Smith & Loveless, Inc.®

14040 Santa Fe Trail Drive
Lenexa, Kansas 66215-1284

DESIGN DATA TABLES

The following eleven (11) tables will assist you in sizing and specifying your **PISTA®** Grit Removal System. Tables 1 and 2 detail the straight-through or **PISTA® 360™** Grit Chamber utilizing concrete for the chamber. Table 3 details the **PISTA®** Grit Chamber utilizing a steel chamber. Table 4 is the **PISTA® 270™** Grit Chamber utilizing concrete for the chamber. Table 5 covers the **PISTA®** grit storage volume. Table 6 details the **PISTA® TURBO™** Grit Pump. Table 7 covers the **PISTA®** Grit Concentrator and Tables 8, 9, 10, and 11 are three (3) final dewatering **PISTA®** systems to select from.

Starting on page F6, you will find tables that contain the design data in metric units.

Table 1
PISTA® GRIT CHAMBER DESIGN DATA – CONCRETE TANK – PISTA® 360™ UNITS

Model	0.5A, 0.5B	1.0A, 1.0B	2.5A, 2.5B	4.0A, 4.0B	7.0A, 7.0B	12.0A, 12.0B	20.0A, 20.0B
Maximum Flow (MGD)	0.5	1.0	2.5	4.0	7.0	12.0	20.0
Chamber Diameter	6'-0"	6'-0"	7'-0"	8'-0"	10'-0"	12'-0"	16'-0"
Chamber Depth (Min.)	3'-8"	3'-8"	4'-6"	4'-8"	5'-0"	6'-8"	7'-6"
Grit Hopper Diameter	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	5'-0"	5'-0"
Grit Hopper Depth (Min.)	5'-0"	5'-0"	5'-0"	5'-0"	5'-6"	6'-8"	6'-10"
Drive: HP	3/4	3/4	3/4	1	1	1-1/2	1-1/2
Input RPM	54	54	54	54	54	54	54
Output RPM	20	20	20	20	20	20	20
Estimated Shipping Wt. (Lbs.)	2000	2000	2000	2000	2500	2500	3000

Table 2
PISTA® GRIT CHAMBER DESIGN DATA – CONCRETE TANK – PISTA® 360™ UNITS

Model	30.0A, 30.0B	50.0A, 50.0B	70.0A, 70.0B	100.0A, 100.0B
Maximum Flow (MGD)	30.0	50.0	70.0	100.0
Chamber Diameter	18'-0"	20'-0"	24'-0"	32'-0"
Chamber Depth (Min.)	9'-2"	11'-6"	12'-8"	12'-8"
Grit Hopper Diameter	5'-0"	5'-0"	6'-0"	8'-0"
Grit Hopper Depth (Min.)	7'-0"	8'-0"	8'-0"	10'-0"
Drive: HP	2	2	2	2
Input RPM	54	54	54	54
Output RPM	20	20	20	20
Estimated Shipping Wt. (Lbs.)	3000	3700	4000	5000

Table 3
PISTA® GRIT CHAMBER DESIGN DATA – STEEL TANK – PISTA® 360™ UNITS

Model	0.5A, 0.5B	1.0A, 1.0B	2.5A, 2.5B	4.0A, 4.0B	7.0A, 7.0B
Maximum Flow (MGD)	0.5	1.0	2.5	4.0	7.0
Chamber Diameter	6'-0"	6'-0"	7'-0"	8'-0"	9'-10¼"
Chamber Depth (Min.)	2'-6 5/8"	2'-6 5/8"	3'-4 5/8"	3'-6¾"	3'-10¾"
Grit Hopper Diameter	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"
Grit Hopper Depth (Min.)	5'-0"	5'-0"	5'-0"	5'-0"	5'-6"
Drive: HP	3/4	3/4	3/4	1	1
Input RPM	54	54	54	54	54
Output RPM	20	20	20	20	20
Estimated Shipping Wt. (Lbs.)	4000	4000	4500	5500	7000

