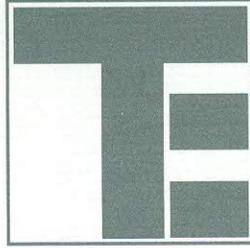


THAYER
ENGINEERING CO.



Land Surveyors
Civil Engineers
Planners

Elliot B. Thayer, PLS, PE
Andrew Dunbar, PLS, LPF, SE

December 3, 2015

City of Augusta Planning Board
c/o Matt Nazar, Director of Development Services
One City Center
Augusta, ME 04330

Ladies and Gentlemen:

Re: Performance Foodservice - NorthCenter, 20 Dalton Road, Augusta, Maine

In response to review comments from Matt Nazar, Greater Augusta Utility District (GAUD), Maine Department of Environmental Protection (MDEP) and the applicant, the following information and attachments are submitted herewith:

1. The stormwater pond is now designed as an infiltration pond, with consensus from GAUD and MDEP. The pond will be constructed with a loam liner to provide an organic layer for quality treatment. Stormwater quantity will not be controlled, other than what is provided by the infiltration pond. Attached is a letter dated November 12, 2015 to GAUD Engineer Andy Begin explaining the infiltration design, Andy Begin's December 1, 2015 email stating approval, copies of the site, details and erosion control plans revised December 3, 2015, and the stormwater computations dated October 19, 2015.

2. The land within 250 feet of the river is in the Shoreland Overlay District. The proposed driveway along the railroad and crossing the railroad to the proposed parking lot is within the 250-foot Shoreland District and will be constructed on existing 0% up to 30% slopes. Less than 30% of the land between the railroad and the river is being developed. Rip-rap slope protection on the river side of the driveway will stabilize the driveway side slope, and a rip-rap ditch and plunge pool for the pond outlet will protect the existing slope. No earth disturbance will occur within 25 feet of the river high water mark. A Permit-by-Rule from MDEP for earth disturbance adjacent to the Kennebec River is being applied for contemporaneously with this City of Augusta Application for Development Review.

3. The proposed stormwater infiltration pond is within the 250-foot Shoreland District. The pond will contain essentially all of the stormwater from the proposed site easterly of the railroad and will not impact the river. An existing culvert under the railroad will be reconstructed to provide a 24-inch diameter emergency overflow from the pond.

4. Lighting will be provided with 30-foot fully shielded pole lights in the locations shown on the site plan. Electrical and communications lines will be extended from the existing services northerly along the westerly side of the railroad to the new crossing and over the railroad to a new transformer pad, then to the parking lot lights. Also attached is the lighting plan with photometrics by ESI dated October 15, 2015.

5. The truck parking area will be fenced with an 8-foot high chain-link fence with 3 strands of barbed wire on top of the fence. The driveway will be gated at the railroad crossing. The emergency access to Sherwood Drive over the existing gravel road will not be gated at this time.

6. A waiver is requested by the applicant from buffering within a parking lot serving more than 70 vehicles. The proposed parking lot is exclusively for commercial truck parking and the drivers' personal vehicle parking, and will essentially be invisible from any residential and public uses.

Attached are ten (10) copies of 11"x17" plans, report and correspondence mentioned above, three (3) full size copies of the plans, and a CD with the same information.

We are looking forward to meeting with the Planning Board on December 8th. Thank you.

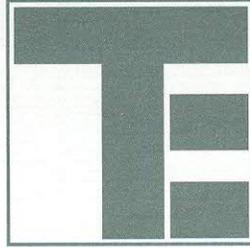
Very truly yours,
Thayer Engineering Company



Elliot B. Thayer, PE PLS

EBT/I
Attachments

THAYER
ENGINEERING CO.



