ATTACHMENT B

SITE PLAN

See Next Two Pages

Rainwise Big Roof Opportunity Assessment
South Park Manor
513-519 S. Cloverdale

RainWise Eligibility: Rain Gardens and Cisterns[1]
Date of Site Visit: 5/22/19
Attendees: Seattle Housing Authority, King County RainWise Program and Outreach Team, Herrera

BMP SITING OPPORTUNITIES

Potential RainWise opportunities are shown on the site plan. "BMP Type" column in "Estimated Roof Drainage Area" table reflects options (c = cistern, r = rain garden) discussed on-site and are not intended to be the preferred or recommended option. Contractor shall work with Owner and RainWise staff to determine preferred BMPs. BMP sizing and rebate amounts will be determined once roof basin areas are verified.

Site is within two Environmentally Critical Areas (ECAs) per SDCI GIS map[2]
- Potential Soil Liquefaction Zone
- Site is within 1000' buffer from abandoned landfill

Per Seattle's 2016 Stormwater Manual[3] (Stormwater Manual), to use infiltration BMPs (rain gardens) within ECAs, a licensed soils professional must evaluate the soils to determine infiltration feasibility. See Page 2 for additional design considerations related to infiltration and BMP selection.

FIELD NOTES

- External downspouts manage localized roof areas
- Owner may prefer multiple cistern to minimize downspout reroutes
- Site has been known to flood during storms - suggests low infiltration rates, high groundwater, or other poor site drainage.
- Many open lid manholes are placed at low spots around the site, possibly to reduce flooding. May be able to repurpose for rain garden overflow riser.

SITE PLAN NOTES

a. Downspouts on north walls (Areas 1A & 1B) are located adjacent to electrical equipment, which may make it more challenging to reroute and combine with other collection areas.
b. Drainage structure may be CSS
c. Cistern location may not meet horizontal setback requirements, if true must not exceed 4' diameter and 4.5' tall or 600 gallons.

RECOMMENDATIONS FOR NEXT STEPS

- Owner to select preferred BMPs.
- If rain gardens are desired, consult a geotechnical engineer to determine siting feasibility based on soil infiltration rates and ECA requirements.
- Owner and Contractor to develop the proposed project configuration and BMP locations.
- Contractor to verify drainage areas, refine BMP sizing and provide rebate estimate.

Estimated Roof Drainage Area*

BLDG 513

Area	SF	BMP	BMP TYPE
1	90	A	c,r
2	540	B	c,r
3	95	C	c
4	570	D	c
TOTAL	1,295		

BLDG 517-519

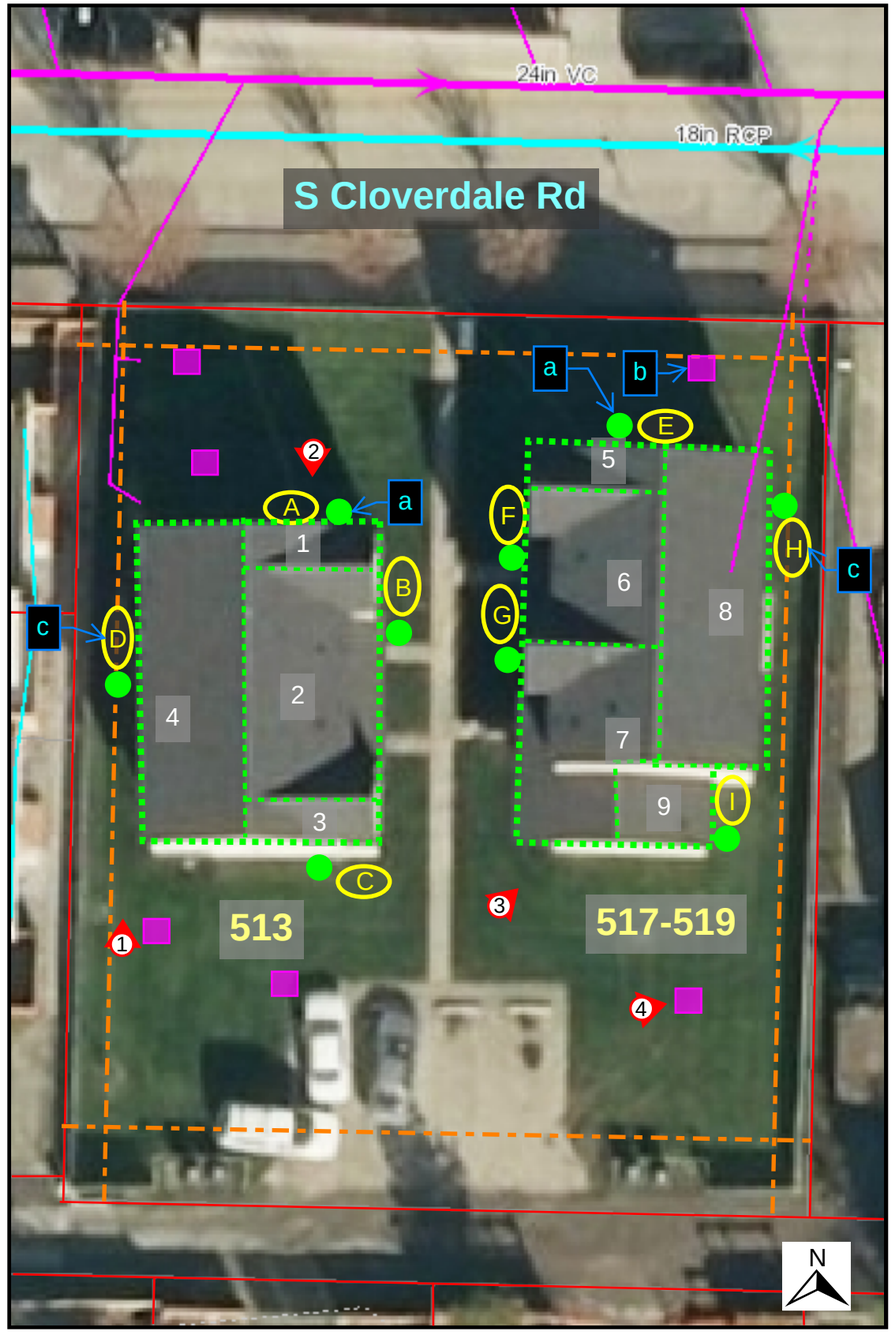
Area	SF	BMP	BMP TYPE
5	90	E	c,r
6	340	F	c,r
7	400	G	c
8	610	H	c
9	135	I	c
TOTAL	1,575		