Table 4
PISTA® GRIT CHAMBER DESIGN DATA – CONCRETE TANK – PISTA® 270™ UNITS

Model	0.5	1.0	2.5	4.0	7.0	12.0	20.0	30.0	50.0	70.0	100.0
Maximum Flow (MGD)	0.5	1.0	2.5	4.0	7.0	12.0	20.0	30.0	50.0	70.0	100.0
Chamber Diameter	6'-0"		7'-0"	8'-0"	10'-0" *	12'-0"	16'-0"	18'-0"	20'-0"	24'-0"	32'-0"
Chamber Depth (Min.)	3'-8"		3'-8"	4'-0"	4'-9"	5'-0"	5'-6"	6'-6"	8'-0"	8'-0"	10'-0"
Grit Hopper Diameter	3'-0"		3'-0"	3'-0"	3'-0"	5'-0"	5'-0"	5'-0"	5'-0"	6'-0"	8'-0"
Grit Hopper Depth (Min.)	5'-0"		5'-0"	5'-0"	5'-6"	6'-8"	6'-10"	7'-0"	8'-0"	8'-0"	10'-0"
Drive: HP	3/4		3/4	3/4	1	1	1.5	1.5	1.5	1.5	1.5
Input RPM	54		54	54	54	54	54	54	54	54	54
Output RPM	20		20	20	20	20	20	20	20	20	20
Estimated Shipping Wt. (Lbs.)	2000		2000	2000	2500	2500	3000	3000	3000	3000	3000
Add for Steel Shell	2300		2600	3300	4800	N/A	N/A	N/A	N/A	N/A	N/A

* 9' – 10-¼" in Steel

Now that you have selected the **PISTA®** Grit Chamber model you require, you can determine the grit storage volume in the **PISTA®** Grit Chamber.

Table 5
PISTA® GRIT CHAMBER
GRIT HOPPER STORAGE VOLUME **

MODEL	CUBIC FEET (Min.)
0.5, 0.5A, 0.5B	32
1.0, 1.0A, 1.0B	32
2.5, 2.5A, 2.5B	32
4.0, 4.0A, 4.0B	32
7.0, 7.0A, 7.0B	35
12.0, 12.0A, 12.0B	100
20.0, 20.0A, 20.0B	102
30.0, 30.0A, 30.0B	106
50.0, 50.0A, 50.0B	125
70.0, 70.0A, 70.0B	164
100.0, 100.0A, 100.0B	335

** Volumes seen above are based on the hopper dimensions listed in Tables 1 through 4, and utilizing a 60° sloped bottom in the **PISTA®** Grit Chamber's grit hopper.

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The following **PISTA®** Grit Removal System components will provide the end-user with the best removal and dewatering efficiencies in the market. In order to provide periodic pump out of the **PISTA®** Grit Chamber, Smith & Loveless recommends the use of the Top-Mounted **PISTA® TURBO™** Grit Pump or Remote-Mounted **PISTA® TURBO™** Grit Pump (Table 6). Smith & Loveless then recommends the use of the **PISTA®** Grit Concentrator (Table 7) and one of four **PISTA®** Grit Dewatering Devices (Tables 8, 9, 10 and 11). This total **PISTA®** Grit Removal System will produce some of the best grit removal efficiencies and dewatering capabilities on the market today.

Table 6
RECOMMENDED FOR ALL PISTA® GRIT CHAMBER MODELS
GENERAL INFORMATION
PISTA® 360™ GRIT PUMP

Pump Rate, GPM	**250**	**500**
Casing Suction Size	4”	6”
Discharge Nozzle	4”	6”
Impeller Max.	10”	12”
Diameter Min.	7”	9”
Shaft Size for Mechanical Seal	1-7/8” or 2-1/8”	1-7/8”, 2-1/8” or 3”
Shaft	Stainless Steel	Stainless Steel
Seal Holder	Bronze	Bronze
Seal	Carbon and Ceramic	Carbon and Ceramic
Shaft Overhang (Lowest Bearing to Top of Impeller)	6” Max.	6” Max.
Motor Insulation	Class F	Class F
Casing	Ni-Hard	Ni-Hard
Impeller Design/Material	Recessed 5-Vane **PISTA® TURBO™/** Ni-Hard	Recessed 5-Vane **PISTA® TURBO™/** Ni-Hard
Estimated Shipping Weight – Lbs. (Including Motor)	750	970

