

APPENDIX E
VILLAGE OF GOSHEN
RESOLUTION REGARDING WATER AND SEWER
AND
ENGINEERING REPORTS

The following was moved by Trustee Char, and seconded by Trustee Gurda:

RESOLUTION

WHEREAS, Merlin Entertainments Group US Holdings Inc. ("Merlin") has heretofore made application to the Town of Goshen seeking the necessary land use approvals to allow the construction of a theme park and resort (the "Project") upon certain property located in the Town of Goshen, County of Orange, State of New York; and

WHEREAS, the Project proposed by Merlin, commonly known as "Legoland" requires approvals from various State and local permitting jurisdictions; and

WHEREAS, in addition to the various land use approvals and permits required, Merlin must demonstrate that there exists proper means and methods of obtaining sanitary sewer disposal services and potable water to meet the demands of the Project; and

WHEREAS, in connection with the said water and sewer requirements, following Merlin's request to obtain water and sewer service from the Village of Goshen, representatives of Merlin and representatives of the Village of Goshen have heretofore discussed the parameters of an agreement pursuant to which the Village would provide said services to the Project; and

WHEREAS, in order to objectively demonstrate the availability of sufficient resources to provide water and sewer services to the Project, the Village of Goshen has commenced and will continue to conduct necessary and appropriate studies to

demonstrate that, after accounting for full buildout within the Village, that sufficient resources are available to provide the requested services to the Project; and

WHEREAS, preliminary studies performed to date have indicated the availability, after accounting for full Village buildout, of sufficient capacity in the Village Publicly Owned Treatment Works ("POTW") to treat the effluent anticipated to be produced by the Project; and

WHEREAS, preliminary studies performed to date relative to available water capacity have indicated, after accounting for full Village buildout, the need to develop additional water capacity to service the anticipated needs of the Project and future Village needs; and

WHEREAS, the Village has requested, and Merlin has agreed, to compensate the Village for the costs incurred in connection with the necessary surveys, studies and construction that must be undertaken in order to determine the Village can provide water to the Project; and

WHEREAS, the Village wishes to adopt this Resolution to memorialize its intent to provide water and sewer services to the Project subject to (1) receipt of final engineering studies (2) the completion of the coordinated SEQRA review for the Project, and (3) subject to final contractual agreements between the parties relative to said services.

NOW, THEREFORE, it is

RESOLVED, that Merlin shall pay for sewer service at the rate of \$9.20 per 1,000 gallons of usage; and it is further

RESOLVED, that Merlin shall pay a unit charge for sewer of \$272,000 per annum; and it is further

RESOLVED that Merlin shall compensate the Village for reasonable costs incurred in connection with the necessary well exploration studies, development and construction in an amount to be determined; and, it is further

RESOLVED, that Merlin shall pay for water at the rate of \$6.00 per 1,000 gallons of usage and, it is further

RESOLVED, that Merlin shall pay a unit charge for water of \$19,000 per annum; and it is further

RESOLVED, that the foregoing is subject to (1) receipt of final engineering studies (2) the completion of the coordinated SEQRA review for the Project, and (3) subject to final contractual agreements between the parties relative to said services.

Trustee Char	aye
Trustee Gurda	aye
Trustee Nuzzolese	aye
Trustee Smith	aye

I, Margaret G. Strobl, Clerk of the Village of Goshen, Orange County, New York, do hereby certify that the attached is a true and exact copy of a Resolution adopted by the Village Board of the Village of Goshen at a meeting of said Board held on the 8th day of August, 2016.

In witness thereof, I have hereunto signed my name and affixed the Corporate Seal of the Village of Goshen, this 9th day of August, 2016.

Margaret G. Strobl

Margaret G. Strobl, Village Clerk



23 September 2016

Village of Goshen
Mayor and Village Board
276 Main Street
Goshen, NY 10924

Re: Outside Village Wastewater Capacity Request from Legoland (Merlin Entertainments)

Dear Mayor and Trustees,

It is our understanding that the proposed Legoland project in the Town of Goshen has requested permission from the Village of Goshen to connect to the Village's wastewater collection and treatment plant. We also understand that the Village is willing to provide these service to the project if there is adequate wastewater capacity for the Village's exiting and anticipated needs as well as the Legoland project.

We were provided with the anticipated wastewater flow projections for the proposed Legoland project from John O'Rourke, P.E. of Lanc and Tully Engineers who are the project's site engineers. The flow projections are reportedly from a similar Legoland facility.

The following table summarizes the project's anticipated wastewater demands versus the Village's existing and anticipated wastewater requirements and permitted plant capacity.

WASTEWATER:

A. Legoland Projections:

- i. Annual Sewer Usage: 33,100,000 gallons
- ii. Peak Month (July): 4,100,000 gallons
- iii. Peak Month Average Daily Flow: 140,000 gallons per day

B. Existing Village Usage (June 2015-June 2016)

- i. Annual Sewer Usage: 402,000,000 gallons
- ii. July Sewer Usage: 24,000,000 gallons (July 2015)
- iii. July Average Daily Flow: 774,000 gallons per day

C. Anticipated In-Village and Committed out of Village Demand

- i. Annual Sewer Usage: 142,000,000 gallons
- ii. Peak Month: 12,000,000 gallons
- iii. Average Daily Flow: 390,000 gallons per day

D. Total Wastewater Flow with Legoland

- i. Annual Sewer Usage: 577,100,000 gallons
- ii. Peak Month: 40,100,000 gallons
- iii. July Average Daily Flow: 1,304,000 gallons per day

E. Wastewater Summary

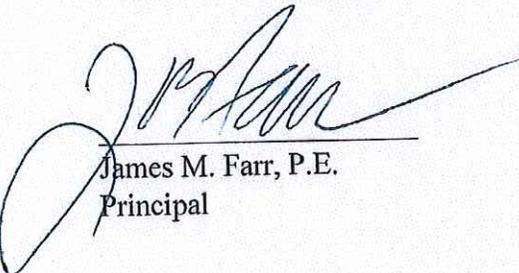
The Village owns and operates their wastewater treatment plant under NYSDEC Permit NY0031518. This permit allows the facility to treat 2,000,000 gallons a day of wastewater water based on a 30-day monthly average.

Based on the above, using the highest usage month of the Legoland facility combined with the Village's existing and committed capacity yields a projected demand of 1,304,000 gallons per day in July. This is below the permitted capacity of 2,000,000 gallons per day.

Based on my analysis the Village's treatment plant could accept the additional flows, if desired by the Village Board.

Should have any questions or comments, please contact us.

Respectfully Submitted,



James M. Farr, P.E.
Principal

Cc: Mr. Dave Donovan, Village Attorney

Farr Engineering
P.O. Box 302 Port Jervis, NY 12771
(914) 474-1980

23 September 2016

Village of Goshen
Mayor Kyle Roddey and Village Board
276 Main Street
Goshen, NY 10924

Re: Outside Village Water Capacity Request from Legoland (Merlin Entertainments)

Dear Mayor Roddey and Trustees,

It is our understanding that the proposed Legoland project in the Town of Goshen has requested permission from the Village of Goshen to connect to the Village's water supply and distribution system. We also understand that the Village is willing to provide these service to the project if there is adequate water supply capacity for the Village's exiting and anticipated needs as well as the Legoland project. We were provided with the anticipated water flow projections for the proposed Legoland project from John O'Rourke, P.E. of Lanc and Tully Engineers who are the project's site engineers. The flow projections are reportedly from a similar Legoland facility.

The following table summarizes the project's anticipated water demands versus the Village's existing and anticipated water requirements and permitted plant capacity.

WATER:

A. Legoland Projections:

- i. Annual Water Usage: 64,500,000 gallons
- ii. Peak Month (July): 8,000,000 gallons
- iii. Peak Month Average Daily Flow: 270,000 gallons per day

B. Existing Village Usage (June 2015-June 2016)

- i. Annual Water Usage: 237,000,000 gallons
- ii. July Water Usage: 24,000,000 gallons (July 2015)
- iii. July Average Daily Flow: 774,000 gallons per day

**C. Anticipated In-Village and Committed out of Village Demand
Assuming 5-Year Planning Period**

- i. Annual Water Usage: 142,000,000 gallons
- ii. Peak Month: 12,000,000 gallons
- iii. Average Daily Flow: 180,000 gallons per day

D. Total Peak Month Flow with Legoland in 2026

- i. Annual Water Usage: 443,500,000 gallons
- ii. Peak Month: 44,000,000 gallons
- iii. July Average Daily Flow: 1,224,000 gallons per day

E. Water Summary

The Village owns and operates their water supply system under NYSDEC Permit Number 3-3330-00222/00001. This Water Supply Approval permit allows the facility to withdrawal an amount of water up to 1,300,000 gallons a day from the combined sources of Prospect Reservoir, Greenhill Reservoir and Crystal Run Village (CRV) Wells No. 1 and 2. This water taking permit assumes that reservoir level is at below minus 75 inches (drought conditions). During normal climatic conditions the Village's water supplies can produce a total of 1.8 MGD (1.0 MGD from Reservoir plus 0.8 MGD from the CRV Wells)

Based on the above, using the highest usage month of the Legoland facility combined with the Village's CURRENT existing and committed capacity yields a projected demand of 1,224,000 gallons per day in July. The projected demand **less than** the permitted allocation of 1,300,000 gallons per day under drought conditions and as such, the Village can CURRENTLY adequately provide the Legoland project with their anticipated water demand. However, WHEN FACTORING IN FUTURE FULL VILLAGE BUILD OUT the Village demand will approximately be 1,400,000 gallons per day and additional water sources will be needed by that time.

