

TERRE KLEEN - GENERAL NOTES:

THE TERRE KLEEN - (US PATENT 6,874,823) HYDRODYNAMIC SEPARATOR AS DESIGNED, MANUFACTURED AND INSTALLED BY TERRE HILL STORMWATER SYSTEMS, INC. IS A PRECAST CONCRETE UNIT. CONTRACT: TERRE HILL STORMWATER SYSTEMS AT P.O. BOX 10, 488 WEAVERLAND VALLEY ROAD, TERRE HILL, PA 17381 (PHONE 1-800-242-1599) OR WWW.TERREKLEEN.COM

CONCRETE: f'c = 5,000 PSI @ 28 DAYS, WITH ASTM C-33 NO. 57 OR NO. 67 COARSE AGGREGATE. DEFORMED STEEL REINFORCEMENT TO ASTM A615 GRADE 60. WELDED WIRE FABRIC CONFORMS TO FEDERAL SPECIFICATION SS-5-710A. JOINT SEALANT MUST BE INSTALLED IN ACCORDANCE WITH CONCRETE SEALANTS, INC. RECOMMENDATIONS.

ANNUAL SPACE BETWEEN PIPE AND HOLE TO BE FILLED BY OTHERS, WITH AN APPROVED NON-SHRINK GROUT OR CONCRETE AS SPECIFIED.

ALL PIPES TO BE CUT FLUSH WITH INSIDE WALL, AFTER GROUT HAS CURED.

BRGP-N ANCHORS TO BE H/31 316 STAINLESS STEEL KNUK BOLT II AS MANUFACTURED BY H/31 CORP. UNILIFT ANCHORS MANUFACTURED BY UNIVERSAL FORM CLAMP COMPANY, OR EQUAL, UNILIFT ANCHORS TYPICAL FOR HANDLING.

PRECAST FRAMES AND COVERS SUPPLIED BY TERRE HILL STORMWATER SYSTEMS. INSTALLATION AND GRADE ADJUST BY OTHERS. COVERS TO BE MARKED WITH TERRE KLEEN STORMWATER TREATMENT SYSTEM LOGO. INSTALLATION AND MAINTENANCE MUST BE IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS AND COMPLY WITH LOCAL ORDINANCES AND INDICES PHASE II REGULATIONS.

TERRE KLEEN TK18 Performance, Design and Installation Specifications

Terre Kleen is a HYDRODYNAMIC SEPARATOR consisting of precast/injected, stacked inclined plates housed inside a precast structure. Terre Kleen removes pollutants by separating sediment and floatables such as oils, grease, trash and debris from stormwater. Terre Kleen features one or more of the following:

1. capture & permanently retain 100 percent of floatable trash & debris of all flows
2. capture & permanently retain 90 percent of the sediment, silt and debris of all flows
3. capture & permanently retain 90 percent of petroleum hydrocarbons (TPH) of all flows; unit shall be capable of retaining "oil sorbents" to permanently remove captured oil, grease and TPH
4. All storm water flows shall enter the Terre Kleen unit, flows in excess of design flows, shall pass through the internal flow through duct to the effluent pipe without the use of an external bypass.
5. All storm water and debris in the grit chamber are self cleaning settling surfaces
6. HS 25 traffic and earth loadings
7. buoyancy prevention
8. Certified sediment, organic solids and other settled material in the primary and grit chambers are stored in a sump area containing not less than 116.0 CuFt; entire sump area is below settling surfaces and the treatment flow path, preventing re-suspension of settled materials
9. Minimum volume of captured gross pollutant sump area is 116.0 CuFt
10. Minimum gross oil storage volume is 203 gallons
11. 30 inch manhole access for maintenance from grade by vacuum truck; with not less than 18 inch continuous access opening to bottom of sump area
12. 18 inch manhole access opening to bottom of sump area
13. Manufacturer shall submit shop drawings and such other information requested by Engineer to verify Performance and Design Specifications
14. Warranty : Labor and material for 4 years from date of installation in the event that the product supplied is not free from defects that materially affect its performance; Terre Kleen shall be installed and used only in the particular application for which it was specifically designed, engineered and manufactured (see written Terre Kleen warranty for entire warranty)

