1509
100.25

STORM WATER MANAGEMENT REPORT

FOR

MARSHALLS TRAILER PARKING ADDITION

LAND LOTS 26 AND 39
SIXTEENTH LAND DISTRICT
DEKALB COUNTY, GEORGIA

TDK Job #1509

December 19, 2016
Revised February 14, 2017

DEVELOPER:

Marshalls of MA, Inc.
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ENGINEER:

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Contact: Tim Kopro, PE

DeKalb County Department of Planning & Sustainability

Lee May
Interim Chief Executive Officer

Andrew A. Baker, AICP
Director

ENGINEER'S CERTIFICATE

PROPOSED WATER QUALITY FACILITY

I, Timothy D. Koppo

a registered professional engineer in the State of Georgia, hereby certify with my signature and seal, that the Water Quality facility (facilities) for the project known as Marshalls Trailer Parking Addition

Development/Building Permit# 21224**, lying in Land Lots** 26 & 39 **of the** 16th **District, DeKalb County, has (have) been designed to comply with the approved plans and specifications, and in accordance with DeKalb County requirements.**

This, the 14th **day of** February **20** 17**.**

GEORGIA REGISTERED No. 21224 PROFESSIONAL ENGINEER TIMOTHY D. KOPPRO
Timothy D. Koppo 2-14-17

Signature Timothy D. Koppo

Georgia Registration No. 21224

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DeKalb County Department of Planning & Sustainability

Lee May
Interim Chief Executive Officer

Andrew A. Baker, AICP
Director

ENGINEER'S CERTIFICATE

STORM WATER RUN-OFF

I, Timothy D. Kopro

a registered professional engineer in the State of Georgia, hereby certify with my signature and seal, that in my opinion, the grading and drainage plans for the project known as Marshalls Trailer Parking Addition

Development Permit # 21224 lying in Land Lot 26 & 39, of the 16th District, Dekalb County, Georgia have been reviewed under my supervision, and state that, in my opinion, the execution of said plans will comply with the Dekalb County Land Development Ordinance.

This the 14th day of February, 20 17 .

GEORGIA REGISTERED No. 21224 PROFESSIONAL ENGINEER TIMOTHY D. KOPRO
Timothy D. Kopro 2-14-17

Signature: Timothy D. Kopro

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Project Description

The Marshalls Distribution Center is an existing 800,000-sf facility, situated on a 74.534-acre site (zoned M) located at 2300 Miller Road, in Land Lots 26 and 39 of DeKalb County, located entirely within the Snapfinger Creek watershed. The site is being expanded by 3.825 acres, comprised of a 3.286-acre undeveloped lot (zoned M) abutting the northeast side of the existing property and the adjacent 0.539-acre terminal segment of Marshalls Industrial Drive right-of-way proposed to be abandoned. The proposed expansion is needed to provide additional trailer parking for the existing facility. The existing Marshalls property and the expansion property are part of the Snapfinger Woods Industrial Park master development. Stormwater detention (i.e., peak flow reduction) was already provided for both properties in conjunction with the original master development, which occurred in the early 1970s. However, since the proposed improvements involve the addition of more than 5,000 sf of impervious area to the site, water quality best management practices (BMPs) are required to be implemented to address the additional impervious areas only, per DeKalb County development regulations. The analysis and design for the required water quality ponds are summarized in a subsequent section, followed by supporting data and calculations.

Existing Condition Analysis

The existing 800,000-sf building is surrounded by truck courts, auto and trailer parking lots, and related access drives. Stormwater runoff exits the property at several different outfall locations along the perimeter. The County could not find any previous stormwater management plans/reports for this property (pursuant to the Open Records Request submitted by TDK Engineers on 3/2/16). Therefore, reasonable assumptions have been made based on available data. The proposed improvements for this project are only on the eastern side of the site. Therefore, the improvements (and related land disturbance areas) occur within only three of these outfall drainage basins, specifically: a 40-acre drainage basin which exits the southwest side of the site via a 30" RCP just downstream of an existing dry detention pond (referred to in this report as "Existing Pond 2"); a 15-acre drainage basin which exits the southeast side of the site via the 24" RCP outlet pipe of another existing dry detention pond (referred to in this report as "Existing Pond 1"); and a 3-acre drainage basin which exits the north side of the site via a natural drainage ditch. The existing offsite outfall pipe systems downstream of existing Ponds 1 and 2 were likely constructed in conjunction with the adjacent Miller Woods residential subdivision, which abuts all along the south side of the site.