Land Surveyors
Civil Engineers
Planners

COPY

Elliot B. Thayer, PLS, PE
Andrew Dunbar, PLS, LPF, SE

November 12, 2015

Andy Begin, PE
Greater Augusta Utility District
Howard Street
Augusta, ME 034330

Dear Andy:

Re: Performance Food Group/NorthCenter Foodservice, Dalton Road, Augusta

Attached please find plans and a stormwater analysis for a stormwater infiltration pond for the proposed 4.5-acre parking lot expansion northerly of the existing NorthCenter facility. As we have discussed, the proposed parking lot is located on a significant sand and gravel aquifer shown on a map entitled "Significant Sand and Gravel Aquifers, Togus Pond Quadrangle, Maine", dated 2005 by Maine Geological Survey, copy attached, and is approximately 2,000 feet downstream on the Kennebec River from Greater Augusta Utility District drilled wells.

In meetings with David Waddell and Bill Noble at MDEP, we have developed a stormwater plan that is acceptable to MDEP, and are requesting your review and approval of this design. Our Augusta Planning Board application for Major Development Review is scheduled for their review on December 8, 2015.

Stormwater quality for the expansion is proposed to be provided by a stormwater infiltration pond on the northwesterly side of the proposed parking lot. The pond outlet will flow westerly as it does now into the Kennebec River.

The pond will be constructed with a loam liner. Three (3) inches of loam material will be rototilled/mixed into the sand/gravel surface material and an additional three (3) inches of loam will be placed over the basin containment area. The loam will provide an organic layer for quality treatment and permeability will be limited to no more than 2.41 inches per hour. Permeability tests will be conducted after construction and provided to MDEP. If permeability tests show a higher infiltration rate, additional loam will be added to the surface of the basin containment area to reduce the infiltration rate to no more than 2.41 inches per hour.

"Mini" forebays to collect sediment from the parking lot will be constructed at 50-foot intervals in the rip-rap ditch along the westerly side of the parking lot at the pond. Accumulated sediment will be periodically removed.

Stormwater quantity will not be controlled, other than what is provided by the infiltration pond. The stormwater from the proposed parking lot will flow through the infiltration pond then directly to the Kennebec River. Allowing peak flows from this site to disperse downriver before combining with flows from the upper Kennebec River watershed will not cause an increase in off-site flooding.

Please let me know of any questions; I'll look forward to hearing from you. Thank you.

Very truly yours,
Thayer Engineering Company



Elliot B. Thayer, PE PLS

EBT/I

Elliot Thayer

From: Betsy Poulin <betsy.poulin@augustamaine.gov>
Sent: Tuesday, December 01, 2015 3:11 PM
To: Elliot Thayer
Subject: FW: Comments for Planning Board Meeting

From: Andy Begin [mailto:abegin@greateraugustautilitydistrict.org]
Sent: Tuesday, December 01, 2015 10:46 AM
To: Betsy Poulin; Mike Morey
Subject: RE: Comments for Planning Board Meeting

Betsy

The District has met with Eliot Thayer, and we have reviewed the design of the detention pond for Storm Water, as submitted to us on November 12, 2015. We are in agreement with the Design and a permeability rate of 2.41 inches/hr, based on a rain event of 6.1 inches/day. Thayer Engineering indicated that maintenance and re-evaluation of the detention pond would determine if future improvements were necessary. We are in agreement with continued monitoring of the detention pond. We see no immediate issues, or threat to the public water supply.

Andy

From: Betsy Poulin [mailto:betsy.poulin@augustamaine.gov]
Sent: Tuesday, December 01, 2015 8:57 AM
To: Andy Begin; Michael Morey
Subject: Comments for Planning Board Meeting

Hello Andy and Michael-

Do either of you have comments on the Augusta Fire Station application or the Performance Food Group Parking Lot? I am writing up my staff memos.

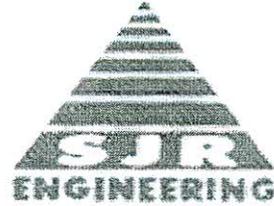
Andy, I hear you reviewed PFG for the infiltration change to the site plan. Elliot is bringing me updated plans tomorrow morning. I don't know if you want to see them before an official sign off?

Thanks.

