

INDUSTRY SERVICES

Site Drainage Systems

Stormwater Drywells
French Drains
Piping
Drainage Appurtenances
Pump Systems

Technical Analysis

Design Review
Percolation Testing
Geologic Database
ADEQ Drywell Registration

Recharge Systems

Municipal/Private Recharge Wells
Injection Wells & Galleries

Environmental Applications

Pattern Drilling/Soil Remediation
Drainage Rehabilitation
Drywell Abandonments
OSHA HAZMAT-Certified

Drainage Renovation

Problem Assessment
Site Redesign/Modification
System Retrofit

Drainage Maintenance

Preventive Maintenance
Service Contracts
Drywell Cleaning

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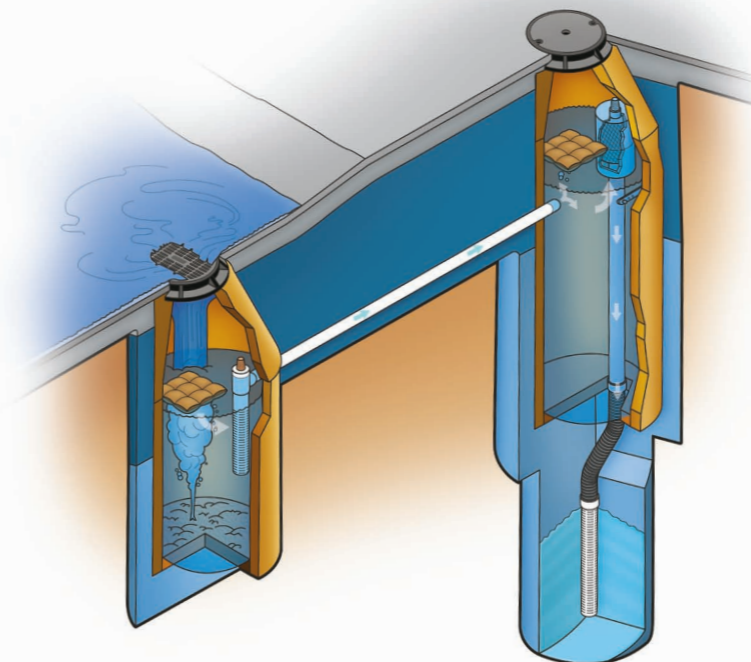
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An evolution of McGuckin Drilling

The **MaxWell® Plus**, as manufactured and installed exclusively by Torrent Resources Incorporated, is the industry standard for draining large paved surfaces, nuisance water and other demanding applications. This patented system incorporates state-of-the-art pre-treatment technology.



THE ULTIMATE IN DESIGN

Since 1974, nearly 65,000 MaxWell® Systems have proven their value as a cost-effective solution in a wide variety of drainage applications. They are accepted by state and municipal agencies and are a standard detail in numerous drainage manuals. Many municipalities have recognized the inherent benefits of the MaxWell Plus and now require it for drainage of all paved surfaces.

SUPERIOR PRE-TREATMENT

Industry research, together with Torrent Resources' own experience, have shown that initial storm drainage flows have the greatest impact on system performance. This "first flush" occurs during the first few minutes of runoff, and carries the majority of sediment and debris. Larger paved surfaces or connecting pipes from catch basins, underground storage, etc. can also generate high peak flows which may strain system function. In addition, nuisance water flows require controlled processing separate from normal storm runoff demands.

Manufactured and Installed Exclusively by Torrent Resources Incorporated
Please see reverse side for additional information
U.S. Patent No. 4,923,330

In the **MaxWell® Plus**, preliminary treatment is provided through collection and separation in deep large-volume settling chambers. The standard MaxWell Plus System has over 2,500 gallons of capacity to contain sediment and debris carried by incoming water. Floating trash, paper, pavement oil, etc. are effectively stopped by the **PureFlo®** Debris Shields in each chamber. These shielding devices are equipped with an effective screen to filter suspended material and are vented to prevent siphoning of floating surface debris as the system drains.