Table 7
RECOMMENDED FOR ALL PISTA® GRIT CHAMBER MODELS
GENERAL INFORMATION
PISTA® GRIT CONCENTRATOR

Pump Rate, GPM - Inlet	**250**	**500**
Head loss through Concentrator, FT @ Design Pump Rate	12	28
Underflow, GPM @ Design Pump Rate	20	30
Inlet Diameter (outer diameter), Inches (plain end)	4-1/2”	4-1/2”
Underflow Outlet Diameter (outer diameter), Inches (plain end)	5-1/2”	5-1/4”
Drain Outlet Diameter, Inches (flanged)	6”	6”
Material – Nickel-Hardened Iron, Brinell Hardness	550+	---
Top Section Material – Nickel-Hardened Iron, Brinell Hardness	---	550+
Bottom Section Material – Scientifically Formulated, Proprietary Polymer with Embedded Silicon Carbide Insert	---	**DURALYTE®**

Table 8
PISTA® TURBO™ GRIT WASHER WITH TRI-CLEANSE TECHNOLOGY™
RECOMMENDED FOR ALL PISTA® GRIT CHAMBER MODELS

Model	**250**	**500**
Drawing Number	67B379	67B377 or 67B457
Dewatering Trough Length	15'-0"	17'-0"
Dewatering Screw Diameter	9"	14"
Discharge	8"	12"
Outlet Weir Trough	4"	6"
Drive Motor (HP)	3	5
Screw Speed (RPM)	10	11
Angle of Inclination	22°	22°
Overall Length	17'-6 1/4"	20'-8 1/2"
Inlet Separator:		
Length	5'-0 1/8"	6'-11"
Width	2'-11 1/2"	4'-6 3/8"
Height	4'-8"	5'-6"
Settling Area	15.1 ft^2	33.0 ft^2
Approximate Shipping Weight (LBS.)	1850	2650
Maximum Grit Slurry Feed Rate (GPM)	275	550
Maximum Capacity (Tons/Hr)	2.47	10.36

Table 9
PISTA® GRIT SCREW CONVEYOR WITH PARALLEL PLATE SEPARATOR
RECOMMENDED FOR ALL PISTA® GRIT CHAMBER MODELS

Model	**15**	**17**
Drawing Number	67C168	67B202
Dewatering Trough Length	15'-0"	17'-0"
Dewatering Screw Diameter	9"	14"
Discharge	8"	12"
Outlet Weir Trough	4"	6"
Drive Motor (HP)	1	3
Screw Speed (RPM)	9	11
Angle of Inclination	22°	22°
Overall Length	18'-8"	20'-9"
Inlet Separator:		
Length	5'-0"	6'-8"
Width	2'-6"	4'-0"
Height	4'-8"	5'-6"
Settling Area	15.1 ft^2	33.0 ft^2
Approximate Shipping Weight (LBS.)	2000	3000
Maximum Capacity (GPM)	50	100

PISTA Grit Removal System ®

Table 10
SEPARATOR SCREEN WITH PISTA® GRIT CONCENTRATOR

HEIGHT	WIDTH	DEPTH	INLET	OUTLET	EST. WT.	RECOMMENDED PISTA® MODELS
80-7/8”	39-3/4”	49”	4”	6”	660 Lbs.	0.5, 0.5A, 0.5B, 1.0, 1.0A, 1.0B, 2.5, 2.5A, 2.5B, 4.0, 4.0A, 4.0B, 7.0, 7.0A, 7.0B