Legend

- Property Line
- Existing storm (GIS[5])
- Existing sewer (GIS[5])
- Building setback
- Downspout
- Potential BMP location
- Estimated roof drainage area*
- Photo location
- Existing drainage structure (approx)

*Rough drainage areas were delineated based on Google Earth and are shown for preliminary assessment purposes. Contractor shall verify downspout locations and final roof drainage areas prior to BMP selection and sizing.

Site Plan



SOURCES

1 Rainwise Eligibility Map. https://www.700milliongallons.org/rainwise/eligibility/
2 Seattle GIS map. http://seattlecitygis.maps.arcgis.com/apps/webappviewer/index.html?id=f822b2c6498c4163b0cf908e2241e9c2
3 Seattle Stormwater Code Volume 3, Chapter 3.2 Step 2.
4 Seattle Municipal Code 23.45.518 Table A
5 Seattle DSO Water & Sewer Map. http://gisrevprxy.seattle.gov/wab_ext/DSOResearch_Ext/

ABBREVIATIONS

BMP	Best Management Practice
ECA	Environmentally Critical Area
GIS	Geographic Information System
SDCI	Seattle Department of Construction and Inspections
SF	Square Foot/Feet

GENERAL SITING AND DESIGN CONSIDERATIONS
Projects must adhere to requirements outlined in the RainWise Design Details (RainWise 2014). Larger "Big Roof" projects may be subject to additional requirements such as those described below.

The conveyance sizing provided in the RainWise Design Details is only applicable for contributing areas up to 4,200 square feet and for the pipe materials and slopes specified. If the project is proposing to manage runoff from contributing areas that exceed this threshold, the capacity of project conveyance elements should be verified (see Stormwater Manual for requirements).

When considering rain gardens, infiltration feasibility shall be determined by a geotechnical and/or hydrogeological professional engineer as required by the Seattle Stormwater Code. Projects that infiltrate runoff from drainage areas exceeding 2,000 SF must also adhere to the requirements of the Seattle Stormwater Manual, including but not limited to the Minimum Investigation and Testing Requirements for Shallow Infiltration BMPs (Volume 3, Table 3.1 in the Stormwater Manual), based on total impervious area proposed for infiltration:

a. >2,000 square feet of impervious area infiltrated by a single rain garden requires a small pilot infiltration test (PIT) at the proposed rain garden location.
b. >5,000 square feet of impervious area infiltrated project wide requires a small PIT at each proposed rain garden location. These projects are also subject to more rigorous subsurface and groundwater monitoring requirements (e.g., comprehensive subsurface investigation, groundwater monitoring).
c. >10,000 square feet or more of impervious area infiltrated on site requires more rigorous subsurface investigation, infiltration testing, and groundwater monitoring and analysis (see Stormwater Manual).

Cistern setback requirements[4] (requirements may vary, contractor to verify):
- Cisterns may be subject to building setback requirements for multifamily developments
- For a lowrise apartment building, the building setbacks are as follows:
  - 5' from side and front lot lines
  - 10' from rear lot line with alley, 15' without alley
- For cisterns larger than 4' diameter and 4.5' tall or with a capacity >600 gallons, a 3' sideyard setback may need to be maintained for fire access.

EXAMPLE CISTERN AND RAIN GARDEN SIZING AND REBATE

Cistern: For a typical 500 SF drainage area routed to a 200 gallon cistern (approx. 3' diameter by 5' tall tank) and the RainWise construction rebate would be approximately $1,500.

Rain Garden: For a typical 500 SF drainage area routed to a rain garden, the rain garden bottom area required is 38 SF (top area calculated based on side slopes and topography) and the RainWise construction rebate would be $2,000. This assumes a minimum infiltration rate of 0.3 inches per hour (infiltration feasibility and infiltration rate would need to be determined). A rain garden to cistern configuration could also be considered.

The drainage area, downspout combination/re-routing approach, and final siting assessment will influence the most cost-effective BMP configuration for the project; the contractor shall refine the design once they confirm these items.