

Gladys Ave Senior Housing Development Preliminary Hydrology Report

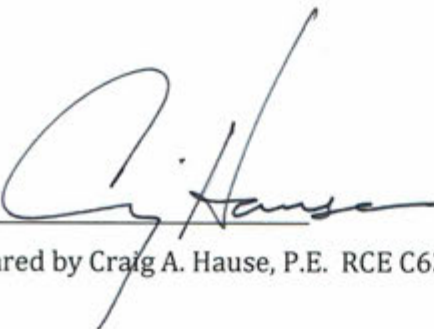
Prepared for.

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Project Location:

824 S. Gladys Ave.
San Gabriel, CA 91776

Prepared: January, 2017
Revised:



Prepared by Craig A. Hause, P.E. RCE C63620



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SUMMARY

INTRODUCTION

This report includes preliminary hydrologic calculations performed for the design of drainage facilities for the Gladys Avenue Senior Housing project in the City of San Gabriel, California. The intent of this report is to provide an adequate technical study of the proposed project to support the review process through the city's planning department for entitlement of the project. Once the project has received planning approval, a Final Hydrology and Hydraulics Report will be prepared in support of the final construction document phase of the project.

The Gladys Avenue Housing Development (Project) is located on approximately 3.0 acres at 824. S. Gladys Avenue. The site sits on the east side of S. Gladys Avenue approximately 200 feet north of E. Grand Avenue, 350 feet south of E. El Monte Street, and 200 feet west of the Rubio Wash LA County flood control channel.

The project proposes the redevelopment of an existing Alzheimer's care facility for the construction of senior living apartments with associated parking, access roads, driveways, hardscape, landscape and other various site amenities.

The primary objectives of this report are as follows:

1. Delineate the tributary drainage areas to both the existing and proposed facilities.
2. Based on drainage patterns, ground slope, land use and soil type and using the Los Angeles County Rational Method, perform hydrologic calculations of on-site drainage facilities.
3. Based on the hydrology results and physical site requirements, design the storm drainage facilities to convey the computed design discharges.
4. Determine the 25-year and 50-year existing and proposed condition flow rates in accordance with the Los Angeles County Hydrology Manual.

EXISTING CONDITIONS

The site is presently a developed Alzheimer care facility with existing buildings, paving, sidewalks, drive isles and landscaping. Approximately 25% of the existing site is landscape (pervious). The property is relatively flat with elevations on the site vary from 379 feet above mean sea level (AMSL) to 373 feet AMSL. The entire property surface drains to the existing S. Gladys Avenue curb and gutter via on-site sheet flow and concrete gutters.

There are no existing underground storm drain facilities within the project area. The project and all the surrounding properties in the immediate area all sheet flow to the surrounding streets. The nearest underground system is an existing catch basin located at the NE corner of E. Mission Rd. and San Gabriel Boulevard (an LACFCD facility)

Ultimately runoff from the sites is conveyed to the Rubio Wash flood control facility south of the project.

Soil Type 006 is the primary soil constituent at the site according to the LA County GIS Website. Soil Type 006 is described as a "Hanford Fine Sandy Loam HF-1" in the LA County LID Manual. Sandy loams generally are composed mostly of sand and silt with low amounts of clay so in general they have moderate to good drainage characteristics compared to clayey soils. In-situ percolation testing performed by the project geotechnical engineer indicate infiltration rates of approximately 14.6 inches/hour at 6-10 feet below the existing grades.

SUMMARY

See Table 1 and Table 2 below for hydrology summary and appendices for more information

Table 1: Existing Condition Peak Flow Rate (cfs)			
Drainage Area	Area	25-year	50-year
A	3.0	7.1	8.6

Table 2: Existing Condition 24-hr Runoff Volume (cu-ft)			
Drainage Area	Area	25-year	50-year
A	3.0	46,988	53,866

PROPOSED CONDITIONS

The project proposes to build senior living apartments with associated parking structure, access roads, driveways, hardscape, landscape and other various site amenities. All of the existing site improvements will be demolished as part of the project. The existing drainage pattern is preserved in the proposed condition.

SUMMARY

See Table 3 and Table 4 below for hydrology summary and appendices for more information

Table 3: Proposed Condition Peak Flow Rate (cfs)			
Drainage Area	Area	25-year	50-year
A	3.0	7.2	8.7

Table 4: Proposed Condition 24-hr Runoff Volume (cu-ft)			
Drainage Area	Area	25-year	50-year
A	3.0	53,615	61,204

As the results show above, the proposed project results in a fractional increase in peak flow rate. This is mainly due to the fact the site has been previously developed and thus the increase in impervious area is reduced. The proposed underground storage chambers will mitigate the increase by increasing the time of concentration prior to outletting flows to the street. Additionally, the small increase in total runoff volume will also be mitigated by the underground chambers although total storm volume mitigation is generally not a project requirement. Based on the infiltration testing previously discussed, water stored in the chambers should infiltrate naturally into the existing ground within a reasonable amount of time (less than 48 hours).

HYDROLOGY ANALYSIS AND METHODOLOGY

Hydrologic calculations were performed using the HYDROCALC software program provided by the LA County Public Works Department and in accordance with the methods described in the LA County Hydrology Manual. Because of the simple nature of the site drainage (no stream confluences, small project area, short Time of Concentration etc.) a link-node rational method calculation is not justified.