Table 11
PISTA® GRIT CART

APPROXIMATE OVERALL DIMENSIONS			APPROX. SHIP. WT. POUNDS	RECOMMENDED PISTA® GRIT CHAMBER MODELS
LENGTH	WIDTH	HEIGHT		
55”	35”	32”	200	0.5, 0.5A, 0.5B, 1.0, 1.0A, 1.0B, 2.5, 2.5A, 2.5B, 4.0, 4.0A, 4.0B

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The following eleven (11) tables contain the design data in metric units to assist you in sizing your **PISTA®** Grit Removal System. Tables 1 & 2 detail the straight through or Model A **PISTA®** Grit Chamber utilizing concrete for the chamber. Table 3 details the straight through or **PISTA® 360™** Grit Chamber utilizing a steel grit chamber. Table 4 is the **PISTA® 270™** Grit Chamber utilizing concrete for the chamber. Table 5 covers the **PISTA®** grit storage volume. Table 6 the **PISTA® TURBO™** Grit Pump. Table 7 the **PISTA®** Grit Concentrator and Tables 8, 9, 10, and 11 are four final dewatering **PISTA®** systems to select from. For **PISTA®** Grit Removal System sizing using American English units, please see Page F1 of this section.

METRIC – Table 1
PISTA® GRIT CHAMBER DESIGN DATA – CONCRETE TANK – PISTA® 360™ UNITS

Model	0.5A, 0.5B	1.0A, 1.0B	2.5A, 2.5B	4.0A, 4.0B	7.0A, 7.0B	12.0A, 12.0B	20.0A, 20.0B
Maximum Flow (cmd)	1,892	3,785	9,465	15,140	26,495	45,420	75,700
Chamber Diameter (m)	1.83	1.83	2.13	2.44	3.05	3.66	4.88
Chamber Depth (m) (Min.)	1.12	1.12	1.37	1.42	1.52	2.03	2.29
Grit Hopper Diameter (m)	0.91	0.91	0.91	0.91	0.91	1.52	1.52
Grit Hopper Depth (m) (Min.)	1.52	1.52	1.52	1.52	1.68	2.03	2.08
Drive: (kw)	0.5	0.5	0.5	0.75	0.75	1.1	1.1
Input RPM	54	54	54	54	54	54	54
Output RPM	20	20	20	20	20	20	20
Estimated Shipping Wt. (kg.)	900	900	900	900	1135	1135	1360

METRIC – Table 2
PISTA® GRIT CHAMBER DESIGN DATA – CONCRETE TANK – PISTA® 360™ UNITS

Model	30.0A, 30.0B	50.0A, 50.0B	70.0A, 70.0B	100.0A, 100.0B
Maximum Flow (cmd)	113,550	189,250	265,000	378,500
Chamber Diameter (m)	5.49	6.10	7.32	9.75
Chamber Depth (m) (Min.)	2.79	3.50	3.86	3.86
Grit Hopper Diameter (m)	1.52	1.52	1.83	2.44
Grit Hopper Depth (m) (Min.)	2.13	2.44	2.44	3.05
Drive: (kw)	1.5	1.5	1.5	1.5
Input RPM	54	54	54	54
Output RPM	20	20	20	20
Estimated Shipping Wt. (kg.)	1360	1680	1815	2270

METRIC – Table 3
PISTA® GRIT CHAMBER DESIGN DATA – STEEL TANK – PISTA® 360™ UNITS

Model	0.5A, 0.5B	1.0A, 1.0B	2.5A, 2.5B	4.0A, 4.0B	7.0A, 7.0B
Maximum Flow (cmd)	1,892	3,785	9,465	15,140	26,495
Chamber Diameter(m)	1.83	1.83	2.13	2.44	3.0
Chamber Depth (m) (Min.)	0.78	0.78	1.03	1.09	1.19
Grit Hopper Diameter(m)	0.91	0.91	0.91	0.91	0.91
Grit Hopper Depth (m) (Min.)	1.52	1.52	1.52	1.52	1.68
Drive: (kw)	0.5	0.5	0.5	0.75	0.75
Input RPM	54	54	54	54	54
Output RPM	20	20	20	20	20
Estimated Shipping Wt. (kg)	1815	1815	2040	2495	3175

