



MEETING AGENDA
JOINT MEETING OF THE BOARD OF SELECTMEN, PLANNING BOARD,
AND BOARD OF HEALTH
August 25, 2020
Town Offices, 50 Billerica Road
Chelmsford, MA 01824
Virtual Meeting

Pursuant to Governor Baker's March 12, 2020 Order Suspending Certain Provisions of the Open Meeting Law, G.L. c. 30A, §18, and the Governor's March 15, 2020 Order imposing strict limitation on the number of people that may gather in one place, this meeting of the Town of Chelmsford Board of Selectmen will be conducted via remote participation to the greatest extent possible. Specific information and the general guidelines for remote participation by members of the public and/or parties with a right and/or requirement to attend this meeting can be found on the Town's website, at www.chelmsfordma.gov. For this meeting, members of the public who wish to watch the meeting may do so by accessing the Chelmsford Telemedia website www.chelmsfordtv.org.

No in-person attendance of members of the public will be permitted, but every effort will be made to ensure that the public can adequately access the proceedings in real time, via technological means. In the event that we are unable to do so, despite best efforts, we will post on the Town's website an audio or video recording, transcript, or other comprehensive record of proceedings as soon as possible after the meeting.

Topic: Board of Selectmen: Multi-Board Meeting

Time: Aug 25, 2020 07:00 PM Eastern Time (US and Canada)

Join Zoom Meeting

<https://us02web.zoom.us/j/83902267954?pwd=STAwSVEzVDU3ZVBWelhpOjN0Wmx5UT09>

Meeting ID: 839 0226 7954

Passcode: 492802

Dial by your location: +1 929 205 6099 US (New York)

-
1. 7:00 PM CALL TO ORDER
 2. PUBLIC INPUT REGARDING SEWER CAPACITY
 3. RESPONSE TO SEWER CAPACITY REPORT

Documents:

[WW FLOW ANALYSIS AND KATRINA RD PS CAPACITY - LETTER REPORT.PDF](#)

4. ADJOURNMENT

NEXT REGULAR BOARD OF SELECTMEN MEETING DATE: **August 31, 2020**

August 6, 2020

Mr. Stephen Jahnle
Assistant Director of Public Works
Town of Chelmsford – Department of Public Works
9 Alpha Road
Chelmsford, Massachusetts 01824

RE: *Letter Report – Existing Wastewater Flow Analysis and Katrina Road Pump Station Capacity Analysis*

Dear Mr. Jahnle:

In accordance with our February 18th, 2020 Letter Agreement and our June 10th, 2020 site visit, Weston & Sampson is pleased to submit this letter report on the analysis of average daily flows (ADFs) to the City of Lowell and the capacity analysis of the wastewater pumps at the Katrina Road Pump Station. The goals of this project included:

- Review Chelmsford's flow meter data for wastewater flows to the City of Lowell for the past five (5) years to determine the current approximate ADFs for Chelmsford and for Tyngsborough flows being conveyed through the Chelmsford collection system.
- Project potential future wastewater flows for the Town of Chelmsford based on approved and potential development, including an allowance for changes in use.
- Evaluate the capacity of the Katrina Road pumps and their ability to accommodate current and projected future peak flows associated with proposed development and potential redevelopment within the Town of Chelmsford.

WASTEWATER FLOWS

The Town of Chelmsford has an intermunicipal agreement (IMA) with the City of Lowell to convey an ADF of up to 3.01 million gallons per day (mgd) of wastewater to Lowell's Duck Island Regional Wastewater Treatment Facility (WWTF). Through a separate IMA, Chelmsford has allocated 0.35 mgd of the 3.01 mgd for wastewater from the Town of Tyngsborough to flow through the Chelmsford system. Wastewater from Tyngsborough flows into the existing 15-inch polyvinyl chloride (PVC) sewer in Tyngsborough Road (State Route 3A) which is directly tributary to the Southwell Field Pump Station.

Chelmsford's ADF to Lowell is measured by five (5) flow meters at five (5) different locations:

- Southwell Field Pump Station
- Katrina Road Pump Station

- Technology Drive Flow Meter
- Drum Hill Road Flow Meter
- Edgewood Street Pump Station

Over 90% of Chelmsford's total ADF to Lowell is tributary to the pump stations at Southwell Field and Katrina Road.