The following site data is used in the HYDROCALC modeling program:

HYDROLOGIC SOIL TYPE

Soil Type 006 was used in accordance with the LA County GIS Website.

RAINFALL DATA

All precipitation data was based on the information provided on the LA County GIS Website.

RUNOFF INDEX

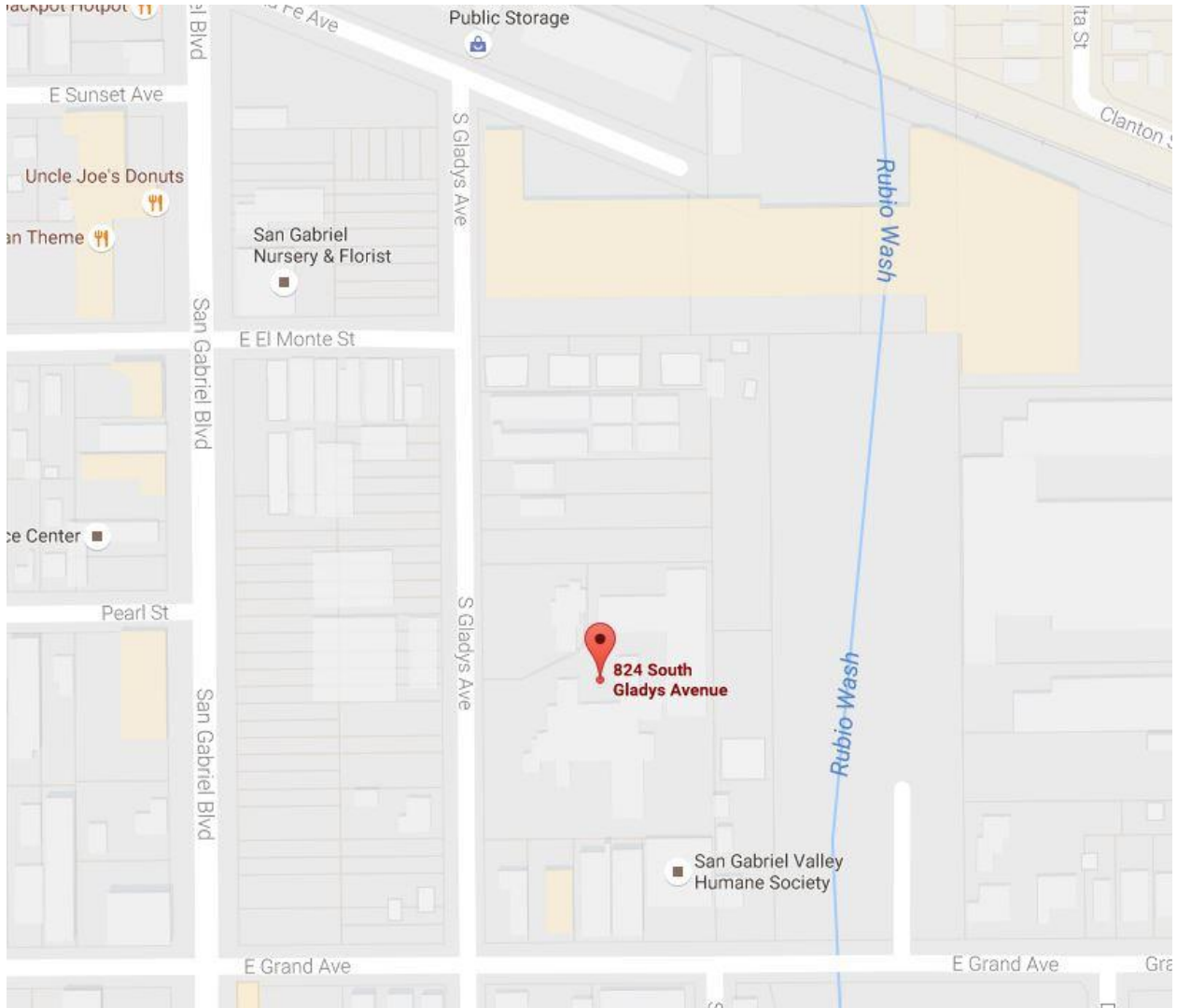
Pervious percentages were calculated based on the actual site plan (not standard development types)

