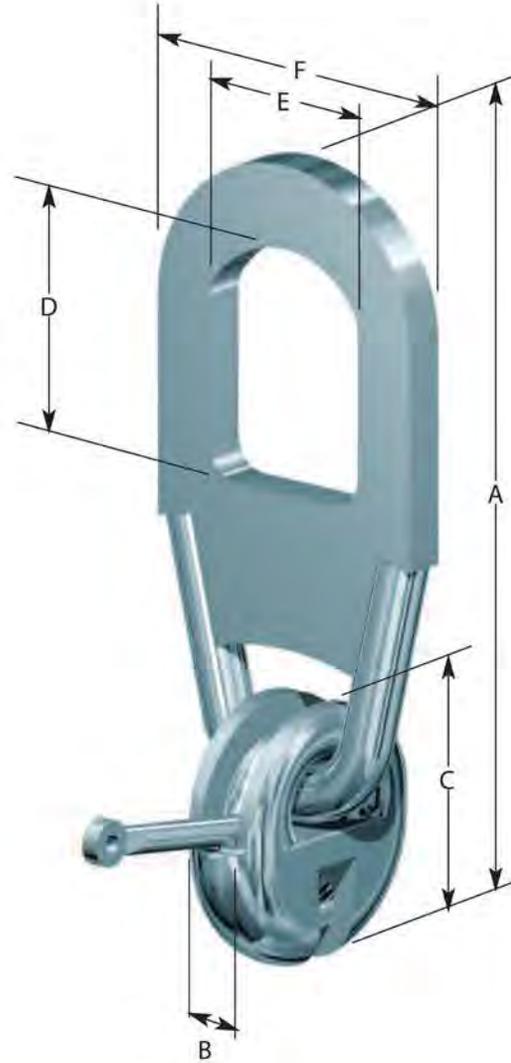
# Precast Products Manual

## Rapid Lift System Ring Clutches

(6120) RL-35 RING CLUTCH

2/2.5-Ton, 4/5-Ton, 8/10-Ton and 22/26-Ton

The RL-35 Ring Clutch is an assembly consisting of a main clutch body, a curved bolt/handle and bail. The design of the ring clutch allows a full 360° rotation of the bail around the main body. The installation of the unit is quick and easy; simply rotate the curved bolt/handle to the open position, drop the main body into the anchor recess and rotate the bolt/handle to the closed position.



RL-35 RAPID LIFT RING CLUTCH DATA

Ring Clutch Systems	Clutch I.D.	Item Number	A	B	C	D	E	F	Weight Per Piece (lbs)	Clutch Capacity (ton)
2T/2.5T	2.5T	79001	10 7/16"	1 1/16"	3 1/8"	2 3/4"	2 1/4"	3 5/8"	3.65	2.5
4T/5T <sup>1</sup>	5T	79002	13"	1 7/16"	4 1/8"	3 3/16"	2 9/16"	4 1/2"	8.65	5
8T/10T**	10T	79003	16 3/4"	2"	5 15/16"	4 9/16"	3 9/16"	5 13/16"	19.87	10
22T/26T <sup>2</sup>	26T	79170	23 7/8"	2 13/16"	8 1/4"	7 1/4"	4 3/4"	8 13/16"	55.0	22

- 1) Super Lift II Ring Clutch may be used, if a longer handle is required.
- 2) Available on special order or limited to quantity on hand. Special orders take 8 to 10 weeks.  
\*\* May be used with DTA (Double Tee Anchor).
- 3) Clutch capacities are rated at a 5:1 safety factor; and apply only to clutches manufactured after 1/1/2000.

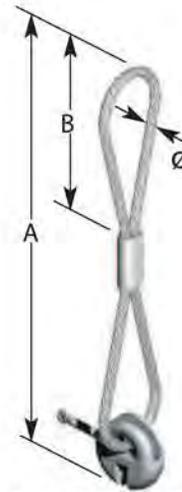
To order, specify: quantity, name and item number.