Betsy Poulin
Assistant Planner

City of Augusta
Development Services
16 Cony Street
Augusta, Maine 04330-5298

Phone: 207.626.2365
Fax: 207.626.2520
www.augustamaine.gov



October 19, 2015

Mr. Elliot Thayer
Thayer Engineering
17 Hasson Street
Farmingdale, Maine 04344

Re: Performance Food Group parking lot expansion, Augusta
Stormwater Analysis

Dear Elliot,

Performance Food Group is proposing to construct a new 4.5 acre parking lot for trailers and vehicles. It is anticipated that this project will be constructed during this construction season (2015).

We have prepared a stormwater analysis in order to properly evaluate existing and proposed stormwater impacts from the development. The project stormwater runoff enters directly into the Kennebec River. No stormwater quantity calculations are necessary to limit flows to predevelopment stages. However, water quality enhancements will be necessary for approvals at City of Augusta and State of Maine Department of Environmental Protection agencies. In the proposed condition, stormwater flows will be attenuated by diverting and capturing stormwater flows from the new construction into an infiltration pond area adjacent to the railroad tracks. No downstream impacts from stormwater flows are expected with this proposal.

The existing site being proposed for new construction is a mixture of undeveloped property consisting mostly of woods and grass area.

SJR ENGINEERING INC.

21 Main Street, Augusta, Maine 04330 | Phone: 207-625-6116 | Fax: 207-625-6117 | www.sjr-engineering.com

Existing conditions have been surveyed by Thayer Engineering. The topography of the proposed developed site is shown at a one foot contour interval. The slope of the property varies from 3% along the flatter areas to 30% along the steeper slopes.

Soils mapping was taken from Kennebec County Soil Survey medium intensity mapping. These soils have been overlaid onto the site development plan. Soils are identified as being Windsor Loamy sand (hydro group "A", K= 0.17).

The K number is an erodibility index number which is a value assigned to the soil based on a no erosion potential of .10 to a high erosion potential of .64. An index number greater than .32 indicates a high level of erosion control measures must be taken in order to control erosion of this soil. The hydrological group rating is a rating system of the relative permeability of the soil with Group "A" being extremely permeable such as a beach sand, to Group "D" being slow draining such as a wetland area.

I have reviewed the drainage characteristics of the site which includes proposed parking lots, driveway areas, and remaining woods. Water quality treatment must satisfy treatment requirements for 95% of the impervious area of the project and 80% of the developed area. The water quality analysis proposed includes treatment by infiltration pond design. All of the proposed parking area (100%) drains to the proposed infiltration pond and/or buffer area along the driveway. I have attached calculations that demonstrate the pond design meets (or exceeds) minimum design elements for infiltration pond water quality treatment.

The pond is required to have a bottom area that is no less than 5% of the impervious area within the pond watershed. Our parking area has 201845 sf of gravel/pavement within the watershed. This calculates to a minimum bottom area of 10,092 sf. Our design shows a bottom area at contour 43 which is 12,479 sf or 6.2% of the impervious area.

The required infiltration volume is based on 1" of impervious area and .4" of vegetative area entering the pond. This number requires 20,652 cf of pond storage be available before discharge. Our design has 91,201 cf to elevation 48, which is the approximate inlet elevation to the lowest existing culvert under the railroad tracks.

I have used the SCS TR-20 (HydroCad 8.5 computer model) method of computing stormwater runoff peak flow rates. This method accounts for soil types, existing land uses, topography, vegetative cover, and proposed land use for the parcel to be developed. The proposed conditions were analyzed using data for a type III, 24 hour storm distribution with a design frequency of occurrence of 50 years. One day precipitation values of 6.1" have been used for the rainfall event. All supporting calculations and data are submitted with this report.

The existing and proposed site conditions were analyzed using information taken from the Thayer Engineering prepared plan of the parcel to be developed. Impervious areas, lawns, meadows, and woods areas for each hydrological soil condition were measured by planimeter in order to calculate a weighted curve number that typifies the drainage condition of the site.