HYDRAULICS

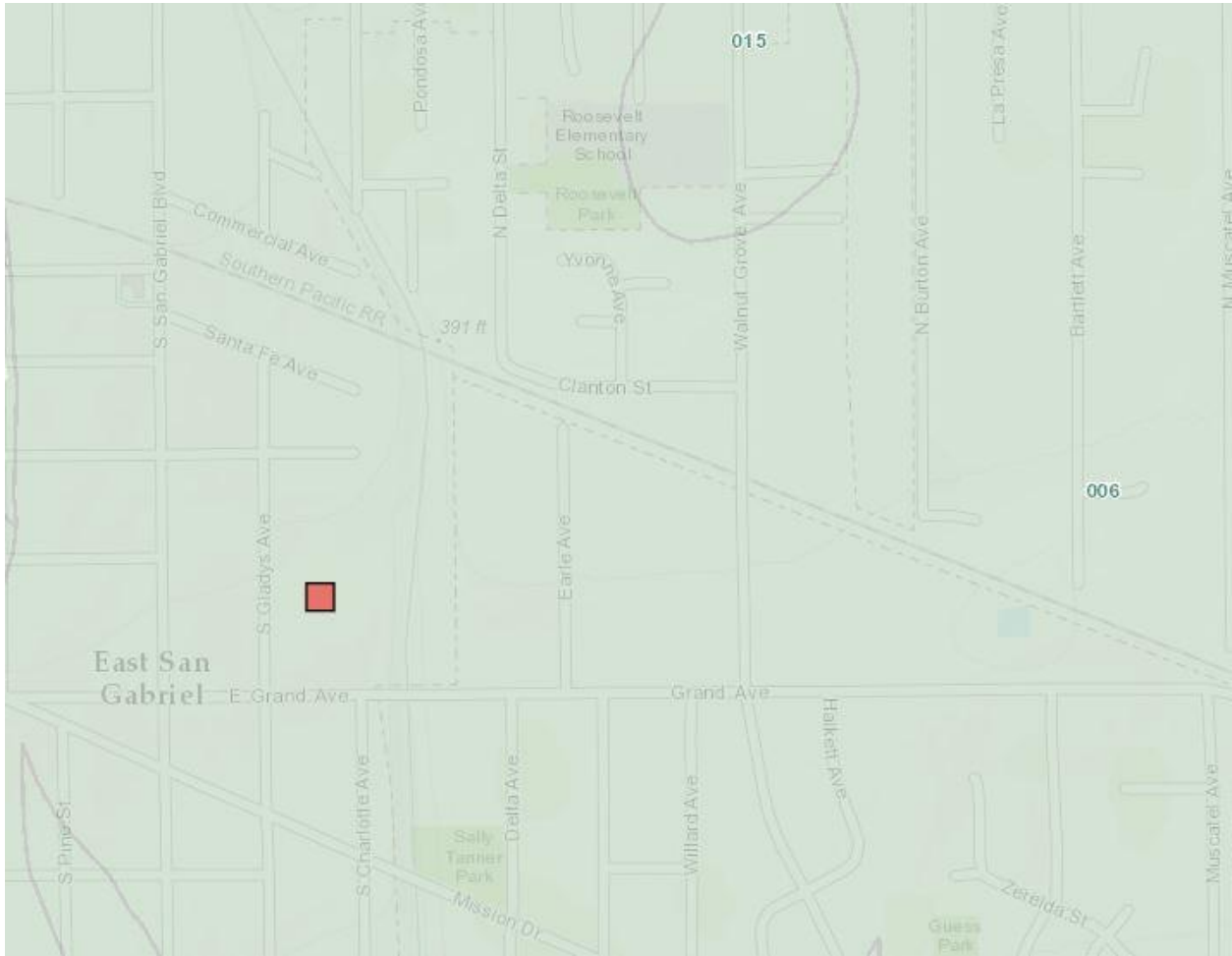
There are no underground storm drain pipes to be sized. Therefore, the Final Hydrology and Hydraulics report need only require sizing calculations for any proposed parkway culverts on S. Gladys Avenue to support the design of the final construction documents. Based on the discussion herein, any impacts to the existing runoff rates and volumes should be minimal, if any.

