SUN TECH
Engineers ◊ Planners ◊ Surveyors

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February 15th, 2016

City of Coconut Creek– Engineering Dept.
Attn: Ms. Eileen Cabrera
5295 Johnson Road
Coconut Creek, Florida 33073

RE: Johnson Technology Park II - Lift Station # 43 Analysis
Sun-Tech Project No. 13-3581

Dear Ms. Cabrera:

Per your request, we have analyzed the City of Coconut Creek Lift Station # 43 and offer the following:

Existing information: (Lyons Technology Center LS as-builts, City of Coconut Creek daily run-time reports and LS # 43 Capacity analysis for In the Pines Master Plan)

Lift Station No.: # 43
Address: Lyons Technology Center, Coconut Creek
Wet well diameter = 8 ft. (LS as-builts)
Lead pump on = (-)5.37 ft. (LS as-builts)
Low water pumps off = (-) 8.37 ft. (LS as-built)

Rated Pump delivery = 623 gpm (Ave. per start up report associated with In the Pines analysis)
Wetwell Volume (8ft.) = 376.04 gal/ft.

Flows:

Existing peak flows = 84.96 gpm
(LS Capacity analysis for In the Pines Master plan dated 07/29/14 with Peaking factor = 4)
Existing design peak flows = 93.75 gpm
(LS Capacity analysis for In the Pines Master plan (Long Pines (50 single family), In the Pines (55 single family) and Church site (750 seats)) dated 07/29/14 with Peaking factor = 4)

Total existing peak flows = 178.71 gpm (DPHF) or 44.68 gpm (ADF)

Proposed design peak flows = 45.74 gpm
(Johnson Technology Park II: 164,647sf Warehouse / office @ 0.1 gpd / sf) with Peaking factor = 4)

Total peak flows (DPHF) = 224.45 gpm (DPHF) or 56.11 gpm (ADF)

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Wetwell Capacity evaluation:

FDEP criteria: (1) Wetwell to have a storage capacity of 5 minutes at DPHF.
(2) Filling time shall not exceed 30 minutes under ADF to prevent septicity.

(1) Wetwell capacity: Wet well diameter = 8 ft.
Pumps on El. = (-) 5.37' *from LS as-builts
Pumps off = (-) 8.37' *from LS as-builts

Calculated volume = ((-) 8.37' – (-) 5.37') = 3 ft. * (376.04 gal / 1ft.)
= 1128.12 gals provided.

Storage capacity = 224.45 gpm * 5 min
= 1122.25 gals required < 1128.12 gals provided.

(2) Filling time = 1128.12 gals / 56.11 gpm ADF = 20.1 min < 30 min. required.

Based on the information provided, we believe the wet well is adequately sized to accommodate existing flow plus future flow (Johnston Technology Park II) based on assumption shown above.

Pump evaluation:

Per LS # 43 as-builts, the design pumps specified 731 gpm @ 60' TDH; however, based on the average adjusted pump run time (475 gpm @ 83' TDH based on 2.89 min (ave. weekly run time from City's report referenced in the In the Pines analysis and 84.96 gpm existing flow), the calculated cycle time for average flow conditions is as follows:

Calculated cycle time: (**Existing** @ ADF)

$T_{ave.} = V_{ww} / (Q_{dp} - ADF) + V_{ww} / ADF$

Where: V_{ww} = Vol. of wet well from Lead pump "on" to pump "off" level
= 3 ft. * (376.04 gal / 1ft.)
= 1128.12 gals
Q_{dp} = 475 gpm (Adjusted pump rate per In the Pines LS analysis)
ADF = 44.68 gpm (existing)

$T_{ave.}$ = 1128.12 gals / (475 – 44.68) + 1128.12 / 44.68 = 27.9 min

Where $T_{ave.}$ = 27.9 min.

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Calculated cycle time: (**Proposed** @ ADF)

$T_{ave.}$ = V_{ww} / (Q_{dp} – ADF) + V_{ww} / ADF

Where: V_{ww} = Vol. of wet well from Lead pump "on" to pump "off" level
= 3 ft. * (376.04 gal / 1ft.)
= 1128.12 gals
Q_{dp} = 475 gpm (Adjusted pump rate per In the Pines LS analysis)
ADF = 44.68 gpm (existing) + 11.43 gpm (proposed)
= 56.11 gpm

$T_{ave.}$ = 1128.12 gals / (475 – 56.11) + 1128.12 / 56.11 = 22.8 min

Where $T_{ave.}$ = 22.8 min. > 6 min. for a maximum of 10 starts per hour.

Based on the above evaluation of the wet well capacity and calculated cycle time, it appears that LS # 43 has adequate capacity to accommodate the proposed additional flows generated from Johnston Technology Park II.

I trust this information is sufficient to meet your needs; however, should you have any questions please feel free to contact me at this office. Your expedious review will be greatly appreciated.

Sincerely,
Sun-Tech Engineering, Inc.

CLIFFORD R. LOUTAN LICENSE No. 56880 STATE OF FLORIDA PROFESSIONAL ENGINEER

Clifford R. Loutan, P.E.
Project Manager

Cc: Mr. Fareed Mohammed, City of Coconut Creek