EFFECTIVE PROCESSING

Incoming water from the surface grated inlets or connecting pipes is received in the Primary Settling Chamber where silt and other heavy particles settle to the bottom. A PureFlo Debris Shield ensures containment by trapping floating debris and pavement oil. The pre-treated flow is then regulated to a design rate of up to 0.25cfs and directed to a Secondary Settling Chamber. The settling and containment process is repeated, thereby effectively achieving controlled, uniform treatment. The system is drained as water rises under the PureFlo Debris Shield and spills into the top of the overflow pipe. The drainage assembly returns the cleaned water into the surrounding soil through the **FloFast®** Drainage Screen.

ABSORBENT TECHNOLOGY

Both MaxWell Plus settling chambers are equipped with absorbent sponges to provide prompt removal of pavement oils. These floating pillow-like devices are 100% water repellent and literally wick petrochemical compounds from the water. Each sponge has a capacity of up to 128 ounces to accommodate effective, long-term treatment. The absorbent is completely inert and will safely remove runoff constituents down to rainbow sheens that are typically no more than one molecule thick.

SECURITY FEATURES

MaxWell Plus Systems include bolted, theft-deterrent, cast iron gratings and covers as standard security features. Special inset castings which are resistant to loosening from accidental impact are available for use in landscaped applications. Machined mating surfaces and "Storm Water Only" wording are standard.

THE MAXWELL FIVE-YEAR WARRANTY

Innovative engineering, quality materials and exacting construction are standard with every MaxWell System designed, manufactured and installed by Torrent Resources Incorporated. The MaxWell Drainage Systems Warranty is the best in the industry and guarantees against failures due to workmanship or materials for a period of five years from date of completion.

MAXWELL® PLUS DRAINAGE SYSTEM DETAIL AND SPECIFICATIONS

CALCULATING MAXWELL PLUS REQUIREMENTS:

The type of property, soil permeability, rainfall intensity and local drainage ordinances determine the number and design of MaxWell Systems. For general applications draining retained stormwater, use one standard **MaxWell® Plus** per the instructions below for up to 5 acres of landscaped contributory area, and up to 2 acres of paved surface. To drain nuisance water flows in storm runoff systems, add a remote inlet to the system. For smaller drainage needs, refer to our **MaxWell® IV**. For industrial drainage, our **Envibro® System** may be recommended. For additional considerations, please refer to “**Design Suggestions For Retention And Drainage Systems**” or consult our Design Staff.

COMPLETING THE MAXWELL PLUS DRAWING

To apply the MaxWell Plus drawing to your specific project, simply fill in the blue boxes per the following instructions. For assistance, please consult our Design Staff.

PRIMARY SETTLING CHAMBER DEPTH

The overall depth of the Primary Settling Chamber is determined by the amount of surface area being drained. Use a standard depth of **15 feet** for the initial acre of contributory drainage area, **plus 2 feet** for each additional acre, up to the design limits of the property type noted in “Calculating MaxWell Plus Requirements” noted above. Other conditions that would require increased chamber depths are property usage, maintenance scheduling, and severe or unusual service conditions. Connecting pipe depth may dictate deeper chambers so as to maintain the effectiveness of the settling process. Maximum chamber depth is 25 feet. A pump and lift station is recommended for systems with deeper requirements.

ESTIMATED TOTAL DEPTH

The Estimated Total Depth is the approximate total system depth required to achieve 10 continuous feet of penetration into permeable soils, based upon known soil information. Torrent utilizes specialized “**crowd**” equipped rigs to get through the difficult cemented soil and to reach clean drainage soils at depths up to **180 feet**. An extensive drilling log database is available to use as a reference.

SETTLING CHAMBER DEPTH

On MaxWell Plus Systems of over 30 feet overall depth and up to 0.25cfs design rate, the standard Settling Chamber Depth is **18 feet**. Maximum chamber depth is 25 feet.

OVERFLOW HEIGHT

The Overflow Height and Secondary Settling Chamber Depth determine the effectiveness of the settling process. The higher the overflow pipe, the deeper the chamber, the greater the settling capacity. An overflow height of **13 feet** is used with the standard settling chamber depth of **18 feet**.

CHAMBER SEPARATION

The standard separation between chambers is **10 feet** from center to center.

Soil conditions and deeper inverts may dictate required variations in chamber separation.