As previously noted the Village is in the process of developing an additional production well in the Village's wellfield. It is the goal to develop the well to mitigate the increase in usage by the projected future demand. To mitigate the anticipated increase in water demand, the Village has initiated a groundwater exploration program at the Crystal Run Village Wellfield. To date soil borings have been completed in the wellfield, soil samples of the sand and gravel material encountered have been secured and analyzed. A location of a sand and gravel full size well has been selected and a well screen has been ordered for the test well. In the upcoming weeks, the test well will be installed, a 72-hour pump test conducted and water quality data secured for analysis. Subsequently, a water taking application and design plans will be submitted to the regulatory agencies for review and approval to convert the test well into a production well.

The Village has engaged the services of Miller Hydrogeologic, Incorporated (MHI) to evaluate the availability of additional water at the Village's CRV well site, which site consists of some 81+/- acres. To date this firm has performed the following preliminary testing:

- * Installed of four (4) soil test borings to a target depth of 60 feet below land surface.
- * Obtained semi-continuous soil samples using the split spoon sample method.
- * Performed field determination of grain size analysis.
- * Completed each boring with two-inch monitoring wells and protective casing.
- * Evaluated site for potential supply test well locations.
- * Selected site for test well
- * Performed test perming to secure soil samples for purpose of selecting well screen size.
- * Selected and ordered well screen.
- * Retained a contractor to install test well.

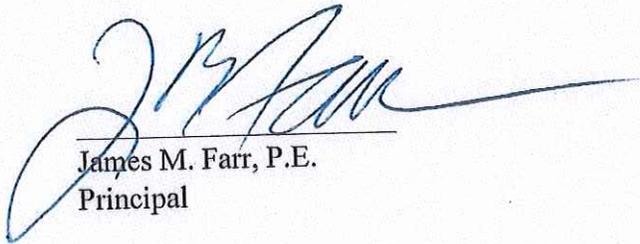
F. Water Conclusions

Based on our analysis the Village of Goshen with its current available and permitted supply can provide the water requested by the Legoland project and also serve the CURRENT needs of the Village. Additional water supply will have to be developed to serve the Village at full build out taking into account the anticipated water usage by LEGOLAND. . The Village as noted above has already begun exploring additional water supplies for that time period.

Based upon the results of that preliminary work, it is estimated that sufficient water will be available to provide the water needs of the Village at full build plus the water needs of the Legoland project as described by their engineers. Further work, such as installation of the test well, development of the test well, performing 72 hour (or longer) pump test, securing and analyzing water quality and regulatory permitting remains to be completed.

Should have any questions or comments, please contact us.

Respectfully Submitted,



James M. Farr, P.E.
Principal

Cc: Mr. Dave Donovan, Village Attorney

ENGINEER'S REPORT

POTABLE WATER SYSTEM TO SERVE

LEGOLAND New York

**TOWN OF GOSHEN
ORANGE COUNTY, NEW YORK**

Prepared By:

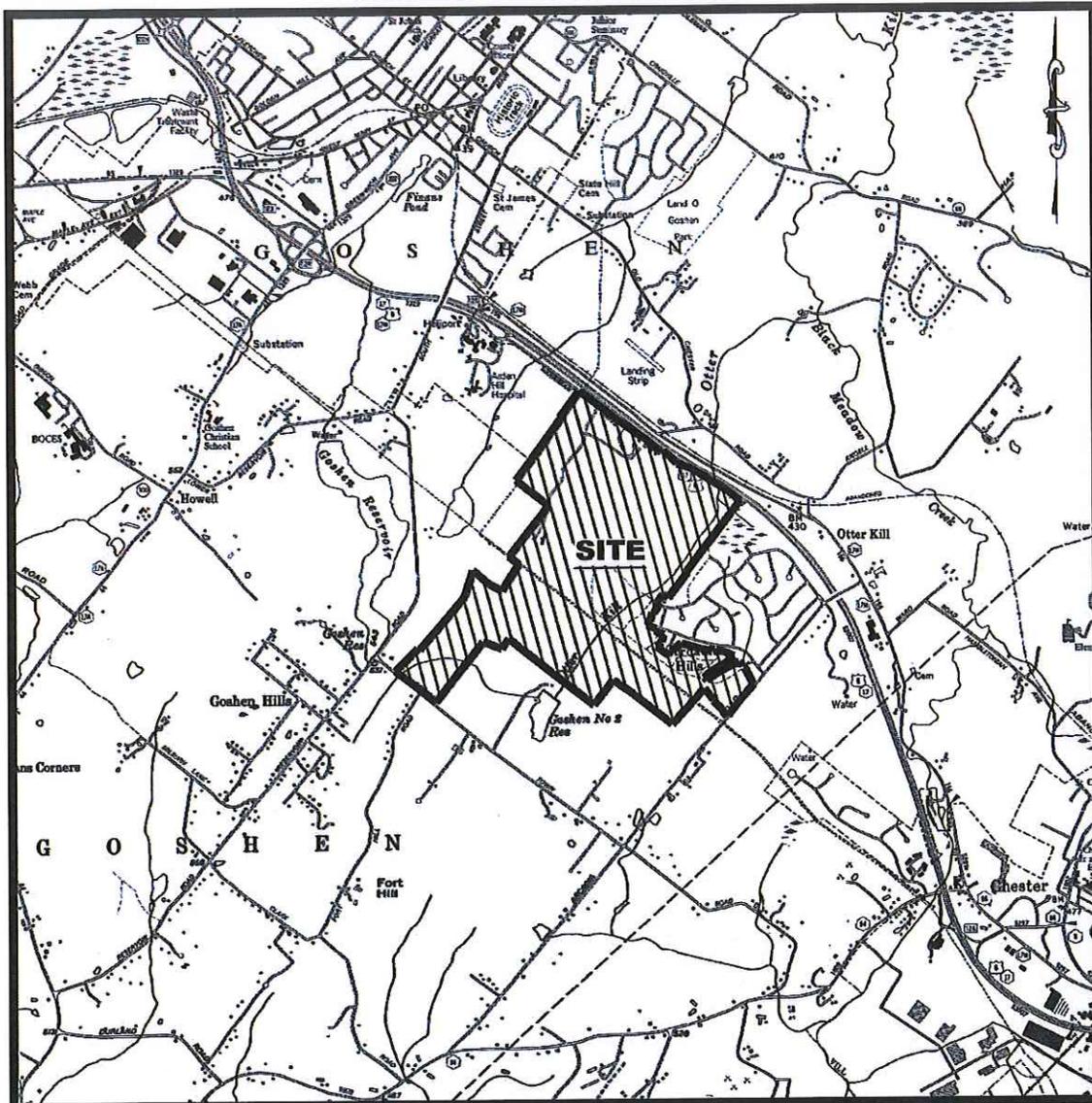
Lanc & Tully Engineering and Surveying, P.C.
P.O. Box 687
Goshen, New York 10924

November 15, 2016

PROJECT OVERVIEW

Merlin Entertainments, as Project Sponsor, proposes to construct a theme park and resort on approximately 140 acres of a 522 acre site consisting of 15 total parcels located off Harriman Drive in the Town of Goshen. The Project Site is generally located south of NYS Route 17, at exit 125, on the east side of the Town of Goshen. The Project Site has street frontage on Harriman Drive and extends south of Conklingtown Road and as far east as Arcadia Road. See Project Location Map, Figure 1.

FIGURE 1 - PROJECT LOCATION



Source: NYS DOT Digital Raster Quadrangles for Goshen and Warwick

**ENGINEER'S REPORT
POTABLE WATER SYSTEM TO SERVE LEGOLAND
TOWN OF GOSHEN, ORANGE COUNTY, NEW YORK**

November 15, 2016

The park, to be called LEGOLAND New York, will include rides and attractions, an aquarium, theaters, restaurants, a hotel and various back-of-house facilities including offices and staff areas as well as associated parking and water, sanitary sewer and drainage facilities. Merlin Entertainments will own and operate the site. All onsite improvements and infrastructure will be owned and maintained by the property owner. All offsite sanitary facilities and infrastructure will be owned and maintained by the Village of Goshen. Based on similar-sized LEGOLAND parks, between 1.5 and 2.5 million annual visitors are anticipated to the site. Hours of Operation of the park in summer months will be from 10:00AM to 8:00PM, seven days a week. During non-peak season the park will be open from 10:00AM to 6:00PM on weekdays and 10:00AM to 8:00PM on weekends. The park will be closed from November through March. The hotel, offices and aquarium will be opened year round but with reduced staff and significantly reduced numbers of visitors. Operations at the park will include a 250-room hotel, 20,000 square foot aquarium, 81,000 square feet among five buildings in the back-of-house area (including administration offices, maintenance warehouse, landscaping building and trash collection) and a theme park consisting of 26 rides and attractions, 2 theaters, 10 retail areas, and approximately 15 restaurants (including both dine-in, counter service and food kiosks) in eight themed areas.