# Precast Products Manual

## Rapid Lift System Ring Clutches

(6125) RL-38 CABLE RING CLUTCH  
1-Ton, 2-Ton, 4-Ton and 8-Ton

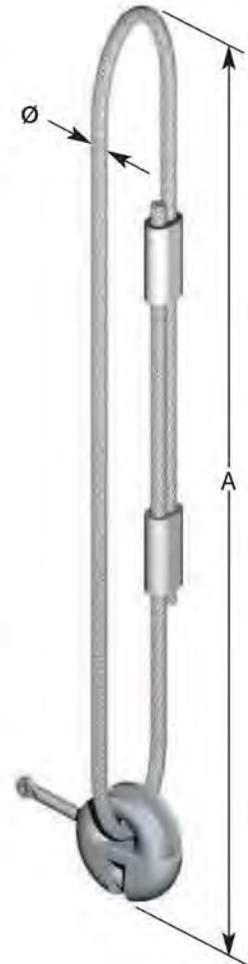
The RL-38 Ring Clutch – Cable is identical in use to the standard ring clutch, but is fabricated with a wire cable bail for more versatility. It is often an effective answer for difficult lifting and rotation challenges.



RL-38 Cable Ring Clutch  
1-Ton, 2-Ton, 4-Ton  
and 8-Ton

(6130) RL-39 CABLE RING CLUTCH  
22-Ton

The RL-39 Ring Clutch – Cable is a heavy-duty version of the cable ring clutch for use where high loads are present.



RL-39 Cable Ring Clutch  
22-Ton

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RL-38 & RL-39 CABLE RING CLUTCH DATA

Item	Ring Clutch System	Clutch I.D.**	Item Number	A	B	Cable Diameter Ø	Weight per Piece	Clutch Capacity (3 ton)
RL-38	1T	1.25T	79216	12 1/2"	8 1/4"	8 mm	2.0 lbs	1
RL-38	2T	2.5T	79001CB	22"	11 7/8"	14 mm	5.0	2
RL-38	4T	5T	79002CB	23 3/8"	11 3/4"	18 mm	8.0	4
RL-38	8T	10T	79003CB	27 3/4"	12 3/4"	22 mm	19.0	8
RL-39*	22T	26T	79170CB	62"	N/A	32 mm	67.0	22

1 Available on special order or limited quantity on hand. Special orders take 8 to 10 weeks. 2 Not to be used with High Capacity System Anchors.

3 Clutch capacities are rated at a 5:1 safety factor.

*To order, specify: quantity, name and item number.*

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# SECTION 3

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## INSTALLATION MANUAL

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INTRODUCTION

SITE PREPARATION

DELIVERY & INSTALLATION

LINKSLABS

BACKFILL

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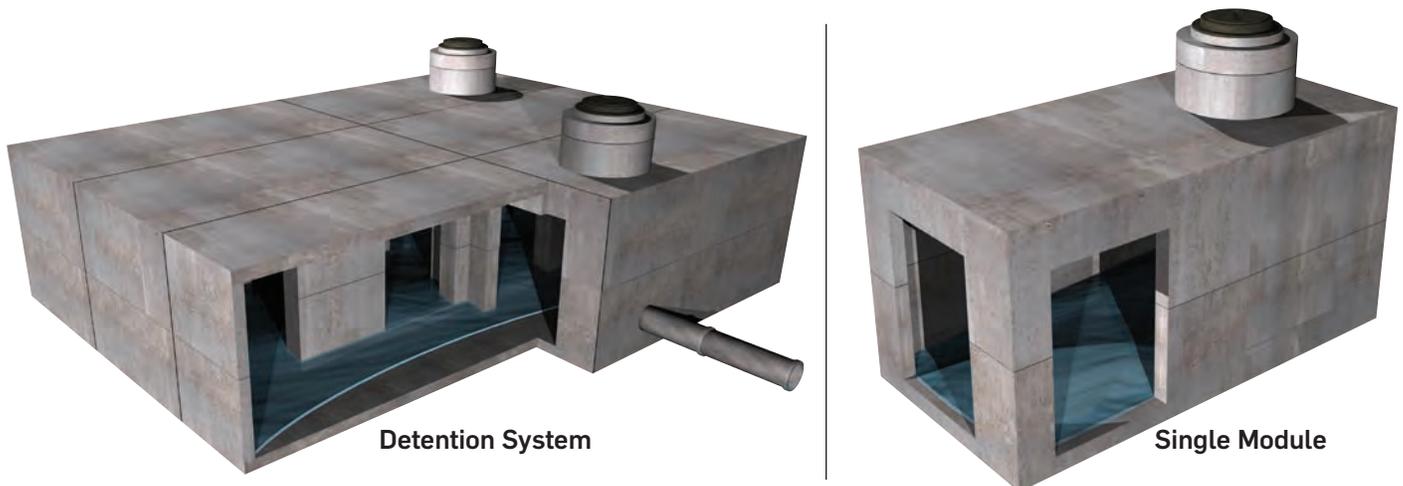
# INTRODUCTION