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METRIC - Table 4
PISTA® GRIT CHAMBER DESIGN DATA – CONCRETE TANK - PISTA® 270™ UNITS

Model	0.5	1.0	2.5	4.0	7.0	12.0	20.0	30.0	50.0	70.0	100.0
Maximum Flow (cmd)	1,892	3,785	9,462	15,140	26,495	45,420	75,700	113,550	189,250	265,000	378,500
Chamber Diameter (m)	1.83		2.13	2.44	3.05 *	3.66	4.88	5.49	6.10	7.32	9.75
Chamber Depth (m) (Min.)	1.12		1.12	1.22	1.45	1.52	1.68	1.98	2.44	2.44	3.05
Grit Hopper Diameter (m)	0.91		0.91	0.91	1.52	1.52	1.52	1.52	1.52	1.83	2.44
Grit Hopper Depth (m) (Min.)	1.52		1.52	1.52	1.68	2.03	2.08	2.13	2.44	2.44	3.05
Drive: kw	0.5		0.5	0.5	0.75	0.75	1.5	1.5	1.5	1.5	1.5
Input RPM	54		54	54	54	54	54	54	54	54	54
Output RPM	20		20	20	20	20	20	20	20	20	20
Estimated Shipping Wt. (kg.)	900		900	900	1135	1135	1360	1360	1360	1360	1360
Add for Steel Shell	1045		1180	1500	2180	N/A	N/A	N/A	N/A	N/A	N/A

* 3 m in Steel

Now that you have selected the **PISTA®** Grit Chamber model you require, you can determine the grit storage volume in the **PISTA®** Grit Chamber.

METRIC – Table 5
PISTA® GRIT CHAMBER
GRIT HOPPER STORAGE VOLUME **

MODEL	CUBIC METERS (Min.)
0.5, 0.5A, 0.5B	0.90
1.0, 1.0A, 1.0B	0.90
2.5, 2.5A, 2.5B	0.90
4.0, 4.0A, 4.0B	0.75
7.0, 7.0A, 7.0B	0.99
12.0, 12.0A, 12.0B	1.10
20.0, 20.0A, 20.0B	1.10
30.0, 30.0A, 30.0B	3.00
50.0, 50.0A, 50.0B	3.54
70.0, 70.0A, 70.0B	4.64
100.0, 100.0A, 100.0B	9.49

** Volumes listed above are based on the hopper dimensions listed in Tables 1 through 4 and utilizing a 60° sloped bottom in the **PISTA®** Grit Chamber's grit hopper.

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The following **PISTA®** Grit Removal System components will provide the customer with the best removal and dewatering efficiencies in the market. In order to provide periodic pump-out of the **PISTA®** Grit Chamber, Smith & Loveless recommends the use of the Top Mounted **PISTA® TURBO™** Grit Pump or Remote Mounted **PISTA® TURBO™** Grit Pump (Table 6). Smith & Loveless then recommends the use of the **PISTA®** Grit Concentrator (Table 7) and one of four **PISTA®** Grit Dewatering Devices (Tables 8, 9, 10 and 11). This total **PISTA®** Grit Removal System will produce some of the best grit removal efficiencies and dewatering capabilities on the market today.

METRIC – Table 6
RECOMMENDED FOR ALL PISTA® GRIT CHAMBER MODELS
GENERAL INFORMATION
PISTA® TURBO™ GRIT PUMP

Pump Rate, lps	**15.8**	**31.5**
Casing Suction Size, mm	100	150
Discharge Nozzle, mm	100	150
Impeller Max., mm	254	305
Diameter Min. , mm	178	229
Shaft Size for Mechanical Seal, mm	47.6 or 54	47.6, 54 or 76.2
Maximum Spherical Solid, mm	76	76
Shaft	Stainless Steel	Stainless Steel
Seal Holder	Bronze	Bronze
Seal	Carbon and Ceramic	Carbon and Ceramic
Shaft Overhang (Lowest Bearing to Top of Impeller)	31.5 mm Max.	31.5 mm Max.
Motor Insulation	Class F	Class F
Casing	Ni-Hard	Ni-Hard
Impeller Design/Material	Recessed 5-Vane **PISTA® TURBO™/**Ni-Hard	Recessed 5-Vane **PISTA® TURBO™/**Ni-Hard
Estimated Shipping Weight – kg. (Including Motor)	340	440