There are two (2) flow meters (Middlesex and Worden) at the town line between Tyngsborough and Chelmsford which measure the wastewater flows from Tyngsborough.

Existing ADF – 2015-2019

The Town of Chelmsford provided flow meter data from the seven (7) meters for the calendar years 2015 through 2019, inclusive. The data included total monthly wastewater flows in million gallons for each year. Appendix A includes all flow meter data, by month and by year. Table 1, below, summarizes the monthly data presented in Appendix A and presents the annual ADFs from Chelmsford and Tyngsborough and the total ADF to the City of Lowell. The allowable ADFs in accordance with the current IMAs are also included for comparison.

Table 1
Annual ADFs – Chelmsford and Tyngsborough 2015-2019 (source: Town of Chelmsford)

Year	Annual ADF		
	Chelmsford (mgd)	Tyngsborough (mgd)	Total (mgd)
2015	2.29	0.09	2.38
2016	2.23	0.09	2.33
2017	2.53	0.12	2.65
2018	2.68	0.14	2.82
2019	2.56	0.17	2.72
AVERAGE (2015-2019)	2.46	0.12	2.58
AVERAGE (2017-2019)	2.59	0.14	2.73
IMA	2.66	0.35	3.01

Based on the information presented in Table 1, the highest ADFs have occurred over the past three (3) years and have been fairly consistent over this time period. Therefore, we have used an ADF based on the average flows from 2017 through 2019 for our analysis herein.

For the purpose of this analysis we have assumed that Tyngsboro will ultimately utilize its entire 0.35 mgd capacity and all calculations of available capacity under the IMA are based on Chelmsford's flows and their 2.66 mgd of allocated capacity based on Table 1.

Estimated Approved Pending Wastewater Flows

One of the goals of this project was to estimate the future wastewater flows from new developments in Town to determine their impacts on the allowable ADFs in accordance with the existing IMA between Chelmsford and Lowell.

Based on information provided by the Town, there are several approved developments, properties, etc. that are either connecting to the existing wastewater collection system soon, currently under construction, or permitted to connect. The Town has also identified “potential” projects that could ultimately request to be connected to the existing wastewater collection system. In order to estimate the future wastewater flows from these properties, the following Massachusetts Title 5 maximum day flow rates were used:

- Bedroom – 110 gallons per day (gpd)
- Restaurant – 35 gpd/seat
- Retail – 50 gpd/1,000 square feet (sf)

The ADF is estimated at 65% of the maximum daily flow. Table 2, below, presents the estimated future wastewater flows for the properties that have already been approved by the Town.

Table 2
Estimated Approved Wastewater Flows (source: Town of Chelmsford)

Project	# of Bedrooms	# of Seats	Retail Area (sf)	Max Daily Flow (gpd)	ADF (gpd)
160 Mill Road	16	-	-	1,760	1,144
104 Turnpike Road	268	-	-	29,480	19,162
241 Littleton Road	40	-	-	4,400	2,860
11 Cushing Place	64	-	-	7,040	4,576
Fairview Street	33	-	-	3,630	2,360
152 Turnpike Road	18	-	-	1,980	1,287
278 Mill Road	-	100	6,500	3,825	2,486
Barton Hill Road	4	-	-	440	286
Tobin Avenue	30	-	-	3,300	2,145
50 Hunt Road	159	-	-	17,490	11,369
Pineview	168	-	-	18,480	12,012
Pile Drive – Office	1	-	-	110	72
59 Princeton Street	33	-	-	3,630	2,360
235 Littleton Road	8	-	-	880	572
Misty Meadow Road	24	-	-	2,640	1,716
197 Billerica Road	-	200	8,245	7,412	4,818
TOTAL:	866	300	14,745	106,497	69,225

The estimated future ADF from the approved developments is approximately 0.069 mgd. As presented in Table 1, the current ADF for Chelmsford from 2017 through 2019 is approximately 2.59 mgd. Therefore, the total estimated ADF based on current flow and approved development is approximately 2.66 mgd which is Chelmsford's allowable ADF to Lowell in accordance with the IMA.

Based on this analysis, it is recommended that no additional permits for connection of proposed development to the Chelmsford Municipal Sewer System be approved until such time as additional capacity can be secured.

Estimated Future Wastewater Flows

As previously mentioned, the Town also identified properties/areas with "potential" future wastewater flows. Table 3 presents the estimated "potential" future wastewater flows from these properties/areas.