EXHIBITS

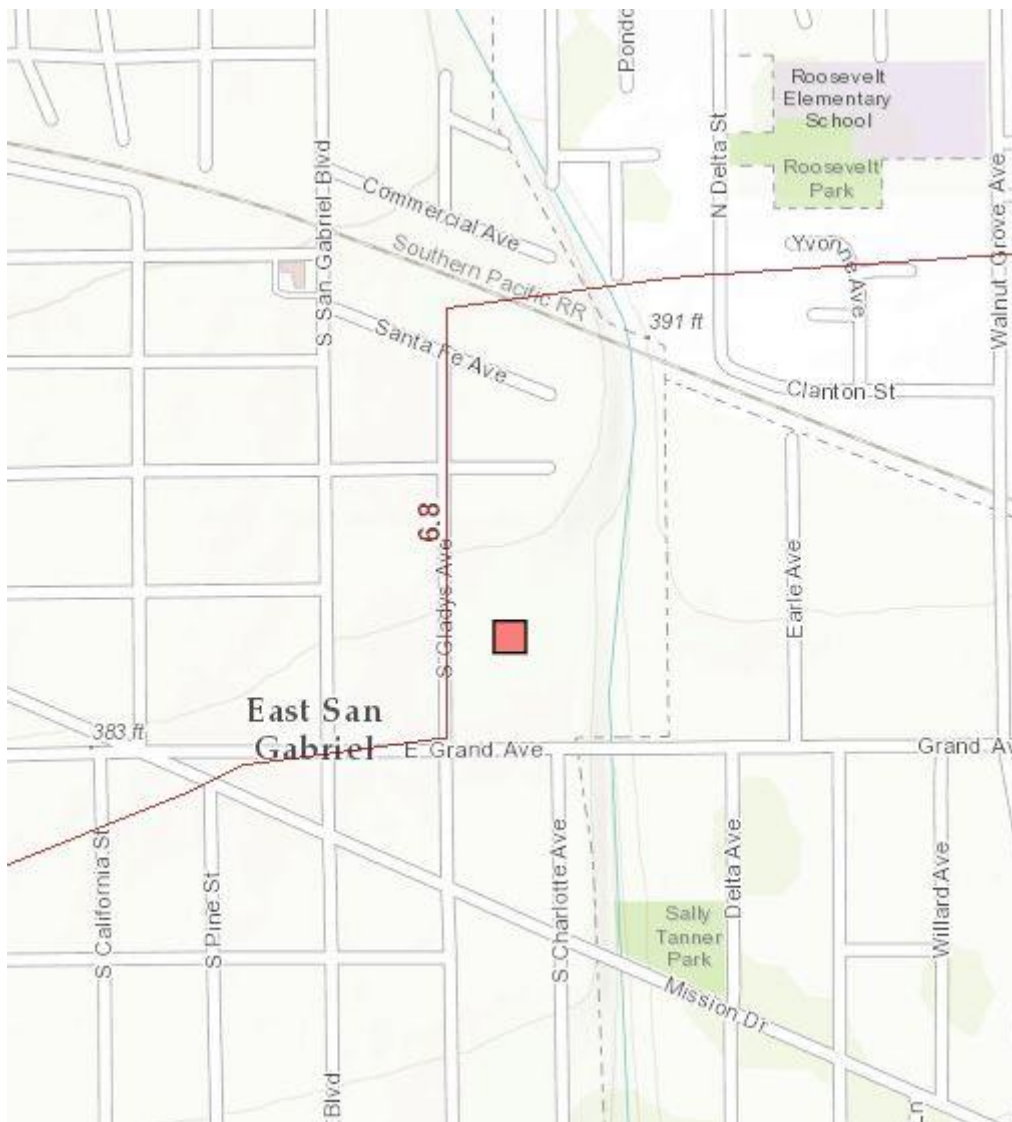
VICINITY MAP



SOILS GROUP MAP



ISOHYETAL MAP



APPENDIX A – RATIONAL METHOD HYDROLOGY (HYDROCALC)

25-YEAR STORM EXISTING HYDROLOGY

DRAINAGE AREA A

Peak Flow Hydrologic Analysis

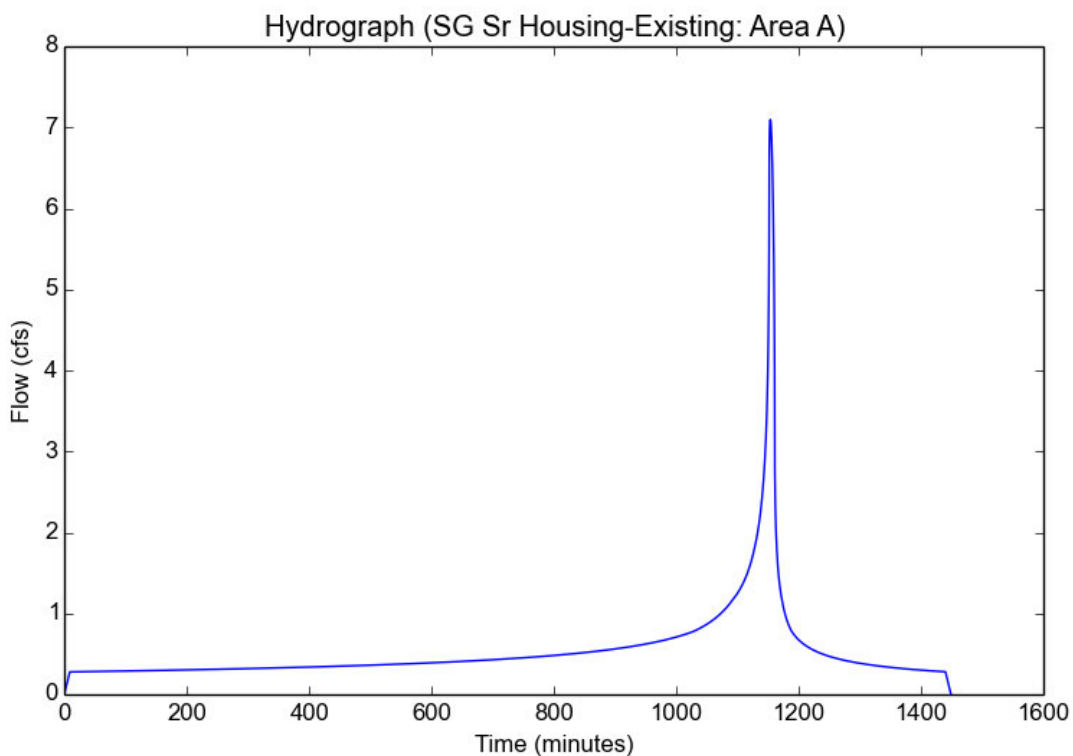
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Version: HydroCalc 1.0.2

Input Parameters

Project Name	SG Sr Housing-Existing
Subarea ID	Area A
Area (ac)	3.0
Flow Path Length (ft)	730.0
Flow Path Slope (vft/hft)	0.008
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.75
Soil Type	6
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.9704
Peak Intensity (in/hr)	2.7023
Undeveloped Runoff Coefficient (Cu)	0.8014
Developed Runoff Coefficient (Cd)	0.8753
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	7.0962
Burned Peak Flow Rate (cfs)	7.0962
24-Hr Clear Runoff Volume (ac-ft)	1.0787
24-Hr Clear Runoff Volume (cu-ft)	46988.0937