DRAINAGE PIPE

This dimension also applies to the **PureFlo®** Debris Shields, the **FloFast®** Drainage Screen, and fittings. The size is based upon system design rates, multiple primary settling chambers, soil conditions, and need for adequate venting. Choices are 6", 8", or 12" diameter. Refer to our company's “**Design Suggestions for Retention and Drainage Systems**” for recommendations on which size best matches your application.

BOLTED RING & GRATE/COVER

Standard models are quality cast iron and available to fit 24" Ø or 30" Ø manhole openings. All units are bolted in two locations with wording “Storm Water Only” in raised letters. For other surface treatments, please refer to “Design Suggestions for Retention and Drainage Systems.”

INLET PIPE INVERT

Pipes up to 12" in diameter from catch basins, underground storage, etc. may be connected into the primary settling chamber. Larger pipe diameters dictate the use of manhole material for the primary setting chamber with 48" grates on the cone. Inverts deeper than 5 feet will require additional depth in both system settling chambers to maintain respective effective settling capacities.

INTAKE INLET HEIGHT

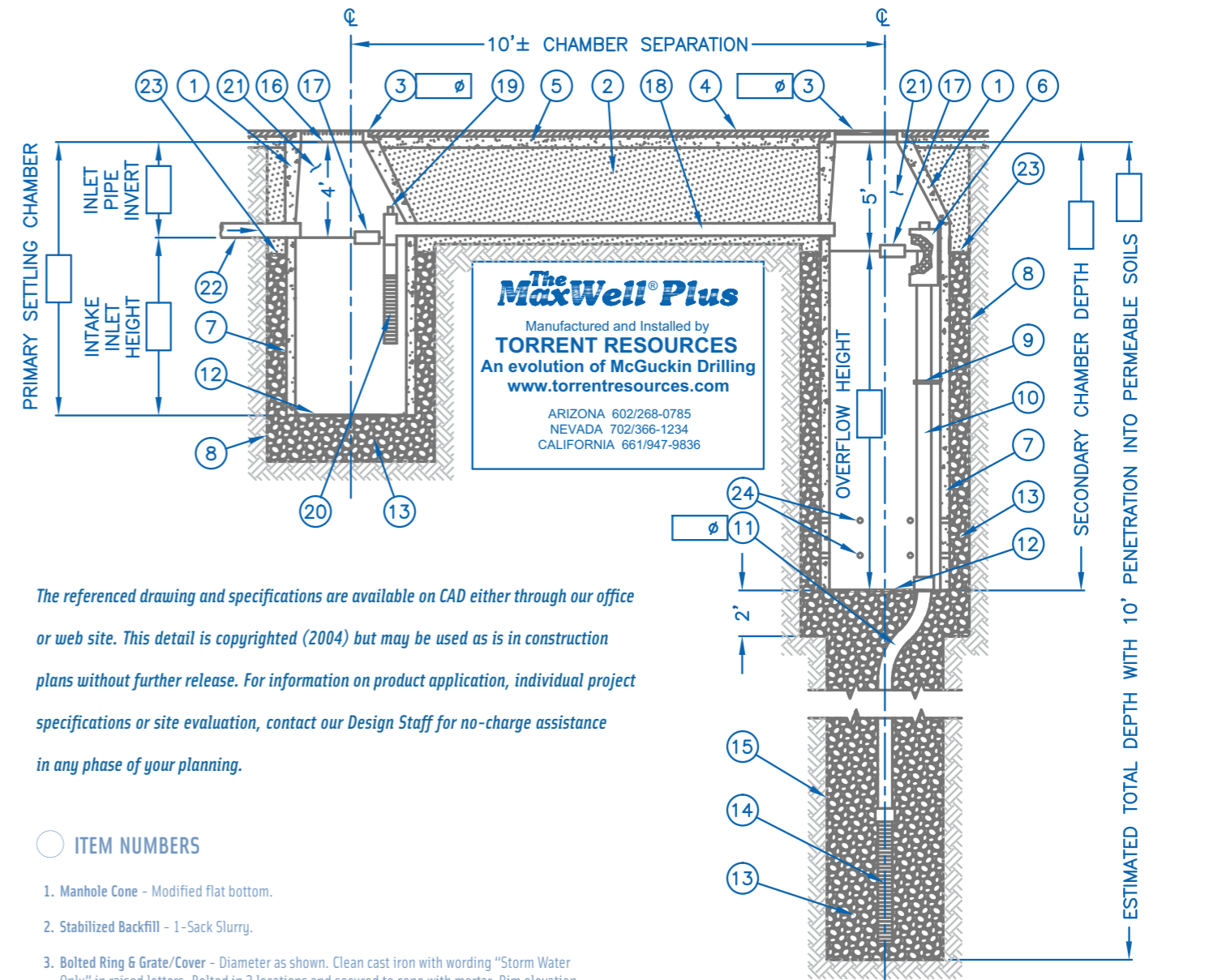
The Intake Inlet Height determines the effectiveness of the settling process in the Primary Settling Chamber. A minimum inlet height of **11 feet** is used with the standard primary settling chamber depth of 15 feet. Greater inlet heights would be required with increased system demands as noted in Primary Settling Chamber Depth. Freeboard Depth Varies with inlet pipe elevation. Increase primary/secondary settling chamber depths as needed to maintain all inlet pipe elevations above connector pipe overflow.