Table 3
Estimated Future Wastewater Flows (source: Town of Chelmsford)

Project	# of Bedrooms	# of Seats	Retail Area (sf)	Max Daily Flow (gpd)	ADF (gpd)
UPS	240	-	-	26,400	17,160
Carlisle, Dalton 40B	48	-	-	5,280	3,432
West Campus	800	-	-	88,000	57,200
Riverneck	96	-	-	10,560	6,864
1 Billerica Road	72	100	-	11,420	7,423
Route 40	72	-	-	7,920	5,148
9 Acton Road	64	-	-	7,040	4,576
Mercury Computer HQ	600	-	-	66,000	42,900
TOTAL:	1,992	100	-	222,620	144,703

There are also several additional properties/areas that the Town identified with "potential" future wastewater flow needs (i.e. 300 Billerica Road, 270-330 Billerica Road, and Anthony's Loam - 11 Walters Street) but their estimated wastewater use is unknown at this time. These undetermined flows, along with potential re-development of previously sewered properties must be considered in any analysis of anticipated future wastewater needs. For the purpose of this analysis, we have assumed a nominal increase in flow of 2% of the current ADF of 2.59 mgd, which is approximately 52,000 gpd, for possible additional development and redevelopment of existing properties.

Table 4, on the following page, presents a summary of the estimated future wastewater flows as well as an allocation for additional development and redevelopment.

Table 4
Total Potential Future Wastewater Flows

Area	Estimated Future Wastewater Flow (gpd)
Anticipated Developments	145,000
Allocation for Additional Development and Redevelopment	52,000
TOTAL:	197,000

Based on this information it is recommended that any negotiations for additional wastewater capacity start in the range of 150,000 to 200,000 gpd of ADF.

KATRINA ROAD PUMP STATION CAPACITY ANALYSIS

Background and Project Understanding

The Katrina Road Pump Station and force main were designed and constructed between 1987 and 1989 as part of Contract Nos. 86-1 and 86-2 and consists of triplex, variable speed, vertical non-clog pumps. The existing pumps are Cornell 8NHTA-VC18DB with 17-inch impellers (see Photo 1 on the following page). Each pump has a rated capacity of 2,700 gallons per minute (gpm) against the design total dynamic head (TDH) of 75-feet. The pumps are driven by 75 horsepower (hp), 480-volt, 3 phase, 1,150 revolutions per minute (rpm) electric motors. Two (2) pumps (Pump No. 1 and Pump No. 2) were installed when the pump station was originally constructed. The third pump (Pump No. 3) was added in 2001. Pump No. 1 and Pump No. 2 were replaced in 2004 and were rebuilt in 2015 and 2019, respectively.

There are two (2) adjacent, interconnected rectangular precast concrete wet well sections – one 16'-0" x 10'-0" and the other 23'-8" x 10'-0" - that are approximately eighteen (18) feet deep. Wastewater flows enter the wet well from the existing 30-inch ductile iron (DI) gravity sewer.

The pumps discharge through approximately 9,500 linear feet (lf) of 16-inch ductile iron (DI) force main to the 78-inch Interceptor sewer in the City of Lowell and ultimately to Lowell's Duck Island Regional WWTF.



Photo 1 – Pumps at the Katrina Road Pump Station

Pump Station Capacity

EXISTING PUMP STATION FLOWS AND PUMP CAPACITY

The Katrina Road Pump Station is equipped with a flow meter on the discharge piping inside the pump station and a flow chart recorder. Monthly pumping records from this meter for the past five (5) years, as provided by the Town of Chelmsford, were summarized and are presented in Table 5 on the following page.

Table 5
Katrina Road Pump Station – Monthly and Annual ADFs (source: Town of Chelmsford)

Month	2015 (mgd)	2016 (mgd)	2017 (mgd)	2018 (mgd)	2019 (mgd)
January	1.64	1.53	1.87	1.56	2.07
February	1.72	1.74	1.76	1.73	1.98
March	1.65	1.66	1.72	1.99	1.65
April	1.93	1.70	2.22	1.84	1.87
May	1.72	1.66	1.77	1.84	1.80
June	1.43	1.47	1.81	1.45	1.74
July	1.46	1.39	1.60	1.50	1.46
August	1.35	1.18	1.39	1.35	1.35
September	1.30	1.43	1.34	1.52	1.40
October	1.31	1.34	1.43	1.50	1.38
November	1.40	1.39	1.50	2.11	1.50
December	1.38	1.51	1.59	1.83	1.63
Average for Year	1.52	1.50	1.67	1.68	1.65

Similar to our analysis of the total overall ADFs for the entire Town as presented in Table 1, we have assumed that the ADF for the Katrina Road Pump Station shall also be based on the average flow from the last three (3) years or approximately 1.67 mgd.