Product Substitution Procedure

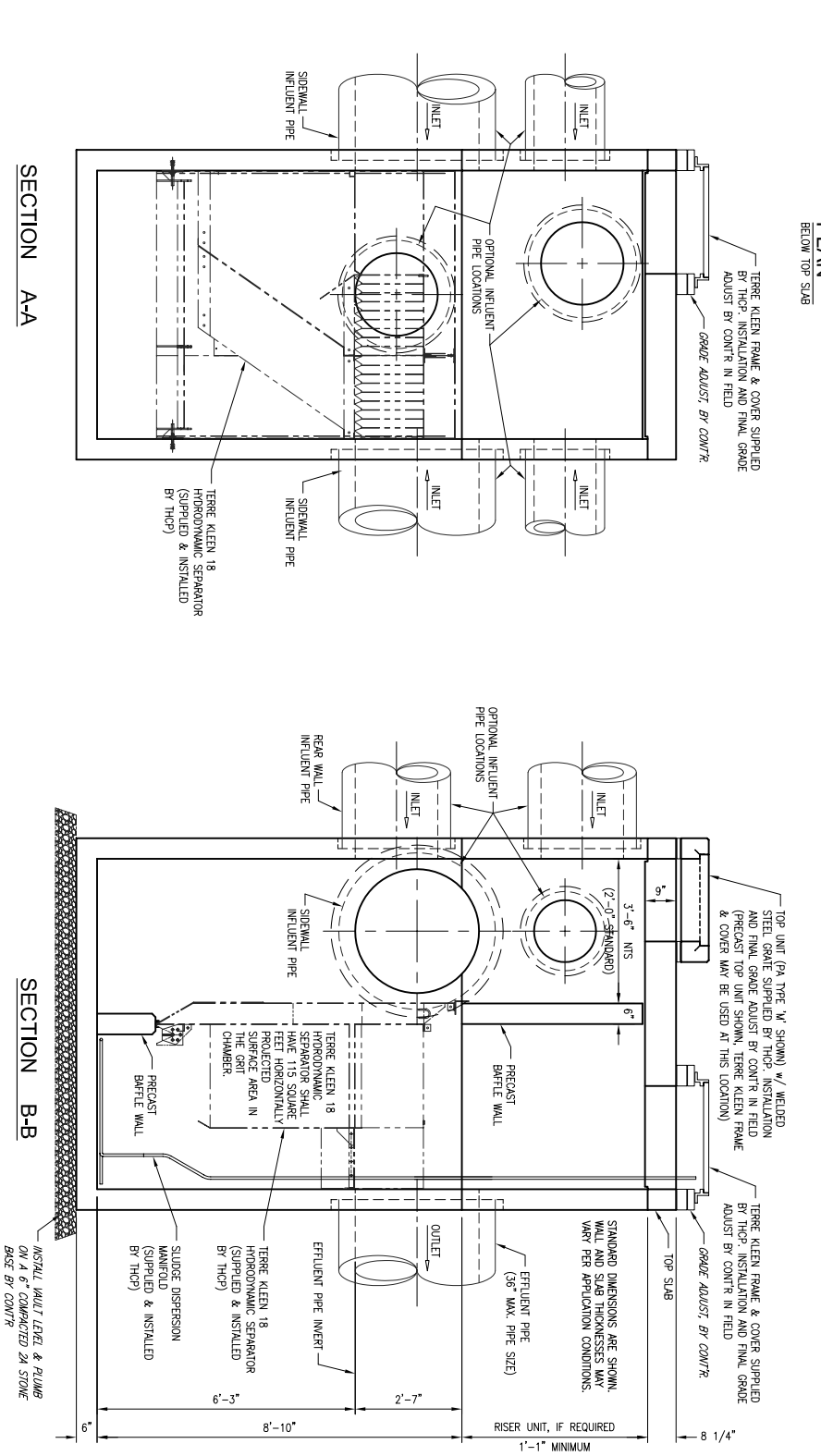
1. No stormwater treatment BMP shall be approved as an equivalent substitution unless the Engineer shall receive and approve drawings and specifications stamped and sealed by a professional engineer registered in the state wherein the project is located showing the following:
 - a. project-specific sizing calculations, with 3rd party performance verification, clearly showing that the unit meets or exceeds the Performance and Design Specifications of the Terre Kleen.
 - b. project-specific hydraulic calculations, with 3rd party performance verification, showing the hydraulic grade line (HGL) plotted through the structure for the design flow

Maintenance Procedures

1. Quarterly inspection is recommended to record sediment, oil, and trash accumulation.
2. Cleaning is recommended when the sediment reaches 16 inches in depth in one or both chambers.
3. No confined space entry required; Terre Kleen design allows access from grade, to both chambers by vacuum hose for removal of 100% of all captured pollutants.
4. Air and water pressurized sludge dispersion manifold, under inclined plates
5. Remove material must be handled and disposed according to local, state, and federal regulations