50-YEAR STORM EXISTING HYDROLOGY

DRAINAGE AREA A

Peak Flow Hydrologic Analysis

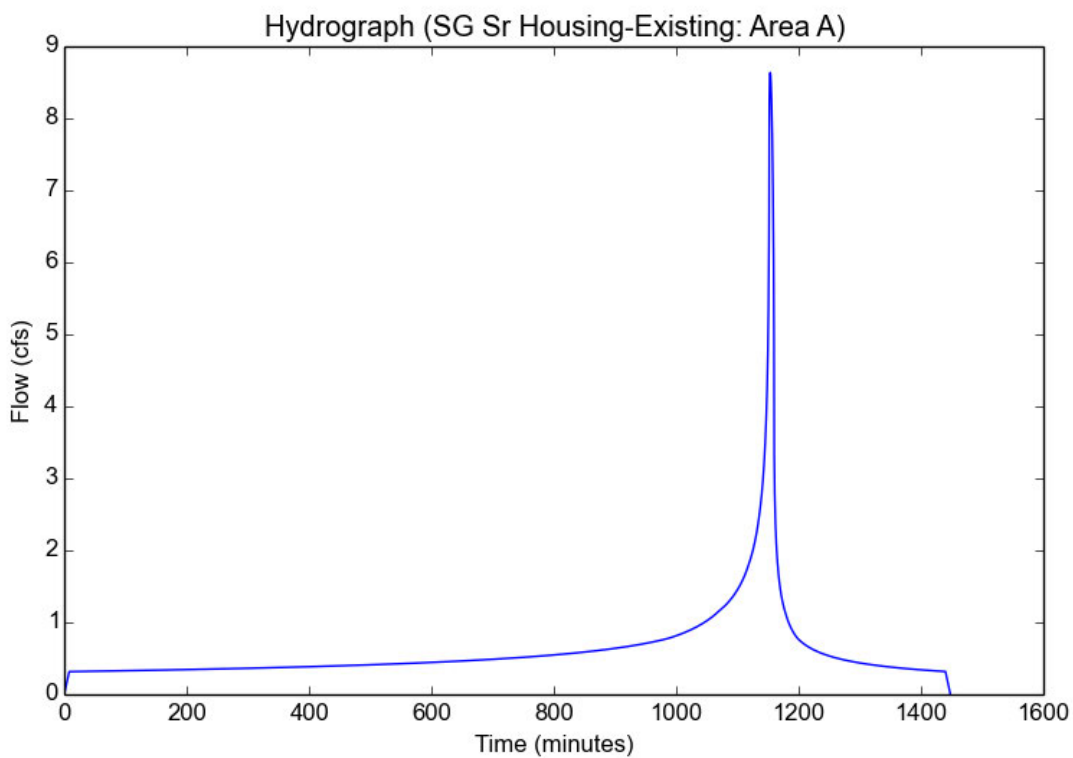
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Version: HydroCalc 1.0.2

Input Parameters

Project Name	SG Sr Housing-Existing
Subarea ID	Area A
Area (ac)	3.0
Flow Path Length (ft)	730.0
Flow Path Slope (vft/hft)	0.008
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.75
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.2529
Undeveloped Runoff Coefficient (Cu)	0.84
Developed Runoff Coefficient (Cd)	0.885
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	8.6366
Burned Peak Flow Rate (cfs)	8.6366
24-Hr Clear Runoff Volume (ac-ft)	1.2366
24-Hr Clear Runoff Volume (cu-ft)	53866.0195



APPENDIX B – RATIONAL METHOD HYDROLOGY (HYDROCALC)

25-YEAR STORM PROPOSED HYDROLOGY

DRAINAGE AREA A

Peak Flow Hydrologic Analysis

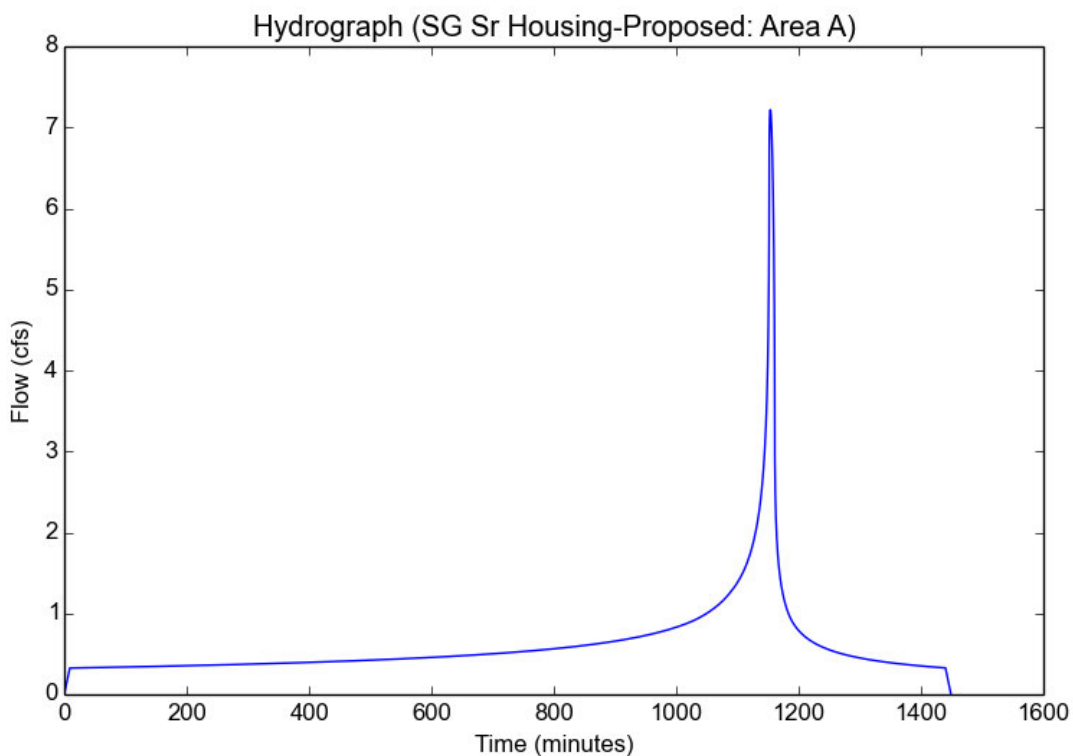
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Version: HydroCalc 1.0.2