StormCapture (shown in **Figure 1**) is a total stormwater management system. The highly-configurable module has many solutions for detention, retention, infiltration, treatment and harvesting. Multiple modules can be arranged into endless formations to meet the needs of even the most challenging sites. The rectangular design facilitates rapid and easy installation, plus stress-free maintenance. The precast concrete provides long-term reliability and low lifecycle costs.

The engineer of record is responsible for reviewing and approving the system design, storage volume, required depth of cover, vehicular loading, water table elevation, backfill material and soil bearing capacity. Any variations found during construction to those stated on the plans must be reported to the engineer and Oldcastle Precast.

*This manual is not intended to be all-inclusive and is a reference guide only.*

**FIGURE 1**



**FIGURE 2**

**StormCapture System During Installation Process**



# SITE PREPARATION

## TIMING

- Excavation and subgrade shall be completed prior to StormCapture delivery.

## EXCAVATION - See *Figures 3 & 4*

- Depth
  - Concrete invert: Depth of fill\* + Module outside height + 2" subgrade depth
  - Open bottom: Depth of fill\* + Module outside height + subgrade depth\*\*
    - \* 6" minimum, 5' maximum, unless otherwise noted
    - \*\* Subgrade depth determined in accordance with StormCapture Tech Note SC-01
- Excavation shall be large enough to allow access around structure for backfilling and compaction equipment.
- Trench sloping shall follow OSHA requirements.
- To prevent excessive water pressure build up on the outside of the modules, the site must be prepared and graded for proper drainage around the StormCapture system.
- Dewatering is required when water level is above bottom of subgrade.