Terre Kleen Installation Specifications

1. Terre Kleen inclined plate assembly shall arrive at the job site fully assembled inside precast concrete structure. Precast structure may arrive in sections due to weight and transportation issues. Eason precast structure shall contain lifting points with UNLIFTING, lifting, and lowering instructions. The contractor shall be responsible for the proper use of the UNLIFTING device. Careful handling shall be the priority of the contractor. Contractor shall provide equipment with sufficient lifting capacity to unload and set the Terre Kleen.
2. Contractor shall excavate, dewater and shore in accordance with project specifications, as provided by Engineer and OSHA regulations.
3. Sub-grade shall be established as shown on the drawings. Underlying soil and sub-grade material shall have design loading of not less than 2000 pounds per square foot (psf). Precast components shall be placed on the compacted base (3% Proctor Density). Elevation of precast components shall be checked to ensure that the entire unit will be properly positioned when fully installed.
4. Contractor shall place "CONSEAL" or equivalent water tight mastic material between each precast component.
5. Precast structure containing the Terre Kleen component shall be aligned horizontally and vertically plumb. Contractor must confirm that the entire Terre Kleen shall be level during and after completion of backfill. The structure, if required shall be included as shown on the drawings and grade adjusted to match final grade elevations by Contractor.
6. Connect and seal storm drain inlet and outlet pipes to Terre Kleen unit using non-sink grout-fill material in accordance with project specifications.
7. Connect and seal storm drain inlet and outlet pipes to Terre Kleen unit using non-sink grout-fill material in accordance with project specifications.
8. BACKFILL SPECIFICATIONS: It is recommended that the stone sub-base be extended a minimum of one foot (1 ft) beyond the exterior face of the precast and compacted to 95% Proctor Density. Upon completion of the precast installation of 90% Proctor Density, the remaining backfill shall be compacted to 95% Proctor Density. Backfill material may be a "minimal composition effort" material. Native material may be used if the material provides an allowable bearing pressure of 2000 pounds per square foot (psf) and compacts to 90% Proctor Density per ASTM A1557, if approved by the Engineer. In areas of vehicular use, the upper two feet (2 ft) of backfill shall be aggregate base, compacted to 95% Proctor Density (ASTM A1557).
9. Contractor shall remove all foreign material and debris including all sediment, oils, grease and debris from the area prior to pipe and Terre Kleen upon completion of installation.