Potable water supply for LEGOLAND New York will be provided by the Village of Goshen. The project would be an "Out of District" user of the Goshen Water District.

EXISTING WATER SUPPLY, STORAGE AND DISTRIBUTION

The Village of Goshen water supply system consists of two surface water reservoirs and one well field and is permitted by the New York State Department of Environmental Conservation to take a combined amount of water up to 1.3 MGD. The Prospect Reservoir and Green Hill Reservoir are the main source of water supply for the Village of Goshen Water District. The Prospect Reservoir is located off of Lower Reservoir Road at the site of the Village Water Filtration Plant. The Prospect Reservoir is fed by surface runoff as well as the Green Hill Reservoir, located off of Conklingtown Road. The Crystal Run Village (CRV) Well Field is located on Stony Ford Road in the Town of Wallkill and contains two Village owned wells; Well#1 is approved for 275 gpm and Well #2 is approved for 300 gpm. The permitted taking from the aquifer is limited to 0.45 MGD with Well #1 and Well #2 alternately pumping. The Crystal Run Village (CRV) Well Field is controlled by the water level in the Prospect Reservoir water storage tank.

There are four (4) existing water storage tanks: a 500,000 gallon bolted steel reservoir located at the Filter Plant at Prospect Reservoir; a 300,000 gallon glass fused bolted steel reservoir located at Glen Arden; a 464,000 gallon glass fused bolted steel standpipe located on Bridle Court; and a 300,000 gallon welded steel standpipe located on Hilltop Drive. Both the Prospect Reservoir Tank and Glen Arden Tank, which are hydraulically connected, provide water storage capacity and distribution system operational pressure for the majority of the Village. The Hilltop Tank and Harness Estates Tank provide water storage for the Village high pressure zone in their respective areas. The booster pump stations for these zones are controlled by demand within the zones as well as system pressures controlled by the Prospect Reservoir and Glen Arden tanks.

**ENGINEER'S REPORT
POTABLE WATER SYSTEM TO SERVE LEGOLAND
TOWN OF GOSHEN, ORANGE COUNTY, NEW YORK**

November 15, 2016

The water distribution system is a self-contained system comprised of approximately 31.5 miles of 4" through 16" cast iron, ductile iron and asbestos concrete water mains, approximately 244 fire hydrants and over 460 valves. There are two (2) water booster stations and two (2) pressure reducing stations.

According to data supplied by the Village, the existing water system serves approximately 5,500 people through approximately 1,750 service connections. The total amount of water produced in 2015 was 239,000,000 gallons. The total amount of water delivered to customers in 2015 was 226,000,000 gallons (average 619,178 gpd). A total of 13,000,000 gallons (approximately 5.5% of production) was unaccounted for and is attributed to flushing mains, fighting fires, filter backwashing, water main and service breaks and/or leaks. The average daily water treated from all sources in 2015 was 655,178 gallons per day and the highest single day demand was 888,400 gallons.

ESTIMATED PROJECT WATER USAGE

The water distribution system designed for LEGOLAND New York is based on the project's anticipated water usage of an annual average of 176,438 GPD with peak usage in July of approximately 255,394 GPD. By comparison, the month of the least water use was December with a usage of 49,127 GPD. The anticipated water demand is based on recorded water usage at the LEGOLAND Windsor Resort, an existing seasonal park of similar size and scope. LEGOLAND Windsor is a 150-acre park with approximately 2.2 million visitors per year with two water attractions.

As stated above, the Village of Goshen has a permitted combined water yield of 1.3 MGD with an average daily treated/distributed of 0.65 MGD, leaving an excess availability of approximately 0.65 MGD. Supporting water demand for LEGOLAND New York during the peak season with 0.25 MGD is well within the Village of Goshen's permitted water supply capability. The supply capability remains sufficient when the proposed peak demand of 0.25 MGD is considered along with the supply system's highest single day demand of 0.88 MGD which results in approximately 1.14 MGD.

WATER DISTRIBUTION

LEGOLAND New York's water distribution system will connect to the existing Village of Goshen water main in Harriman Drive. Approximately 4,325 feet of 8" ductile iron water main will be installed along Harriman Drive and into the project site, though an on-site water booster station to a water storage tank to support the park. From the water storage tank, approximately 8,530 feet of 8" ductile iron will be installed through the site, predominately within the ring and service roads to provide both domestic and fire suppression to the various facilities in a closed system. Fire hydrants will be installed at all water main high points and at a maximum spacing of 400' along the length of the water mains. A hydrant will be available at the closest point to the Arcadia Hills subdivision for an emergency connection. Domestic service will be provided to the various facilities through 3/4" or 1" Type K copper service lines with curb stops. Fire suppression systems will be provided by 4" or 6" ductile iron lines to the facilities, as appropriate, and include exterior valves and interior back flow prevention as required.

SYSTEM PRESSURES

In order to fill the water storage tank for LEGOLAND New York, a water booster station is required. Therefore, system pressures are calculated based on the water level of the tank full and will fluctuate according to the water level. Calculations of the static and residual pressure available at the high point conclude a static pressure of 26.0 psi and a residual pressure of 24.06 psi at a total flow of 500 gpm. Flow available at the minimum allowed operating pressure of 20 psi is calculated at 904 gpm. The calculations are included in Appendix A. As reflected on the calculation pages, static and residual pressures are more than adequate to support the proposed project. Calculations of the static pressure at the low point of the system (Security Building) demonstrate that a pressure reducing station would not be required with a static pressure of approximately 76 psi.

WATER BOOSTER STATION

The water booster station will be an AquaPak, factory built water booster pump station as manufactured by USEMCO, Inc., Tomah, Wisconsin. The station will be installed on the west side of the main access road to boost pressure to fill the water storage tank. The package system will have a wooden exterior façade and shingled roof to conform to the general architecture of the park. The station will be equipped with duplex Franklin Electric 30VR-02-1Astg-7.5HP vertical multi-stage pumps, capable of providing 200 gpm against a differential head pressure of 98 feet. The turnkey station will have all internal piping, valves, instrumentation and controls, and will be equipped with a natural gas fueled emergency generator and transfer switch. Calculations for the booster pump requirements are included in Appendix A. The selected Pump Performance Datasheets are included in Appendix B.

WATER STORAGE TANK

Water from the booster station will be pumped to a 522,000 gallon (nominal) water storage tank. The storage tank has been sized to provide for one-day storage of average demand (255,394 gallons) plus standard fire flow requirements of 2,000 gpm for 2 hours (240,000 gallons). The storage tank is a 56' diameter – 36.5' high (total – 28.43' nominal) bolted glass-fused to steel tank with a concrete floor designed and constructed in accordance with AWWA D103 (latest version). The floor elevation of the tank will be 610.0 feet with an overflow elevation of 638.0 feet. The tank will have one 24" diameter side manway access and a 30" square access hatch in the roof. The overflow pipe from the tank will discharge into a catch basin which will discharge to the ground surface of the tank site. The tank will be equipped with a pressure-actuated level indicating transmitter to detect the water level in the storage tank and transmit signals to the booster pump station controls. Alarm conditions will be transmitted via modem/dialer to the park's owner and water system operator.

**ENGINEER'S REPORT
POTABLE WATER SYSTEM TO SERVE LEGOLAND
TOWN OF GOSHEN, ORANGE COUNTY, NEW YORK**

November 15, 2016

CONCLUSIONS

The proposed LEGOLAND New York will generate an additional water demand of water usage of an annual average of 176,438 GPD with peak usage in July of approximately 255,394 GPD and minimal usage in December of approximately 49,127 GPD. The Village of Goshen has a permitted combined water yield of 1.3 MGD with an average daily treated/distributed of 0.65 MGD, leaving an excess availability of approximately 0.65 MGD which is more than adequate to supply the park. The required water booster pump station will be provided with a standby emergency generator to ensure operation during power outages and will also include an auto-dialer alarm system to promptly notify the project owner and operator if the booster pump station is not operating properly. The water storage tank will provide sufficient storage for both domestic and fire suppression requirements. Static and residual pressures have been calculated for the distribution system which demonstrate that more than adequate pressures will be provided at all points of the system. Therefore, no adverse impacts on the Village of Goshen water supply system are anticipated.

LANC & TULLY, P.C.

John O'Rourke, P.E.

JOR/DMK/

water sys.engrpt.doc

APPENDIX A
Calculations

LANC & TULLY, P.C.