CHAMBER SEPARATION

The standard separation between chambers is **10 feet** from center to center.

Soil conditions and deeper inverts may dictate required variations in chamber separation.

The MaxWell® Plus Drainage System Detail And Specifications



The referenced drawing and specifications are available on CAD either through our office or web site. This detail is copyrighted (2004) but may be used as is in construction plans without further release. For information on product application, individual project specifications or site evaluation, contact our Design Staff for no-charge assistance in any phase of your planning.

ITEM NUMBERS

1. Manhole Cone - Modified flat bottom.
2. Stabilized Backfill - 1-Sack Slurry.
3. Bolted Ring & Grate/Cover - Diameter as shown. Clean cast iron with wording “Storm Water Only” in raised letters. Bolted in 2 locations and secured to cone with mortar. Rim elevation $\pm 0.02'$ of plans.
4. Graded Basin or Paving (by Others).
5. Compacted Base Material (by Others).
6. PureFlo® Debris Shield - Rolled 16 Ga. steel X 24" length with vented anti-siphon and internal .265" Max. SWO flattened expanded steel screen X 12" length. Fusion bonded epoxy coated.
7. Pre-cast Liner - 4000 PSI concrete 48" ID. X 54" OD. Center in hole and align sections to maximize bearing surface.
8. Min. 6' Ø Drilled Shaft.
9. Support Bracket - Formed 12 Ga. steel. Fusion bonded epoxy coated.
10. Overflow Pipe - Sch. 40 PVC mated to drainage pipe at base seal.
11. Drainage Pipe - ADS highway grade with TRI-A coupler. Suspend pipe during backfill operations to prevent buckling or breakage. Diameter as noted.
12. Base Seal - Geotextile or concrete slurry.
13. Rock - Washed, sized between 3/8" and 1-1/2" to best complement soil conditions.
14. FloFast® Drainage Screen - Sch. 40 PVC 0.120" slotted well screen with 32 slots per row/ft. Diameter varies 120" overall length with TRI-B coupler.
15. Min. 4' Ø Shaft - Drilled to maintain permeability of drainage soils.
16. Fabric Seal - U.V. Resistant Geotextile - To be removed by customer at project completion.
17. Absorbent - Hydrophobic Petrochemical Sponge. Min 128 oz. capacity.
18. Connector Pipe - 4" Ø Sch. 40 PVC.
19. Anti-Siphon Vent with flow regulator.
20. Intake Screen - Sch. 40 PVC 0.120" modified slotted well screen with 32 slots per row/ft. 48" overall length with TRI-C end cap.
21. Freeboard Depth Varies with inlet pipe elevation. Increase primary/secondary settling chamber depths as needed to maintain all inlet pipe elevations above connector pipe overflow.
22. Optional Inlet Pipe (by Others).
23. Moisture Membrane - 6 mil. Plastic. Place securely against eccentric cone and hole sidewall. Used in lieu of slurry in landscaped areas.
24. Eight - (8) perforations per foot, 2 row minimum.

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