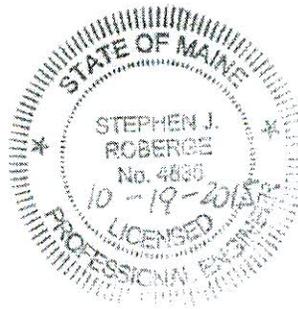
We have calculated proposed stormwater flows to the proposed 18" diameter driveway culvert for a portion of the parking lot just before the pond. The flows are 9.73 cfs for a 50 year storm event. We have also calculated the remaining parking area and upslope undeveloped area draining to the pond. These flows are 11.49 cfs for a 50 year storm event. Adding both sources of water entering the pond results yields a 21.22 cfs total flow. The pond has been designed to infiltrate into the ground. If the stormwater event is such that infiltration does not keep up with the intensity of the rainfall, two existing culverts under the railroad tracks, and a 24" diameter overflow pipe are available for discharges to the river. The 24" pipe has the capacity to discharge up to 31.96 cfs when installed at a 2% slope.

Please feel free to contact me if you have any questions concerning the calculations of stormwater from this project. It is important to note that proper erosion control and revegetation of disturbed areas are essential for the proper operation of the stormwater facilities. Maintenance of the yard parking lot areas and careful attention to the pavement/seeded interface must be a top priority in order for the system to function properly. Thank you for involving this firm on your project.

Sincerely yours,



Stephen Roberge, PE
for SJR Engineering Inc.





SJR ENGINEERING
 21 Mayflower Road
 Augusta, Maine 04330
 Tel/Fax: (207) 622-1676

Subject: INFILTRATION POND DESIGN

Job #: 2015-21

REQUIRED INFILTRATION BOTTOM AREA = 5% OR MORE OF IMPERVIOUS AREA

IMPERVIOUS AREA = 201845 SF±
 VEGETATIVE AREA = 114972 SF±
 TOTAL AREA = 316817 SF±

REQUIRED BOTTOM AREA $201845 \times .05 = 10,092$ SF

AVAILABLE BOTTOM AREA (CONTOUR 43) = 12479 SF OK

REQUIRED VOLUME

$$\frac{1}{12} \cdot (201845 \text{ SF IMPERVIOUS AREA}) + \frac{.4'}{12} \cdot (114972 \text{ SF LANDSCAPED \& UPSLOPE AREA TO POND})$$

16820 + 3832 = 20652 CF REQUIRED

POND VOLUME CALCS

<u>CONT.</u>	<u>(SF) AREA</u>	<u>(CF) VOL</u>	<u>(CF) CUM VOL</u>
43	12479	0	0
44	14467	13473	13473
45	16538	15502	28975
46	18851	17695	46670
47	22072	20461	67131
48	26068	24070	91201

→ GREATLY EXCEEDS REQUIRED
OK

NOTE: LOAM MEDIA NOT GREATER THAN 2.41"/HR PERMEABILITY

ROTOTILL/MIX 3" LOAM MATERIAL INTO EXISTING SURFACE MATERIAL & GRADE FLAT. INSTALL REMAINING LOAM MATERIAL OVER BASIN CONTAINMENT AREA.

Project: _____

Date: _____

Sheet: 2 of 2



SJR ENGINEERING

21 Mayflower Road
Augusta, Maine 04330
Tel/Fax: (207) 622-1676

Subject: NORTH CENTER PARKING LOT EXP

Job #: 2015-21

CULVERT UNDER DRIVEWAY TO ENTRANCE (SEE HYDROCAD DATA) 50 YEAR EVENT

$$Q = 9.73 \text{ cfs to inlet of pipe}$$

$$\text{USE } 18" \text{ ADS N12 PIPE @ } S = 0.0082 \quad Q = 14.95 \text{ cfs}$$

TOTAL Q TO POND 50 YEAR EVENT

$$\text{FROM CULVERT (SEE ABOVE)} = 9.73 \text{ cfs}$$

$$\text{REMAINING/CR PARKING/WOODS} = 11.49 \text{ cfs}$$

$$\text{TOTAL} = 21.22 \text{ cfs}$$

PROVIDE EMERGENCY SPILLWAY

$$\text{USE } 24" \text{ DIAMETER PIPE @ } 2\% \text{ SLOPE } Q = 31.96 \text{ cfs OK}$$

Culvert sizing

Type III 24-hr 50 year storm Rainfall=6.10"

Prepared by SJR Engineering Inc.