P.O. Box 687
GOSHEN, NY 10924
Tel (845) 294-3700
Fax (845) 294-8609
www.lanctully.com

JOB LEGOLAND WATER SYSTEM

SHEET NO. 1

OF 1

CALCULATED BY DMR

DATE 11-15-16

CHECKED BY 1

DATE _____

SCALE _____

WATER BOOSTER STATION:

GROUND ELEVATION @ STATION LOCATION = 590.0 FT

WATER TANK OVERFLOW ELEVATION = 638.0 FT

A 98.0 FT

WATER DEMAND: 255,394 GPD AVG. = 177 GPM ≈ 200 GPM FOR PUMP SELECTION

SYSTEM PRESSURES:

WATER ELEVATION TANK FULL = 638.0

HIGH POINT HYDRANT GROUND EL (RESTROOM) = 578.0

60.0 FEET

X 0.43351

26.0 PSI STATIC

FRICION LOSS @ 500 GPM

790 LF 8" + FITTINGS ≈ 1000 LF

0.36 PSI / 100 LF (C100) X 10 = 3.6 PSI

X 0.54 (C140 MULTIPLIER)

1.94 PSI

RESIDUAL PRESSURE @ 500 GPM = 26.0 PSI - 1.94 PSI = 24.06 PSI
≈ 24 PSI

FLOW AVAILABLE @ 20 PSI:

$$Q_A = 500 \left(\frac{26-20}{26-24} \right)^{0.54}$$

Q_A = 904.9 ≈ 905 GPM AVAILABLE @ 20 PSI

STATIC PRESSURE @ SITE LOW POINT (SEWER BLDG)

WATER LEVEL TANK FULL = 638 FT

GROUND ELEVATION - LOW POINT = 463 FT

175 FT

X 0.43351

75.8 ≈ 76 PSI

APPENDIX B
Pump Performance Datasheets

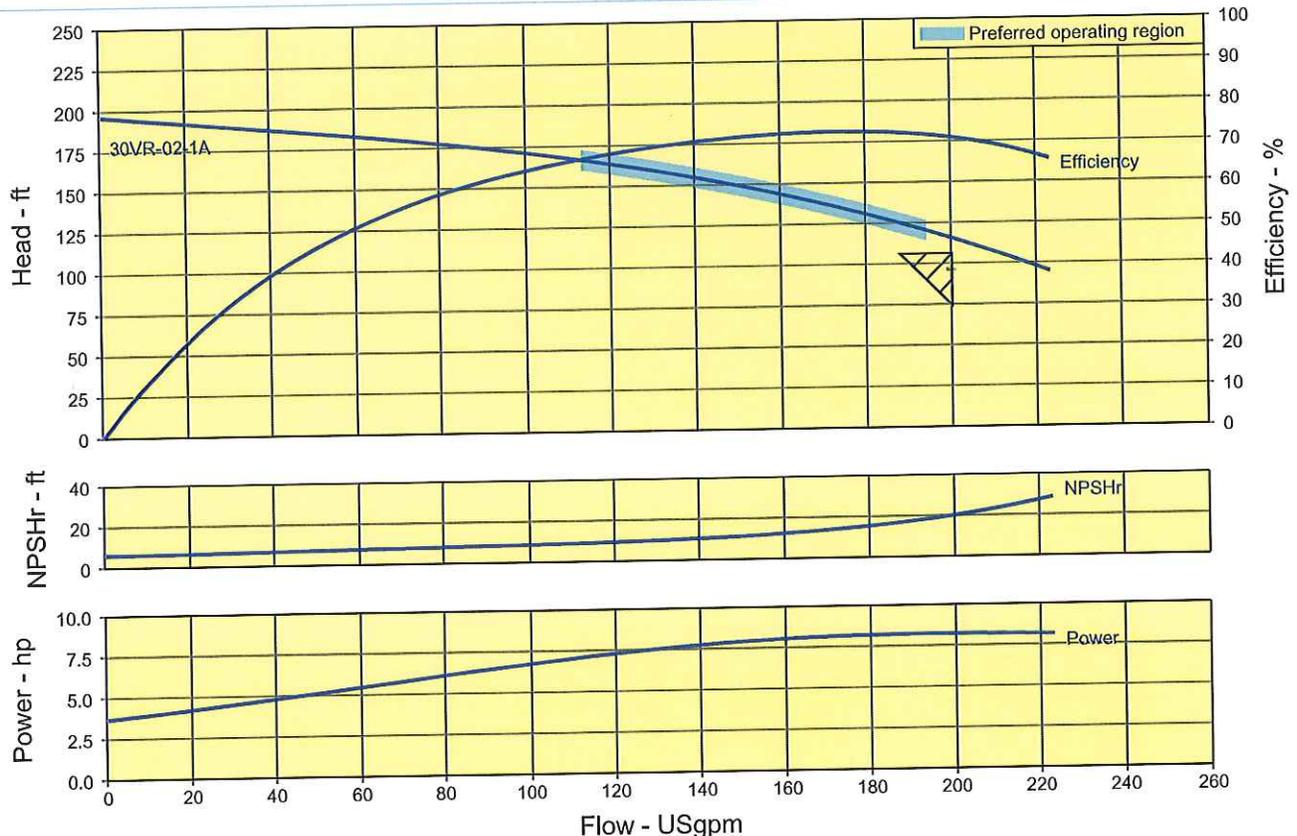


Pump Performance Datasheet

Company name :
 Company contact name :
 Company contact number :
 Quote number :
 Inquiry received date :

Model/Order No : 30VR-02-1Astg-7.5HP Vertical Multistage Based on curve number : 30VR-02-1A
 Stages : 2 Date last saved : 16 Nov 2016 12:56 PM
 Quantity of pumps in parallel : 1

Operating Conditions		Liquid	
Flow, rated	: 200.0 USgpm	Liquid type	: Water
Differential head / pressure, rated (requested)	: 106.0 ft	Additional liquid description	:
Differential head / pressure, rated (actual)	: 115.4 ft	Solids diameter, max	: 0.00 in
Suction pressure, rated / max	: 0.00 / 0.00 psi.g	Solids concentration, by volume	: 0.00 %
NPSH available, rated	: Ample	Temperature, max	: 68.00 deg F
Frequency	: 60 Hz	Fluid density, rated / max	: 1.000 / 1.000 SG
Performance		Viscosity, rated	: 1.00 cP
Speed, rated	: 3450 rpm	Vapor pressure, rated	: 0.00 psi.a
Impeller diameter, rated	: 30VR-02-1A	Material	
Impeller diameter, maximum	: 30VR-02-1A	Material selected	: 316SS
Impeller diameter, minimum	: 30VR-02-1A	Pressure Data	
Efficiency	: 70.93 %	Maximum working pressure	: 84.97 psi.g
NPSH required / margin required	: 20.15 / 0.00 ft	Maximum allowable working pressure	: 230.0 psi.g
Ns (imp. eye flow) / Nss (imp. eye flow)	: 1,931 / 6,206 US Units	Maximum allowable suction pressure	: 58.00 psi.g
MCSF	: 123.3 USgpm	Hydrostatic test pressure	: 540.0 psi.g
Head, maximum, rated diameter	: 196.3 ft	Driver & Power Data	
Head rise to shutoff	: 70.02 %	Driver sizing specification	: Maximum power
Flow, best eff. point	: 173.8 USgpm	Margin over specification	: 0.00 %
Flow ratio, rated / BEP	: 115.05 %	Service factor	: 1.15 (used)
Diameter ratio (rated / max)	: 100.00 %	Power, hydraulic	: 5.83 hp
Head ratio (rated dia / max dia)	: 100.00 %	Power, rated	: 8.22 hp
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00	Power, maximum, rated diameter	: 8.22 hp
Selection status	: Acceptable	Minimum recommended motor rating	: 7.50 hp / 5.59 kW (Fixed)



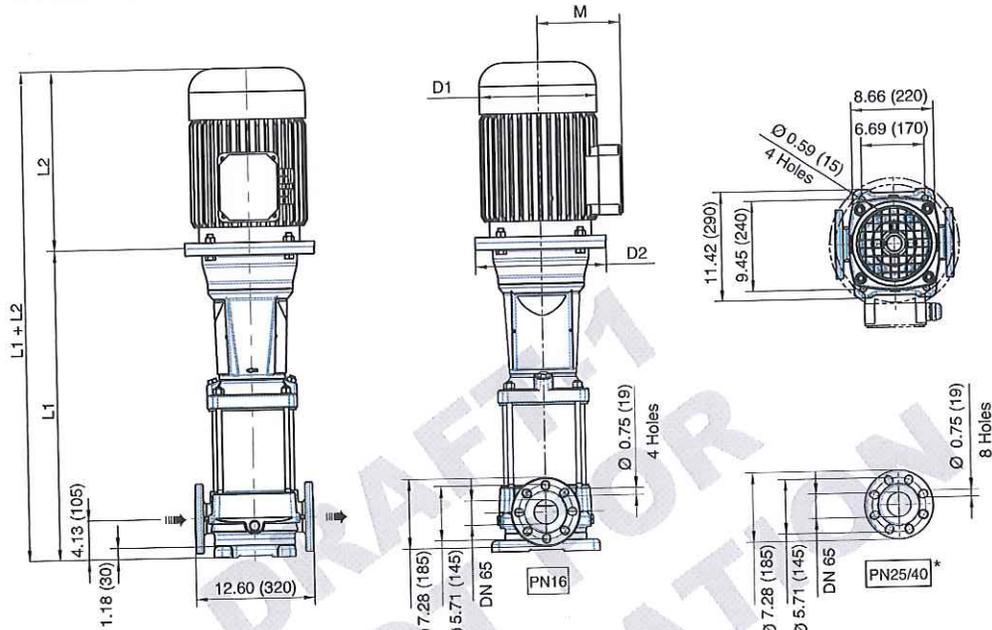
VERTICAL MULTI-STAGE PUMPS

VR SERIES - 60 HZ



DIMENSIONS

30VR 60 HZ



inches (mm)

F version

The pump is supplied without counterflanges (optional accessories, including bolts and joints).