## SUBGRADE - See *Figures 3 & 4*

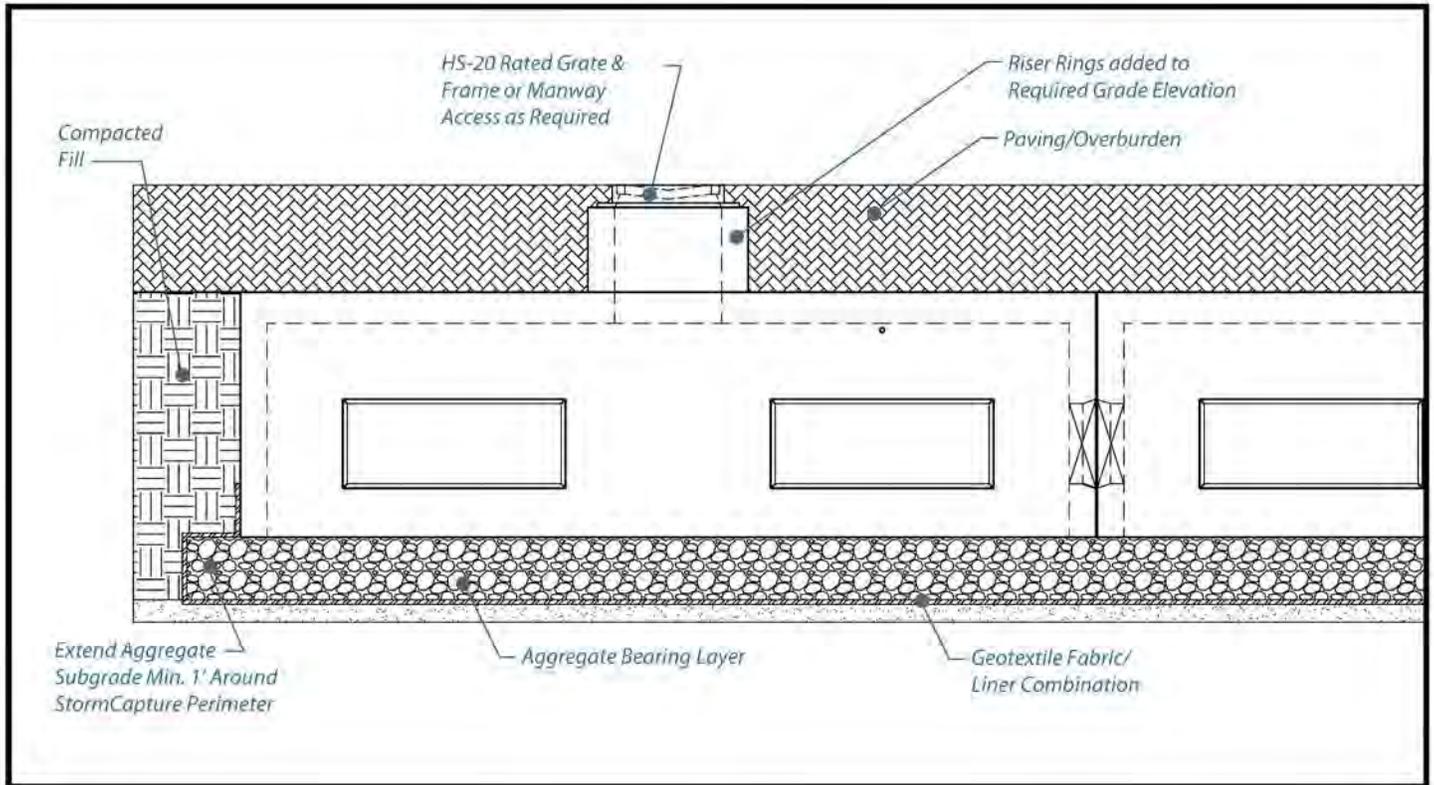
1. Native soil shall be level and compacted adequately to allow for required bearing capacity on design documents.
2. Add 2" of sand for leveling purposes.
3. Geotextile fabric and containment membrane liner.
  - An 8 oz. non-woven geotextile fabric must be used as a separation layer around the StormCapture system.
  - When the project requires a containment membrane liner, a layer of 8 oz. non-woven geotextile fabric must be used on both the inside and outside face of the liner.
  - Install containment membrane liner per manufacturer's recommendations.
4. Aggregate bearing layer - See *Figure 3*
  - Open-bottom modules only are required to be placed on a crushed aggregate bearing layer to a depth in accordance with StormCapture Tech Note SC-01. Material shall be clean, durable crushed aggregate compacted as directed by the engineer of record. Oldcastle recommends size 5, 56 or 57 (per ASTM C33).
  - Extend aggregate bearing layer a minimum of 1' around the system perimeter.
  - Aggregate bearing layer must be level and compacted prior to module placement.
  - An 8 oz. non-woven geotextile fabric must be used as a separation layer around the aggregate material and StormCapture system.

**Note:** Further investigation by a geotechnical engineer may be required where there are concerns with seasonally high water table, and/or poor soil conditions such as low allowable bearing capacity, permafrost and seasonal freeze/thaw cycles.