Input Parameters

Project Name	SG Sr Housing-Proposed
Subarea ID	Area A
Area (ac)	3.0
Flow Path Length (ft)	730.0
Flow Path Slope (vft/hft)	0.008
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.9
Soil Type	6
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.9704
Peak Intensity (in/hr)	2.7023
Undeveloped Runoff Coefficient (Cu)	0.8014
Developed Runoff Coefficient (Cd)	0.8901
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	7.2162
Burned Peak Flow Rate (cfs)	7.2162
24-Hr Clear Runoff Volume (ac-ft)	1.2308
24-Hr Clear Runoff Volume (cu-ft)	53614.6458



50-YEAR STORM PROPOSED HYDROLOGY

DRAINAGE AREA A

Peak Flow Hydrologic Analysis

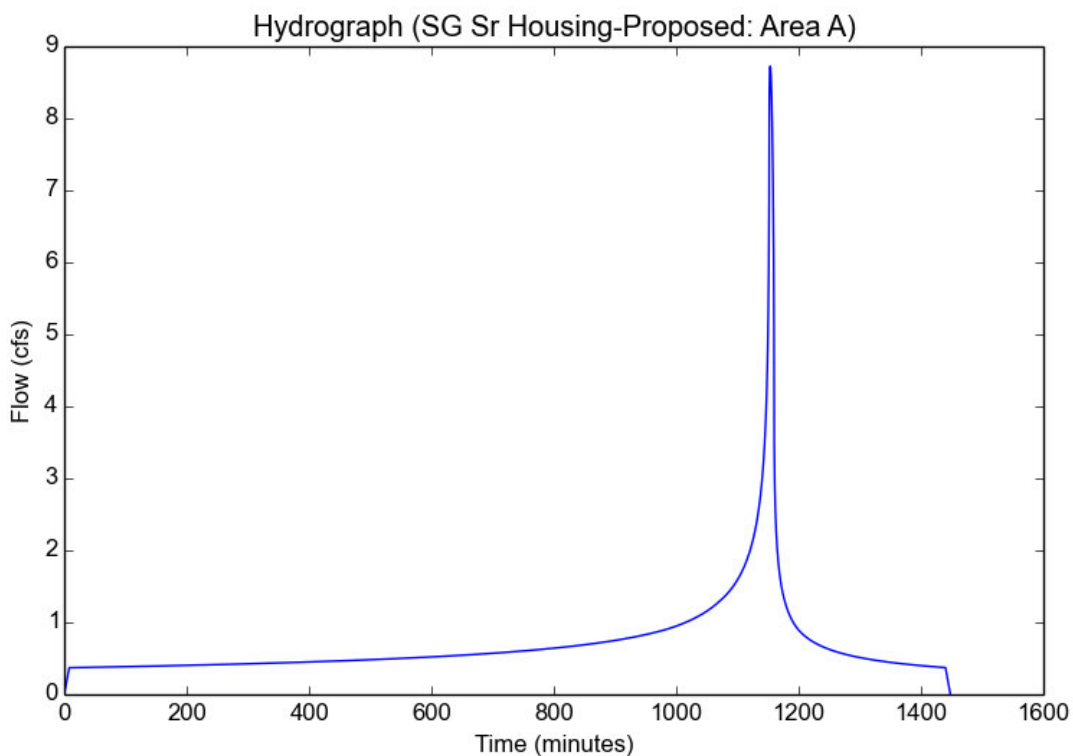
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Version: HydroCalc 1.0.2

Input Parameters

Project Name	SG Sr Housing-Proposed
Subarea ID	Area A
Area (ac)	3.0
Flow Path Length (ft)	730.0
Flow Path Slope (vft/hft)	0.008
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.9
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.2529
Undeveloped Runoff Coefficient (Cu)	0.84
Developed Runoff Coefficient (Cd)	0.894
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	8.7244
Burned Peak Flow Rate (cfs)	8.7244
24-Hr Clear Runoff Volume (ac-ft)	1.4051
24-Hr Clear Runoff Volume (cu-ft)	61204.0397

