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**MEMORANDUM**
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| PROJECT | A. Paul and Carol C. Schaap Center for the Performing Arts and the Richard and Jane Manoogian Art Gallery | DATE | 3/3/2021 |
| PROJECT NO. | 12345.000 | | |
| PROJECT LOCATION | Grosse Pointe Park, MI | | |
| SUBJECT | Stormwater and Building Sustainability Summary | | |
| PREPARED BY | Scott Maggart | | |

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This building utilizes the very latest in stormwater management, energy conservation and material ecology found in building science today. It will set a new standard of environmental stewardship for the City of Grosse Pointe Park and serve as a reference standard for future building projects.

Because impervious surfaces increase stormwater runoff, the design team sought to minimize impervious surfaces while working within the project's program requirements. The project proposes a reduction in the amount of impervious surface as compared with the historic impervious surfaces on the collective properties that now make up the site. The site was 87% impervious at its estimated high in 2002, while the proposed project will be 74% impervious: this 15% improvement is significant due to the existing site hosting several building and parking footprints.

Proposed site stormwater management strategies are focused on both the immediate site and the larger watershed. The site is part of the Detroit River and Lake St. Clair watersheds. In addition to draining the site, the goals of the stormwater management system are to improve the water quality of the runoff (as compared with the current conditions) and to provide some natural approaches to help limit the peak rate of runoff from the site. Natural stormwater management strategies also help to promote infiltration and evapotranspiration which reduces the overall volume of runoff to the storm water collection system. Reducing the volume and peak rate of stormwater runoff helps minimize the negative watershed impacts that site stormwater runoff can cause.

To support water quality and peak runoff rate reduction objectives, a bioretention area will be constructed on the east side of the east parking lot to support peak runoff rate reduction objectives and to help improve the quality of stormwater runoff. This area will consist of approximately 18" of sandy plant mix over a 12" stone drainage bed. Plants and trees will allow uptake of storm water and evapotranspiration. Any water that exceeds the capacity of the bioretention area will be handled

by underdrains and overflow standpipes. Water will enter the bioretention area through cuts in the eastern curb of the east parking lot. The current expectation is that drainage from the eastern half of the east parking lot will be directed to the bioretention area. Bioretention of this type filters runoff to the point that it meets the Grosse Pointe Park water quality standard.

Grosse Pointe Park has a water quality ordinance that requires treatment of the first inch of rainfall runoff to a quality level that removes 80% of total suspended solids. The project will meet this standard using the bioretention area noted above and a manufactured water quality device.

The facility's Energy Conservation Measures and building material selections include the following strategies for sustainability outlined below. Many of the items measures are in reference to ASHRAE code baselines, the country's single most important energy code.

1. Boilers: High efficiency condensing boilers operating at 91% efficiency compared to baseline boiler operating at 80% efficiency.
2. Chiller incorporates remote evaporator: No-glycol (saves 12% energy usage)
3. Fenestration: SHGC (shading coefficient) improved beyond code minimum
4. Ventilation: DCV (demand-controlled ventilation) based on C02 and occupancy sensors.
5. Dehumidification: Use of sensible heat pump for passive reheat (energy recovery) during cooling mode.
6. The material palette for select finishes incorporates attributes such as recycled material, low percentages of virgin content, and minimized carbon footprint. The project looks to specify a percentage of materially locally fabricated, as well.
7. Building envelope is designed to meet the 2009 Michigan Building Uniform Energy Code
8. Electrically lighting power density is 20% below current ASHRAE 90.1 standard requirements due to calculated LED fixture placement. Power density is significant related to how energy is consumed, proportional to area; this is a considerable energy savings
9. Lighting power consumption is further reduced by using a combination of individual local controls and occupancy sensors to keep lights off when not in use. Many mechanical units in the space utilize VFD or ECM controls [how the units control motor speed and electrical consumption] to save energy when the space in unoccupied and extend the life of the equipment.

These energy savings and sustainable material selections come at no loss in building performance or user's experience. These measures promote a sustainable approach to building design, allowing for an above code compliant facility.

The water quality device will be placed at the most-downstream point of the storm sewer prior to connection with the public sewer. Water quality structures work by separating suspended solids from storm water through hydrodynamic force in which water swirls in the structure, causing the solids to settle out of the water.

The City of Grosse Pointe Park sewer infrastructure in the project area is a combined sanitary and storm system. Much of the city now has separated sewers, and it is possible that the sewers in the project area will be separated in the future. Therefore, storm and sanitary sewage will be routed in separate systems on the project site and will combine in a manhole just before the east property line.