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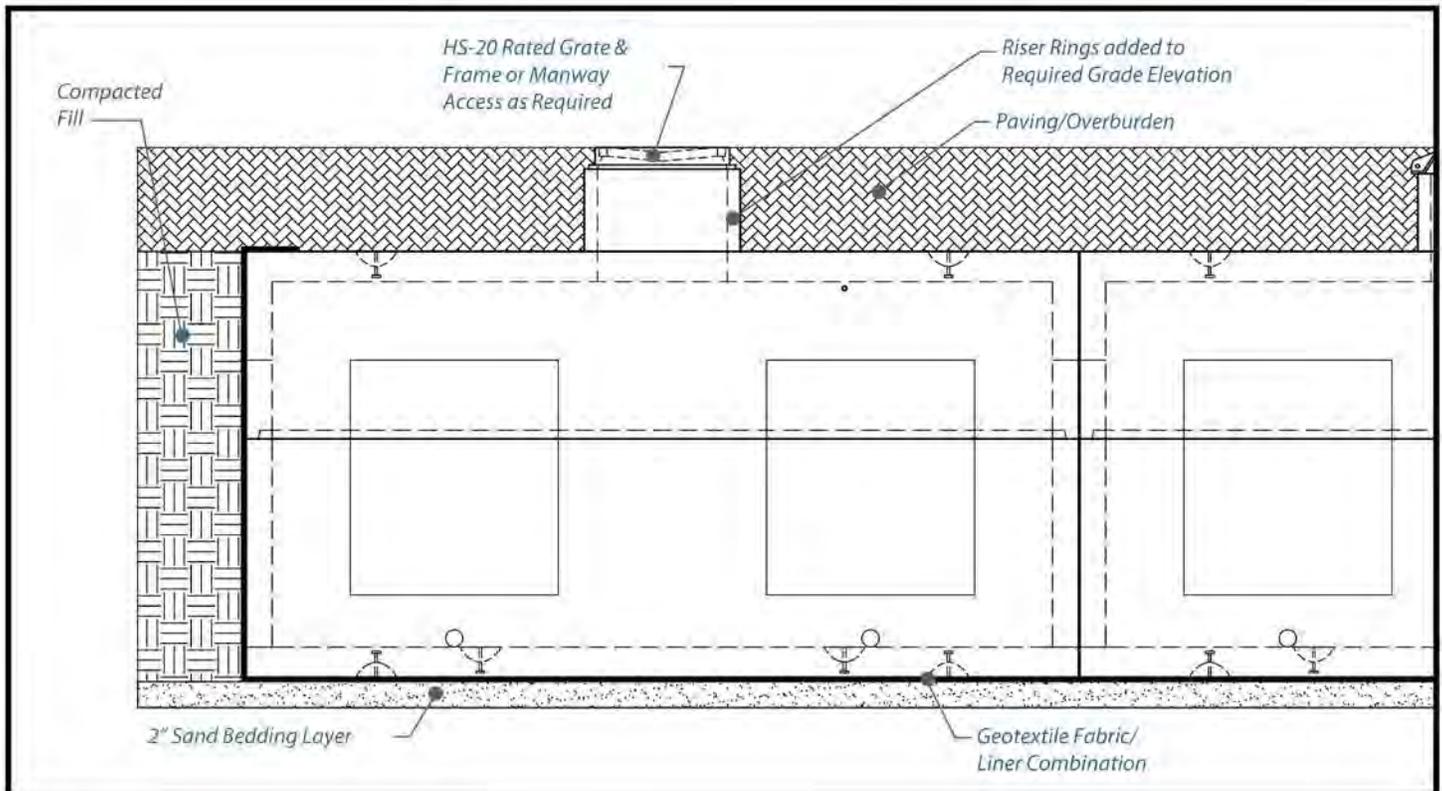
**FIGURE 3**

**1-Piece Module - With Liner**



**FIGURE 4**

**2-Piece Module - With Liner**



# DELIVERY & INSTALLATION

StormCapture modules are to be installed in accordance with ASTM C891-90, Installation of Underground Precast Utility Structures. Project plan and specifications must be followed along with any applicable regulations.

## TIMING

- Plan for first delivery of StormCapture modules after site preparation is completed.
- Individual pieces can be installed in as little as 10 minutes.

## DELIVERY

- Verify that equipment can handle module weights as noted on construction documents prior to delivery.
- StormCapture modules will be delivered on flatbed trucks.