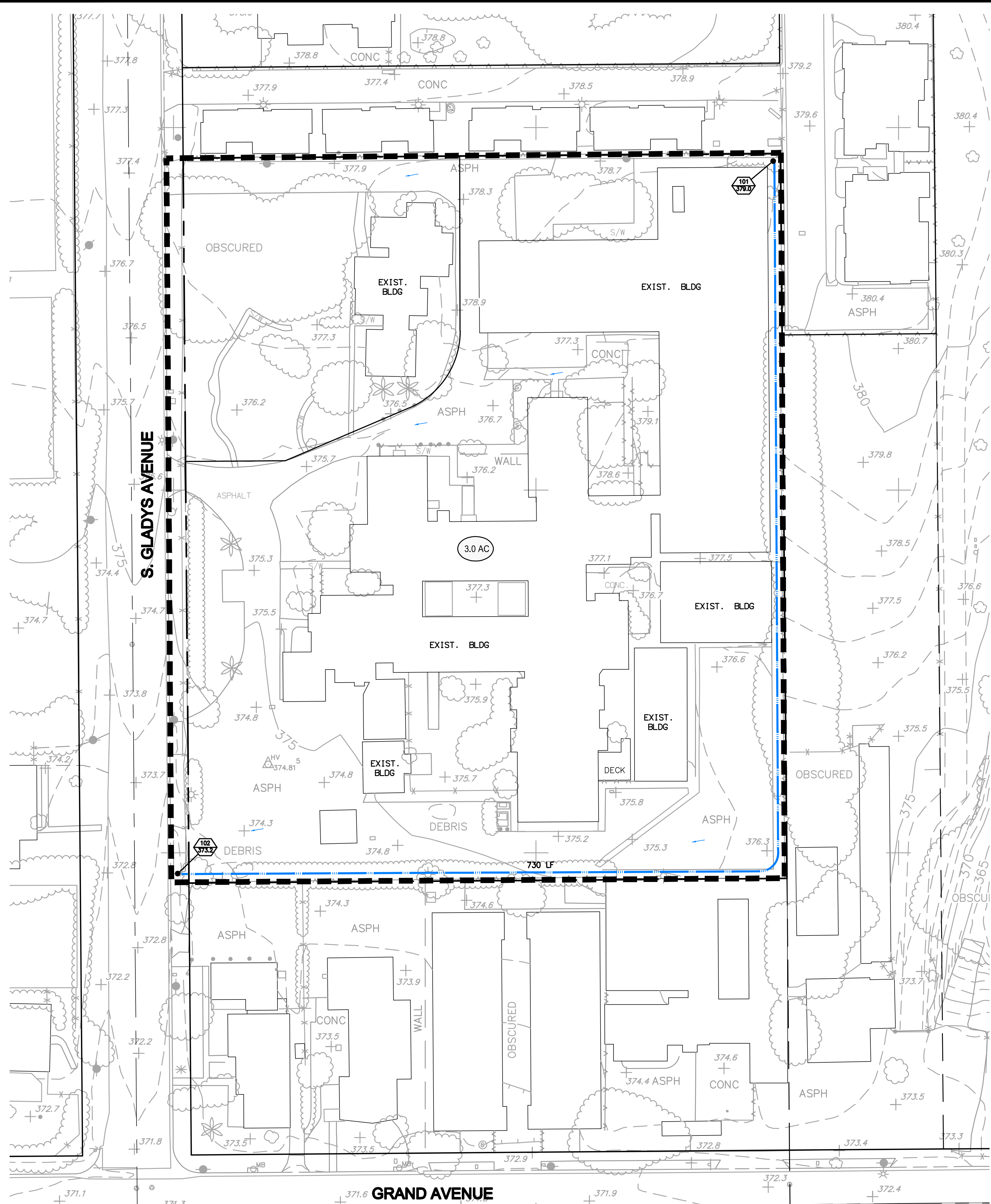


LIST OF MAPS

EXISTING HYDROLOGY MAP

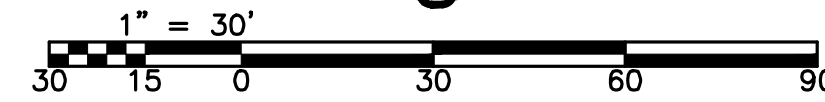
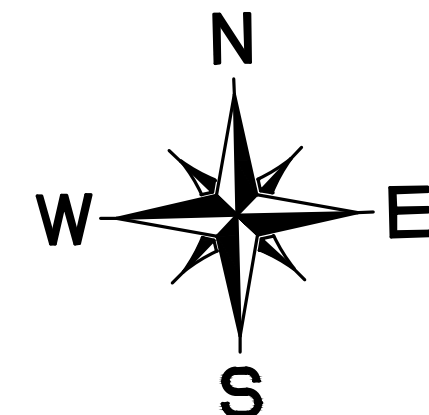
PROPOSED HYDROLOGY MAP

Plotted: Jan 04, 2017 - 5:11pm by: C.House Drawing Name: K:\02025\000\DWG\REPORTS\Water\EAH\025-HD-EX.dwg Tab: Layout1