METRIC – Table 7
RECOMMENDED FOR ALL PISTA® GRIT CHAMBER MODELS
GENERAL INFORMATION
PISTA® GRIT CONCENTRATOR

Pump Rate, (lps)	**15.8**	**35.28**
Head loss through Concentrator, (m) @ Design Pump Rate	3.7	7.6
Underflow, (lps) @ Design Pump Rate	1.3	1.9
Inlet Diameter (outer diameter), (mm) (plain end)	114	114
Underflow Outlet Diameter (outer diameter), (mm) (plain end)	140	133
Drain Outlet Diameter, (mm) (flanged)	150	150
Material – Nickel Hardened Iron, Brinell Hardness	550+	550+
Material – Top Section – Nickel Hardened Iron, Brinell Hardness	---	550+
Material – Bottom Cone – Proprietary **DURALYTE®** Compound	---	Yes

METRIC-Table 8 PISTA® TURBO™ GRIT WASHER WITH TRI-CLEANSE TECHNOLOGY™ RECOMMENDED FOR ALL PISTA® GRIT CHAMBER MODELS		
Model	**250**	**500**
Drawing Number	67B379	67B377 or 67B457
Dewatering Trough Length (m)	5	5.2
Dewatering Screw Diameter (mm)	230	356
Discharge (mm)	200	300
Outlet Weir Trough (mm)	100	150
Drive Motor (kW)	2.2	5
Screw Speed (RPM)	10	11
Angle of Inclination	22°	22°
Overall Length (m)	5.3	6.3
Inlet Separator:		
Length (m)	1.6	2.1
Width (m)	0.9	1.4
Height (m)	1.4	1.7
Settling Area (m^2)	5 m^2	3 m^2
Approximate Shipping Weight (kg)	840	1202
Maximum Grit Slurry Feed Rate (lps)	17.4	34.7
Maximum Capacity (Tonnes/Hr)	2.2	9.4

METRIC – Table 9 PISTA® GRIT SCREW CONVEYOR WITH PARALLEL PLATE SEPARATOR RECOMMENDED FOR ALL PISTA® GRIT CHAMBER MODELS		
Model	**15**	**17**
Drawing Number	67C168	67B202
Dewatering Trough Length (m)	4.572	5.182
Dewatering Screw Diameter (mm)	229	356
Angle of Inclination	22°	22°
Overall Length (m)	5.691	6.325
Inlet Separator (m):		
Length	1.521	2.033
Width	0.762	1.219
Height	1.423	1.676
Approximate Shipping Weight (kg)	900	1360
Maximum Capacity (lps)	3.15	6.3

METRIC – Table 10 SEPARATOR SCREEN WITH PISTA® GRIT CONCENTRATOR						
HEIGHT	**WIDTH**	**DEPTH**	**INLET**	**OUTLET**	**EST. WT.**	**RECOMMENDED PISTA® MODELS**
2054 mm	1010 mm	1245 mm	100 mm	150 mm	300 kg	0.5, 0.5A, 0.5B, 1.0, 1.0A, 1.0B, 2.5, 2.5A, 2.5B, 4.0, 4.0A, 4.0B, 7.0, 7.0A, 7.0B

METRIC – Table 11 PISTA® GRIT CART				
APPROXIMATE OVERALL DIMENSIONS			**APPROX. SHIP. WT.**	**RECOMMENDED PISTA® GRIT CHAMBER MODELS**
LENGTH	**WIDTH**	**HEIGHT**		
1370 mm	889 mm	813 mm	90 kg	0.5, 0.5A, 0.5B, 1.0, 1.0A, 1.0B, 2.5, 2.5A, 2.5B, 4.0, 4.0A, 4.0B