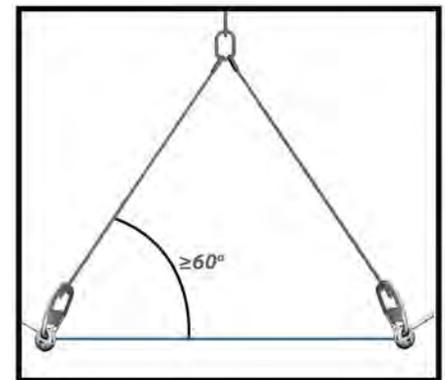
## HANDLING

- StormCapture modules are lifted by the designed embedded lifters at points provided by Oldcastle (**Figure 5**).
- Designed embedded lifters must be used. Use proper rigging to assure all lifters are equally engaged with a minimum 60° angle on slings (**Figure 6**).
- Special lifting clutches are required and shall be coordinated with the producing plant.
- Always follow safety protocols for handling StormCapture modules during installation as illustrated on this page.
- Never stand under load (**Figure 7**).
- Never place hands in the lift gear (**Figure 8**).
- Never place hands under load (**Figure 9**).

## PLACEMENT

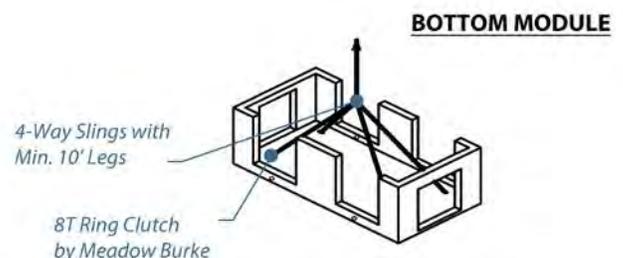
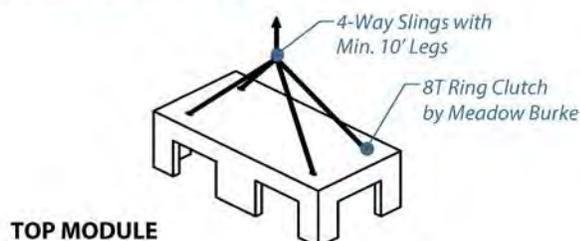
- Use the plan line, grade and elevations shown on the construction documents to install the modules. The sand bedding or aggregate bearing layer must be level.
- Modules must be placed as close together as possible with gaps no greater than 3/4".
- All vertical & top joints shall be covered with an 8" minimum width self-adhesive joint wrap as shown in **Figure 10**.
- Horizontal joints between modules or slabs shall be sealed with Conseal CS-102 butyl rubber sealant as shown in **Figure 11**.
- Seal pipe penetrations to containment membrane liner with pipe boots per liner manufacturer's recommendations.

**FIGURE 6**



**FIGURE 5**

### EMBEDDED LIFTERS



**FIGURE 7**



**FIGURE 8**



**FIGURE 9**



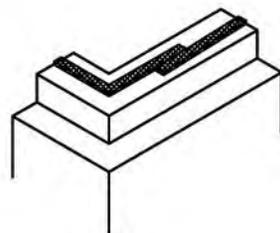
**FIGURE 10**

**Sealed Joints Between Modules**

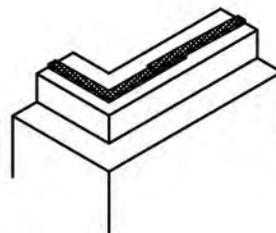


**FIGURE 11**

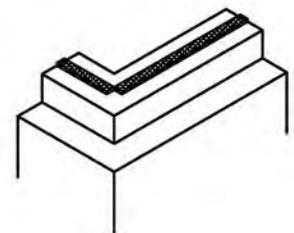
Keyways must be free of dirt, rocks and water. Rocks and dirt prevent the vault sections from seating and sealing properly. Remove all protective paper from rubber sealant material. Splice rubber sealant material with a "side by side" joint, away from corners. Corner splicing will not seal properly.



*CORRECT - Install rubber sealant material at the outer edge of the keyway. Rubber sealant should be continuous around corners.*



*INCORRECT - Do not overlap the rubber sealant material at splice.*



*INCORRECT - Do not overlap the rubber sealant material at a corner. Rubber sealant should be continuous around corners.*