Based on a recent visual inspection of Existing Ponds 1 and 2, the ponds appear to be in good condition, with no evidence of sedimentation. Both ponds were recently field-surveyed to obtain current topographic and outlet structure/pipe data, and this data was utilized in the pre-development and post-development Hydraflow models to determine existing and proposed peak outflows at the pond outfalls. Based on the results of this analysis, the post-development 100-year ponding elevation at Pond 1 is 0.27' less than pre-development, and the post-development 100-year ponding elevation at Pond 2 is only 0.31' more than pre-development. The 100-year storm does not overtop the dam of either pond (freeboard is 0.3' for existing Pond 1 and 0.5' for existing Pond 2 at pre-development, and 0.6' for existing Pond 1 and 0.2' for existing Pond 2 at post-development). The post-development peak flows at the site boundary downstream of Pond 1 are lower than the pre-development peak flows for all design storms except the 1-year (which only increases by 4.1%). The post-development peak flows at the site boundary downstream of Pond 2 are higher than the pre-development peak flows, but no more than 3.3% higher for all design storms up through the 25-year, only 12.2% higher for the 50-year, and only 18.8% higher for the 100-year. However, the amount of the 100-year peak flow increase is only 5.6 cfs. At the 10% study points, the peak flow increases from pre-development to post-development are negligible -- a maximum of only 1.6% for the 1-year storm, 1.2% for the 2-year storm, and less than 1.0% for all design storms 5-year and above.

Water Quality Best Management Practices

Required water quality volume (WQV) was calculated to account for the amount of impervious area being added to the site. Two micropool extended detention ponds are proposed to serve as the required BMP facilities. [There is no practical opportunity to implement runoff reduction volume (RRV) measures for this project, due to the constraints of the existing site development/utilization and limited area available for the necessary parking expansion.]

An orifice at the outlet structure of each pond was sized for the WQV discharge, to draw down the water from the 100% WQV elevation in a minimum time of 24 hours.

The outlet pipe at WQ Pond 1 was designed to serve as the principal spillway for the pond, and safely passes the 100-year storm runoff. Therefore, no open-channel emergency spillway was required for WQ Pond 1. The outlet pipe at WQ Pond 2 was not designed to satisfy emergency overflow requirements, however. Therefore, an open – channel emergency spillway has been provided at WQ Pond 2 to safely pass the 100-year storm runoff.

The completed Stormwater Quality Site Development Removal Tool is included in this report, indicating that a TSS removal rate of 88% will be achieved.

Storm Drainage Design

Existing storm drainage pipes (designed for developed conditions) have been utilized for the proposed improvements to the maximum extent practical. The design frequency used for new storm drainage pipes is 100-year.

Methods and Resources

Hydrologic / Hydraulic Methods:	Hydraflow Hydrographs Hydraflow Express Hydraflow Storm Sewers
SCS Curve Numbers:	Georgia Stormwater Management Manual (2016 edition), Table 3.1.5-1 Runoff Curve Numbers
Topography:	Topographic surveying performed by Valentino & Associates, Inc. during July 2016 - January 2017, and DeKalb County GIS Topographic mapping.

Prop. Water Quality Ponds

Pond ID	Forebay Volume Required/ Provided [cf]	WQV Required/ Provided [cf]	Micropool Elevation	WQV Ponding Elevation	100-yr Peak Outflow [cfs]	100-yr Ponding Elevation
WQ Pond #1	816/863	9,854/11,825	944.2	945.50	27.5	946.82
WQ Pond #2	NA	7,428/8,171	927.1	929.15	194.7	930.87

Flow Table at Study Points and Ponding Elevations (Pre-Developed Conditions)

Freq.	SP#1	SP#2	10%SP#1	10%SP#2	Ex. Pond #1 Ponding Elev.	Ex. Pond #2 Ponding Elev.
1	19.7	16.6	314.4	502.7	940.94	919.11
2	22.1	17.5	405.8	650.1	941.37	919.54
5	25.9	18.9	568.6	916.0	942.17	920.26
10	28.9	20.0	716.7	1155.0	942.90	920.86
25	32.9	21.4	935.9	1507.5	943.97	921.68
50	35.8	23.7	1118.3	1803.8	944.84	922.31
100	38.5	29.8	1310.3	2116.6	945.73	922.87

Flow Table at Study Points and Ponding Elevations (Post-Developed Conditions)

Freq.	SP#1	SP#2	10%SP#1	10%SP#2	WQ Pond #1 Ponding Elev.	WQ Pond #2 Ponding Elev.	Ex. Pond #1 Ponding Elev.	Ex. Pond #2 Ponding Elev.
1	20.5	17.1	319.4	507.8	945.79	929.99	941.08	919.31
2	22.1	18.0	410.7	655.1	945.92	930.09	941.39	919.78
5	25.6	19.5	573.3	920.8	946.08	930.26	942.11	920.53
10	28.8	20.5	721.2	1159.6	946.19	930.40	942.86	921.16
25	32.7	22.1	940.6	1512.3	946.36	930.59	943.92	922.02
50	35.4	26.6	1123.4	1808.9	946.57	930.73	944.71	922.63
100	37.7	35.4	1315.8	2122.1	946.82	930.87	945.46	923.18

Flow Table (Basin F & F1)

Freq.	Pre-Dev	Post-Dev
	F	**F1**
1	1.3	1.3
2	2.0	2.0
5	3.5	3.5
10	5.0	5.0
25	7.2	7.2
50	9.2	9.2
100	11.3	11.3