HYDROLOGY & HYDRAULIC REPORT

TRACT 8775

2492 D STREET, HAYWARD, CA

APN 416-200-22-6

ALAMEDA COUNTY

CALIFORNIA

(VESTING TENTATIVE MAP)

Prepared by

Milani & Associates

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Job No. 3636

HYDROLOGY REPORT

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SUMMARY & BACKGROUND

At the request of the property owner, 94541 D LLC, Milani & Associates has performed a preliminary hydraulic/hydrology study for the proposed seventeen (17) lot, twenty-one (21) unit subdivision located at 2492 D Street, Hayward, Alameda County, CA. The project comprises all of assessor parcel 416-200-22-5.

EXISTING CONDITIONS

The existing site is zoned Fairview Area Specific Plan, Residential 17 with Housing Element Overlay (FA-17-HE) and encompasses 3.11 acres.

The existing site contains approximately 1,850 sf of impervious surface, consisting of an abandoned, single story residential structure which is scheduled for demolition.

PROPOSED DEVELOPMENT

The proposed development consists of a mixed-unit development consisting of fourteen (14) detached, story single family units together with three (3) multi-family sites consisting of 7 proposed townhouse units. The proposed development will maintain access from “D” Street, a public roadway maintained by the City of Hayward. The site will obtain: 1) water service from EBMUD from an existing 12” water main and 2) Gas, Electric, telephone and related services located within in “D” Street . Public sewer service will be provide by Oro Loma with existing public sewer facilities located north of the project development.

The project maintains a City of Hayward address but is located in the Fairview District, an unincorporated portion of the City, subject to Alameda County review and approval.

The project development will maintain the historic drainage patterns within the development footprint, maintaining current drainage inlet structures and current historic drainage locations.

The project, as proposed, avoids previously mapped wetland features. These features have been field inspected and verified by Salex.

DESIGN GOALS AND OBJECTIVES

The proposed site improvements within proposed Parcel B will be subject to hydromodification. Post excess storm discharge flows originating from the project site will not exceed historic excess storm flows. This design provision maintains the integrity of all downstream drainage facilities.

Design Guidelines

Onsite interim drainage detention facilities will be provided to mitigate 100-year post development excess storm flows originating from the project development site such that post development flows will be reduced to historic 100-year pre-development excess storm flows.

Storage Computations:

Preliminary Storage computations will utilize onsite detention within private storm drainpipe elements within the private C.3 basin located along the westerly edge of the private roadway serving the project development.

Required storage volume:

The required storage volume will be determined by using a modified rational method to computed synthetic hydrographs for both the historic and post development conditions. Alameda County Mean Annual Precipitation Mapping and Depth Duration Curves will be utilized. The referenced documents can be found in the appendix section of this report.

The following will be utilized in the preliminary computations:

MAP = 23”

Tc = 60’

Composite Historic C factor = {(3.068 ac * 0.3) + (0.042 ac * 0.9)}/3.11 = 0.30

Post development C factor (composite) = [(1.64 ac * 0.90) + (1.47 ac * 0.30)]/3.11 ac = 0.62

Q100 (historic) = 0.30 * 3.11 acres * 1.38 “/hr =1.29 cfs (rounded to 1.3 cfs)

Q100 (post development) = 0.62 *3.11 ac* 1.38”/hr = 2.6 cfs

Under a rational method synthetic hydrograph, the rising limb of the hydrograph comprises 1/3 0f the storm duration with the descending limb comprising 2/3 of the hydrograph.

The required storage volume would be computed by determining the difference between the volume of the two hydrographs.

The required storage volume would be computed as follows:

Post- Development Hydrograph volume – Pre-development Hydrograph Volume:

Storage = [0.5 * (60'*60) * 2.6 cfs] – [0.5 * (60*60) * 1.3 cfs] = 4,750 cf – 2,320 cf = 2,430 cf

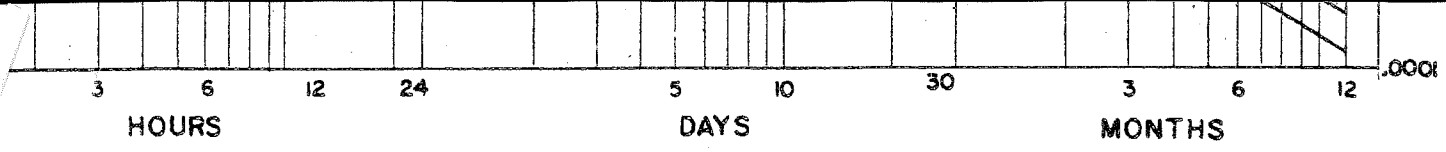
Required Storage Volume = 2,430 cf.