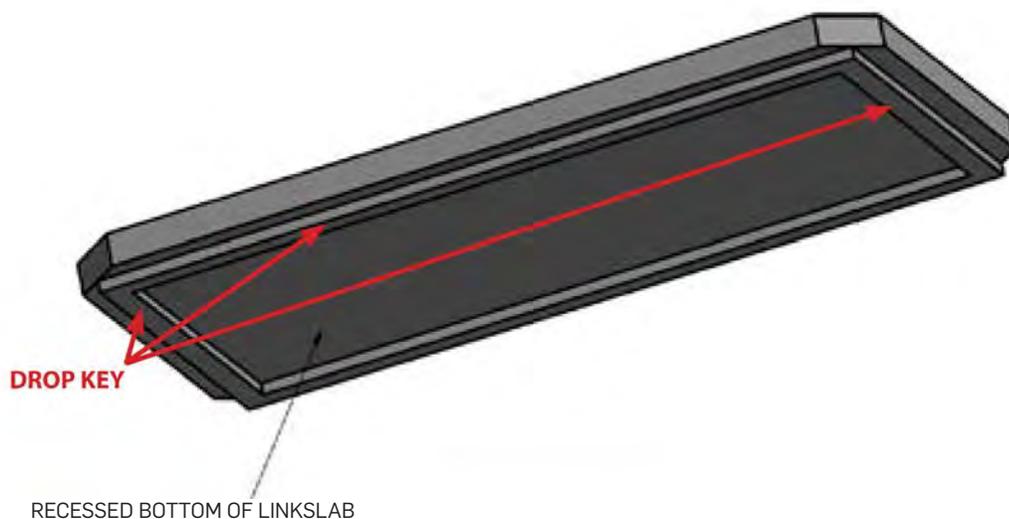
## LINKSLAB PROCEDURE

Maintaining proper line and grade is critical to installation. A qualified surveyor on the site with proper equipment is recommended to ensure a square, level and straight layout. Subgrade must be compacted.

1. Start in the corner of the layout and place the first bottom module C1.
2. Place adjacent bottom modules B, B, D, D. Be sure to set the corners square and straight (from C1 up with D modules, and from C1 right with B modules).
3. Where called out on plans, place reinforcement beams between the modules where the LinkSlab will sit (between B and A). Reinforcement beams may not be required at all locations, so refer to the project specific configuration.
4. Place interior modules A, A.
  - Check the distance between pieces when there is a gap for a LinkSlab. Both bottom corners should be between 8' and 8'-1 ¼".
5. Place Conseal CS-102 at the horizontal joints.
6. Place top modules (C1, B, B, D, D, A, A).
  - Check the distance between pieces when there is a gap for a LinkSlab. Both top corners should be 8' and 8'-1 ¼".
7. Place Conseal CS-102 for the horizontal LinkSlab joints at D, A, A and B.
8. Place the LinkSlab. Ensure that it fits tightly between all adjacent modules. The drop key should fit inside the adjacent modules. Do not allow the LinkSlab to rest on the drop key.
  - Ensure surface contact with the bottom of the LinkSlab and the top of the adjacent modules. Reset adjacent modules as necessary to correct the problem.
9. Continue placing adjacent modules and LinkSlabs.
  - Oldcastle Precast recommends placing each LinkSlab as soon as the supporting modules are in place to ensure proper fit.
10. Continue installation procedure as recommended in the StormCapture Installation Manual.

**FIGURE 13**

**LinkSlab Isometric View**



# BACKFILL

Once all modules are in place with joints sealed and geotextile fabric wrapped, the StormCapture system shall be inspected by the engineer of record or an accepted representative. Upon approval, backfilling can begin.

- Do not compact within 6" of module to avoid damaging the system. Care shall be taken during placement of backfill not to displace modules, joint wrap, containment membrane liner or geotextile fabric.
- Backfilling shall be in 1' lifts with proper compaction between lifts. Typical backfill shall be compacted to 95% standard proctor density or as specified.
- Expansive soil material shall not be used as backfill around the structure.
- Compaction shall be adequate to support expected loads on top of the system and surrounding area. Consult with geotechnical engineer for the project.
- Once installed, StormCapture modules are ready for paving or overburden material (**Figure 14**).
- Finished grading, paving and landscaping shall be per construction documents.
- Construction equipment exceeding design loading shall not be allowed on structure. Consult Oldcastle Precast if unsure.
- Contact Oldcastle Precast and the engineer of record if the live loads are greater than HS-20.
- Track vehicles including D-4 type dozers or lighter are permitted.