To establish the current capacity of the pumps at the Katrina Road Pump Station, Weston & Sampson operated each of the three (3) pumps manually on June 10th, 2020 to determine the current approximate pump outputs. According to the flow chart recorder, each pump operated at between approximately 2,400- and 2,500 gpm when run individually. Understanding that the pump station does have the ability for two (2) pumps to run in parallel during extreme high flow conditions, we operated Pump No. 1 and Pump No. 2 simultaneously and Pump No. 1 and Pump No. 3 simultaneously during our field investigations. According to the flow chart recorder, dual pump operation discharged approximately 3,400 gpm. We also observed the readings from the flow meter on the discharge pipe during normal single pump operation, which further confirmed the current single pump output rate as listed above.

As previously mentioned, the Katrina Road Pump Station is currently receiving an ADF of approximately 1.67 mgd (1,160 gpm) and under normal single pump operation, the pumps are discharging between 2,400- and 2,500 gpm, which is approximately 2.1 times the ADF. Based on Figure 2-1 from *TR-16, Guides for the Design of Wastewater Treatment Works*, a peak factor of 3.4 is recommended to establish the anticipated peak flow on maximum day at this average rate of flow, which results in an anticipated peak flow of 5.7 mgd (3,900 gpm). One (1) pump currently does not keep up with this rate of flow, if this peak flow is sustained for any period of time. Two (2) pumps operating simultaneously will bring the pump discharge rate up to 3,400 gpm which still does not quite keep up with this peak rate of flow.

Based on this information, the Katrina Road Pump Station is currently not equipped to handle theoretical peak wastewater flows based on the current ADFs. Although it is our understanding the pumps have not had an issue keeping up with incoming flows with one pump running, as additional flow is added to the pump station this situation will need to be monitored.

Estimated Approved Pending Wastewater Flows

As previously mentioned, one of the goals of this project was to evaluate the ability of the existing wastewater collection system to accommodate potential future flows associated with proposed development, including potential redevelopment, within the Katrina Road Pump Station tributary area.

Based on the information presented in Table 2, we identified which of the currently Town-approved projects would flow to the Katrina Road Pump Station. Table 6, below, presents a summary of these projects and their respective estimated future wastewater flows.

Table 6
Estimated Approved Wastewater Flows to Katrina Road Pump Station (source: Town of Chelmsford)

Project	# of Bedrooms	# of Seats	Retail Area (sf)	Max Daily Flow (gpd)	ADF (gpd)
160 Mill Road	16	-	-	1,760	1,144
104 Turnpike Road	268	-	-	29,480	19,162
241 Littleton Road	40	-	-	4,400	2,860
11 Cushing Place	64	-	-	7,040	4,576
152 Turnpike Road	18	-	-	1,980	1,287
278 Mill Road	-	100	6,500	3,825	2,486
Barton Hill Road	4	-	-	440	286
50 Hunt Road	159	-	-	17,490	11,369
Pile Drive – Office	1	-	-	110	72
235 Littleton Road	8	-	-	880	572
Misty Meadow Road	24	-	-	2,640	1,716
197 Billerica Road	-	200	8,245	7,412	4,818
TOTAL:	602	300	14,745	77,457	50,348

The estimated future ADF from the approved developments is approximately 0.050 mgd. As presented in Table 5, the current ADF for the Katrina Road Pump Station is approximately 1.67 mgd. Therefore, the total estimated ADF based on current flow and approved development is approximately 1.72 mgd (1,190 gpm), which provides a peak factor of just over 2.0 based on the pump output of approximately 2,450 gpm.

Once again, the ability of the pumps to keep up with incoming peak flows should be monitored as this additional approved flow is introduced to the collection system and conveyed to the Katrina Road Pump Station.

