January 31, 2019

Mr. Frank Girardi; Executive Director, Capital Program (Task Assigned)
Office of Facilities and Construction
Broward County Public Schools
600 Southeast 3rd Avenue; Fort Lauderdale, FL 33301

Re: SMART Program Risk Assessment / Market Conditions: December 2018 Update

Dear Mr. Girardi,

Atkins’ current risk assessment on the SBBC SMART Program (Program) includes information from actual pricing data on near 12% of the Program. This information allows us to establish cost trends that more accurately predict a cost probability range for the Program based on the actual pricing and the current risks. The current Risk Assessment result is shown in Figure 1.

![Figure 1 – Risk Assessment Results](image)

The range of possible results in Figure 1 has trended to a midpoint of a 46% increase to the Program costs (midpoint is where half the results are lower and half are higher). This calculates to a projected increase of approximately $415 million to the SMART Program total cost. This midpoint has now shifted towards the higher end of the original risk project range, and the higher end of the projected risk is now higher than previously considered, as shown in the following table:

<table>
<thead>
<tr>
<th>Date of Submittal</th>
<th>Risk Analysis Result Range (Percentage Increase / $ increase in Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mid-Point Risk Result</td>
</tr>
<tr>
<td>January 2017</td>
<td>22% / $200</td>
</tr>
<tr>
<td>May 2018</td>
<td>22% / $200</td>
</tr>
<tr>
<td>Sept. 2018</td>
<td>33% / $302</td>
</tr>
<tr>
<td>Dec. 2018</td>
<td>46% / $415</td>
</tr>
</tbody>
</table>

Table 1 – Risk Analysis Results Comparison
Through discussions with our team we are advising that we focus on the “70% Risk Result” as the amount for funding planning. The 70% Risk Result is the point where 70% of the thousands of model runs are equal to or less than that figure (with 30% of the results being above that point), and thus is a more conservative amount than the 50% risk result.

The significant increases in September and December 2018 have resulted from having more certainty that the higher ends of previously established risks are being recognized throughout the bids and pricing on projects, particularly with the roofing. The roofing risk was assessed in the December Board Workshop, and that information has been incorporated. Also, updates based on actuals and updated estimates on the classroom addition projects have increased since September. Additionally, the December 2018 results include revised inflation calculations related to the updated program completion plan that shifts the midpoint of planned program expenditures from the spring of 2019 to the fall of 2020.

The actual contracted costs to-date on the Program show that projects that have been bid or negotiated are near 40% above the initially established budgets (see Attachment 1, noting that this calculation excludes the cost increases for the three large high school projects at Blanche Ely, Stranahan and Charles Flanagan, that when included increase the percent increase to about 50%). This trend also supports the mid-point of this risk assessment. The major reasons for these increases continue to be consistent with the following major risk assessment factors:

- Actual roofing costs are well above the initial established budgets and at high end of the previous risk assessment, and this largest Program risk has been substantially increased based on bid data and roofing evaluations (noting that current roofing project solutions will avoid future roof replacements);
- Cumulative impact of higher inflation than budgeted since 2014 that is projected to continue and is now beyond the original dates for inflation calculations (more on this follows in the market conditions section);
- Scope unquantified in the ADEFP that has been identified during design development (i.e. added fire main required when adding fire sprinkler systems to buildings);
- Current estimates for classroom addition buildings at school sites have increased above established budgets;
- Additions have been approved in lieu of renovations as better long-term solutions

Some of the major market conditions factors that are driving the higher inflation impact are as follows:

**Market Conditions driving Construction Inflation**

Atkins has reviewed the South Florida construction market and has concluded that a **5% year over year inflation factor** should be included in the plan for the SMART Program for the near future. This 5% has been utilized in the risk assessment for the years from 2014 to 2019. These factors are in comparison to the 3% per year inflation factor that was utilized in the 2014 SMART plan projections used for the Bond Issue. The increase in this yearly construction inflation rate is **having a significant impact on Program construction costs**. For the additional inflation from 2019 to October 2020 (the new midpoint of planned expenditure), a 4% most likely inflation has been utilized. Reasons for this increase in inflation include these factors:
1. **Volume of Construction in the U.S.**: increases in volume of construction have continued since 2014, as shown in Figure 2:

![Census Bureau: U.S. Construction Volume Per Year (Billions)](chart)

*Figure 2: U.S. Construction Volume: base source: census.gov*

Figure 2 shows the increased volume of construction in the U.S. since 2011. Since the 2014 SMART Program inception this calculates to over an 8% increase per year, with 2018 projected to have the highest yearly increase over this term. **History has shown that construction cost trends closely follow this volume of construction, as is occurring now.**

2. **Continued major programs in progress and upcoming in South Florida** in addition to the SMART Program: Miami-Dade Water and Sewer - $13.5 Billion; Miami-Dade Schools Bond Program completion - $1.2 Billion; Jackson Hospital - $1 Billion+; continued FDOT Programs, including I-395/I-95 - $1 Billion+; continued investment in Higher Ed. Construction (FIU, UM, FAU); Palm Beach County infrastructure and schools; increase in retail construction (malls and multi-use), including Miami WorldCenter at $2 Billion; major construction at PortMiami and Port Everglades; and Miami International Airport continued expansion and improvements, etc.

![South Florida Construction Employment (1,000s)](chart)

*Figure 3: S. Florida Construction Employment: base source: bls.gov*
3. **Continued demand for construction labor in South Florida:** South Florida construction labor has averaged more than a 10% increase in employment per year since 2014 as shown in Figure 3, depleting the supply of skilled workers available. Information in 2018 demonstrates a trend even higher than previous years, supporting that the volume of construction continues to demand from a scarce construction labor market in South Florida.

4. **Volatility of the cost of construction materials:** the cost of construction materials continues to have volatility in the market, and present cost risks as contractors will include perceived short-term risk in their prices / bids. These increases are a combination of the high demand for materials to meet the construction volume and the impact of tariff disputes that create additional volatility.

**Cost Index Results:**

The Turner Construction Cost Index is an industry index that has been shown to be reasonably accurate in showing actual construction cost trends. Note that combined increases from the Figure 4 construction cost change/year calculates to a cumulative compounded increase in the range of 30% since 2014, versus a range of 16% increase with the 3% rate included in the original assessment, demonstrating the high impact of inflation on the SMART Program costs.

![Turner Construction Cost Index](turnerconstruction.com)

**Figure 4: Turner Construction Cost Index:** base source: turnerconstruction.com

**Conclusion**

The SMART Program currently has $225 million in additional capital (SMART) reserve funds dedicated by the Board related to the potential increases in construction costs to meet the intended scope of the Program. The mid-range of the risk assessment is currently in the range of $413 million that is also consistent with the “Running Estimates for the Program”, where actual costs, estimates and risk projections are combined to forecast a final Program cost. Considering that increases in construction costs have been at the high end of our risk assessment, **it is recommended that the District continue to place new revenues into the unassigned reserve funds to support the SMART program to the current mid-range of program risk of 46% (approximately $413 million), as market conditions and risks continue to be assessed.**
Risk identification and mitigation efforts continue to be considered to manage these increases, including:

- Ensure designs meet the intent of the ADEFP scope;
- Utilize the most cost/risk-effective delivery methods for the program
- Continual monitoring of the program so cost trends can be identified early and potentially mitigated
- Continue to update risk on quarterly basis as further data becomes available

As the program continues, any scope added beyond the ADEFP plan will further impact the risk, as will any further changes in schedule or market conditions. Any changes to these and other items will be addressed in the quarterly updates.

Sincerely,

[Signature]

David J. Carter, CCM; Vice President

C: Judith Marte (BCPS); Phillip Kaufold (BCPS); Shelley Meloni (BCPS); Ashley Carpenter (Atkins); Danny Jardine (CBRE |Heery)

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