Setting	Design Capacity	Design Flow head	Design Capacity	Design Flow head	Design Capacity	Design Flow head	Peak Flow head	Peak Pipe diam.	Standard Storage	Standard Trash and Debris	Minimum grade to pipe invert	
TK01	1.0 cfs	< 0.50 ft	1.0 cfs	< 0.50 ft	1.7 cfs	< 0.50 ft	2.5 cfs	0.93 ft	18 in.	88 CF	192 Gallon	2.92 ft
TK02	2.0 cfs	< 0.50 ft	2.0 cfs	< 0.50 ft	3.4 cfs	< 0.50 ft	5.0 cfs	1.18 ft	18 in.	132 CF	238 Gallon	3.27 ft
TK03	3.0 cfs	< 0.50 ft	3.0 cfs	< 0.50 ft	5.1 cfs	< 0.50 ft	7.2 cfs	1.43 ft	24 in.	192 CF	327 Gallon	3.27 ft
TK04	4.0 cfs	< 0.50 ft	4.0 cfs	< 0.50 ft	6.8 cfs	< 0.50 ft	9.6 cfs	1.68 ft	24 in.	252 CF	416 Gallon	3.27 ft
TK05	5.0 cfs	< 0.50 ft	5.0 cfs	< 0.50 ft	8.6 cfs	< 0.50 ft	12.0 cfs	1.93 ft	30 in.	312 CF	505 Gallon	3.27 ft
TK06	6.0 cfs	< 0.50 ft	6.0 cfs	< 0.50 ft	10.0 cfs	< 0.50 ft	13.8 cfs	2.18 ft	30 in.	372 CF	594 Gallon	3.27 ft
TK07	7.0 cfs	< 0.50 ft	7.0 cfs	< 0.50 ft	11.0 cfs	< 0.50 ft	15.0 cfs	2.43 ft	36 in.	432 CF	683 Gallon	3.27 ft
TK08	8.0 cfs	< 0.50 ft	8.0 cfs	< 0.50 ft	12.0 cfs	< 0.50 ft	16.5 cfs	2.68 ft	36 in.	492 CF	772 Gallon	3.27 ft
TK09	9.0 cfs	< 0.50 ft	9.0 cfs	< 0.50 ft	13.0 cfs	< 0.50 ft	18.0 cfs	2.93 ft	42 in.	552 CF	861 Gallon	3.27 ft
TK10	10.0 cfs	< 0.50 ft	10.0 cfs	< 0.50 ft	14.0 cfs	< 0.50 ft	19.5 cfs	3.18 ft	42 in.	612 CF	950 Gallon	3.27 ft
TK11	11.0 cfs	< 0.50 ft	11.0 cfs	< 0.50 ft	15.0 cfs	< 0.50 ft	21.0 cfs	3.43 ft	48 in.	672 CF	1039 Gallon	3.27 ft
TK12	12.0 cfs	< 0.50 ft	12.0 cfs	< 0.50 ft	16.0 cfs	< 0.50 ft	22.5 cfs	3.68 ft	48 in.	732 CF	1128 Gallon	3.27 ft
TK13	13.0 cfs	< 0.50 ft	13.0 cfs	< 0.50 ft	17.0 cfs	< 0.50 ft	24.0 cfs	3.93 ft	54 in.	792 CF	1217 Gallon	3.27 ft
TK14	14.0 cfs	< 0.50 ft	14.0 cfs	< 0.50 ft	18.0 cfs	< 0.50 ft	25.5 cfs	4.18 ft	54 in.	852 CF	1306 Gallon	3.27 ft
TK15	15.0 cfs	< 0.50 ft	15.0 cfs	< 0.50 ft	19.0 cfs	< 0.50 ft	27.0 cfs	4.43 ft	60 in.	912 CF	1395 Gallon	3.27 ft
TK16	16.0 cfs	< 0.50 ft	16.0 cfs	< 0.50 ft	20.0 cfs	< 0.50 ft	28.5 cfs	4.68 ft	60 in.	972 CF	1484 Gallon	3.27 ft
TK17	17.0 cfs	< 0.50 ft	17.0 cfs	< 0.50 ft	21.0 cfs	< 0.50 ft	30.0 cfs	4.93 ft	66 in.	1032 CF	1573 Gallon	3.27 ft
TK18	18.0 cfs	< 0.50 ft	18.0 cfs	< 0.50 ft	22.0 cfs	< 0.50 ft	31.5 cfs	5.18 ft	66 in.	1092 CF	1662 Gallon	3.27 ft
TK19	19.0 cfs	< 0.50 ft	19.0 cfs	< 0.50 ft	23.0 cfs	< 0.50 ft	33.0 cfs	5.43 ft	72 in.	1152 CF	1751 Gallon	3.27 ft
TK20	20.0 cfs	< 0.50 ft	20.0 cfs	< 0.50 ft	24.0 cfs	< 0.50 ft	34.5 cfs	5.68 ft	72 in.	1212 CF	1840 Gallon	3.27 ft
TK21	21.0 cfs	< 0.50 ft	21.0 cfs	< 0.50 ft	25.0 cfs	< 0.50 ft	36.0 cfs	5.93 ft	72 in.	1272 CF	1929 Gallon	3.27 ft
TK22	22.0 cfs	< 0.50 ft	22.0 cfs	< 0.50 ft	26.0 cfs	< 0.50 ft	37.5 cfs	6.18 ft	78 in.	1332 CF	2018 Gallon	3.27 ft
TK23	23.0 cfs	< 0.50 ft	23.0 cfs	< 0.50 ft	27.0 cfs	< 0.50 ft	39.0 cfs	6.43 ft	78 in.	1392 CF	2107 Gallon	3.27 ft
TK24	24.0 cfs	< 0.50 ft	24.0 cfs	< 0.50 ft	28.0 cfs	< 0.50 ft	40.5 cfs	6.68 ft	84 in.	1452 CF	2196 Gallon	3.27 ft
TK25	25.0 cfs	< 0.50 ft	25.0 cfs	< 0.50 ft	29.0 cfs	< 0.50 ft	42.0 cfs	6.93 ft	84 in.	1512 CF	2285 Gallon	3.27 ft
TK26	26.0 cfs	< 0.50 ft	26.0 cfs	< 0.50 ft	30.0 cfs	< 0.50 ft	43.5 cfs	7.18 ft	90 in.	1572 CF	2374 Gallon	3.27 ft
TK27	27.0 cfs	< 0.50 ft	27.0 cfs	< 0.50 ft	31.0 cfs	< 0.50 ft	45.0 cfs	7.43 ft	90 in.	1632 CF	2463 Gallon	3.27 ft
TK28	28.0 cfs	< 0.50 ft	28.0 cfs	< 0.50 ft	32.0 cfs	< 0.50 ft	46.5 cfs	7.68 ft	96 in.	1692 CF	2552 Gallon	3.27 ft
TK29	29.0 cfs	< 0.50 ft	29.0 cfs	< 0.50 ft	33.0 cfs	< 0.50 ft	48.0 cfs	7.93 ft	96 in.	1752 CF	2641 Gallon	3.27 ft
TK30	30.0 cfs	< 0.50 ft	30.0 cfs	< 0.50 ft	34.0 cfs	< 0.50 ft	49.5 cfs	8.18 ft	96 in.	1812 CF	2730 Gallon	3.27 ft

1. Design flow rates based on weighted Removal efficiency and adjusted for a particle density 14lbs/cu ft and 60 degree Fahrenheit water temperature.

2. Peak headloss is defined by the standard insert clearance and design peak flow.

3. Head loss for the standard insert clearance and design peak flow.

4. Head loss for the standard insert clearance and design peak flow.

5. Special designs are available to increase these values.

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