**FIGURE 14**

**Backfill**



## INSTALLATION IS NOW COMPLETE

*Project specific conditions may apply. Please refer to design documents for any special circumstances regarding installation or infiltration. **Oldcastle Precast is not liable for installation.***

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# SECTION 4

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## INSPECTION & MAINTENANCE

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## **STORMCAPTURE INSPECTION & MAINTENANCE MANUAL**

### **General**

Inspection and maintenance of the StormCapture system is vital for the satisfactory performance and lifecycle of the stormwater management system. Permit requirements, local, state and federal regulations, along with Oldcastle and any incorporated device manufacturer recommendations must be followed for system compliance. The StormCapture design provides manway access for ease of inspection and debris removal if required. Flushing, which can cause particle displacement, undermining and internal disturbance, is not recommended for gravel foundation, open bottom systems. Flushing is acceptable in systems with concrete bases. Inlet controls, internal or external, are recommended for controlling, monitoring and maintaining the StormCapture system.

**External Inlets** are typically devices that are separate from the StormCapture modules. These external devices receive site stormwater and are designed with manway access for maintenance and typically include an internal sump for sediment capture. External inlets may receive single or multiple pipes and incorporate an open grated top with an outfall pipe to the StormCapture system. Grated inlets may incorporate protection devices or baffles to capture floatables or the "first flush". Scheduled inspections and maintenance shall include the removal of any sedimentation build up in the external inlets. Debris or sedimentation build up shall not exceed 3" below an outfall elevation. Internal components may be incorporated for pre-treatment. Manufacturer recommendations must be followed. Scheduled maintenance and inspection will include removal of debris and sediments by manual or mechanical means.

**Maintenance Modules** (MM's) are optional internal control modules based on design preference. MM's are modules with roof manway access openings and provide the primary means of access to the StormCapture system for scheduled inspection and maintenance. In addition, MM's may incorporate weirs or baffles to enhance reduction or removal of Total Suspended Solids (TSS) from the stormwater. Placement of internal components must be part of the system engineering and design. Grated inlets can be incorporated to accommodate surface stormwater flows into the StormCapture and may include an inlet protection device. Scheduled inspection and manufacturer recommendations for maintenance must be followed.

For open bottom systems (no concrete floor), concrete splash pads may be installed below inlet grate openings and pipe inlets to prevent base erosion. During scheduled inspection and maintenance activities, the concrete splash pads must be inspected for proper function and any sediment shall be removed. Standard StormCapture module design incorporates lateral and longitudinal passageways between modules to accommodate internal stormwater conveyance between modules. These passageways may be of a window configuration with standard 12" tall sediment baffles below the windows extending from the internal module invert, or doorway configurations extending from the floor slab. Any sediment and debris build up over 6" deep inside a module shall be removed by manual or mechanical means. Removal by vacuum is recommended. Internal module flushing, which can cause particle displacement, undermining or internal disturbance, is prohibited.

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## Inspection Frequency

Oldcastle recommends that the StormCapture system be inspected quarterly, and following any significant rain events within the first year of operation. Standard Operating Procedures shall specify an annual inspection and maintenance plan as required thereafter or as stated in the permit, or as required by other governing regulations. **Only authorized and trained personnel shall inspect and enter a StormCapture system.** Personnel must be properly trained and equipped before entering any underground or confined space structure. Training includes being familiar with and following any local, state and federal regulations governing the operation, inspection and maintenance of underground structures, as well as specific StormCapture system requirements.

## Inspection Activities

During inspection, a minimum of the following shall be inspected:

- Contributing drainage area inlets are clear of debris.
- If the StormCapture system is an exfiltration system (open bottom with stormwater percolating into the ground), monitor and confirm that the system drains completely within a reasonable time or the required permit time.
- Sediment depths within the modules (anything over 6" deep shall be removed as outlined above).
- Inlet and outlet pipe penetrations to check for movement and/or leakage.
- Movement of modules.
- General interior condition of modules to look for concrete cracking or deterioration.
- Condition of pre-treatment devices, baffles and polishing devices if part of the system.

## Recordkeeping

A log must be kept of all inspection and maintenance activities.

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