



Rendering - View from the corner of M and South Capitol Streets, S.E.



Rendering - View from the intersection of Van and M Streets looking southwest





Rendering - View from South Capitol Street looking north to the Capitol





TYPICAL BIKE RACK

SCALE : NOT TO SCALE



TYPICAL TRASH RECEPTACLE

SCALE : NOT TO SCALE



WASHINGTON GLOBE

SCALE : NOT TO SCALE



TREE GUARD

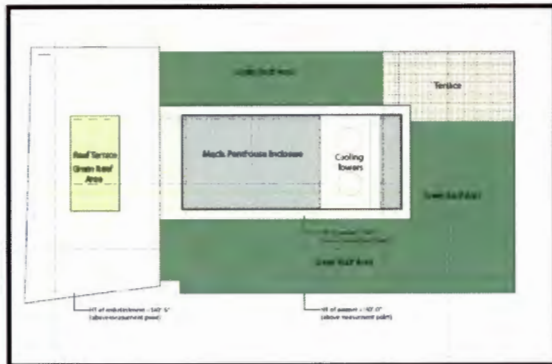
SCALE : NOT TO SCALE



TEAR-DROP STREETLIGHT

SCALE : NOT TO SCALE

Streetscape Plan



M STREET, S.E.

90' WIDE RIGHT-OF-WAY
ASPHALT PAVED PUBLIC ROADWAY

ENCHMARK
10' CUT
LEV=30.06

DUE EAST
150.67'

VAN STREET
50' WIDE RIGHT-OF-WAY
ASPHALT PAVED PUBLIC ROADWAY

DUE NORTH

DUE SOUTH

ROOF
TERRACE

GREEN ROOF AREA 2

TERRACE

GREEN
ROOF
AREA 3

MECHANICAL PENTHOUSE
ENCLOSURE

LOT 866

GREEN ROOF AREA 1

PROP. 8" DOMESTIC

PROP. 8" FIRE

STM INV OUT 28.22

PROP. 15" STORM

156.00'

PROP. 8" SAN

DUE NORTH

STM INV
IN 27.44

STM INV
IN 25.94

SOUTH CAPITOL STREET, S.E.
130' WIDE RIGHT-OF-WAY
ASPHALT PAVED PUBLIC ROADWAY



I. METHODOLOGY:

THE RATIONAL METHOD WAS USED TO DETERMINE THE PRE-DEVELOPMENT AND POST-DEVELOPMENT RUNOFF QUANTITIES. THE TIME OF CONCENTRATION (Tc) FOR PRE-DEVELOPMENT WAS CALCULATED TO BE APPROXIMATELY 5 MINUTES. A 5 MINUTE TIME OF CONCENTRATION WAS ASSUMED FOR POST-DEVELOPMENT CONDITIONS.

II. EXISTING SITE HYDROLOGY:

PURSUANT TO D.C. ENVIRONMENTAL WATERSHED PROTECTION DIVISION REQUIREMENTS, EXISTING CONDITIONS MUST BE ASSUMED TO BE COMPLETELY PERVIOUS, WITH A "C" VALUE OF 0.35, REGARDLESS OF WHAT EXISTING IMPROVEMENTS ARE PRESENT AT THE SITE. A COMBINED SEWER SYSTEM IS DOWNSTREAM FROM THE SUBJECT SITE. THE PRE-DEVELOPMENT FLOW RATES ARE AS FOLLOWS:

USING THE RATIONAL FORMULA Q=CFCA

WHERE C = 0.35 I2 = 5.28 IN/HR
A = 0.81 AC I15 = 7.56 IN/HR
Tc = 5 MIN.

2-YEAR PRE-DEVELOPMENT FLOW: (0.35) (5.28) (0.81) = 1.50 cfs
15-YEAR PRE-DEVELOPMENT FLOW: (0.35) (7.56) (0.81) = 2.14 cfs

III. PROPOSED SITE HYDROLOGY:

PURSUANT TO D.C. ENVIRONMENTAL WATERSHED PROTECTION DIVISION REQUIREMENTS, IMPERVIOUS AREAS UNDER PROPOSED CONDITIONS ARE CONSIDERED TO HAVE A "C" VALUE OF 0.65. PORTIONS OF THE SITE WILL BE LEFT IN A PERVIOUS STATE (GREEN SPACE) WITH A C VALUE OF 0.35. FLOW TIME THROUGH THE SYSTEM HAS BEEN CONSIDERED IN THE CALCULATIONS OF THE POST-DEVELOPMENT FLOWS. SEE CALCULATIONS, THIS SHEET, THE POST DEVELOPMENT FLOW RATES ARE AS FOLLOWS:

USING THE RATIONAL FORMULA Q=CFCA

WHERE C = 0.65 I2 = 5.28 IN/HR
A = 0.81 AC I15 = 7.56 IN/HR
Tc = 5 MIN (PLUS PIPE FLOW TIME)

2-YEAR POST-DEVELOPMENT FLOW: (0.65) (5.28) (0.81) = 4.06 cfs
15-YEAR POST-DEVELOPMENT FLOW: (0.65) (7.56) (0.81) = 5.81 cfs

IV. STORMWATER QUANTITY AND DISCHARGE CONTROL:

STORMWATER QUANTITY CONTROL VOLUME IS CALCULATED USING THE FOLLOWING FORMULA:

$V_q = (Q_{POST15} - Q_{PRE2}) \times 1.25 \times T_c \times 60$

WHERE: V_q = QUANTITY VOLUME (ft³)
 Q_{POST15} = 15-YEAR POST-DEVELOPMENT PEAK FLOW (cfs)
 Q_{PRE2} = 2-YEAR PRE-DEVELOPMENT PEAK FLOW (cfs)
 T_c = TIME OF CONCENTRATION (MINUTES)

2-YEAR RUNOFF INCREASE: POST-PRE = 4.06 - 1.50 = 2.56 cfs
15-YEAR RUNOFF INCREASE: POST-PRE = 5.81 - 2.14 = 3.67 cfs

THEREFORE, USING FORMULA FROM ABOVE:

$V_q = (5.81 \text{ cfs} - 1.5 \text{ cfs}) \times 1.25 \times 5 \text{ MIN} \times 60$

$V_q = 1,616 \text{ CF REQUIRED}$

V. STORMWATER QUALITY CONTROL:

WATER QUALITY CONTROL WILL BE PROVIDED USING THE GREEN ROOF INLINE WITH A STORMFILTER BMP UNIT. THE STORMFILTER IS ADDING ADDITIONAL QUALITY TREATMENT ABOVE AND BEYOND CODE REQUIREMENT. RUNOFF FROM THE PROPOSED STORM SEWER SYSTEM WILL PASS THROUGH THE GREEN ROOF AND STORMFILTER TO REMOVE TOTAL SUSPENDED SOLIDS (TSS).SEE THIS SHEET FOR STRUCTURE DETAILS AND POLLUTANT REMOVAL COMPUTATIONS.

DEPTH OF FIRST FLUSH OF SIDEWALKS AND ROOFTOPS = 0.3
DEPTH OF FIRST FLUSH PARKING AND ROADWAYS = 0.5

$V_q = ((\text{DEPTH OF FF OF SWRT} \times \text{AREA OF SWRT}) + (\text{DEPTH OF FF OF P/R} \times \text{AREA OF P/R})) / 12$

$V_q = ((0.3' \times 35,558) + (0.5' \times 0)) / 12$

$V_q = 888 \text{ CF REQUIRED QUALITY VOLUME}$

VI. GREEN ROOF

TOTAL ROOF SIZE = 24,788 SF

GREEN ROOF AREA 1 = 7,622 SF

GREEN ROOF AREA 2 = 2,521 SF

GREEN ROOF AREA 3 = 991 SF

TOTAL = 11,134 SF

MECHANICAL PENTHOUSE ENCLOSURE DRAINING TO GREEN ROOF AREAS = 5,951 SF

TOTAL ROOF AREA GREEN = 17,085 OR 68% (MEETING THE DDOE 50% RULE)

GREEN ROOF VOLUME

ANTICIPATED VOID IN GREEN ROOF MATERIAL OF 40%
ANTICIPATED DEPTH OF GREEN ROOF IN ALL AREAS MINIMUM 0.67'

$11,134 \times 0.67' \times 0.4 = 2,983 \text{ CF OF VOLUME IN GREEN ROOF AREA}$

VII. SUMMARY:

REQUIRED QUANTITY VOLUME = 1,616 CF

REQUIRED QUALITY VOLUME = 888 CF

TOTAL REQUIRED VOLUME = 2,504 CF

TOTAL AREA PROVIDED IN GREEN ROOF = 2,983 CF

THESE REQUIREMENTS WILL BE MET THROUGH THE USE OF A GREEN ROOF.



BOHLER
ENGINEERING

Preliminary Engineering Exhibit