*Please note: The holes are rotated compared to PN 16.

Model	Motor			Dimensions (in)										Weight (lbs)								
	Rated Power		NEMA Frame	L1	L2				M (max)	D1				PE	Motor				PMA			
	kW	HP			10 ODP	10 TEFC	30 ODP	30 TEFC		10 ODP	10 TEFC	30 ODP	30 TEFC		10 ODP	10 TEFC	30 ODP	30 TEFC	10 ODP	10 TEFC	30 ODP	30 TEFC
30VR01-1A	3.7	5	182/4TC	17.91	-	14.3	12.603	15.359	6.696	-	8.74	10.079	10.079	117	-	103	53	69	-	-	170	186
30VR01-00	3.7	5	182/4TC	17.91	-	14.3	12.603	15.359	6.696	-	8.74	10.079	10.079	117	-	103	53	69	-	-	170	186
30VR02-2A	5.5	7.5	213/5TC	28.50	-	-	15.124	18.628	7.973	-	-	9.846	11.306	164	-	-	103	118	-	-	267	282
30VR02-1A	5.5	7.5	213/5TC	28.50	-	-	15.124	18.628	7.973	-	-	9.846	11.306	164	-	-	103	118	-	-	267	282
30VR02-00	7.5	10	213/5TC	29.29	-	-	15.124	18.628	7.973	-	-	9.846	11.306	171	-	-	103	133	-	-	274	304
30VR03-2A	11	15	254/6TC	32.52	-	-	19.021	20.488	9.448	-	-	11.558	13.18	180	-	-	151	156	-	-	331	336
30VR03-1A	11	15	254/6TC	32.52	-	-	19.021	20.488	9.448	-	-	11.558	13.18	180	-	-	151	156	-	-	331	336
30VR03-00	11	15	254/6TC	32.52	-	-	19.021	20.488	9.448	-	-	11.558	13.18	188	-	-	151	211	-	-	339	399
30VR04-2A	15	20	254/6TC	35.75	-	-	18.401	21.275	9.448	-	-	11.558	13.18	188	-	-	151	211	-	-	339	399
30VR04-1A	15	20	254/6TC	35.75	-	-	18.401	21.275	9.448	-	-	11.558	13.18	188	-	-	151	211	-	-	339	399
30VR04-00	15	20	254/6TC	35.75	-	-	18.401	21.275	9.448	-	-	11.558	13.18	197	-	-	151	211	-	-	348	4408
30VR05-2A	15	20	254/6TC	38.98	-	-	18.401	21.275	9.448	-	-	11.558	13.18	197	-	-	298	362	-	-	495	559
30VR05-1A	18.5	25	284/6TSC	38.98	-	-	21.073	23.307	11.073	-	-	13.7	14.173	197	-	-	298	362	-	-	495	559
30VR05-00	18.5	25	284/6TSC	38.98	-	-	21.073	23.307	11.073	-	-	13.7	14.173	197	-	-	298	362	-	-	495	559
30VR06-2A	18.5	25	284/6TSC	42.20	-	-	21.073	23.307	11.073	-	-	13.7	14.173	206	-	-	299	392	-	-	504	568
30VR06-1A	22	30	284/6TSC	42.20	-	-	18.75	23.307	11.073	-	-	13.7	14.173	206	-	-	299	392	-	-	505	598
30VR06-00	22	30	284/6TSC	42.20	-	-	18.75	23.307	11.073	-	-	13.7	14.173	213	-	-	299	392	-	-	512	605
30VR07-2A	22	30	284/6TSC	45.63	-	-	18.75	23.307	11.073	-	-	13.7	14.173	222	-	-	299	392	-	-	521	614
30VR07-1A	30	40	324/TSC	45.63	-	-	23.651	25.866	12.575	-	-	15.118	15.827	222	-	-	531	547	-	-	753	769
30VR07-00	30	40	324/TSC	45.63	-	-	23.651	25.866	12.575	-	-	15.118	15.827	222	-	-	531	547	-	-	753	769
30VR08-2A	30	40	324/TSC	48.86	-	-	23.651	25.866	12.575	-	-	15.118	15.827	230	-	-	531	547	-	-	761	777
30VR08-1A	30	40	324/TSC	48.86	-	-	23.651	25.866	12.575	-	-	15.118	15.827	230	-	-	531	547	-	-	761	777
30VR08-00	30	40	324/TSC	48.86	-	-	23.651	25.866	12.575	-	-	15.118	15.827	230	-	-	531	547	-	-	761	777

ENGINEER'S REPORT

SANITARY SEWER SYSTEM TO SERVE

LEGOLAND New York

**TOWN OF GOSHEN
ORANGE COUNTY, NEW YORK**

Prepared By:

Lanc & Tully Engineering and Surveying, P.C.
P.O. Box 687
Goshen, New York 10924

November 15, 2016

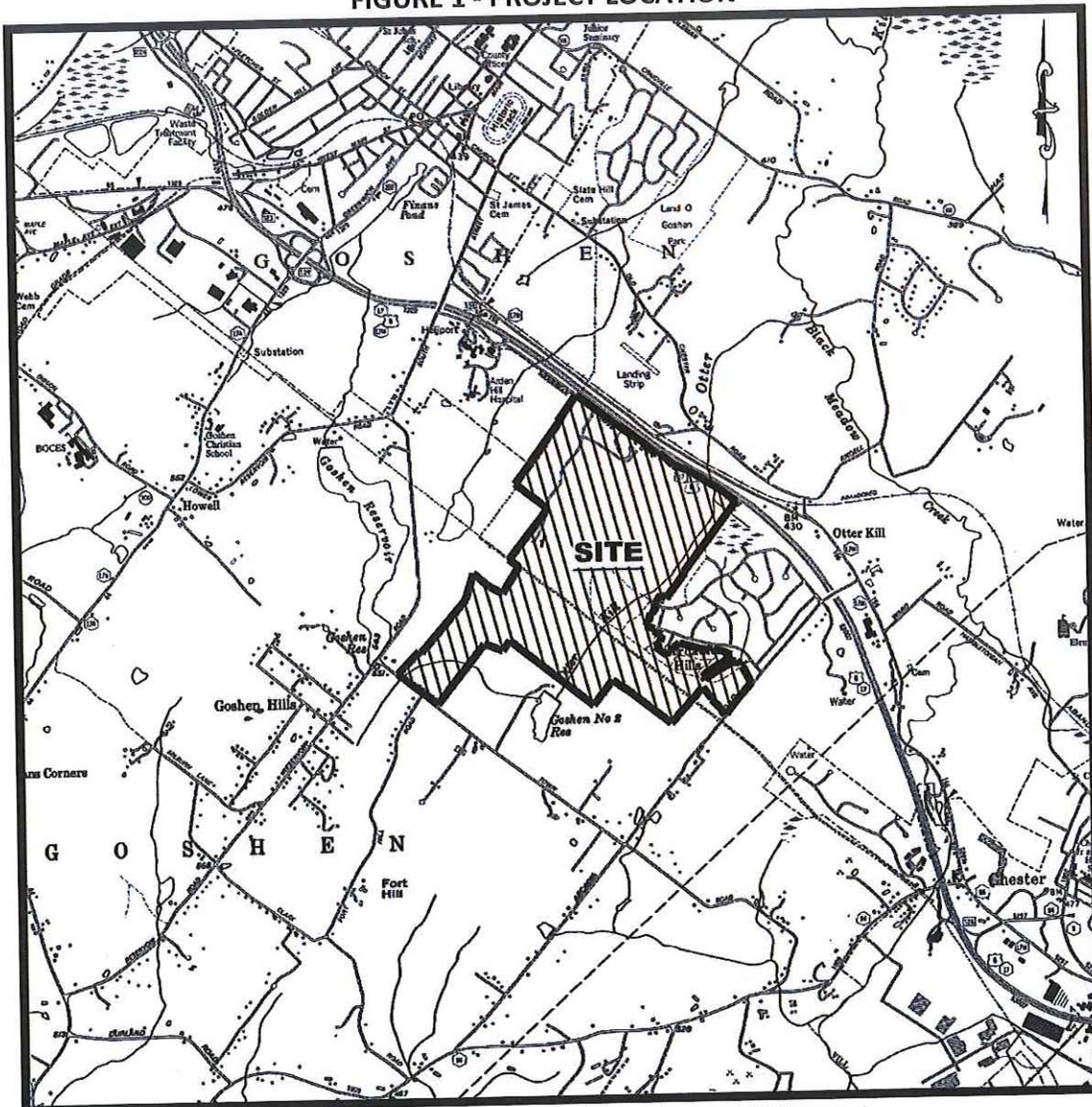
**ENGINEER'S REPORT
SANITARY SEWER SYSTEM TO SERVE LEGOLAND
TOWN OF GOSHEN, ORANGE COUNTY, NEW YORK**

November 15, 2016

PROJECT OVERVIEW

Merlin Entertainments, as Project Sponsor, proposes to construct a theme park and resort on approximately 140 acres of a 522 acre site consisting of 15 total parcels located off Harriman Drive in the Town of Goshen. The Project Site is generally located south of NYS Route 17, at exit 125, on the east side of the Town of Goshen. The Project Site has street frontage on Harriman Drive and extends south of Conklingtown Road and as far east as Arcadia Road. See Project Location Map, Figure 1.