LEGEND

- WATERSHED BOUNDARY
- WATER COURSE
- FLOW DIRECTION AREA
- DESIGNATION AREA (ACRES)
- NODE ELEVATION

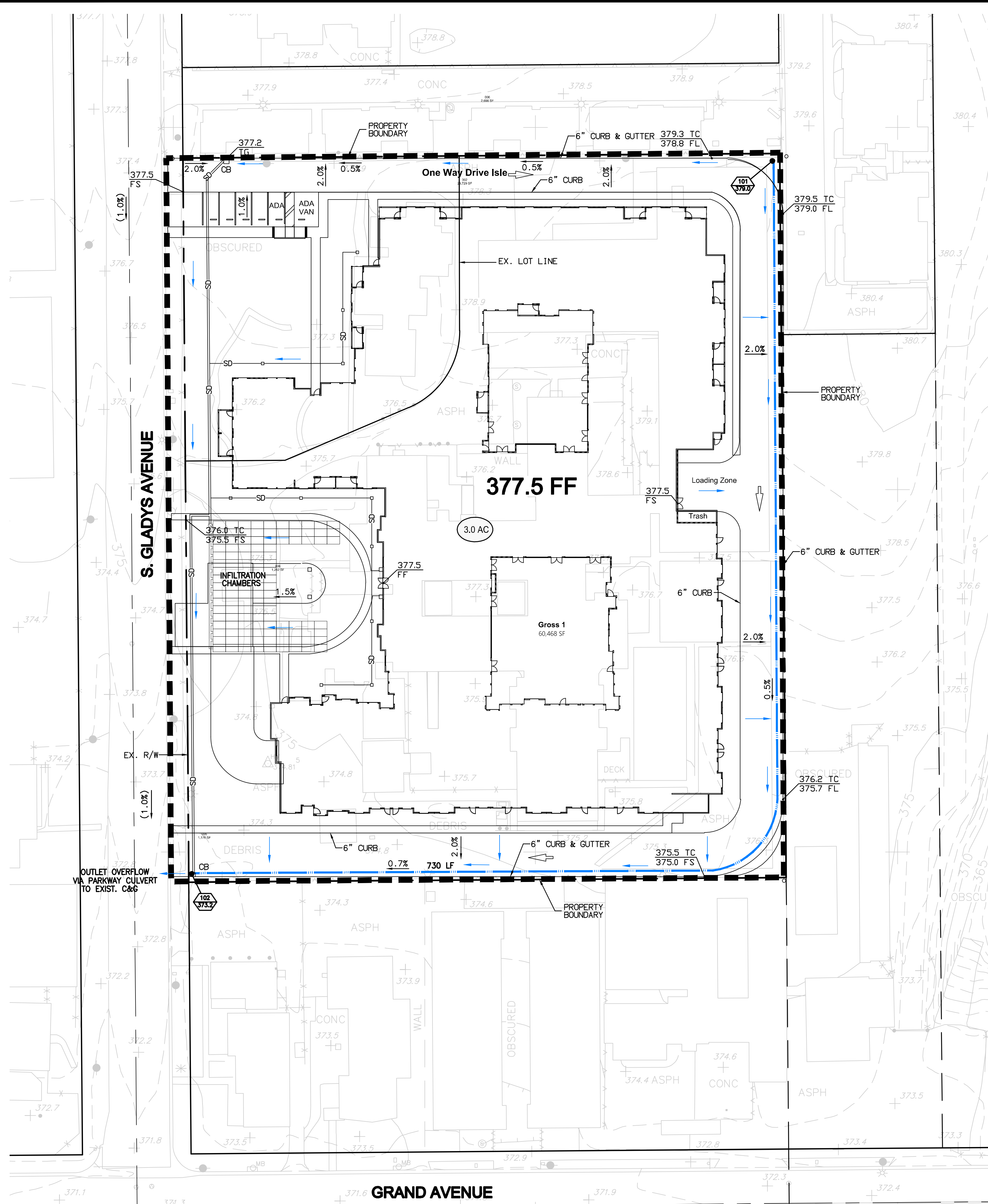


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SAN GABRIEL SENIOR HOUSING PROJECT
 824 S. GLADYS AVENUE
 SAN GABRIEL, CA

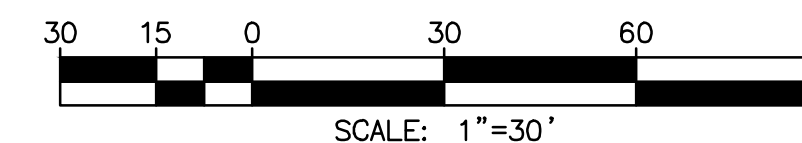
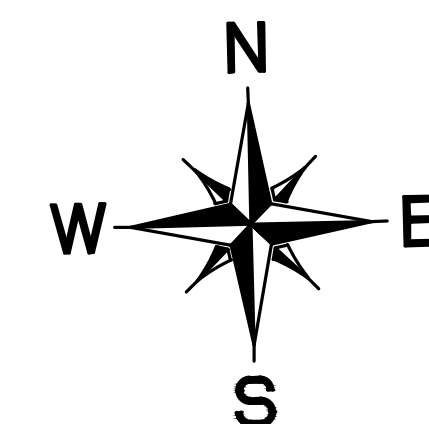
EXISTING HYDROLOGY MAP

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LEGEND

- WATERSHED BOUNDARY
- WATER COURSE
- FLOW DIRECTION AREA
- DESIGNATION AREA (ACRES)
- NODE ELEVATION



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 SAN GABRIEL, CA

PROPOSED HYDROLOGY MAP