Storage Facility Location:

The proposed detention (storage facility) is a proposed underground storage tank within the large project C.3 basin located westerly of Lots 2 and 3 as reflected on the proposed Vesting Tentative Map exhibit. The proposed preliminary structure will retain approximately 2,725 cf of excess storm runoff with a proposed outlet metering structure that will reduce peak, post development storm flows to pre-historic development levels.

Final design elements will be included in the final design drawings for the project once the project obtains all discretionary approvals and proceeds with final design drawings.

Appendix



EXAMPLE: Determining Rainfall Intensity
(for use with the Rational Formula, $Q_x = C i_x A$)

Determining the intensity i

Given watershed location: Castro Valley

Using the 15 year recurrence frequency.

The Average Mean Annual Precipitation (MAP) for the watershed is 23inches from the isohyetal map.

The Time of Concentration = 28 minutes (assumed)

From the Unit Intensity Curve

$I_x = I_{15} = 0.064\ hour^{-1}$

$i_{15} = I_{15} \times MAP = 0.064\ hr^{-1} \times 23in = 1.47\ in/hr$

Determining the Mass Precipitation for Detention Retention Basin Design

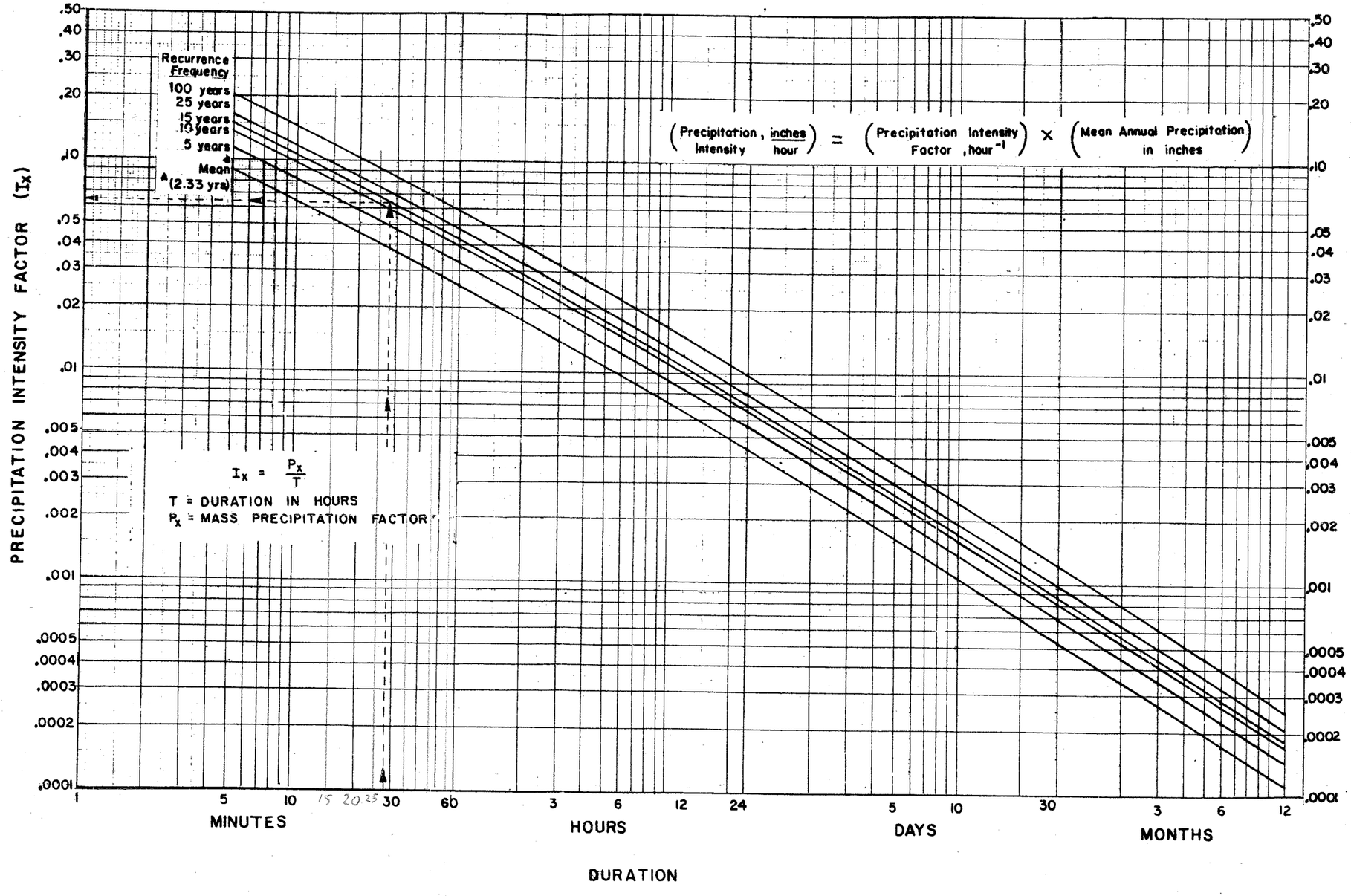
(Based on a 24 hour storm duration, 100 year recurrence frequency)