Estimated Future Wastewater Flows

As previously mentioned, the Town also identified properties with “potential” future wastewater flows. Based on the information presented in Table 3, we identified which of the “potential” projects would flow to the Katrina Road Pump Station. Table 7, below, presents a summary of these projects and their respective estimated “potential” future wastewater flows.

Table 7
Estimated Future Wastewater Flows to Katrina Road Pump Station (source: Town of Chelmsford)

Project	# of Bedrooms	# of Seats	Retail Area (sf)	Max Daily Flow (gpd)	Future ADF (gpd)
Carlisle, Dalton 40B	48	-	-	5,280	3,432
Riverneck	96	-	-	10,560	6,864
1 Billerica Road	72	100	-	11,420	7,423
9 Acton Road (Grist Mill 2)	64	-	-	7,040	4,576
Mercury Computer HQ	600	-	-	66,000	42,900
TOTAL:	880	100	-	100,300	65,195

There are also several additional properties/areas that the Town identified with “potential” future wastewater flow needs but their estimated wastewater use is unknown at this time. These undetermined flows, along with potential re-development of previously sewered properties must be considered in any analysis of anticipated future wastewater flows to the Katrina Road Pumps Station. For the purpose of this analysis, we have assumed a nominal increase in flow of 2% of the current ADF of 1.67 mgd, which is approximately 35,000 gpd, for possible additional development and redevelopment of existing properties within the Katrina Road Pump Station tributary area.

The estimated future ADF from the currently approved projects, possible redevelopment, and “potential” projects is approximately 0.15 mgd (0.05 mgd + 0.065 mgd + 0.035 mgd). As presented in Table 5, the current ADF for the Katrina Road Pump Station is approximately 1.67 mgd. Therefore, the total estimated future ADF for the Katrina Road Pump Station is approximately 1.82 mgd (1,260 gpm). Under normal single pump operation, the pumps are discharging between 2,400- and 2,500 gpm, which is only approximately 1.94 times this projected ADF. Based on Figure 2-1 from *TR-16, Guides for the Design of Wastewater Treatment Works*, a peak factor of 3.4 is recommended, which results in an anticipated future peak flow on maximum day of approximately 6.2 mgd (4,300 gpm). Even with two pumps running simultaneously at a discharge rate of 3,400 gpm, the current pumps are not capable of handling this projected peak flow.

Although the pumps appear to be capable of handling future projected ADFs, the ability of the pumps to keep up with incoming peak flows should be monitored as additional flow is introduced to the collection system and conveyed to the Katrina Road Pump Station.

At some point the Town will need to consider upsizing the system with higher capacity pumps such that each pump in the triplex system is capable of discharging at a rate closer to the future anticipated

peak flow rate of 4,300 gpm. Any increase in capacity will need to take into account the capacity and integrity of the existing force main to accommodate higher flows and pressures.

FORCE MAIN VELOCITIES/SIZING

Any consideration to increase pump discharge rates should also include a review of the impacts on the existing force main. Based on the observed pump discharge rate of approximately 2,400- to 2,500 gpm and the potential future discharge of up to 4,300 gpm, Weston & Sampson calculated the approximate velocities in the exiting force main from the Katrina Road Pump Station. According to existing record drawings, the force main from this pump station to the 78-inch Interceptor sewer in Lowell is 16-inch, Class 52, DI pipe.

Typically, force mains are designed for velocities between 3 feet per second (fps) and 5 fps. Since higher velocities result in greater friction losses and increased pumping costs and can contribute to pressure surges/water hammer problems, velocities in excess of 5 fps are not recommended.

Using the flow rate equation $V = Q/A$ where:

V = velocity, in fps

Q = flow, in cubic feet per second (cfs)

A = area of force main, in square feet (sf)

Weston & Sampson calculated the force main velocities over a range of flows, including during current single and dual pump operation as well as under potential increased discharge rates. Table 8 presents the calculated force main velocities:

Table 8
Katrina Road Pump Station – Estimated Force Main Velocities

Q (gpm)	Q (cfs)	Force Main Area ⁽¹⁾ (sf)	Velocity (fps)
2,400 ⁽²⁾	5.35	1.503	3.56
2,500 ⁽²⁾	5.57	1.503	3.71
3,000	6.68	1.503	4.44
3,400 ⁽³⁾	7.58	1.503	5.04
3,500	7.80	1.503	5.19
3,600	8.02	1.503	5.34
3,700	8.24	1.503	5.48
3,800	8.47	1.503	5.64
3,900	8.69	1.503	5.78
4,000	8.91	1.503	5.93
4,100	9.14	1.503	6.08
4,200	9.36	1.503	6.23
4,300 ⁽⁴⁾	9.58	1.503	6.37