Printed 10/2/2015

HydroCAD® 8.50 s/n 000591 © 2007 HydroCAD Software Solutions LLC

Page 1

Summary for Subcatchment 1S: Culvert-Parking lot to pond

Runoff = 9.73 cfs @ 12.04 hrs, Volume= 0.678 af, Depth> 5.42"

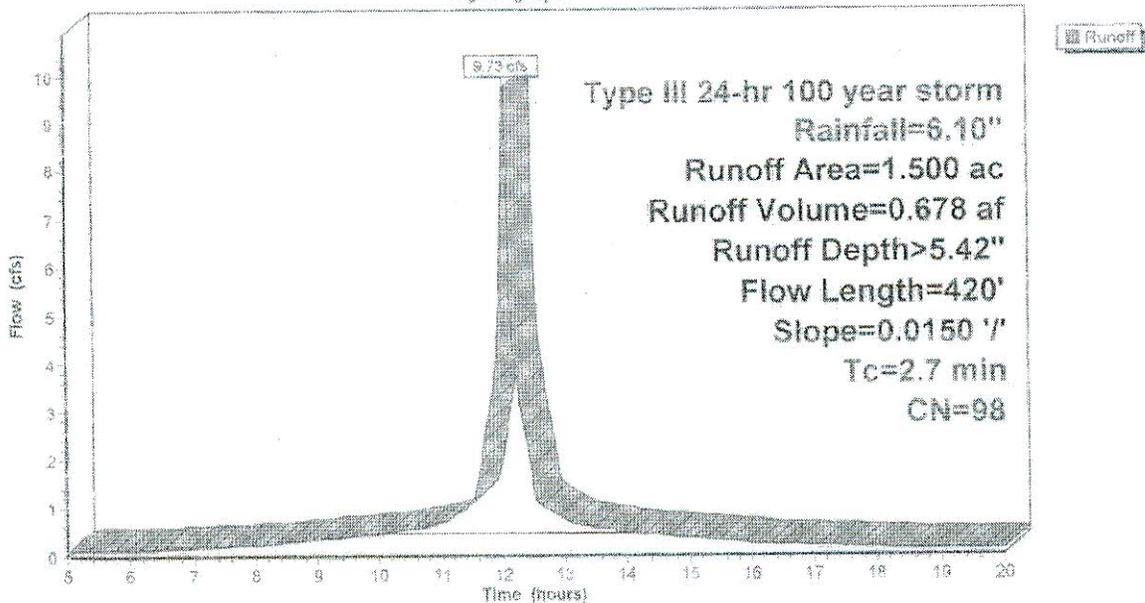
Runoff by SCS TR-20 method, UH=SC5, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 year storm Rainfall=6.10"

Area (ac)	CN	Description
1.500	98	Paved parking & roofs
1.500		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.19		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.8	120	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	200	0.0150	6.43	102.94	Trap/Vee/Rect Channel Flow, Bot.W=2.00' D=2.00' Z= 3.0 ' / ' Top.W=14.00' n= 0.030 Earth, grassed & winding
2.7	420	Total			

Subcatchment 1S: Culvert-Parking lot to pond

Hydrograph



Culvert sizing

Prepared by SJR Engineering Inc.

HydroCAD® 8.5G s/n 000591 © 2007 HydroCAD Software Solutions LLC

Type III 24-hr 50 year storm Rainfall=6.10"

Printed 10/2/2015

Page 2

Summary for Subcatchment 2S: Remaining Parking lot to pond

Runoff = 11.49 cfs @ 12.27 hrs, Volume= 1109 af, Depth> 2.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 100 year storm Rainfall=6.10"

Area (ac)	CN	Description
3.000	98	Paved parking & roofs
3.000	32	Woods/grass comb., Good, HSG A
6.000	65	Weighted Average
3.000		Pervious Area
3.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.6600	0.17		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.00"
8.7	160	0.0150	0.31		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
0.5	200	0.0150	6.43	102.94	Trap/Vee/Rect Channel Flow, Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
18.7	460	Total			

Subcatchment 2S: Remaining Parking lot to pond

Hydrograph