FIGURE 1 - PROJECT LOCATION



Source: NYSDOT Digital Raster Quadrangles for Goshen and Warwick

ENGINEER'S REPORT
SANITARY SEWER SYSTEM TO SERVE LEGOLAND
TOWN OF GOSHEN, ORANGE COUNTY, NEW YORK

November 15, 2016

The park, to be called LEGOLAND New York, will include rides and attractions, an aquarium, theaters, restaurants, a hotel and various back-of-house facilities including offices and staff areas as well as associated parking and water, sanitary sewer and drainage facilities. Merlin Entertainments will own and operate the site. All onsite improvements and infrastructure will be owned and maintained by the property owner. All offsite sanitary facilities and infrastructure will be owned and maintained by the Village of Goshen. Based on similar-sized LEGOLAND parks, between 1.5 and 2.5 million annual visitors are anticipated to the site. Hours of Operation of the park in summer months will be from 10:00AM to 8:00PM, seven days a week. During non-peak season the park will be open from 10:00AM to 6:00PM on weekdays and 10:00AM to 8:00PM on weekends. The park will be closed from November through March. The hotel, offices and aquarium will be opened year round but with reduced staff and significantly reduced numbers of visitors. Operations at the park will include a 250-room hotel, 20,000 square foot aquarium, 81,000 square feet among five buildings in the back-of-house area (including administration offices, maintenance warehouse, landscaping building and trash collection) and a theme park consisting of 26 rides and attractions, 2 theaters, 10 retail areas, and approximately 15 restaurants (including both dine-in, counter service and food kiosks) in eight themed areas.

WASTEWATER TREATMENT

Wastewater conveyance and treatment for LEGOLAND New York will be provided by the Village of Goshen. The project would be an "Out of District" user of the Goshen Sewer District. The Village of Goshen Wastewater Treatment Plant, located on Cypress Road, is approximately 2.5 miles from the Project Site. The plant is permitted to treat 2 MGD based on a 30 day average under NYSDEC Permit NY0031518. Average flow treated at the wastewater treatment plant is 1.10 MGD; an additional 0.39 MGD average flow is anticipated by committed in-Village and outside Village projects under development.

The wastewater collection and transmission system designed for LEGOLAND New York is based on the project's anticipated generation of an average of 130,689 GPD of wastewater during peak season and an average of 26,025 GPD during the off peak season. The anticipated wastewater generation is based on recorded wastewater volumes at the LEGOLAND Windsor Resort, an existing seasonal park of similar size and scope, and adjusted accordingly for the variations in the proposed LEGOLAND New York facility. LEGOLAND Windsor is a 150-acre park with approximately 2.2 million visitors per year with two water attractions. A total of 33,018,594 gallons of wastewater was generated in 2015 at LEGOLAND Windsor Resort for the park and hotel or an average of 90,462 GPD.

As stated above, the Village of Goshen has a permitted treatment capacity of 2.0 MGD and currently treats an average of 1.10 MGD. The additional peak season anticipated flow from LEGOLAND New York of 130,689 GPD will increase the treatment volume to approximately 1.23 MGD. Accounting for future flows generated by the anticipated committed in-Village and outside Village projects under development, total future flows to the Village wastewater treatment plant during the peak season are estimated at 1.62 MGD which is below the permitted 2.0 MGD.

**ENGINEER'S REPORT
SANITARY SEWER SYSTEM TO SERVE LEGOLAND
TOWN OF GOSHEN, ORANGE COUNTY, NEW YORK**

November 15, 2016

WASTEWATER COLLECTION

LEGOLAND New York's onsite sewer collection will be a gravity system generally following the proposed service road which will flow to a sanitary sewer pump station to be installed in the near the existing end of Harriman Drive. An existing 8" sanitary sewer forcemain (originally thought to be a 6" forcemain based on information provided by the Town of Goshen) is located within Harriman Drive which conveys wastewater from the Arcadia Hills sanitary sewer pump station to a gravity manhole to the Village of Goshen sewer collection system. A portion of this existing forcemain will be replaced with a new forcemain sized to accommodate the flow capacity demands of both the existing Arcadia Hills pump station and the new LEGOLAND New York pump station. The LEGOLAND New York forcemain will connect with the existing forcemain from the Arcadia Hills pump station within Harriman Drive near the new pump station. Approximate 2,200 linear feet of the existing Arcadia Hills forcemain will remain in-place and undisturbed. Should results of further investigation of the existing Arcadia Hills forcemain warrant, the forcemain will be replaced in its entirety. The proposed sewer collection and transmission system is comprised of 42 sanitary sewer manholes, approximately 6,645 linear feet of 8" gravity sewer main, and a sewer pump station (on site), a check valve and vault for tying the two forcemains together and approximately 4,950 linear feet of SDR18 8" forcemain.

PUMP STATION

The Pump Station will be a PumpMate, factory built wet well mounted above-ground valve and control station for submersible pumps with factory installed equipment on a fiberglass covered reinforced concrete base and fiberglass enclosure, as manufactured by USEMCO, Inc., Tomah, Wisconsin. The principal items of equipment include a U.L certification for package pumping stations, internal piping, valves, and control panel; two submersible non-clog wastewater pumps, and auto-dialer alarm system. The pump station will be furnished with a natural gas fueled standby emergency generator and automatic transfer switch. The pump station area will be fenced by 6 foot high chain link fencing.

The pump station will be furnished with two (2) Grundfos SLV.30.A30.80.2.61R.C submersible wastewater pumps. The design point for the pumps is 155 gpm at 31.5' TDH. The pumps selected are 8.0 BHP, 3,530 RPM, with Super Vortex impellers. The pump selection is also based on operation while the Arcadia Hills pump station is running. Only one pump is required for normal operation, the second pump is a 100% standby unit. A control panel with automatic alternator will be provided for the operation of the pumps. Controls are designed so that the standby pump will automatically start upon failure of the lead pump and/or upon liquid level reaching to the lag pump start level. A 7.5 foot inside diameter wet well with a total depth of 13 feet is proposed. Between the wet well base and the invert of the collection sewer invert is a distance of 9 feet, thereby providing approximately 2,975 gallons of storage capacity.

Design flow, total dynamic head, wet well capacity and pump cycle calculations for the pump station calculations are included in Appendix A.

**ENGINEER'S REPORT
SANITARY SEWER SYSTEM TO SERVE LEGOLAND
TOWN OF GOSHEN, ORANGE COUNTY, NEW YORK**

November 15, 2016

Preliminary float settings for LEGOLAND New York Pump Station for Peak Season operation have been calculated as follows:

Pumps Off:	454.5	Lag Pump On:	458.0
Lead Pump On:	457.0	High Level Alarm:	459.0

These settings provide a cycle time during peak flow of 4.78 minutes and a cycle time of 14.43 minutes during average flow. These cycle times are well within the manufacturer's specifications.

Due to dramatic flow variations between Peak Season and Off-Peak Season, float level settings will be adjusted at a minimum twice per year. Analysis and design are based on Peak Season flows as required.

Engineering data of the selected Grundfos Pumps, including pump performance curve, is included in Appendix B.

CONCLUSIONS

The proposed LEGOLAND New York will generate an additional flow of 130,689 gpd during peak season operations and an additional 26,025 gpd during off-peak season operations. Accounting for additional future committed flows from projects under development, total anticipated flow to the Village of Goshen wastewater treatment plant is estimated at 1.62 MGD, well within the plants permitted treatment volume. The new sanitary sewer infrastructure, including the Arcadia Hills forcemain, will be constructed and tested in accordance with NYSDEC requirements to ensure no inflow or infiltration to the Village of Goshen sanitary sewer system. The pump station will be provided with a standby emergency generator to ensure operation during power outages and will also include an auto-dialer alarm system to promptly notify the project owner and operator if the pump station is not operating properly. No adverse impacts on the Village of Goshen sanitary sewer and wastewater treatment systems are anticipated.

LANC & TULLY, P.C.

John O'Rourke, P.E.

JOR/DMK/
sewer sys.engrpt.doc

APPENDIX A
Design Calculations

Design Flow

The wastewater collection and transmission system designed for LEGOLAND New York is based on the project's anticipated generation of an average of 130,689 GPD of wastewater during peak season and an average of 26,025 GPD during the off peak season. The anticipated wastewater generation is based on recorded wastewater volumes at the LEGOLAND Windsor Resort, an existing seasonal park of similar size and scope, and adjusted accordingly for the variations in the proposed LEGOLAND New York facility.