From the Unit Mass Precipitation Curve

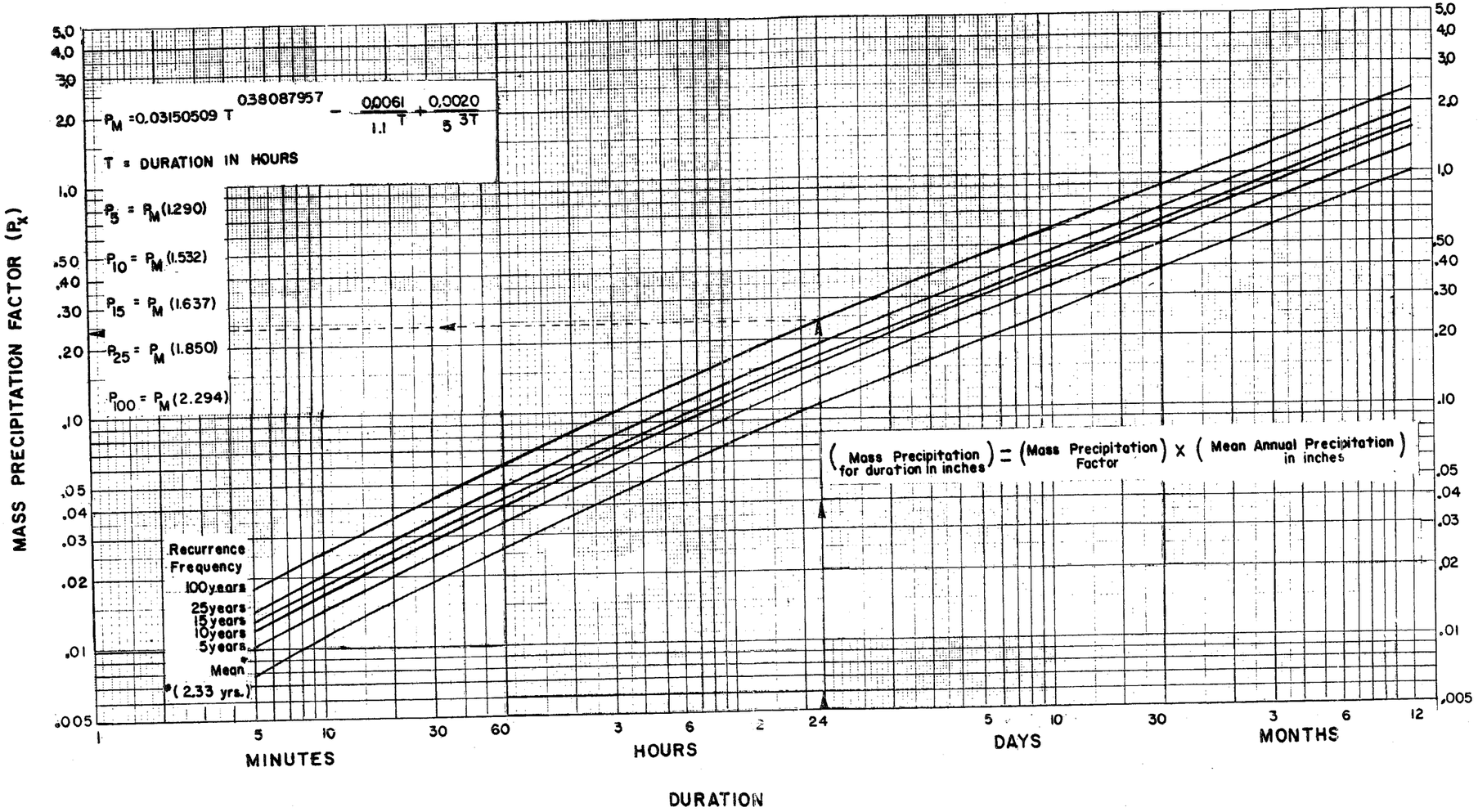
$P_x = P_{100} = 0.24$

Mass Precipitation = $P_{100} \times MAP = 0.24 \times 23in = 5.52in$

UNIT INTENSITY CURVES



UNIT MASS PRECIPITATION CURVES




Piedmont
Oakland
San Leandro
Watershed Example
Castro Valley
San Lorenzo
Hayward
Dublin
Fremont
Newark
Mission San Jose Dist
Warm Springs Dist
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SCALE