Notes:

- (1) 16-inch DI, Class 52 pipe – Outer diameter = 17.4-inches; Wall thickness = 0.40-inches; Inner diameter = 16.6-inches
- (2) Current single pump output
- (3) Measured output with simultaneous operation of two pumps
- (4) Proposed future single pump discharge rate to accommodate all future “potential” wastewater flows

As shown in Table 8, based on the current pump discharge rates, the current velocities in the Katrina Road Pump Station force main are within the recommended range of 3 to 5 fps. Pump discharge rates higher than 3,400 gpm exceed the recommended maximum velocity of 5 fps and would require further analysis to determine if such increases would be recommended within the existing force main.

At a length of approximately 10,000 feet, replacement with a larger diameter force main would involve costs well in excess of \$1M and should only be considered in conjunction with concerns of the integrity of the existing force main and plans to replace it or to provide redundancy within the system in the case of a rupture similar to what occurred at Southwell Field.

CONCLUSIONS AND RECOMMENDATIONS

- The Town of Chelmsford has an IMA with the City of Lowell to convey an ADF of up to 3.01 mgd of wastewater to Lowell's Duck Island Regional Wastewater Treatment Facility (WWTF).
- Through a separate IMA, Chelmsford has allocated 0.35 mgd of the 3.01 mgd for wastewater from the Town of Tyngsborough to flow through the Chelmsford system, leaving Chelmsford with a capacity of 2.66 mgd.
- The total ADF for the last three (3) years was approximately 2.73 mgd.
- Although Chelmsford has never exceeded their total allowable ADF of 3.01 mgd to Lowell, in 2018, the Chelmsford annual average flow did slightly exceed their 2.66 mgd capacity, which means that if Tyngsborough were using their entire 0.35 mgd, the 3.01 mgd would have been exceeded.
- For the purpose of this analysis, we have assumed that Tyngsboro will ultimately utilize its entire 0.35 mgd capacity and all calculations of available capacity under the IMA are based on Chelmsford's flows and their 2.66 mgd of allocated capacity.
- Based on the information presented in Table 2, Town-approved developments will add approximately 0.069 mgd of ADF to the existing wastewater collection system. The additional wastewater will increase the Town's ADF to Lowell to approximately 2.66 mgd which is Chelmsford's current allowable ADF per the IMA. Based on this analysis, it is recommended that no additional permits for connection of proposed development to the Chelmsford Municipal Sewer System be approved until such time as additional capacity can be secured.
- Based on potential additional wastewater flows of 145,000 gpd for future anticipated developments and 52,000 gpd for additional unanticipated development and redevelopment (see Table 4), it is recommended that any negotiations for additional wastewater capacity start in the range of 150,000 to 200,000 gpd of ADF.
- Based on information compiled, the Katrina Road Pump Station is currently not equipped to handle theoretical peak wastewater flows based on the current ADFs. Although it is our understanding the pumps have not had an issue keeping up with incoming flows with one pump running, as additional flow is added to the pump station this situation will need to be monitored.

- At some point the Town will need to consider upsizing the Katrina Road Pump Station with higher capacity pumps such that each pump in the triplex system is capable of discharging at a rate closer to the future anticipated peak flow rate of 4,300 gpm. Any increase in capacity will need to take into account the capacity and integrity of the existing force main to accommodate higher flows and pressures.

- Based on the current pump discharge rates, the current velocities in the Katrina Road Pump Station force main are within the recommended range of 3 to 5 fps. Pump discharge rates higher than 3,400 gpm exceed the recommended maximum velocity of 5 fps and would require further analysis to determine if such increases would be recommended within the existing force main.

Weston & Sampson appreciates the opportunity to work on this important project. We trust that the information presented herein adequately addresses your concerns. Please contact us if you have any questions or require additional information.

Very truly yours,

WESTON & SAMPSON ENGINEERS, INC.

John C. Potts

John C. Potts, P.E.
Senior Project Manager