Peak Season flow = 130,689 gpd = 90.8 gpm average flow
 Peak Multiplier x 3.0 $\frac{3.0}{}$
 (assuming 10,000 population) 272.4 gpm peak flow

*Off-Peak Season flow = 26,025 gpd = 18.1 gpm average flow
 Peak Multiplier x 3.2 $\frac{3.2}{}$
 (assuming 5,000 population) 57.9 gpm peak flow

* Due to dramatic flow variations between Peak Season and Off-Peak Season, float level settings will be adjusted at a minimum twice per year. Analysis and design are based on Peak Season flows.

Total Dynamic Head Calculations

Static Head

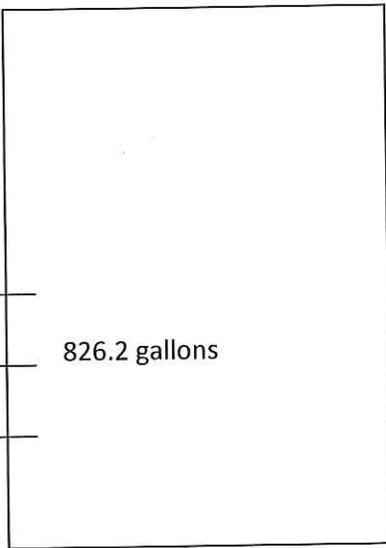
Discharge elevation = 483.00 feet
 Suction elevation = 451.50 feet
 Static Head = 31.50 feet
 Total Dynamic Head: 31.50*

*Friction losses in 8" SDR18 are negligible at 155 gpm

Based upon the total dynamic head* of 31.5 feet, Grundfos SLV.30.A30.80.2.61R.C, 8 HP submersible pumps with Super Vortex impellers will pump 155 gpm at an efficiency of approximately 31 percent.

Wet Well Capacity Calculations (Peak Season)

Rim El	=	464.00	_____
Inv Out	=	460.00	_____
Inv In	=	460.00	_____
HL Alarm	=	459.00	_____
HL On	=	458.00	_____
LL On	=	457.00	_____
Pumps Off	=	454.50	_____
Suction El	=	451.50	_____
Base El	=	451.00	_____



Invert In = 460.0
 Base Elevation = 451.0
 9.0 ft
 9 X 44.179 = 397.611 CF
 $\times \frac{7.48052}{}$
 = 2,974.337 gal. storage

7.5 foot inside diameter
 (volume = $\pi \times r^2 = 44.179$ cf/ft)

Pump Cycles

Peak Season:

826.2 gal / 90.8 gpm = 9.10 minutes (average) + 5.33 minutes pump time = 14.43 minutes
 826.2 gal / 272.4 gpm = 3.03 minutes (peak) + 1.75 minutes pump time = 4.78 minutes

APPENDIX B
Engineering Data

Position	Count	Description
----------	-------	-------------

1 SLV.30.A30.80.2.61R.C



Product photo could vary from the actual product

Product No.: 99030191

Non-self-priming, single-stage, centrifugal pump designed for handling wastewater, process water and unscreened raw sewage.

The pump is designed for intermittent and continuous operations in submerged installation. The efficient SuperVortex impeller provides passage of long fibres and solids up to 3 1/8 in and is suitable for wastewater with a dry matter content of up to 5 %.

A unique stainless-steel clamp assembling system enables quick and easy disassembly of the pump from the motor unit for service and inspection. No special tools are required. Pipework connection is via a ANSI flange.

Controls:

Moisture sensor: with moisture sensors
 Water-in-oil sensor: without water-in-oil sensor

Liquid:

Pumped liquid: any viscous fluid
 Maximum liquid temperature: 104 °F
 Density: 62.29 lb/ft³

Technical:

Actual calculated flow: 155 US gpm
 Resulting head of the pump: 55.26 ft
 Type of impeller: Super Vortex
 Maximum particle size: 3 1/8 in
 Primary shaft seal: SIC/SIC
 Secondary shaft seal: CARBON/CERAMICS
 Approvals on nameplate: CSA
 Curve tolerance: ANSI/HI11.6:2012 3B2

Materials:

Pump housing: EN-GJL-250
 Impeller: EN-GJL-250
 Motor: EN-GJL-250

Installation:

Maximum ambient temperature: 104 °F
 Flange standard: ANSI
 Pump inlet: 80
 Pump outlet: 80
 Pressure stage: PN 10
 Maximum installation depth: 65.62 ft
 Frame range: C



Company name:

Created by:

Phone:

Date:

11/16/2016

Position	Count	Description
		Electrical data:
		Power input - P1: 7.2 kW
		Rated power - P2: 8 HP
		Main frequency: 60 Hz
		Rated voltage: 3 x 230/460 V
		Voltage tolerance: +10/-10 %
		Max starts per. hour: 20
		Rated current: 21.4/11.4 A
		Starting current: 170 A
		Cos phi - power factor: 0.87
		Cos phi - p.f. at 3/4 load: 0.84
		Cos phi - p.f. at 1/2 load: 0.75
		Rated speed: 3530 rpm
		Motor efficiency at full load: 90.7 %
		Motor efficiency at 3/4 load: 90.8 %
		Motor efficiency at 1/2 load: 89.8 %
		Number of poles: 2
		Start. method: star/delta
		Enclosure class (IEC 34-5): IP68
		Insulation class (IEC 85): H
		Explosion proof: no
		Length of cable: 49 ft
		Cable type: SEOOW 600V
		Others:
		Net weight: 308 lb



Company name:

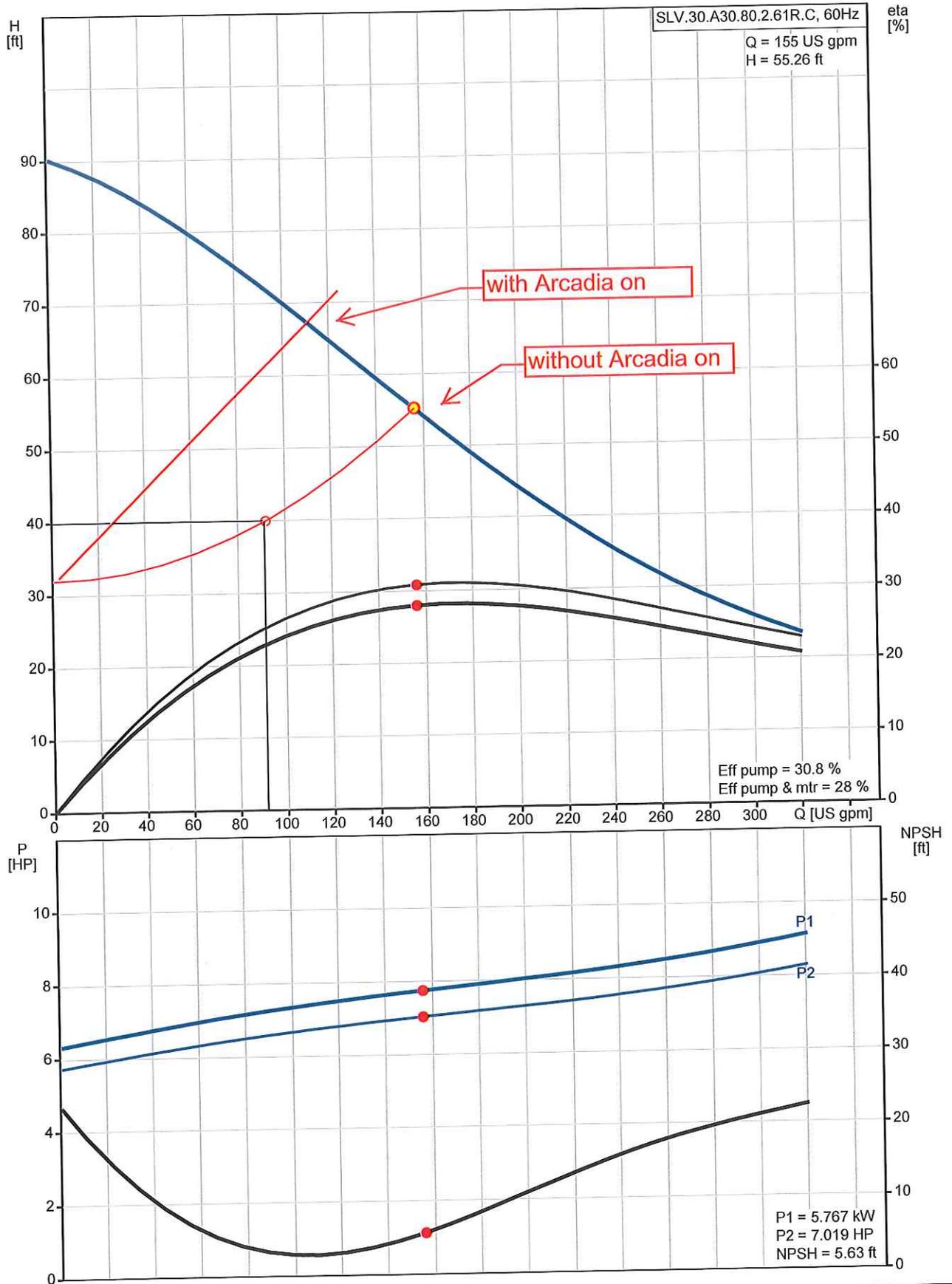
Created by:

Phone:

Date:

11/16/2016

99030191 SLV.30.A30.80.2.61R.C 60 Hz





Company name:

Created by:

Phone:

Date:

11/16/2016

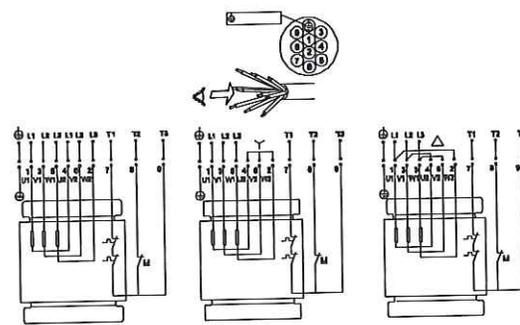
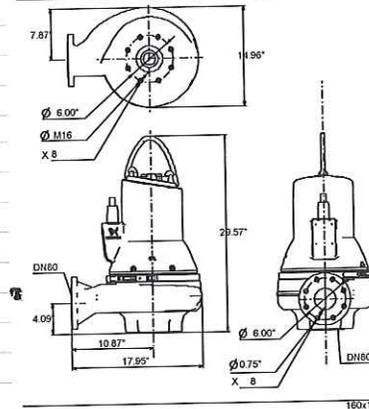
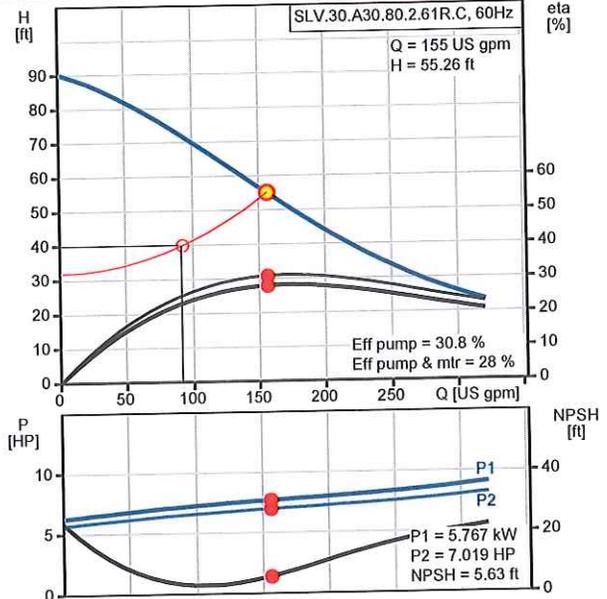
Description	Value
General information:	
Product name:	SLV.30.A30.80.2.61R.C
Product No.:	99030191
EAN:	5712605416715
Price:	On request
Technical:	
Actual calculated flow:	155 US gpm
Max flow:	273 US gpm
Resulting head of the pump:	55.26 ft
Head max:	87.6 ft
Type of impeller:	Super Vortex
Maximum particle size:	3 1/8 in
Primary shaft seal:	SIC/SIC
Secondary shaft seal:	CARBON/CERAMICS
Approvals on nameplate:	CSA
Curve tolerance:	ANSI/HI11.6:2012 3B2
Cooling jacket:	without cooling jacket

Materials:	
Pump housing:	EN-GJL-250
Impeller:	EN-GJL-250
Motor:	EN-GJL-250

Installation:	
Maximum ambient temperature:	104 °F
Flange standard:	ANSI
Pump inlet:	80
Pump outlet:	80
Pressure stage:	PN 10
Maximum installation depth:	65.62 ft
Inst dry/wet:	SUBMERGED
Installation:	VERTICAL
Frame range:	C

Liquid:	
Pumped liquid:	any viscous fluid
Maximum liquid temperature:	104 °F
Density:	62.29 lb/ft ³

Electrical data:	
Power input - P1:	7.2 kW
Rated power - P2:	8 HP
Main frequency:	60 Hz
Rated voltage:	3 x 230/460 V
Voltage tolerance:	+10/-10 %
Max starts per. hour:	20
Rated current:	21.4/11.4 A
Starting current:	170 A
Cos phi - power factor:	0.87
Cos phi - p.f. at 3/4 load:	0.84
Cos phi - p.f. at 1/2 load:	0.75
Rated speed:	3530 rpm
Motor efficiency at full load:	90.7 %
Motor efficiency at 3/4 load:	90.8 %
Motor efficiency at 1/2 load:	89.8 %
Number of poles:	2
Start. method:	star/delta
Enclosure class (IEC 34-5):	IP68





Company name:

Created by:

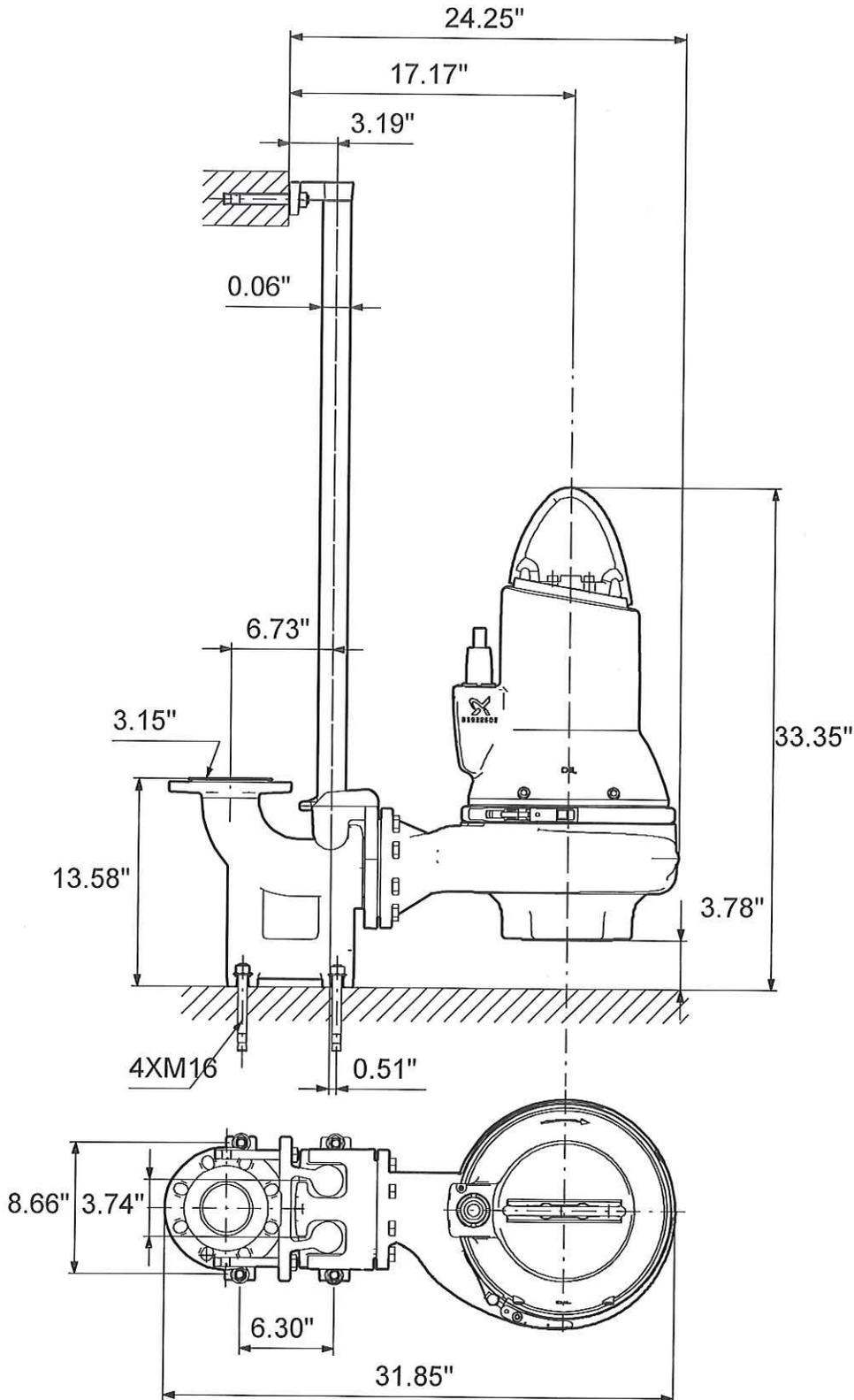
Phone:

Date:

11/16/2016

Description	Value
Insulation class (IEC 85):	H
Explosion proof:	no
Motor protection:	THERMAL SWITCH
Length of cable:	49 ft
Cable type:	SEOOW 600V
Controls:	
Additional I/O:	N
Moisture sensor:	with moisture sensors
Water-in-oil sensor:	without water-in-oil sensor
Others:	
Net weight:	308 lb

99030191 SLV.30.A30.80.2.61R.C 60 Hz



Note! All units are in [mm] unless otherwise stated.
Disclaimer: This simplified dimensional drawing does not show all details.